Universidade Fernando Pessoa
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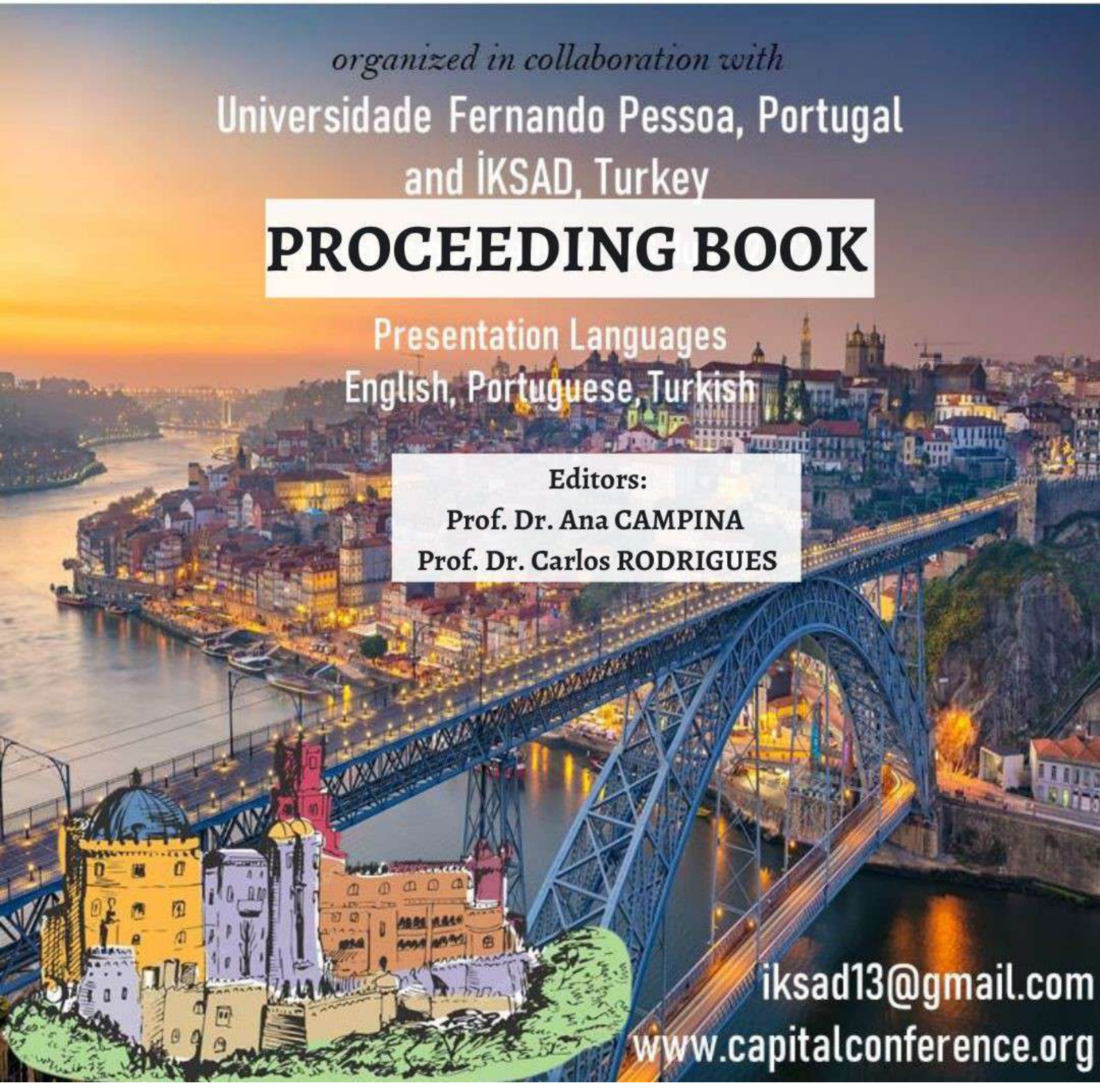
INTERNATIONAL CAPITAL CONFERENCE on MULTIDISCIPLINARY SCIENTIFIC RESEARCH

Lisbon-Portugal
In person & virtual participation
13 - 14 July 2022



organized in collaboration with
Universidade Fernando Pessoa, Portugal
and İKSAD, Turkey

PROCEEDING BOOK

Presentation Languages
English, Portuguese, Turkish

Editors:
Prof. Dr. Ana CAMPINA
Prof. Dr. Carlos RODRIGUES

iksad13@gmail.com
www.capitalconference.org



INTERNATIONAL CAPITAL CONFERENCE ON MULTIDISCIPLINARY SCIENTIFIC RESEARCH

PROCEEDING BOOK

13 -14 July 2022
Lisbon, Portugal

Editors:
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Prof. Dr. Carlos RODRIGUES

ISBN: 978-625-8323-93-1

CONFERENCE ID

CONFERENCE TITLE

INTERNATIONAL CAPITAL CONFERENCE ON MULTIDISCIPLINARY SCIENTIFIC RESEARCH

DATE AND PLACE

13 -14 July 2022 Lisbon, Portugal

IKSAD- www.iksad.org.tr

ORGANIZATION

Universidade Fernando Pessoa, Portugal

The Institute of Economic Development and Social Research, Turkey

EVALUATION PROCESS

All applications have undergone a double-blind peer review process

PRESENTATION LANGUAGES

English, Portuguese, Turkish

TOTAL NUMBER OF PAPER: 134

Rejected: 34

Turkey: 60

Other Countries: 74

PARTICIPANTS' COUNTRIES

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PHOTO






The dielectric constant of the skin change in the anterior tibial muscle induced by local acupuncture stimulation
João Eduardo de Araujo, PT, Ph.D



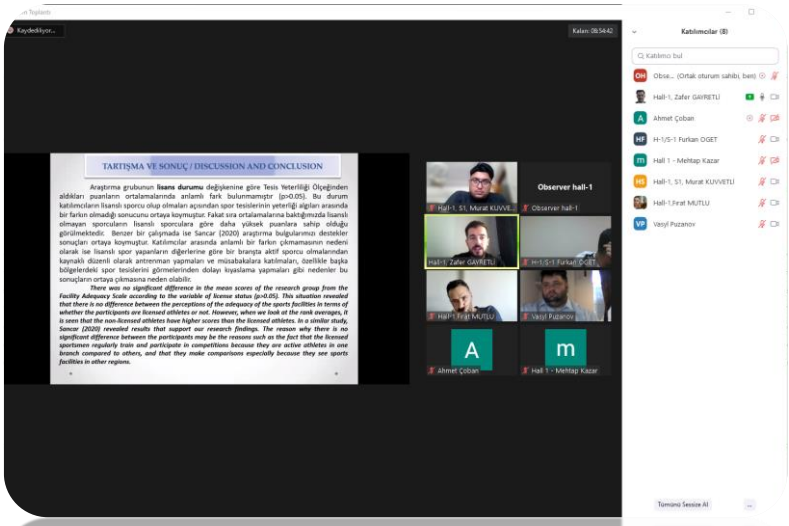


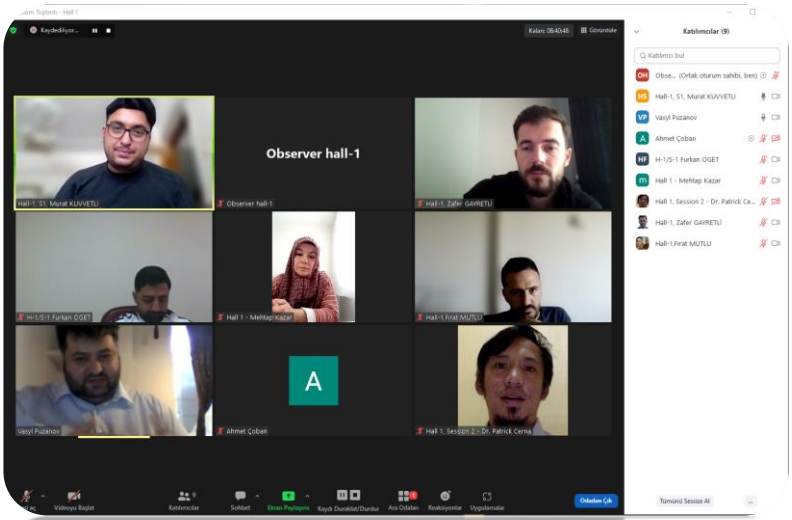


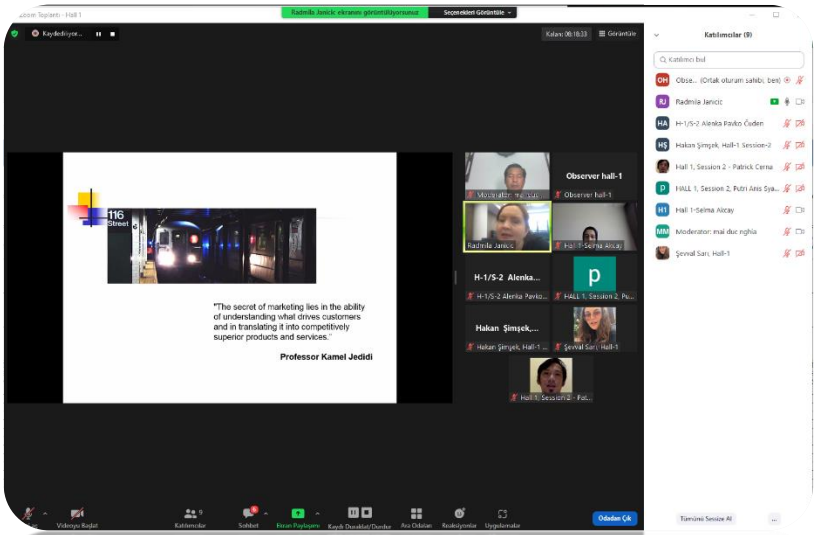


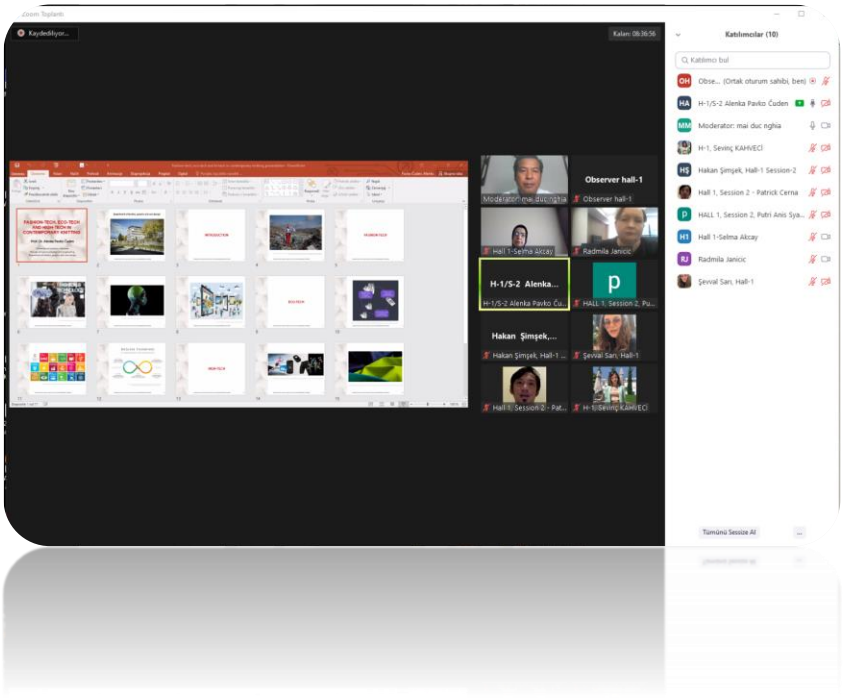


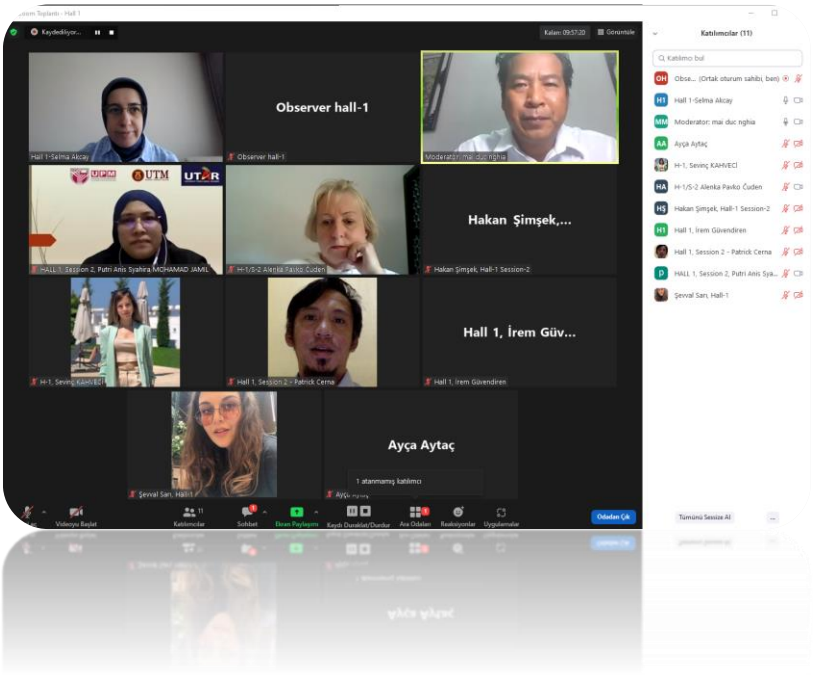


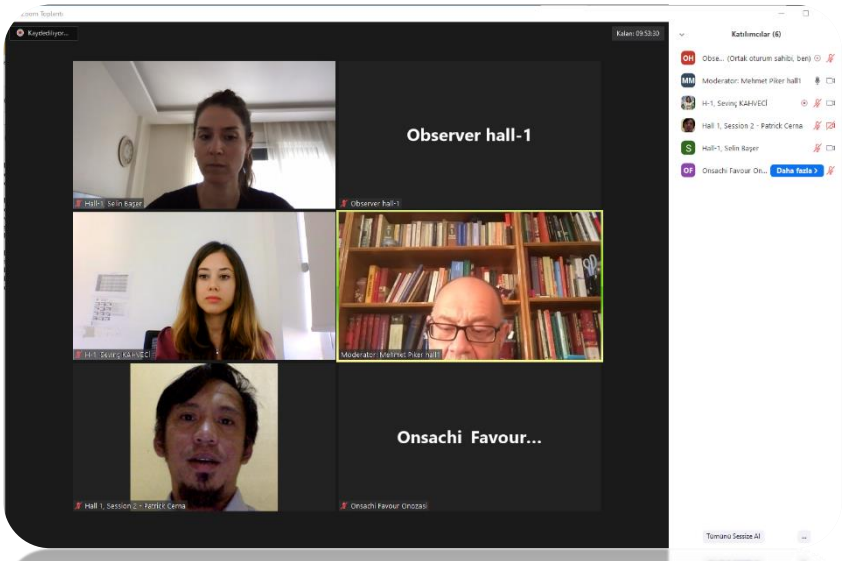

TARTIŞMA VE SONUÇ / DISCUSSION AND CONCLUSION
Araştırma grubunun lisans durumu değişkenine göre Tesis Yeterliliği Ölçeğinden aldıkları puanların ortalamalarında anlamlı fark bulunmamıştır (p>0.05). Bu durum katılımcıların lisanslı sporcu olup olmaları açısından spor tesislerinin yeterliği algıları arasında bir farkın olmadığı sonucunu ortaya koymuştur. Fakat sıra ortalamalarına baktığımızda lisanslı olmayan sporcuların lisanslı sporculara göre daha yüksek puanlara sahip olduğu görülmektedir. Benzer bir çalışmada ise Sancar (2020) araştırma bulgularımızı destekler sonuçları ortaya koymuştur. Katılımcılar arasında anlamlı bir farkın çıkmamasının nedeni olarak ise lisanslı spor yapanların diğerlerine göre bir branşta aktif sporcu olmalarından kaynaklı düzenli olarak antrenman yapmaları ve müsabakalara katılmaları, özellikle başka bölgelerdeki spor tesislerini görmelerinden dolayı kıyaslama yapmaları gibi nedenler bu sonuçların ortaya çıkmasına neden olabilir.
There was no significant difference in the mean scores of the research group from the Facility Adequacy Scale according to the variable of license status (p>0.05). This situation revealed that there is no difference between the perceptions of the adequacy of the sports facilities in terms of whether the participants are licensed athletes or not. However, when we look at the rank averages, it is seen that the non-licensed athletes have higher scores than the licensed athletes. In a similar study, Sancar (2020) revealed results that support our research findings. The reason why there is no significant difference between the participants may be the reasons such as the fact that the licensed sportsmen regularly train and participate in competitions because they are active athletes in one branch compared to others, and that they make comparisons especially because they see sports facilities in other regions.
Observer hall-1
Hall-1, S1, Murat KUVVETLİ
Hall-1, Zafer GAYRETLİ
H-1/S-1 Furkan OGET
Hall-1,Firat MUTLU
Vasyl Puzanov
Ahmet Çoban
Hall 1 - Mehtap Kazar
Katılımcılar (8)
Tümünü Sessize Al

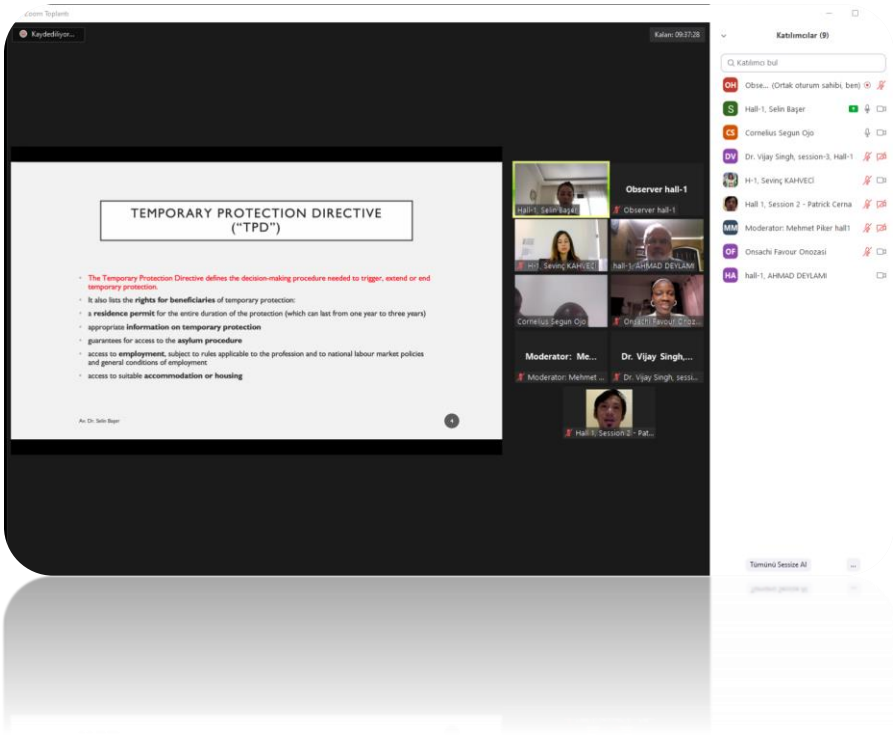

Observer hall-1
Hall-1, S1, Murat KUVVETLİ
Hall-1, Zafer GAYRETLİ
H-1/S-1 Furkan OGET
Hall 1 - Mehtap Kazar
Hall-1,Firat MUTLU
Vasyl Puzanov
Ahmet Çoban
Hall 1, Session 2 - Dr. Patrick Cerna
Katılımcılar (9)
Tümünü Sessize Al

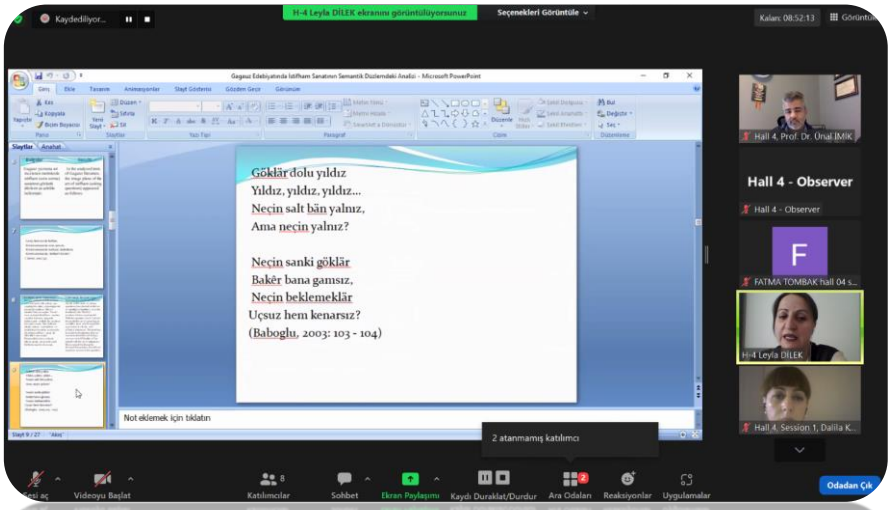

"The secret of marketing lies in the ability of understanding what drives customers and in translating it into competitively superior products and services."
Professor Kamel Jedidi
Observer hall-1
Radmila Janicic
H-1/S-2 Alenka...
Hakan Şimşek,...
Şevval Sarı, Hall-1
Katılımcılar (9)
Tümünü Sessize Al

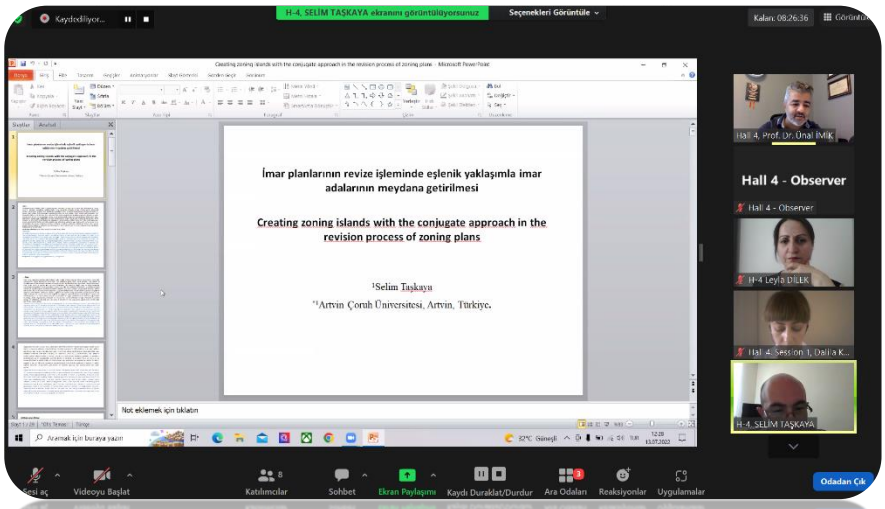

Observer hall-1
H-1/S-2 Alenka...
Hakan Şimşek,...
Katılımcılar (10)

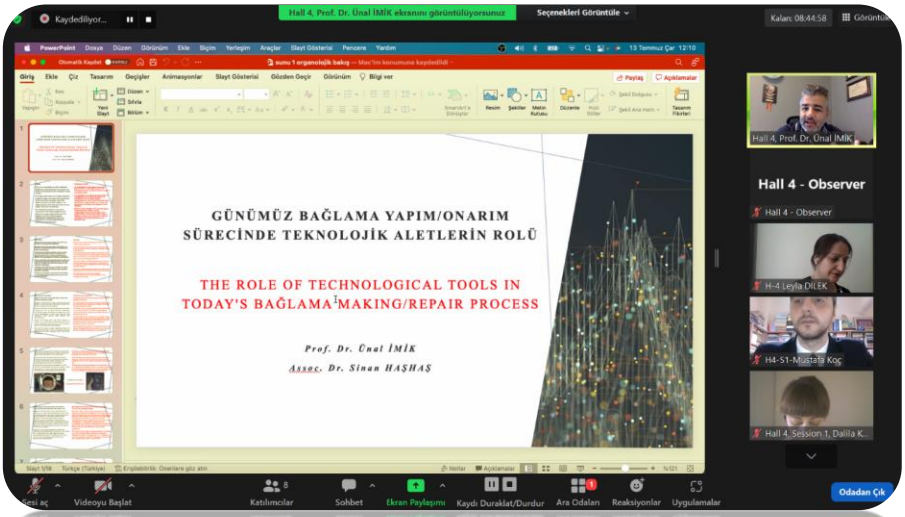

Observer hall-1
Hakan Şimşek,...
Hall 1, İrem Güv...
Ayça Aytaç
Katılımcılar (11)

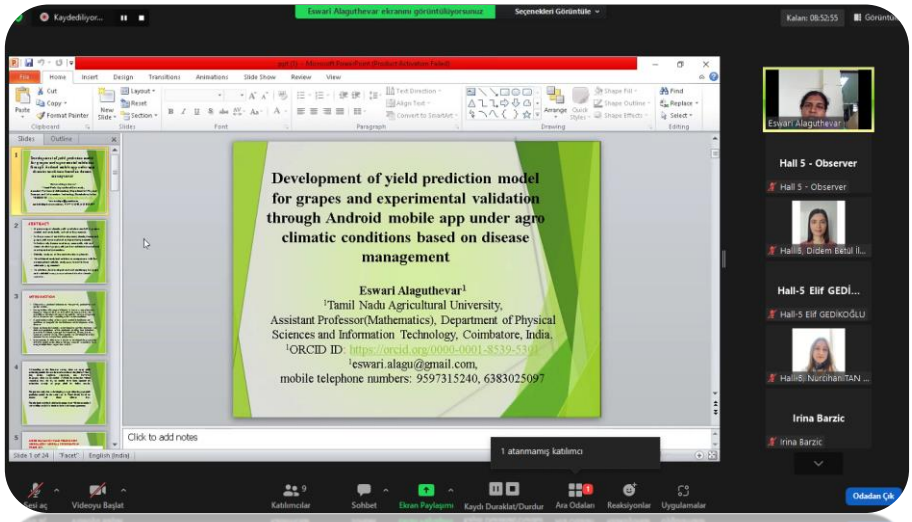

Observer hall-1
Onsachi Favour...
Katılımcılar (6)

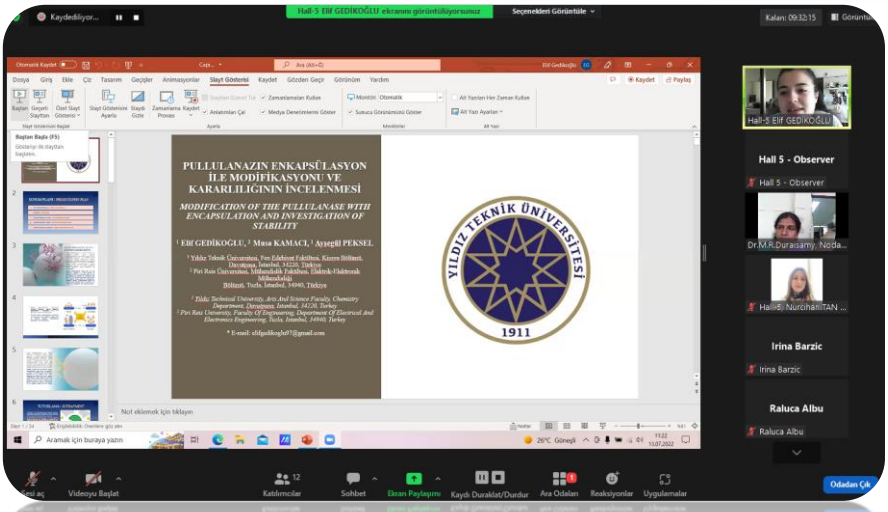

Kaydediliyor...
Kalan: 09:37:28
TEMPORARY PROTECTION DIRECTIVE
("TPD")
The Temporary Protection Directive defines the decision-making procedure needed to trigger, extend or end temporary protection.
It also lists the rights for beneficiaries of temporary protection:
a residence permit for the entire duration of the protection (which can last from one year to three years)
appropriate information on temporary protection
guarantees for access to the asylum procedure
access to employment, subject to rules applicable to the profession and to national labour market policies and general conditions of employment
access to suitable accommodation or housing
Katılımcılar (9)
Observer hall-1
Moderator: Me...
Dr. Vijay Singh,...
Tümünü Sessize Al

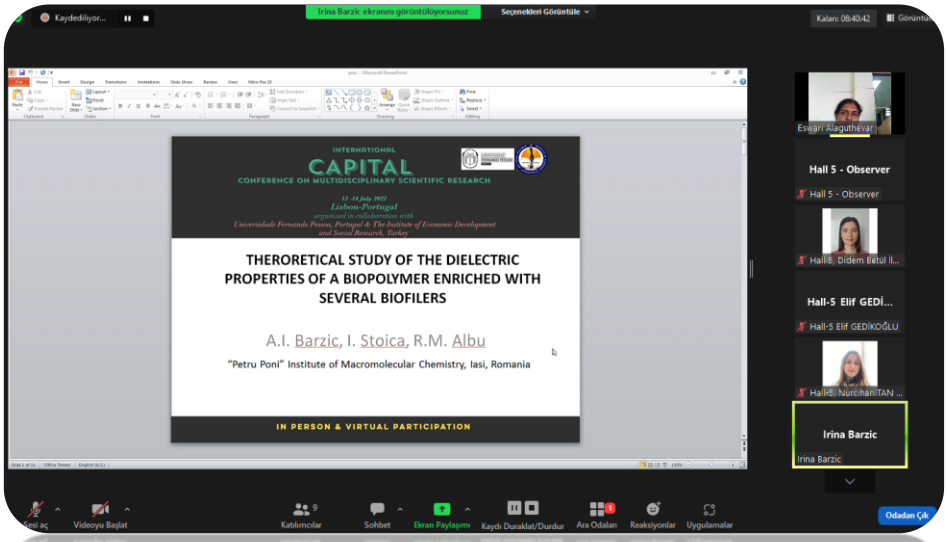

Kaydediliyor...
H-4 Leyla DİLEK ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
Kalan: 08:52:13
Göklər dolu yıldız
Yıldız, yıldız, yıldız...
Neçin salt bân yalnız,
Ama neçin yalnız?
Neçin sanki göklər
Bakêr bana gamsız,
Neçin beklemeklər
Uçsuz hem kenarsız?
(Baboglu, 2003: 103 - 104)
Not eklemek için tıklatın
2 atanmamış katılımcı
Hall 4, Prof. Dr. Ünal İMİK
Hall 4 - Observer
FATMA TOMBAK hall 04 s...
H-4 Leyla DİLEK
Hall 4, Session 1, Dalila K...
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Ara Odaları
Reaksiyonlar
Uygulamalar
Odadan Çık

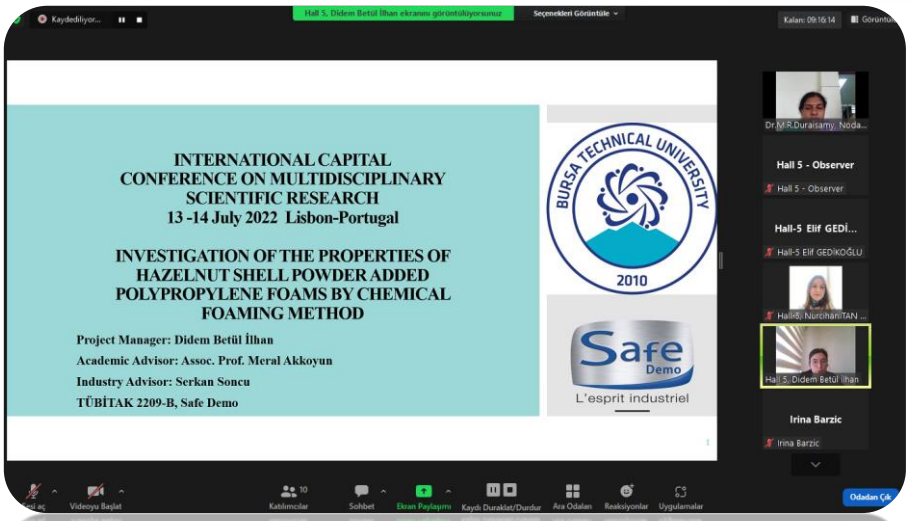

Kaydediliyor...
H-4, SELİM TAŞKAYA ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
Kalan: 08:26:36
İmar planlarının revize işleminde eşlenik yaklaşımla imar adalarının meydana getirilmesi
Creating zoning islands with the conjugate approach in the revision process of zoning plans
[1]Selim Taşkaya
[*1]Artvin Çoruh Üniversitesi, Artvin, Türkiye,
Not eklemek için tıklatın
Hall 4, Prof. Dr. Ünal İMİK
Hall 4 - Observer
H-4 Leyla DİLEK
Hall 4, Session 1, Dalila K...
H-4, SELİM TAŞKAYA
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Ara Odaları
Reaksiyonlar
Uygulamalar
Odadan Çık

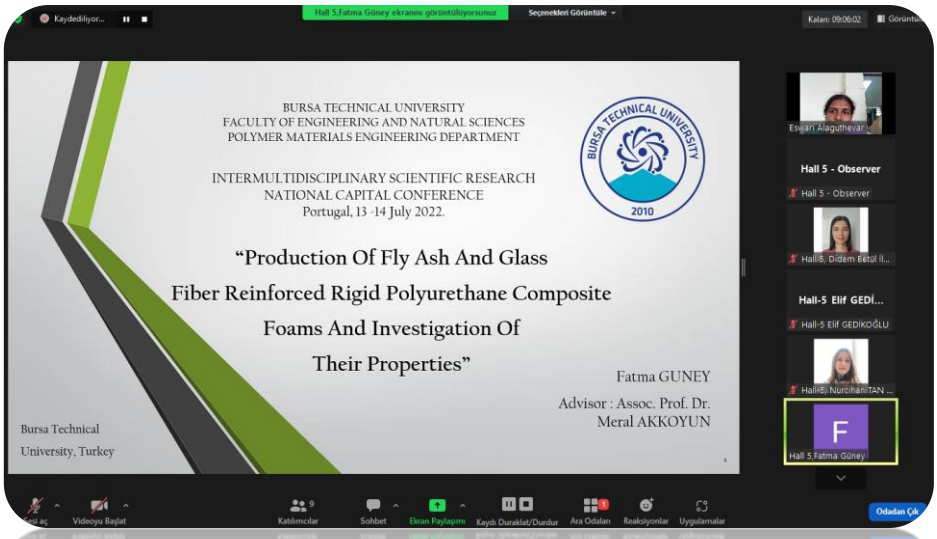

Hall 4, Prof. Dr. Ünal İMİK ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
Kalan: 08:44:58
GÜNÜMÜZ BAĞLAMA YAPIM/ONARIM SÜRECİNDE TEKNOLOJİK ALETLERİN ROLÜ
THE ROLE OF TECHNOLOGICAL TOOLS IN TODAY'S BAĞLAMA[1]MAKING/REPAIR PROCESS
Prof. Dr. Ünal İMİK
Assoc. Dr. Sinan HAŞHAŞ
Hall 4 - Observer
Hall 4, Prof. Dr. Ünal İMİK
H-4 Leyla DİLEK
H4-S1-Mustafa Koç
Hall 4, Session 1, Dalila K...
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Ara Odaları
Reaksiyonlar
Uygulamalar
Odadan Çık

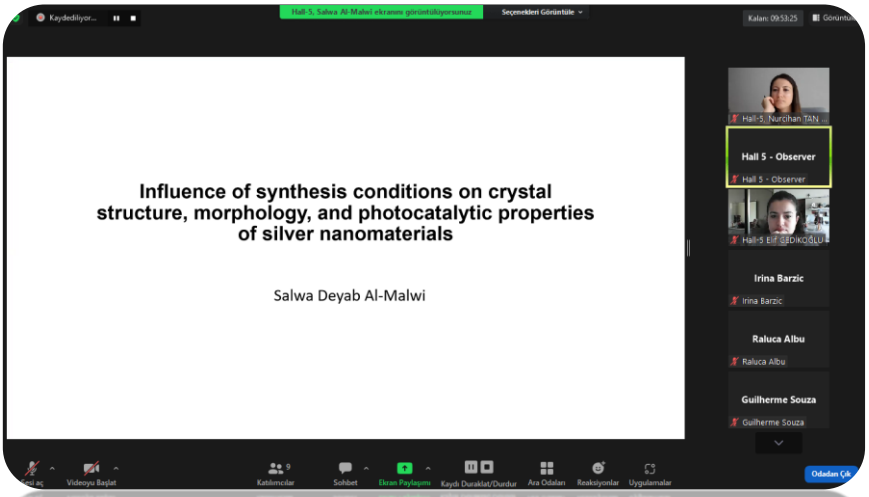

Eswari Alaguthevar ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
Kalan: 08:52:55
Development of yield prediction model for grapes and experimental validation through Android mobile app under agro climatic conditions based on disease management
Eswari Alaguthevar[1]
[1]Tamil Nadu Agricultural University,
Assistant Professor(Mathematics), Department of Physical Sciences and Information Technology, Coimbatore, India.
[1]ORCID ID: https://orcid.org/0000-0001-8539-5301
[1]eswari.alagu@gmail.com,
mobile telephone numbers: 9597315240, 6383025097
Click to add notes
1 atanmamış katılımcı
Hall 5 - Observer
Hall-5 Elif GEDİ...
Irina Barzic
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Ara Odaları
Reaksiyonlar
Uygulamalar
Odadan Çık

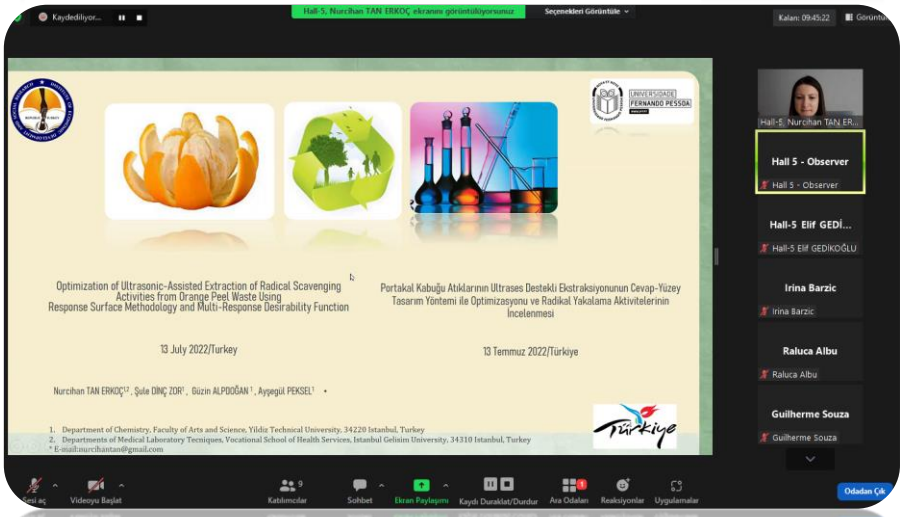

Hall-5 Elif GEDİKOĞLU ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
Kalan: 09:32:15
PULLULANAZIN ENKAPSÜLASYON İLE MODİFİKASYONU VE KARARLILIĞININ İNCELENMESİ
MODIFICATION OF THE PULLULANASE WITH ENCAPSULATION AND INVESTIGATION OF STABILITY
[1] Elif GEDİKOĞLU, [2] Musa KAMACI, [1] Ayşegül PEKSEL
YILDIZ TEKNİK ÜNİVERSİTESİ
1911
Hall 5 - Observer
Irina Barzic
Raluca Albu
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Ara Odaları
Reaksiyonlar
Uygulamalar
Odadan Çık

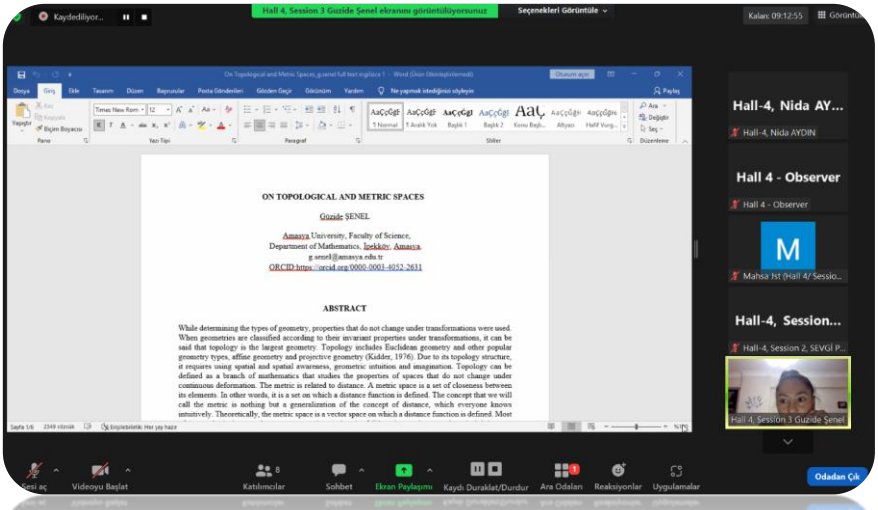

Irina Barzic ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
Kalan: 08:40:42
INTERNATIONAL
CAPITAL
CONFERENCE ON MULTIDISCIPLINARY SCIENTIFIC RESEARCH
13 -14 July 2022
Lisbon-Portugal
organized in collaboration with
Universidade Fernando Pessoa, Portugal & The Institute of Economic Development and Social Research, Turkey
THERORETICAL STUDY OF THE DIELECTRIC PROPERTIES OF A BIOPOLYMER ENRICHED WITH SEVERAL BIOFILERS
A.I. Barzic, I. Stoica, R.M. Albu
"Petru Poni" Institute of Macromolecular Chemistry, Iasi, Romania
IN PERSON & VIRTUAL PARTICIPATION
Hall 5 - Observer
Hall-5 Elif GEDİ...
Irina Barzic
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Ara Odaları
Reaksiyonlar
Uygulamalar
Odadan Çık

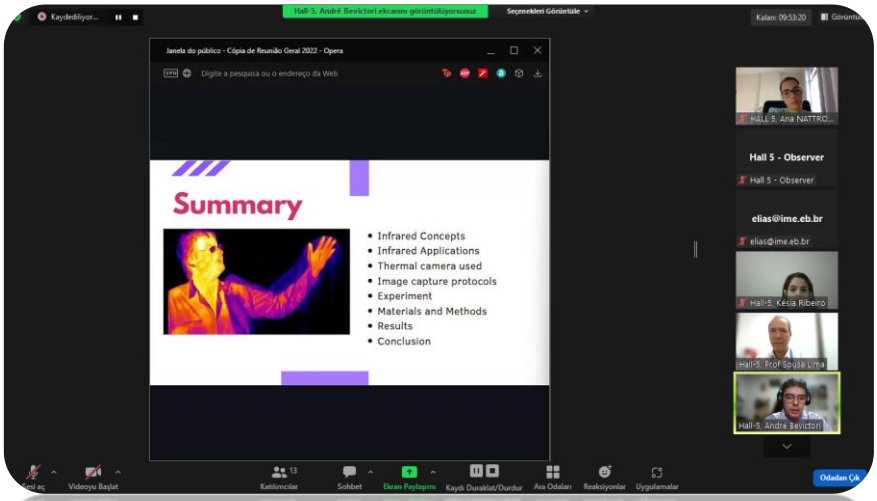

Hall 5, Didem Betül İlhan ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
Kalan: 09:16:14
INTERNATIONAL CAPITAL CONFERENCE ON MULTIDISCIPLINARY SCIENTIFIC RESEARCH
13 -14 July 2022 Lisbon-Portugal
INVESTIGATION OF THE PROPERTIES OF HAZELNUT SHELL POWDER ADDED POLYPROPYLENE FOAMS BY CHEMICAL FOAMING METHOD
Project Manager: Didem Betül İlhan
Academic Advisor: Assoc. Prof. Meral Akkoyun
Industry Advisor: Serkan Soncu
TÜBİTAK 2209-B, Safe Demo
BURSA TECHNICAL UNIVERSITY
2010
Safe Demo
L'esprit industriel
Hall 5 - Observer
Hall-5 Elif GEDİ...
Irina Barzic
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Ara Odaları
Reaksiyonlar
Uygulamalar
Odadan Çık

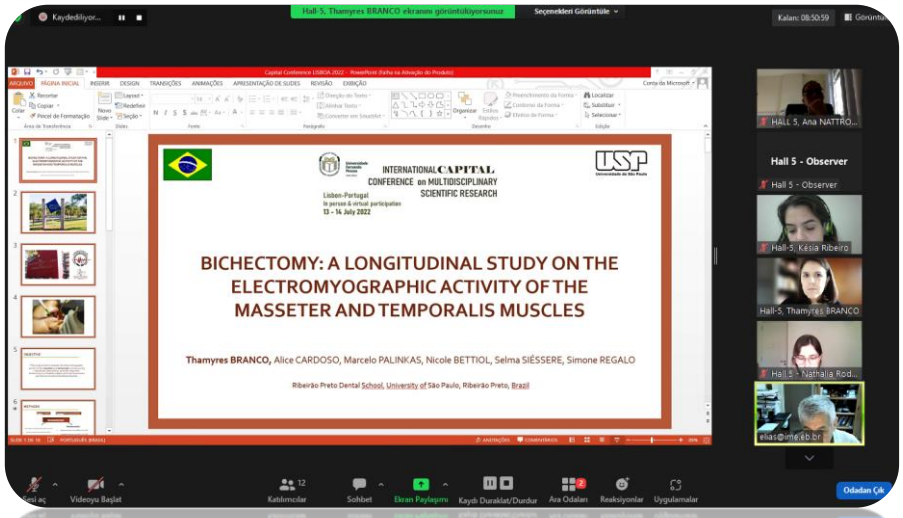

Hall 5,Fatma Güney ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
Kalan: 09:06:02
BURSA TECHNICAL UNIVERSITY
FACULTY OF ENGINEERING AND NATURAL SCIENCES
POLYMER MATERIALS ENGINEERING DEPARTMENT
INTERMULTIDISCIPLINARY SCIENTIFIC RESEARCH
NATIONAL CAPITAL CONFERENCE
Portugal, 13 -14 July 2022.
"Production Of Fly Ash And Glass Fiber Reinforced Rigid Polyurethane Composite Foams And Investigation Of Their Properties"
Fatma GUNEY
Advisor : Assoc. Prof. Dr. Meral AKKOYUN
Bursa Technical University, Turkey
BURSA TECHNICAL UNIVERSITY
2010
Hall 5 - Observer
Hall-5 Elif GEDİ...
Hall 5,Fatma Güney
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Ara Odaları
Reaksiyonlar
Uygulamalar
Odadan Çık

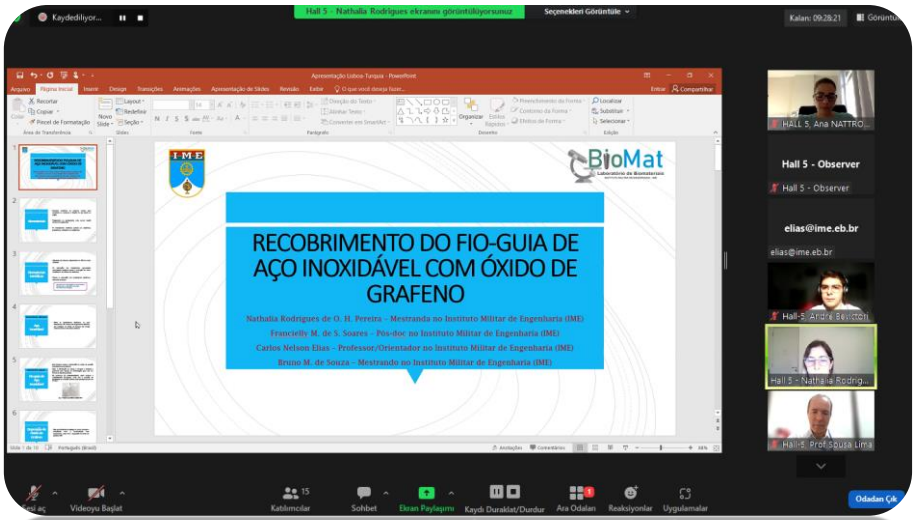

Influence of synthesis conditions on crystal structure, morphology, and photocatalytic properties of silver nanomaterials
Salwa Deyab Al-Malwi
Hall 5 - Observer
Irina Barzic
Raluca Albu
Guilherme Souza


Optimization of Ultrasonic-Assisted Extraction of Radical Scavenging Activities from Orange Peel Waste Using Response Surface Methodology and Multi-Response Desirability Function
13 July 2022/Turkey
Portakal Kabuğu Atıklarının Ultrases Destekli Ekstraksiyonunun Cevap-Yüzey Tasarım Yöntemi ile Optimizasyonu ve Radikal Yakalama Aktivitelerinin İncelenmesi
13 Temmuz 2022/Türkiye
Nurcihan TAN ERKOÇ, Şule DİNÇ ZOR, Güzin ALPDOĞAN, Ayşegül PEKSEL
Hall 5 - Observer
Hall-5 Elif GEDİ...
Irina Barzic
Raluca Albu
Guilherme Souza

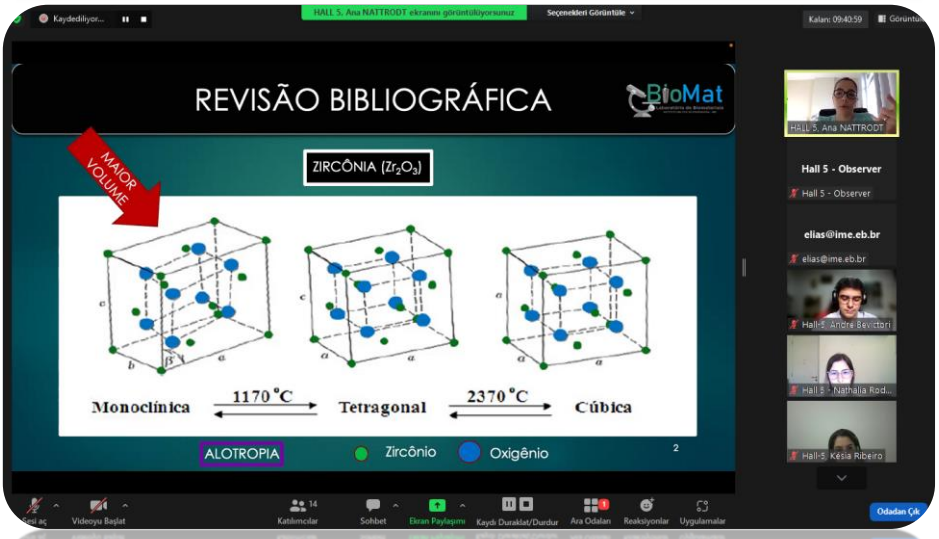

ON TOPOLOGICAL AND METRIC SPACES
Güzide ŞENEL
ABSTRACT
Hall-4, Nida AY...
Hall 4 - Observer
Hall-4, Session...


Hall 5, André Bevictori ekranını görüntülüyorsunuz
Janela do público - Cópia de Reunião Geral 2022 - Opera
Summary
Infrared Concepts
Infrared Applications
Thermal camera used
Image capture protocols
Experiment
Materials and Methods
Results
Conclusion
Hall 5 - Observer
elias@ime.eb.br

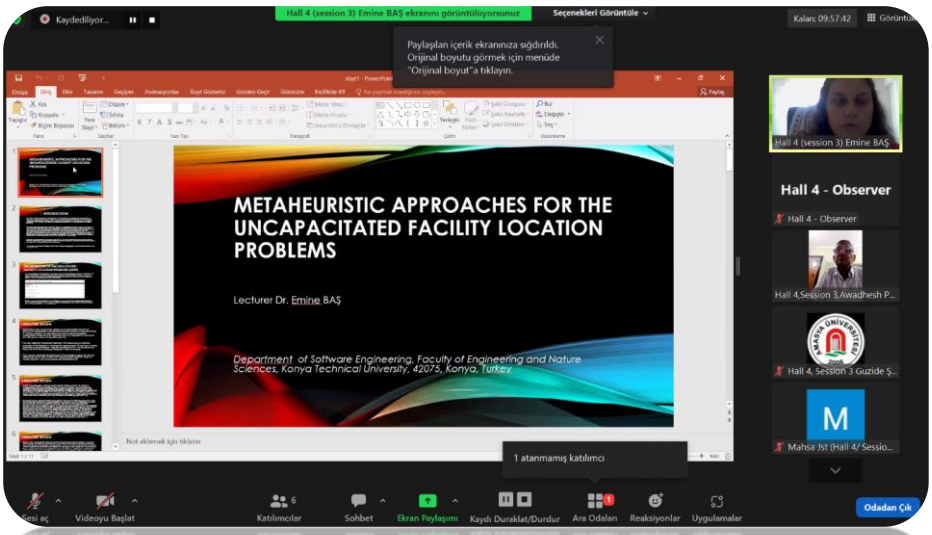

Hall-5, Thamyres BRANCO ekranını görüntülüyorsunuz
INTERNATIONAL CAPITAL CONFERENCE on MULTIDISCIPLINARY SCIENTIFIC RESEARCH
BICHECTOMY: A LONGITUDINAL STUDY ON THE ELECTROMYOGRAPHIC ACTIVITY OF THE MASSETER AND TEMPORALIS MUSCLES
Thamyres BRANCO, Alice CARDOSO, Marcelo PALINKAS, Nicole BETTIOL, Selma SIÉSSERE, Simone REGALO
Hall 5 - Observer

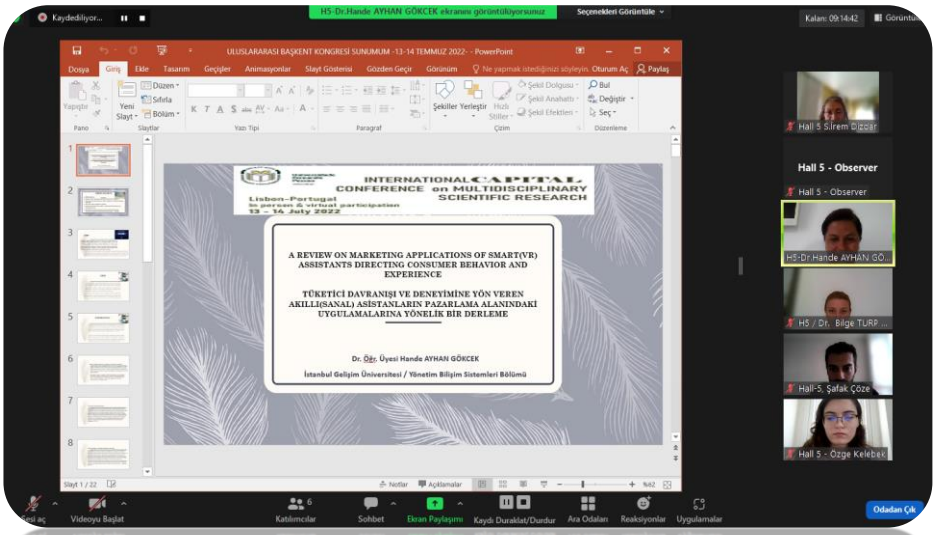

Hall 5 - Nathalia Rodrigues ekranını görüntülüyorsunuz
RECOBRIMENTO DO FIO-GUIA DE AÇO INOXIDÁVEL COM ÓXIDO DE GRAFENO
Hall 5 - Observer
elias@ime.eb.br

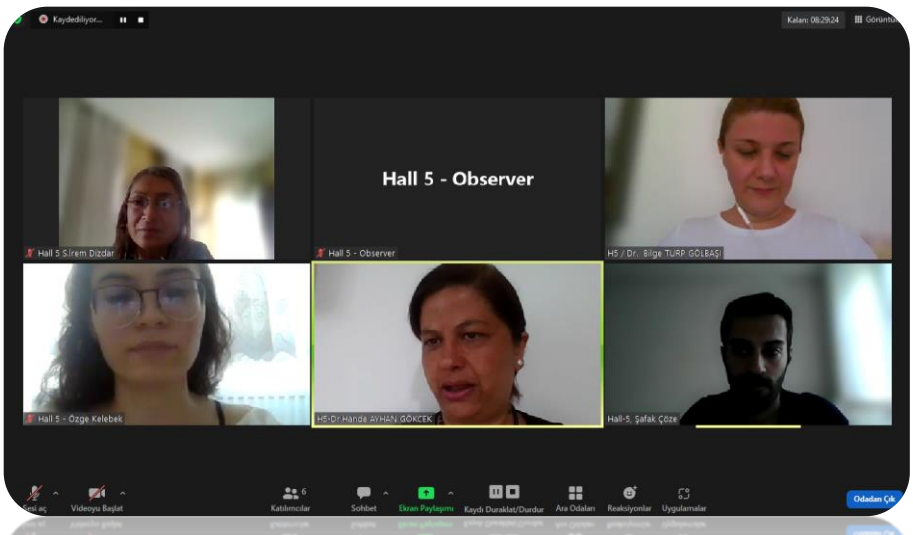

Hall 5, Késia Ribeiro ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
Kalan: 09:21:10
Apresentação de slides do PowerPoint - [Comportamento galvanico entre ligas biomédicas] - Microsoft PowerPoint (Falha na Ativação do Produto)
BioMat
Laboratório de Biomateriais
IME
COMPORTAMENTO GALVÂNICO ENTRE LIGAS BIOMÉDICAS
Késia Simões Ribeiro
Carlos Nelson Elias
Francielly Moura de Souza Soares
Hall 5 - Observer
Hall-5: Késia Ribeiro
elias@ime.eb.br
1 atanmamış katılımcı
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Ara Odaları
Reaksiyonlar
Uygulamalar
Odadan Çık

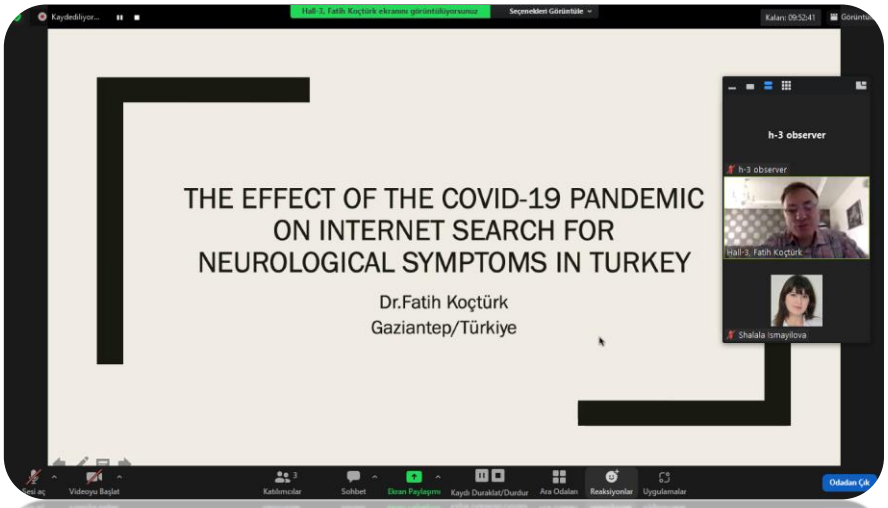

HALL 5, Ana NATTRODT ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
Kalan: 09:40:59
REVISÃO BIBLIOGRÁFICA
BioMat
MAIOR VOLUME
ZIRCÔNIA (Zr_2O_3)
Monoclínica
1170 °C
Tetragonal
2370 °C
Cúbica
ALOTROPIA
Zircônio
Oxigênio
2
HALL 5, Ana NATTRODT
Hall 5 - Observer
elias@ime.eb.br
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Ara Odaları
Reaksiyonlar
Uygulamalar
Odadan Çık

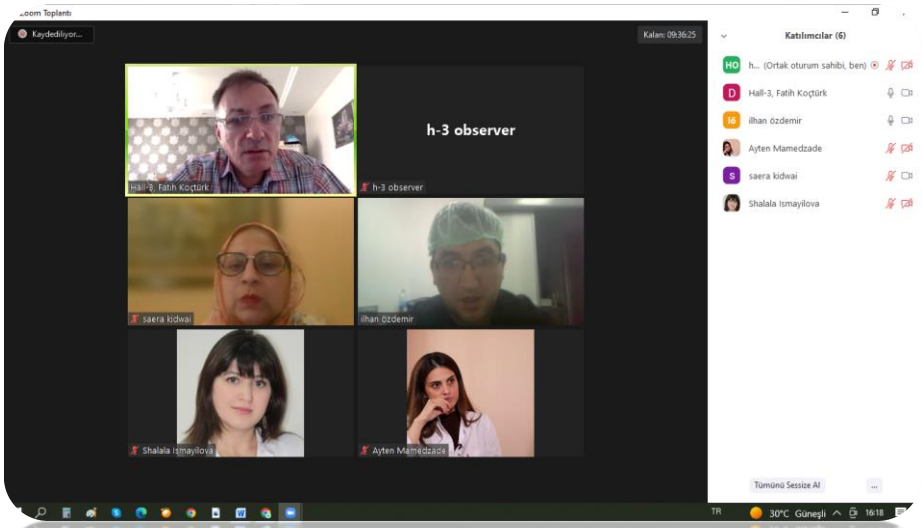

Hall 5, Késia Ribeiro ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
Kalan: 09:21:10
Apresentação de slides do PowerPoint - [Comportamento galvanico entre ligas biomédicas] - Microsoft PowerPoint (Falha na Ativação do Produto)
BioMat
Laboratório de Biomateriais
IME
COMPORTAMENTO GALVÂNICO ENTRE LIGAS BIOMÉDICAS
Késia Simões Ribeiro
Carlos Nelson Elias
Francielly Moura de Souza Soares
Hall 5 - Observer
Hall-5: Késia Ribeiro
elias@ime.eb.br
1 atanmamış katılımcı
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Ara Odaları
Reaksiyonlar
Uygulamalar
Odadan Çık

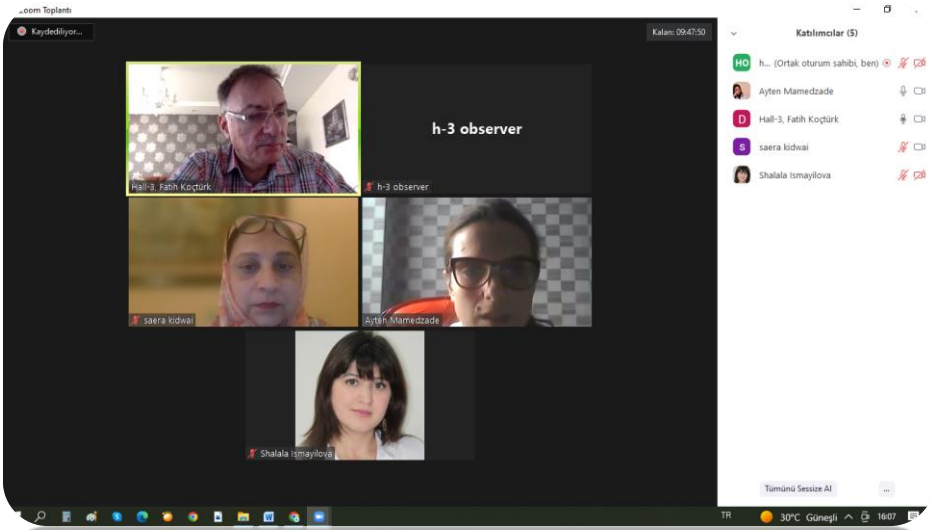

Hall 4 (session 3) Emine BAŞ ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
Paylaşılan içerik ekranınıza sığdırıldı.
Orijinal boyutu görmek için menüde "Orijinal boyut"a tıklayın.
METAHEURISTIC APPROACHES FOR THE UNCAPACITATED FACILITY LOCATION PROBLEMS
Lecturer Dr. Emine BAŞ
Department of Software Engineering, Faculty of Engineering and Nature Sciences, Konya Technical University, 42075, Konya, Turkey
1 atanmamış katılımcı
Hall 4 - Observer
Hall 4 (session 3) Emine BAŞ
Hall 4,Session 3,Awadhesh P...
Hall 4, Session 3 Guzide Ş...
Mahsa Jst (Hall 4/Sessio...
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Ara Odaları
Reaksiyonlar
Uygulamalar
Odadan Çık

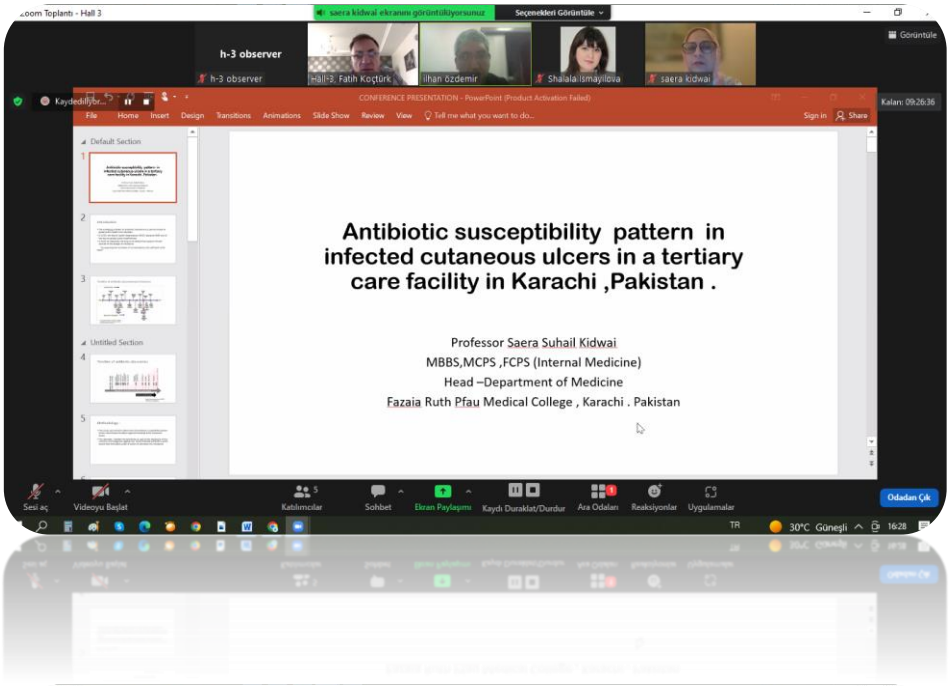

H5-Dr.Hande AYHAN GÖKÇEK ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
ULUSLARARASI BAŞKENT KONGRESİ SUNUMUM -13-14 TEMMUZ 2022- - PowerPoint
INTERNATIONAL CAPITAL CONFERENCE on MULTIDISCIPLINARY SCIENTIFIC RESEARCH
Lisbon-Portugal
In person & virtual participation
13 - 14 July 2022
A REVIEW ON MARKETING APPLICATIONS OF SMART(VR) ASSISTANTS DIRECTING CONSUMER BEHAVIOR AND EXPERIENCE
TÜKETİCİ DAVRANIŞI VE DENEYİMİNE YÖN VEREN AKILLI(SANAL) ASİSTANLARIN PAZARLAMA ALANINDAKİ UYGULAMALARINA YÖNELİK BİR DERLEME
Dr. Öğr. Üyesi Hande AYHAN GÖKÇEK
İstanbul Gelişim Üniversitesi / Yönetim Bilişim Sistemleri Bölümü
Hall 5 - Observer
Hall 5 Sİrem Dizdar
H5-Dr Hande AYHAN GÖ...
H5 / Dr. Bilge TURP ...
Hall-5, Şafak Çöze
Hall 5 - Özge Kelebek
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Ara Odaları
Reaksiyonlar
Uygulamalar
Odadan Çık

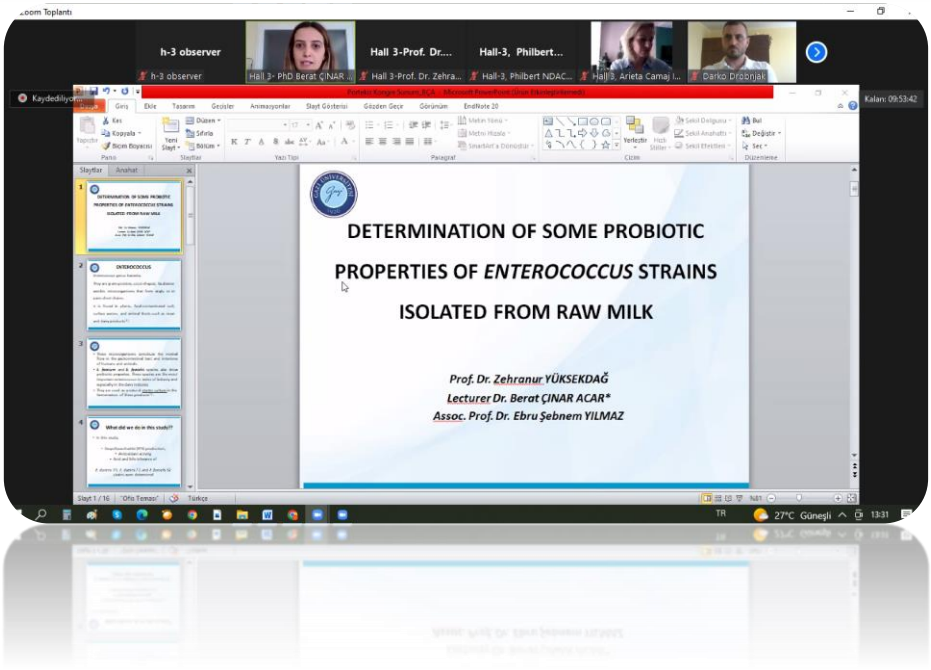

Hall 5 - Observer
Hall 5 Sİrem Dizdar
Hall 5 - Observer
H5 / Dr. Bilge TURP GÖLBAŞI
Hall 5 - Özge Kelebek
H5-Dr Hande AYHAN GÖKÇEK
Hall-5, Şafak Çöze
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Ara Odaları
Reaksiyonlar
Uygulamalar
Odadan Çık

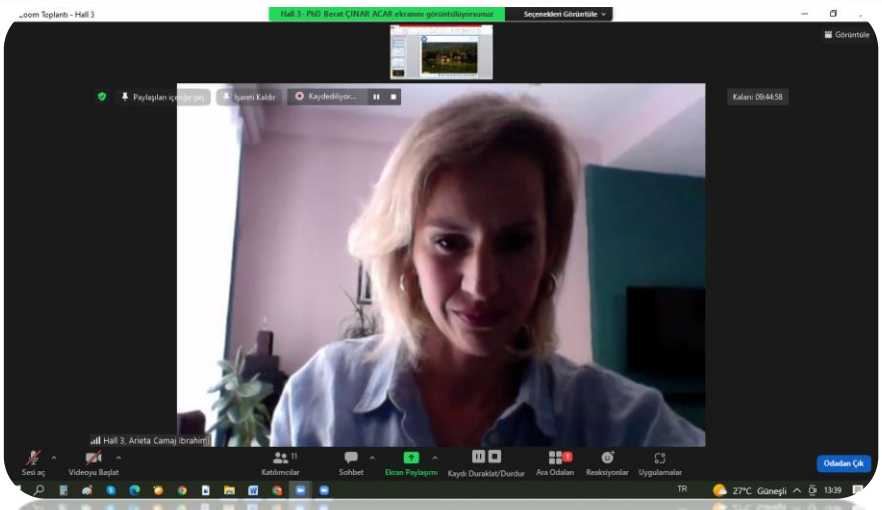

Kaydediliyor...
Hall-3, Fatih Koçtürk ekranını görüntülüyorsunuz
Seçmeleden Görüntüle
Kalan: 09:52:41
THE EFFECT OF THE COVID-19 PANDEMIC ON INTERNET SEARCH FOR NEUROLOGICAL SYMPTOMS IN TURKEY
Dr.Fatih Koçtürk
Gaziantep/Türkiye
h-3 observer
h-3 observer
Hall-3, Fatih Koçtürk
Shalala Ismayilova
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Ara Odaları
Reaksiyonlar
Uygulamalar
Odadan Çık

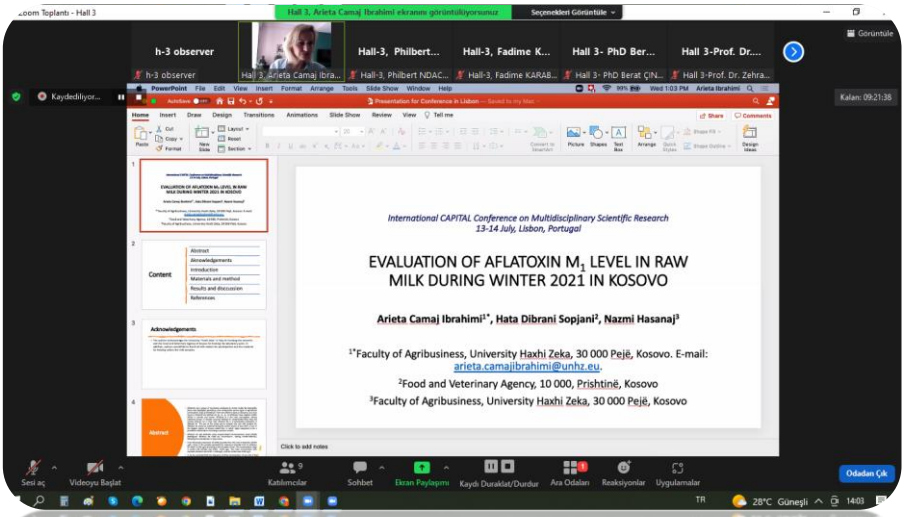

Kaydediliyor...
Kalan: 09:36:25
h-3 observer
Hall-3, Fatih Koçtürk
h-3 observer
saera kidwai
ilhan özdemir
Shalala Ismayilova
Ayten Mamedzade
Katılımcılar (6)
h... (Ortak oturum sahibi, ben)
Hall-3, Fatih Koçtürk
ilhan özdemir
Ayten Mamedzade
saera kidwai
Shalala Ismayilova
Tümünü Sessize Al
30°C Güneşli
16:18

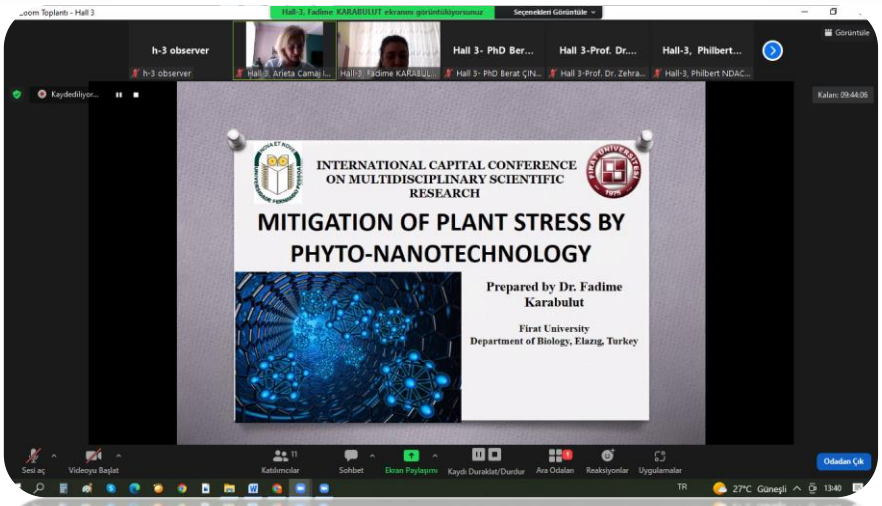

Kaydediliyor...
Kalan: 09:47:50
h-3 observer
Hall-3, Fatih Koçtürk
h-3 observer
saera kidwai
Ayten Mamedzade
Shalala Ismayilova
Katılımcılar (5)
h... (Ortak oturum sahibi, ben)
Ayten Mamedzade
Hall-3, Fatih Koçtürk
saera kidwai
Shalala Ismayilova
Tümünü Sessize Al
30°C Güneşli
16:07

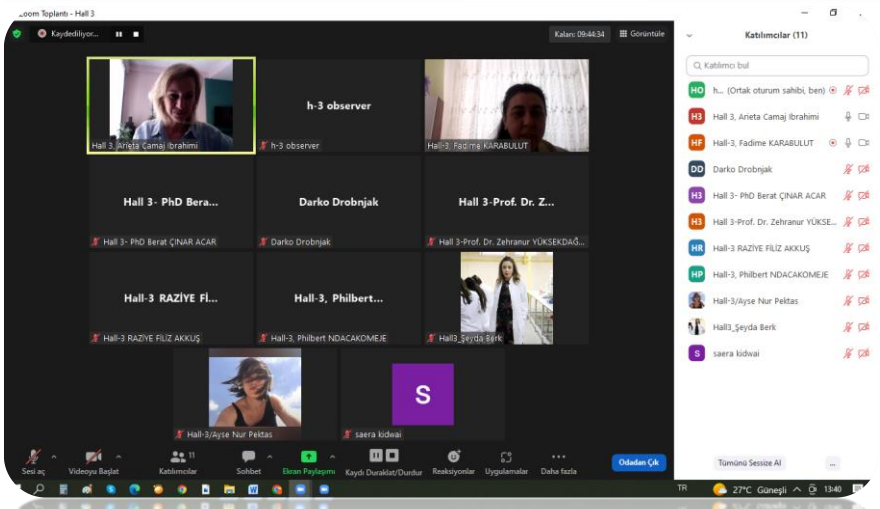

Antibiotic susceptibility pattern in infected cutaneous ulcers in a tertiary care facility in Karachi ,Pakistan .
Professor Saera Suhail Kidwai
MBBS,MCPS ,FCPS (Internal Medicine)
Head –Department of Medicine
Fazaia Ruth Pfau Medical College , Karachi . Pakistan

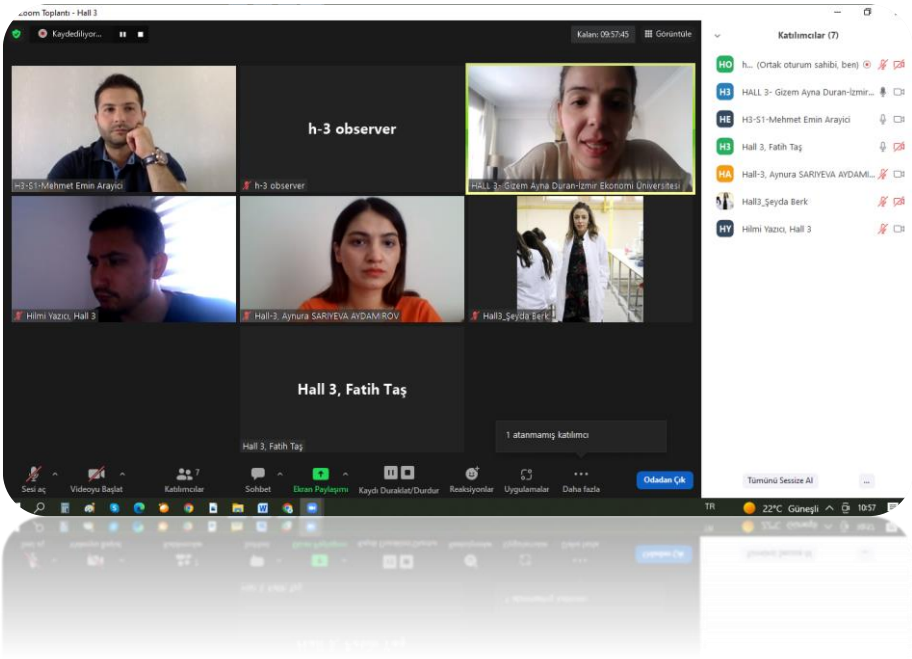

DETERMINATION OF SOME PROBIOTIC
PROPERTIES OF ENTEROCOCCUS STRAINS
ISOLATED FROM RAW MILK
Prof. Dr. Zehranur YÜKSEKDAĞ
Lecturer Dr. Berat ÇINAR ACAR*
Assoc. Prof. Dr. Ebru Şebnem YILMAZ

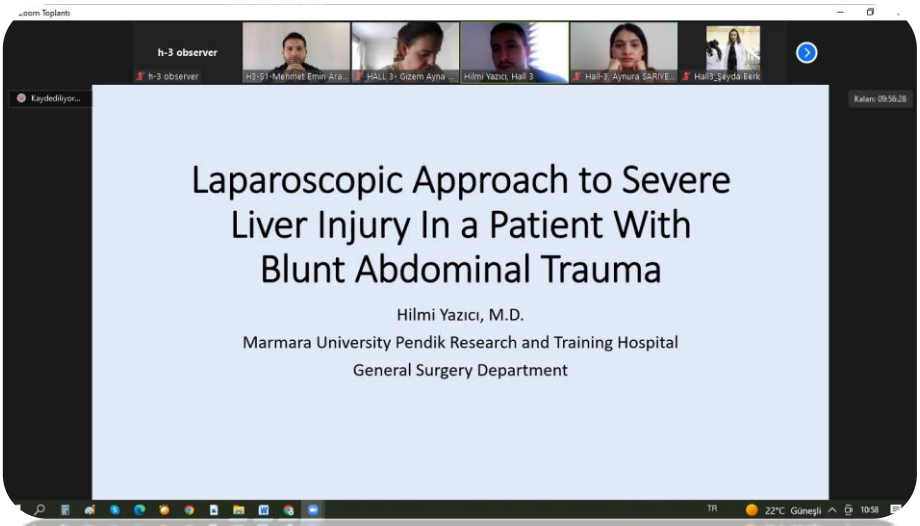


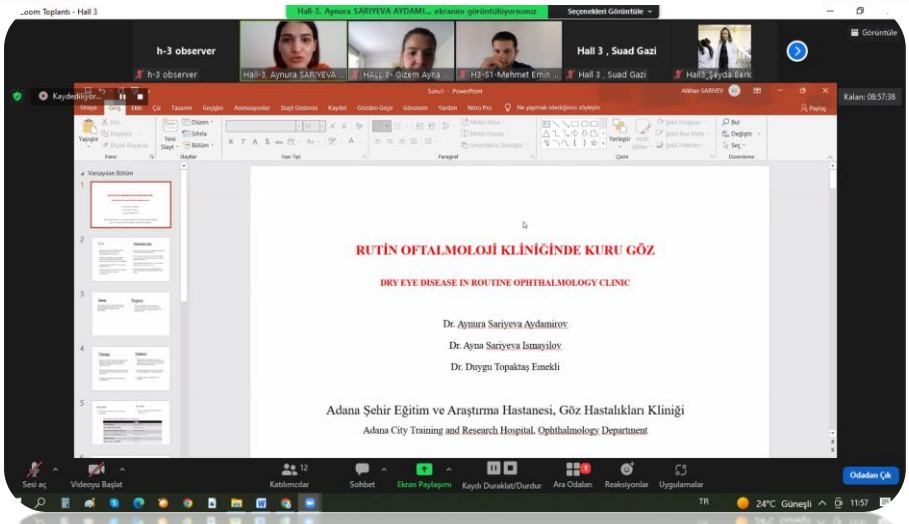

International CAPITAL Conference on Multidisciplinary Scientific Research
13-14 July, Lisbon, Portugal
EVALUATION OF AFLATOXIN M1 LEVEL IN RAW MILK DURING WINTER 2021 IN KOSOVO
Arieta Camaj Ibrahimi[1*], Hata Dibrani Sopjani[2], Nazmi Hasanaj[3]
[1*]Faculty of Agribusiness, University Haxhi Zeka, 30 000 Pejë, Kosovo. E-mail: arieta.camajibrahimi@unhz.eu.
[2]Food and Veterinary Agency, 10 000, Prishtinë, Kosovo
[3]Faculty of Agribusiness, University Haxhi Zeka, 30 000 Pejë, Kosovo

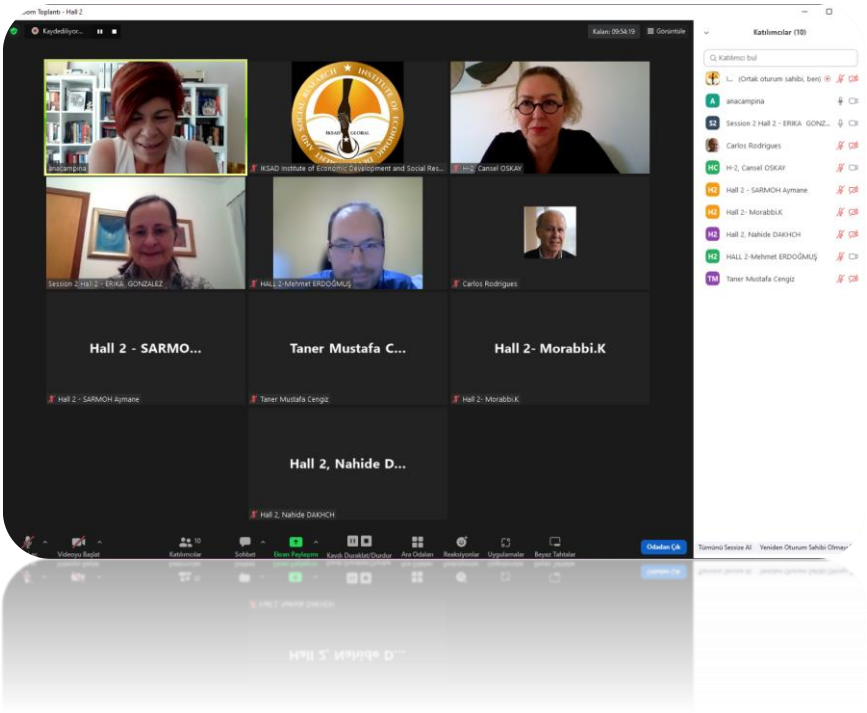

INTERNATIONAL CAPITAL CONFERENCE ON MULTIDISCIPLINARY SCIENTIFIC RESEARCH
MITIGATION OF PLANT STRESS BY PHYTO-NANOTECHNOLOGY
Prepared by Dr. Fadime Karabulut
Firat University
Department of Biology, Elazıg, Turkey

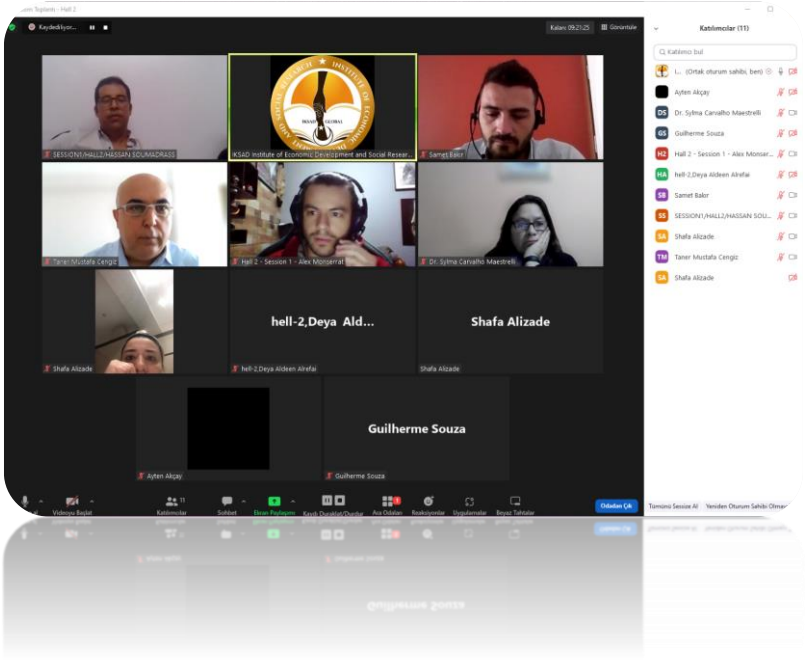

Hall 3, Arieta Camaj Ibrahimi
h-3 observer
Hall-3, Fadime KARABULUT
Hall 3- PhD Bera...
Darko Drobnjak
Hall 3-Prof. Dr. Z...
Hall-3 RAZİYE Fİ...
Hall-3, Philbert...
Hall3_Şeyda Berk
Hall-3/Ayse Nur Peltas
saera kidwai
Katılımcılar (11)

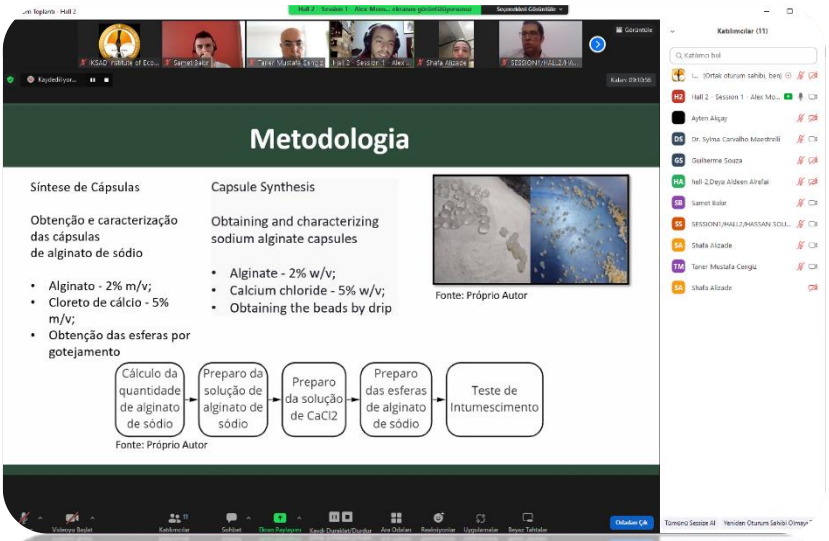

Kaydediliyor...
Kalan: 09:57:45
Görüntüle
h-3 observer
Katılımcılar (7)
HALL 3- Gizem Ayna Duran-İzmir Ekonomi Üniversitesi
Hall 3, Fatih Taş
1 atanmamış katılımcı
Sesi aç
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kaydı Duraklat/Durdur
Reaksiyonlar
Uygulamalar
Daha fazla
Odadan Çık
Tümünü Sessize Al

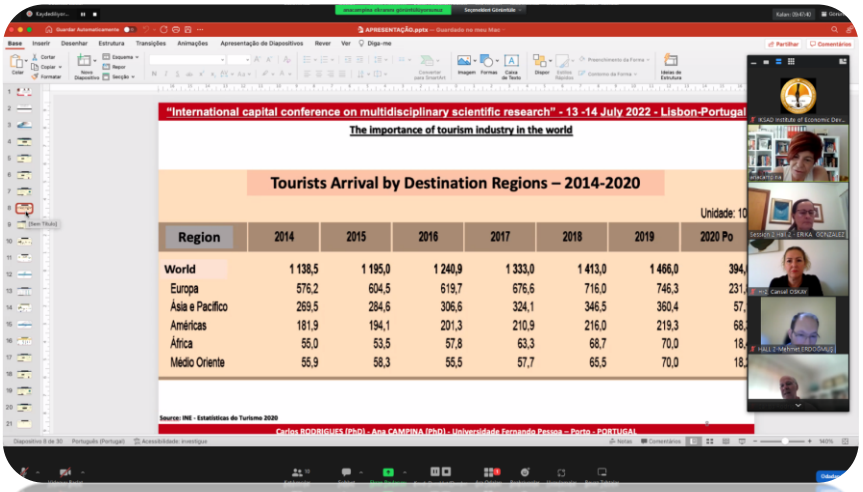

h-3 observer
Kaydediliyor...
Laparoscopic Approach to Severe Liver Injury In a Patient With Blunt Abdominal Trauma
Hilmi Yazıcı, M.D.
Marmara University Pendik Research and Training Hospital
General Surgery Department

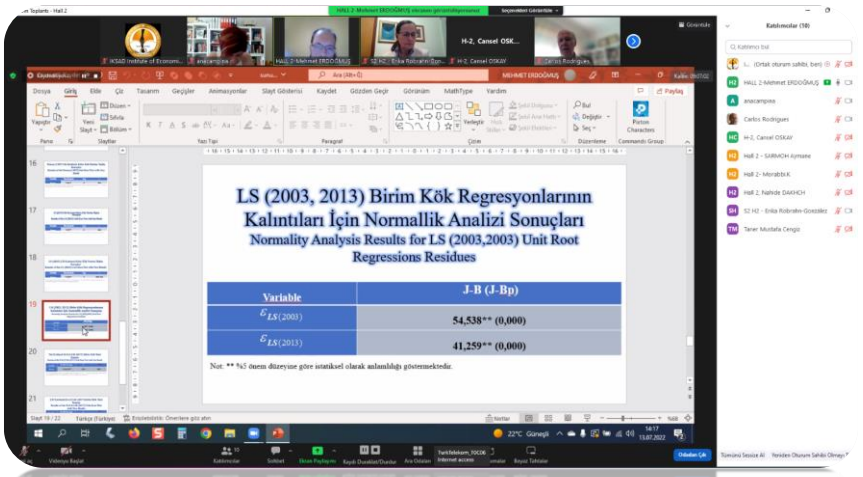

Hall 3, Aynura SARIYEVA AYDAMI... ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
h-3 observer
Hall 3 , Suad Gazi
RUTİN OFTALMOLOJİ KLİNİĞİNDE KURU GÖZ
DRY EYE DISEASE IN ROUTINE OPHTHALMOLOGY CLINIC
Dr. Aynura Sariyeva Aydamirov
Dr. Ayna Sariyeva İsmayilov
Dr. Duygu Topaktaş Emekli
Adana Şehir Eğitim ve Araştırma Hastanesi, Göz Hastalıkları Kliniği
Adana City Training and Research Hospital, Ophthalmology Department

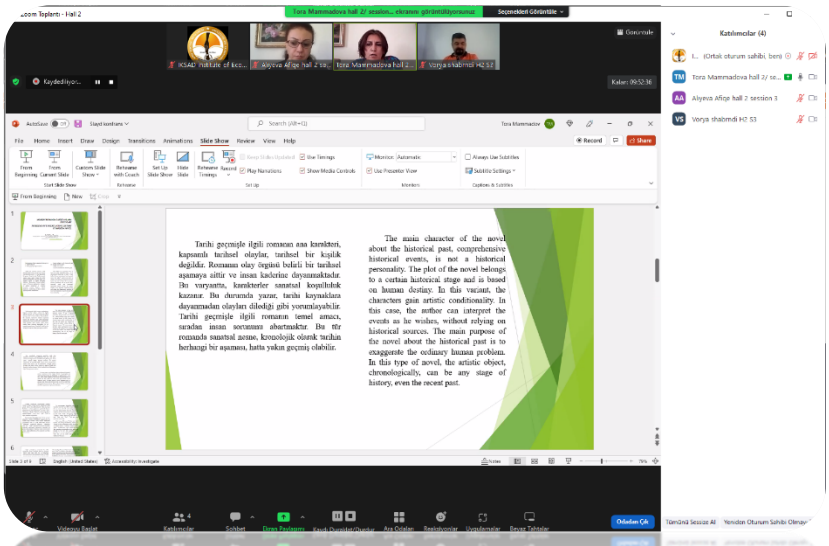

Hall 2 - SARMO...
Taner Mustafa C...
Hall 2- Morabbi.K
Hall 2, Nahide D...


hell-2,Deya Ald...
Shafa Alizade
Guilherme Souza


Metodologia
Síntese de Cápsulas
Obtenção e caracterização das cápsulas de alginato de sódio
Alginato - 2% m/v;
Cloreto de cálcio - 5% m/v;
Obtenção das esferas por gotejamento
Capsule Synthesis
Obtaining and characterizing sodium alginate capsules
Alginate - 2% w/v;
Calcium chloride - 5% w/v;
Obtaining the beads by drip
Fonte: Próprio Autor
Cálculo da quantidade de alginato de sódio
Preparo da solução de alginato de sódio
Preparo da solução de CaCl2
Preparo das esferas de alginato de sódio
Teste de Intumescimento
Fonte: Próprio Autor


"International capital conference on multidisciplinary scientific research" - 13 -14 July 2022 - Lisbon-Portugal
The importance of tourism industry in the world
Tourists Arrival by Destination Regions – 2014-2020
Region
2014
2015
2016
2017
2018
2019
2020 Po
World
1 138,5
1 195,0
1 240,9
1 333,0
1 413,0
1 466,0
Europa
576,2
604,5
619,7
676,6
716,0
746,3
Ásia e Pacífico
269,5
284,6
306,6
324,1
346,5
360,4
Américas
181,9
194,1
201,3
210,9
216,0
219,3
África
55,0
53,5
57,8
63,3
68,7
70,0
Médio Oriente
55,9
58,3
55,5
57,7
65,5
70,0
Source: INE - Estatísticas do Turismo 2020
Carlos RODRIGUES (PhD) - Ana CAMPINA (PhD) - Universidade Fernando Pessoa – Porto - PORTUGAL


LS (2003, 2013) Birim Kök Regresyonlarının
Kalıntıları İçin Normallik Analizi Sonuçları
Normality Analysis Results for LS (2003,2003) Unit Root
Regressions Residues
Variable
J-B (J-Bp)
$\varepsilon_{LS(2003)}$
54,538** (0,000)
$\varepsilon_{LS(2013)}$
41,259** (0,000)
Not: ** %5 önem düzeyine göre istatiksel olarak anlamlılığı göstermektedir.


Tarihi geçmişle ilgili romanın ana karakteri, kapsamlı tarihsel olaylar, tarihsel bir kişilik değildir. Romanın olay örgüsü belirli bir tarihsel aşamaya aittir ve insan kaderine dayanmaktadır. Bu varyantta, karakterler sanatsal koşullulok kazanır. Bu durumda yazar, tarihi kaynaklara dayanmadan olayları dilediği gibi yorumlayabilir. Tarihi geçmişle ilgili romanın temel amacı, sıradan insan sorununu abartmaktır. Bu tür romanda sanatsal zemin, kronolojik olarak tarihin herhangi bir aşaması, hatta yakın geçmiş olabilir.
The main character of the novel about the historical past, comprehensive historical events, is not a historical personality. The plot of the novel belongs to a certain historical stage and is based on human destiny. In this variant, the characters gain artistic conditionality. In this case, the author can interpret the events as he wishes, without relying on historical sources. The main purpose of the novel about the historical past is to exaggerate the ordinary human problem. In this type of novel, the artistic object, chronologically, can be any stage of history, even the recent past.

INTERNATIONAL

CAPITAL

CONFERENCE ON MULTIDISCIPLINARY SCIENTIFIC RESEARCH

CONFERENCE PROGRAM

13 -14 July 2022 / Lisbon-Portugal

Face to face
Online (with ZOOM Conference)

Meeting ID: 818 1912 9539
Passcode: 131415



IMPORTANT, PLEASE READ CAREFULLY

- To be able to make a meeting online, login via https://zoom.us/join site, enter ID instead of "Meeting ID or Personal Link Name" and solidify the session.
- The Zoom application is free and no need to create an account.
- The Zoom application can be used without registration.
- The application works on tablets, phones and PCs.
- Moderator - responsible for the presentation and scientific discussion (question-answer) section of the session.

POINTS TO TAKE INTO CONSIDERATION - TECHNICAL INFORMATION

- Make sure your computer has a microphone and is working.
- You should be able to use screen sharing feature in Zoom.
- Attendance certificates will be sent to you as PDF at the end of the congress.
- Requests such as change of place and time will not be taken into consideration in the congress program.
- If you think there are any deficiencies / spelling mistakes in the program, please inform by e-mail until July 12, 2022 (17:00) at the latest.
- (All speakers required to be connected to the session 15 min before the session starts)
- Moderator is responsible for ensuring the smooth running of the presentation, managing the group discussion and dynamics.
- Before you login to Zoom please indicate your name surname and HALL number, exp. Hall 1, Kadir İNANIR

FACE TO FACE / DATE: 14.07.2022



LISBON TIME: 10:00-12:30

HEAD OF SESSION: KALDYGUL ADILBEKOVA

TOPIC TITLE	AUTHORS	AFFILIATION
INVESTIGATION OF THE MEDIATOR ROLE OF MENTAL WORKLOAD IN THE RELATIONSHIP BETWEEN JOB SATISFACTION AND INTENTION TO LEAVE	Gökçe Özkılıççı Serpil Aytaç	Fenerbahçe University, Türkiye
ASSESSMENT OF THE DIAGNOSTIC EFFECTIVENESS OF TERAHERTZ RADIATION IN ORAL SOFT TISSUE LESIONS: PRELIMINARY FINDINGS	Esra Ece Çakmak Hakan Altan Emre Barış Kıvanç Kamburoğlu	Ankara University, Middle East Technical University, Türkiye
IMAGING OF ORAL SOFT TISSUE LESIONS : CASE SERIES BY USING TERAHERTZ RADIATION, ULTRASONOGRAPHY AND HISTOPATHOLOGY	Esra Ece Çakmak Hakan Altan Emre Barış Kıvanç Kamburoğlu	Ankara University, Middle East Technical University, Türkiye
TWO COMPARTMENTAL FRACTIONAL DERIVATIVE MODEL OF ANTIBIOTIC RELEASE FROM HYDROGELS AIMED FOR MEDICAL APPLICATIONS	Vesna Miskovic-Stankovic Teodor M. Atanackovic	University Union-Nikola Tesla, University of Novi Sad, Serbia
DIELECTRIC CONSTANT CHANGE IN THE ANTERIOR TIBIAL MUSCLE INDUCED BY LOCAL ACUPUNCTURE STIMULATION	Manoela Gallon Pitta Flávia Belavenuto Rangon Kelly Zhang Elaine Caldeira de Oliveira Guirro João Eduardo de Araujo	University of São Paulo, Brazil
THE CONCEPT OF HISTOTY IN THE CONTEMPORARY OFFICIAL RUSSIAN IMPERIALISTIC DISCOURSE	Vladimir Paperni	University of Haifa, Hafa,Israel.

ONLINE / 13.07.2022 / HALL-1 / SESSION-1

LISBON TIME: 09:00-11:00

HEAD OF SESSION: MURAT KUVVETLİ		
TOPIC TITLE	**AUTHORS**	**AFFILIATION**
CONTEMPORARY CONCEPTS IN TEACHER EDUCATION AND NEW ROLES OF TEACHERS IN EUROPEAN DISCOURSE COMPETENCY STANDARDS	Jelena Đermanov, Nataša Tančić	University of Novi Sad, Novi Sad, Serbia.
THE CONCEPT OF MULTIDISCIPLINARITY IN THE SYSTEM OF HELPING PROFESSIONS IN THE CONTEXT OF UNDERGRADUATE EDUCATION OF A SOCIAL WORKER AND A SPECIAL PEDAGOGUE	Lukáš Stárek	Univerzita Jana Amose Komenského Praha s.r.o., Prague, Czech Republic.
A CONTENT ANALYSIS STUDY ON THE LETTERS OF YOUNG LEARNERS OVER CORONAVIRUS	Murat KUVVETLİ İbrahim Yaşar KAZU Mehtap KAZAR	Firat University, Türkiye
THE EFFECT OF ACUTE PHYSICAL EXERCISE APPLIED TO CHILDREN IN THE DEVELOPMENT PROCESS ON COGNITIVE FUNCTIONS	Furkan ÖĞET Yusuf BUZDAĞLI	Erzurum Technical University, Türkiye
INVESTIGSTION OF SOCIAL MEDIA USAGE DISORDERS OF STUDENTS IN SPORTS SCIENCES	Zafer GAYRETLİ İlker ÖZMUTLU	Tekirdağ Namık Kemal University, Türkiye
INVESTIGATION OF THE SPORTS FACILITIES OF THE YOUTH AND SPORTS PROVINCIAL DIRECTORATE IN TERMS OF THE NEEDS AND EXPECTATIONS OF THE STUDENTS STUDYING AT THE FACULTY OF SPORTS SCIENCES	Zafer GAYRETLİ İlker ÖZMUTLU	Tekirdağ Namık Kemal University, Türkiye
ANALYSIS OF POSTGRADUATE THESES ON LIFELONG LEARNING IN TÜRKIYE	Ahmet ÇOBAN Fırat MUTLU	Dicle University, Türkiye
ELEMENTS OF THE GRAMMAR TRANSLATION METHOD IN UKRAINIAN MODERN TEACHING EXPERIENCE	Svitlana Zapolskykh Vasyl PUZANOV	Zaporizhzhia National University, Ukraine
INTERNATIONAL COOPERATION AND HIGHER EDUCATION IN AZERBAIJAN MODERN TRENDS OF INTERNATIONALIZATION.	A.T. Garayeva	Baku State University Azerbaijan State Pedagogical University

ONLINE / 13.07.2022 / HALL-2 / SESSION-1

LISBON TIME: 09:00-11:00

HEAD OF SESSION: DILSHAD MOHAMMED		
TOPIC TITLE	**AUTHORS**	**AFFILIATION**
TOPRAK DOLGU BARAJLARIN PROJELENDİRİLMESİNDE GEOTEKNİK ÇALIŞMALAR	Samet BAKIR Ertuğrul ORDU	Tekirdağ Namık Kemal University,Türkiye
THE PERIODIC STRUCTURAL RELATIONSHIP OF THE NORTH ATLANTIC OSCILLATION WITH THE OXFORD PRECIPITATION	Taner Mustafa CENGİZ Şeyma Ordu	Tekirdağ Namık Kemal University, Çorlu, Tekirdağ.
OBTAINING AND CHARACTERIZING CONCRETE WITH SODIUM ALGINATE CAPSULES ADDITIONS	Alex Monserrat Pereira Costa, Alan Rodrigo Sorce, Marcos Vinicius Vieira Gaglieri, Eliana Cristina da Silva Rigo, Sylma Carvalho Maestrelli	Universidade Federal de Alfenas, Universidade de São Paulo,Brazil
PRESERVING THE JORDANIAN ARCHITECTURAL IDENTITY AND APPLYING THE ELEMENTS OF SUSTAINABILITY "THE NABULSI HOUSE"	Deya Aldeen Alrefai Assist.Prof.Dr.Ayten Özsavaş Akçay	Near East University, Nicosia, Northern Cyprus, Türkiye.
QUALITATIVE ASSESSMENT OF SOILS OF THE MUGAN STEPPE OF THE AZERBAIJAN REPUBLIC	Shafa Alizade	Baku State University, Baku, Azerbaijan
THE USE OF RHEOLOGICAL TESTS TO EVALUATE SOIL CONDITIONING FOR EPB EXCAVATION	Guilherme de Oliveira Souza, Yasmin Carvalheiro Romero, Fábio Kazuyoshi Matsumura, Maria Eugênia Gimenez Boscov	University of São Paulo,São Paulo, Brazil
OPTIMIZATION OF DELAY TIME AT SIGNALIZED ROAD INTERSECTIONS USING GENETIC ALGORITHM	Dilshad Mohammed	University of Duhok, Iraq
THE IMPACT OF PATHOLOGICAL CONDITIONS ON HISTORIC BUILDINGS: THE CASE OF ANCIENT MEDINA-CASABLANCA, MOROCCO	Hassan Soumadrass, Zitouni Beidouri, Khalid Zarbane	Hassan II University-Casablanca, Morocco.

ONLINE / 13.07.2022 / HALL-3 / SESSION-1

LISBON TIME: 09:00-11:00

HEAD OF SESSION: GIZEM AYNA DURAN		
TOPIC TITLE	**AUTHORS**	**AFFILIATION**
LAPAROSCOPIC APPROACH TO SEVERE LIVER INJURY IN A PATIENT WITH BLUNT ABDOMINAL TRAUMA	Hilmi Yazıcı	Marmara University, Türkiye
IMMUNOHISTOCHEMICAL EVALUATION OF PLACENTAS WITH VEGF ANTIBODY IN A COVID-19 POSITIVE TWIN PREGNANCY CASE	Fırat AŞIR, Fikri ERDEMCİ, Fatih TAŞ, Mehmet YILMAZ, Engin DEVECİ	Dicle University, Siirt University, Türkiye
UPREGULATION OF BRCA1 AND PPIP5K2 GENES AND PLATINUM DRUG RESISTANCE IN BOTH MILD AND SEVERE COVID-19 PATIENTS	Gizem AYNA DURAN	Izmir University of Economics, Türkiye
ANTI-CANCER NATURAL COMPOUNDS AND THEIR MOLECULAR TARGETS ON TRANSCRIPTION FACTORS, EPIGENETIC MODIFICATIONS AND CANCER STEM CELLS	Mehmet Emin Arayici Yasemin Basbinar Hulya Ellidokuz	Dokuz Eylul University, Türkiye
CYTOTOXICITY ANALYSIS OF DIFFERENT TREATED PORCINE DERMAL MATRIX: AN IN VITRO STUDY	Rodolfo Reda Alessio Zanza Maurilio D'Angelo Dario Di Nardo Luca Testarelli	Sapienza University of Rome, Italy;
CHARACTERISTICS OF CANCER STEM CELLS AS THERAPEUTİC TARGETS	Şeyda BERK	Sivas Cumhuriyet University, Türkiye
RUTİN OFTALMOLOJİ KLİNİĞİNDE KURU GÖZ	Aynura Sariyeva Aydamirov Ayna Sariyeva Ismayilov Duygu Topaktaş Emekli	Adana City Training and Research Hospital, Türkiye
IDENTIFICATION GENETIC VARIANTS OF LZTFL1 GENE RS11385942 ASSOCIATED WITH SEVER COVID-19 INFECTION IN IRAQI PATIENTS	Zhraa Razaq, Suad Gazi Jaafer Alkufi	Nahrain University, Iraq
ASSESSMENT OF HEALTH SYSTEM PERFORMANCES IN EUROPEAN UNION COUNTRIES DURING COVID-19	Fatih Durur Meryem Turgut Gökçen Özler Meliha Meliş Günaltay	Ankara University Nigde Omer Halisdemir University, Türkiye
ASSESSMENT OF BED UTILIZATION PERFORMANCE OF OECD COUNTRIES WITH THE PABON LASSO MODEL	Ferda Işıkçelik Fatih Durur Gökçen Özler Meliha Meliş Günaltay	Ankara University, Türkiye

ONLINE / 13.07.2022 / HALL-4 / SESSION-1

LISBON TIME: 09:00-11:00

HEAD OF SESSION: ÜNAL IMIK		
TOPIC TITLE	**AUTHORS**	**AFFILIATION**
BREAD CRISIS IN ISTANBUL (OCTOBER 17-19, 1935): INCIDENTS AND PROFITEERING IN BAKERIES	Mustafa Koç	Istanbul University, Türkiye.
AN EVALUATION OF PORTUGAL – TÜRKIYE THROUGH THE EYES OF HANS CHRISTIAN ANDERSEN, A NORTHERN TRAVELER ON THE EAST-WEST AXIS	Fatma TOMBAK	Adnan Menderes University, Türkiye
FROM REGIONAL TO TRANSNATIONAL: THE JOURNEY OF VAISHNAV RELIGION AND BENGALI HINDU CULTURE	Tridib Khan	Chandrakona Vidyasagar Mahavidyalaya, affiliated to Vidyasagar University, West Bengal, India
FEMALE UTOPIA IN "THE SOUND AND THE FURY": THE MYTH OF PERSEPHONE	Dalila Karakaçi	Luigj Gurakuqi: University, Albania.
THE CLASSICAL INDIAN DRAMA NARRATIVE AND RASA THEORY IN THE CONTEXT OF CINEMA: A CROSS-CULTURAL UNDERSTANDING WITH SOME KEY DIALECTS OF WESTERN SCHOLARSHIP	Santanu Sarkar Anuradha Choudry	Indian Institute of Technology, Kharagpur, West Bengal, India
ANALYSIS OF THE ART OF INTERROGATION IN GAGAUZ LITERATURE ON THE SEMANTIC PLANE	Leyla DİLEK	Kurtalan Distric Directorate of National Education, Gozpinar Secondary School, Kurtalan, Siirt, Türkiye
THE ROLE OF TECHNOLOGICAL TOOLS IN TODAY'S BAĞLAMA MAKING/REPAIR PROCESS	Ünal İMİK. Sinan HAŞHAŞ	İnönü University, Atatürk University, Türkiye
REFLECTIONS OF TECHNOLOGICAL DEVELOPMENTS ON BAĞLAMA PERFORMANCE	Ünal İMİK Sinan HAŞHAŞ	İnönü University, Atatürk University, Türkiye

ONLINE / 13.07.2022 / HALL-5 / SESSION-1

LISBON TIME: 09:00-11:00

HEAD OF SESSION: ESWARI ALAGUTHEVAR		
TOPIC TITLE	**AUTHORS**	**AFFILIATION**
ENHANCEMENT PHOTOCATALYTIC DEGRADATION OF METHYLENE BLUE ON GRAPHENE OXIDE INTERCALATED ZNAL–NO 3 LAYERED DOUBLE HYDROXIDES	Rahmah H. Al-Ammari, Salwa D. Al-Malawi	King Abdulaziz University, Saudi Arabia
INFLUENCE OF SYNTHESIS CONDITIONS ON PHYSICO-CHEMICAL AND PHOTOCATALYTIC PROPERTIES OF SILVER NANOMATERIALS	Salwa D. Al-Malwi, Rahmah H. Al-Ammari	King Abdulaziz University, Saudi Arabia
OPTIMIZATION OF ULTRASONIC-ASSISTED EXTRACTION OF RADICAL SCAVENGING ACTIVITIES FROM ORANGE PEEL WASTE USING RESPONSE SURFACE METHODOLOGY AND MULTI-RESPONSE DESIRABILITY FUNCTION	Nurcihan TAN ERKO, Şule DİNÇ ZOR, Güzin ALPDOĞAN, Ayşegül PEKSEL	Yıldız Teknik University, İstanbul Gelişim University, Türkiye
MODIFICATION OF THE PULLULANASE WITH ENCAPSULATION AND INVESTIGATION OF STABILITY	Elif GEDIKOGLU Musa KAMACI Aysegul PEKSEL	Yıldız Teknik University, Türkiye Piri Reis University,
INVESTIGATION OF THE PROPERTIES OF HAZELNUT SHELL POWDER ADDED POLYPROPYLENE FOAMS BY CHEMICAL FOAMING METHOD	Didem Betül İlhan Serkan Soncu Meral Akkoyun	Bursa Technical University, Demo Plastik Ürünleri Sanayi ve Ticaret A.Ş. NOSAB Türkiye
PRODUCTION OF FLY ASH AND GLASS FIBER REINFORCED RIGID POLYURETHANE COMPOSITE FOAMS AND INVESTIGATION OF THEIR PROPERTIES	Fatma Güney Meral Akkoyun	Bursa Technical University, Bursa, Türkiye.
ANALYSIS OF THE LENGTH OF DRY PERIODS FOR AGRICULTURAL PRODUCTION USING THE MARKOV CHAIN MODEL: CASE OF SYNOPTIC STATIONS IN BENIN	B. A. Darius Gnihatin, Aristide B. Akpo	Universitéd'Abomey-Calavi, Bénin, Bénin
DEVELOPMENT OF YIELD PREDICTION MODEL FOR GRAPES AND EXPERIMENTAL VALIDATION THROUGH ANDROID MOBILE APP UNDER AGRO CLIMATIC CONDITIONS BASED ON DISEASE MANAGEMENT	Eswari Alaguthevar	Tamil Nadu Agricultural University, India.
THERORETICAL STUDY OF THE DIELECTRIC PROPERTIES OF A BIOPOLYMER ENRICHED WITH SEVERAL BIOFILERS	Andreea Irina Barzic, Stoica Iuliana, Raluca Marinica Albu	"Petru Poni", Iasi, Romania.

ONLINE / 13.07.2022 / HALL-1 / SESSION-2

LISBON TIME: 11:30-13:30

HEAD OF SESSION: MAI DUC NGHIA		
TOPIC TITLE	**AUTHORS**	**AFFILIATION**
NUMERICAL INVESTIGATION OF HEAT TRANSFER IN A RIBBED TRIANGULAR WAVY CHANNEL UNDER NANOFLUID FLOW	Selma Akçay	Cankiri Karatekin University, Türkiye.
DEVELOPING A HYDROECONOMIC OPTIMIZATION MODEL FOR THE EUPHRATES BASIN	Ayça AYTAÇ M.Cihat Tuna M.Şahin Doğan	Dogus University Firat University, Aksaray University, Türkiye
A LANGUAGE RECOGNITION SYSTEM FOR PHILIPPINES INDIGENOUS B'LAAN LANGUAGE USING HYBRID CONVOLUTIONAL AND RECURRENT NEURAL NETWORK	Patrick D. Cerna	PSHS CRC, Philippines
DETERMINING CUSTOMER SATISFACTION INDEX FOR CIVIL AVIATION ORGANIZATIONS BASED ON FUZZY LOGIC AND SERVQUAL METHOD	Hakan Şimşek İrem Güvendiren Şevval SARI	Antalya Bilim University, Türkiye.
STUDY TO IMPROVE SAFETY FOR REPAIR WORKSHOPS OF THE INTERNAL COMBUSTION ENGINES	Mai Duc Nghia, Doan Cong Thang	Air Force Officer's College, Nhatrang city, Vietnam
OCCUPATIONAL EXPOSURE TO DUST AND RESPIRATORY SYMPTOMS AMONG LATEX GLOVE WORKERS AT DIFFERENT WORKSTATIONS IN SENAWANG, NEGERI SEMBILAN	Putri Anis Syahira Mohamad Jamil, Nur Athirah Diyana Mohammad Yusof, Karmegam Karuppiah	University Tunku Abdul Rahman, University Teknologi Malaysia, Kuala Lumpur, University Putra Malaysia
MINING INDUSTRY AFTER COVID-19	Edmond HOXHA	Polytechnic University of Tirana, Tirana, Albania
FASHION-TECH, ECO-TECH AND HIGH-TECH IN CONTEMPORARY KNITTING	Alenka Pavko Čuden	University of Ljubljana, Ljubljana, Slovenia.

ONLINE / 13.07.2022 / HALL-2 / SESSION-2

LISBON TIME: 11:30-13:30

HEAD OF SESSION: ANA CAMPINA		
TOPIC TITLE	**AUTHORS**	**AFFILIATION**
INTERNATIONAL TOURISM AS A SOURCE OF INCOME GENERATION IN PORTUGAL	Carlos Rodrigues, Ana Campina	Universidade Fernando Pessoa, Portugal.
EVALUATION OF THE EFFECTS OF THE COVID-19 PANDEMIC ON THE MACROECONOMIC PERFORMANCE OF THE TURKISH ECONOMY	Cansel OSKAY	Mersin University, Türkiye
DO SHOCKS AFFECT FOREIGN VISITOR ARRIVALS PERMANENTLY OR TEMPORARILY? A RESEARCH ON RUSSIAN VISITORS TO TURKEY	Mehmet ERDOĞMUŞ	Sivas Cumhuriyet University, Türkiye
HOW DO MANAGERS PERCEIVE GROWTH IN A CRISIS CONTEXT? CASE OF MOROCCAN SMES	Kenza MORABBI Said OUHADI	Cadi Ayyad University, Morocco
ANALYSIS OF GROWTH INTENTION AND ITS INFLUENCE ON GOVERNANCE: CASE OF MOROCCAN FAMILY SME'S	Kenza MORABBI Said OUHADI	Cadi Ayyad University, Morocco
PRODUCT DONATION AS A REVERSE LOGISTIC PRACTICE: PERCEPTION IN THE MOROCCAN AGRO-FOOD INDUSTRY	MOUNAIM L'Houssaine SARMOH Aymane	Cadi Ayyad University, Marrakech, Morocco
THE EFFECT OF RETURN POLICY LENIENCY ON ONLINE PURCHASE INTENTION	MOUNAIM L'Houssaine SARMOH Aymane	Cadi Ayyad University, Marrakech, Morocco
COVID 19 | FOOD RETAILING AND HOME DELIVERY SERVICE: A PREFERRED ALTERNATIVE AND A CURRENT TREND THAT RESISTS THE CRISIS	Nahide DAKHCH	Ibn Tofail University, ENCG, Kénitra, Morocco
ANALYSIS OF THE EFFECTS OF PUBLIC EXPENDITURE AND TAXES ON ECONOMIC GROWTH	Levent AKSU	Balıkesir University, Türkiye
CULTURE AS A VECTOR FOR SOCIAL INNOVATION AND CREATIVE ECONOMY: APPLICATION CASES WITH BRAZILIAN COMMUNITIES	Erika M. Robrahn-González	University of Coimbra, CGEO, ITM, Mação, Portugal.

ONLINE / 13.07.2022 / HALL-3 / SESSION-2

LISBON TIME: 11:30-13:30

HEAD OF SESSION: WIDYA PINTAKA BAYU PUTRA		
TOPIC TITLE	**AUTHORS**	**AFFILIATION**
DETERMINATION OF SOME PROBIOTIC PROPERTIES OF ENTEROCOCCUS STRAINS ISOLATED FROM RAW MILK	Zehranur YÜKSEKDAĞ Berat ÇINAR ACAR Ebru Şebnem YILMAZ	Gazi University, Mustafa Kemal University, Türkiye
MITIGATION OF PLANT STRESS BY PHYTO-NANOTECHNOLOGY	Fadime KARABULUT	Firat University, Türkiye
THE EFFECT OF PRE-L-TRYPTOPHAN TREATMENTS ON GERMINATION CHARACTERISTICS OF TOLERANT AND SENSITIVE MAIZE (Zea mays L.) CULTIVARS UNDER SALINITY STRESS	Philbert NDACAKOMEJE Nesrin COLAK Faik Ahmet AYAZ	Karadeniz Technical University, Türkiye.
EVALUATION OF AFLATOXIN M 1 LEVEL IN RAW MILK DURING WINTER 2021 IN KOSOVO	Arieta Camaj Ibrahimi Hata Dibrani Sopjani Nazmi Hasanaj	University Haxhi Zeka, Kosovo.
THE EFFECT OF NININ, LYSOZYME, CITRIC ACID AND LACTIC ACID IN BEEF PREPARATIONS CONTAMINATED WITH LISTERIA MONOCYTOGENES	Raziye Filiz Akkuş Ufuk Kamber	Ardahan Vocational School of Technical Sciences, Ardahan, Kafkas University, Kars, Türkiye
STORAGE CAPABILITY OF A BEVERAGE BASED ON UNCLARIFIED CHEESE WHEY FROM KHAINAK'S MILK	Dusheeva Nurgul S., Elemanova Rimma Sh., Musulmanova Mukarama Mukhamedovna, Mambetova Anara Shergazievna, Sabyrbekova Ainagul	KSTU named after I. Razzakov, Kyrgyz Republic
DNA BARCODES FOR INSECTS	Ayşe Nur PEKTAŞ	Sivas Cumhuriyet University, Research Center (CUTAM), Sivas, Türkiye
GENETIC DIVERSITY IN THE MITOGENOME OF ENDANGERED VAQUITA DOLPHIN (Phocoena sinus)	Widya Pintaka Bayu Putra	Research Center - National Research and Innovation Agency, Bogor, Indonesia
GENITO-GENITAL RUBBING AND GROOMING IN RELATION TO ALLOMOTHERING IN A GROUP OF FEMALE CAPTIVE BONOBOS	Sarah Radtke Maryanne Fisher	Humber College, Liberal Studies,Toronto, Canada. St. Mary's University, Halifax, Canada
ANALYSIS OF THE HEPATOPATHOLOGICAL ALTERATIONS INDUCED BY YANGONIN "YA" DIETARY SUPPLEMENTATION BY A SPECIAL SCORING SYSTEM (LIGHT AND TEM) MICROSCOPE AND BIOCHEMICAL TESTS	Mohammed Abdulabbas Hasan	University of Thi-Qar, Iraq. Universiti Putra Malaysia, Malaysia
MORTALITY RATE OF EUROPEAN BISON (Bison bonasus bonasus L 1758) IN ROMANIA IN 2004 – 2018	Milivoje Urošević Goran Stanišić Radomir Mandić Panče Dameski Darko Drobnjak	Center for Preservation of Indigenous Breeds – CEPIB, Metropolitan University, Belgrade, Serbia Ohrid University of Bitola, North Macedonia

ONLINE / 13.07.2022 / HALL-4 / SESSION-2

LISBON TIME: 11:30-13:30

HEAD OF SESSION: DANIEL SEABRA		
TOPIC TITLE	**AUTHORS**	**AFFILIATION**
THE RELATIONSHIP BETWEEN INDIVIDUALIZED CARE PERCEPTIONS AND COMPASSION LEVEL OF NURSING STUDENTS	Sevgi PAKİŞ ÇETİN, Kıvan ÇEVİK	Manisa Celal Bayar University, Manisa, Türkiye
ÜNIVERSITE ÖĞRENCILERININ AKIL SAĞLIĞININ CINSIYETE GÖRE KARŞILAŞTIRILMASI	Mahsa Jostejouy Khoei	İstanbul Doğuş University. Türkiye
HEMŞİRELİK ÖĞRENCİLERİNİN KARİYER PLANLARININ İNCELENMESİ	Burcu TOTUR DİKMEN, Ezgi BAĞRIAÇIK, Nida AYDIN	Yakın Doğu University, Türkiye
CURRENT APPROACHES TO BEHAVIORAL AND CONSERVATIVE TREATMENT OF URINARY INCONTINENCE	Figen Kazankaya Selin Paker Şenay Ünsal Atan	Ege University, Türkiye
THE ABSENCE OF SOCIAL SCIENCES AND THE PERVERSE EFFECTS OF THE LAW TO PREVENT AND COMBAT VIOLENCE IN SPORT IN ULTRA GROUPS	Daniel Seabra	Fernando Pessoa University, Oporto, Portugal
CONSUMERS' AND CUSTOMERS' BEHAVIOR DEPENDING OF X, Y AND Z GENERATION	Radmila Janičić	University of Belgrade,
EXAMINING THE EFFECTS OF BRAND LOVE AND CUSTOMER ENGAGEMENT	SAADANE Khaoula, BOUCHRIHA Zineb, BERBOU Lahoucine, OUIDDAD Smail	Hassan First University, Morocco
CONSUMER VALUE CO-CREATION: OVERVIEW, TYPOLOGY AND CONCEPTUALIZATION ATTEMPT	Zineb BOUCHRIHA Khaoula SAADANE Smail OUIDDAD	Hassan First University, Morocco
CREATING ZONING ISLANDS WITH THE CONJUGATE APPROACH IN THE REVISION PROCESS OF ZONING PLANS	Selim Taşkaya	Artvin Çoruh University, Artvin, Türkiye.

ONLINE / 13.07.2022 / HALL-5 / SESSION-2

LISBON TIME: 11:30-13:30

HEAD OF SESSION: MAJOR GHEORGHE GIURGIU		
TOPIC TITLE	**AUTHORS**	**AFFILIATION**
USE OF THERMOGRAPHY TO BODY TEMPERATURE MEASURE	André Luiz Leal Bevictori Carlos Nelson Elias Manuela Cunha Bastos Netto	Instituto Militar de Engenhgaria, Materials Science, Rio de Janeiro, Brazil
AVALIAÇÃO DA DEGRADAÇÃO HIDROTÉRMICA DA ZIRCÔNIA COM RECOBRIMENTO DE PINTURA ELETROSTÁTICA	Ana Karine Rocha de Andrade Nattrodt Alessandro Brito Thomaz Carlos Nelson Elias, Vitor Shigueo Maciel Sakai, Juliana Lima Gonçalves	Instituto Militar de Engenharia, Biomaterials Lab, Rio de Janeiro, Brazil.
STAINLESS STEEL ENTERAL TUBE GUIDE-WIRE COATING WITH GRAPHENE	Nathalia Rodrigues de O. Habib Pereira Francielly Moura de S. Soares Carlos Nelson Elias Bruno M. de Souza	Instituto Militar de Engenharia, Materials Science Department, Rio de Janeiro, Brazil.
COMPORTAMENTO GALVÂNICO ENTRE LIGAS BIOMÉDICAS	Késia Ribeiro Francielly Soares Carlos Elias	Universidade do Estado do Rio de Janeiro, Engenharia Metalúrgica, Rio de Janeiro, Brasil.
INFLUENCE OF TOOTH PROFILE MODIFICATIONS ON GEAR TRANSMİSSİON ERROR	Emirhan Kartal Efe Savran Bahadır Karba Fatih Karpat	Bursa Uludağ University, TR Transmisyon Engineering A.Ş., /Türkiye
BICHECTOMY: A LONGITUDINAL STUDY ON THE ELECTROMYOGRAPHIC ACTIVITY OF THE MASSETER AND TEMPORALIS MUSCLES	Thamyres Branco, Alice Cardoso, Marcelo Palınkas, Nicole Bettıol, Selma Sıessere, Simone Regalo	School of Dentistry of Ribeirão Preto, University of São Paulo, Brazil
DENIPLANT NUTRACEUTICALS - A SUPPORTIVE THERAPY AND ADJUVANT FOR THE FEMALE REPRODUCTIVE SYSTEM DYSBIOSIS	Major Gheorghe Giurgiu Med Manole Cojocaru Mihnea Andrei Nicodin	Deniplant-Aide Sante Medical Center, Biomedicine, Bucharest, Titu Maiorescu University Central Clinic Military Hospital, Romania
A NUTRACEUTICAL STRATEGY FOR PSORIATIC DISEASE: WHAT DOES THE FUTURE HOLD?	Major Gheorghe Giurgiu Med Manole Cojocaru	Deniplant-Aide Sante Medical Center, Biomedicine, Bucharest, Titu Maiorescu University Central Clinic Military Hospital, Romania

ONLINE / 13.07.2022 / HALL-1 / SESSION-3

LISBON TIME: 14:00-16:00

HEAD OF SESSION: MEHMET BEHCET PİKER		
TOPIC TITLE	**AUTHORS**	**AFFILIATION**
THE TEMPORARY PROTECTION REGIME OF THE EUROPEAN UNION: AN EVALUATION SPECIFIC TO THE RUSSIA-UKRAINE WAR	Selin BAŞER	İstanbul, Türkiye,
THE EFFECT OF NEW COMMUNICATION TECHNOLOGIES ON JOURNALISM ETHICS: CITIZEN JOURNALISM	Sevinç KAHVECİ	Girne Amerikan University, Türkiye
NEW WORLD ORDER AFTER COVID 19	Mehmet Behcet PİKER	Ozyegin University, Türkiye
INFLUENCE OF BROADCASTING IN THE PROMOTION OF EBIRA CULTURE: A STUDY OF "AANI YEYE" PROGRAMME ON JATO FM	Ojo, Cornelius Segun, Onsachi, Favour Onozazi Ohunene	Ajayi Crowther University, Oyo.
REASON AND REASONING IN LAW AND JURISPRUDENCE	Ahmad Deylami	, The University of Qom, Qom, Iran
EXECUTIVE ORDERS IN NIGERIA AS TOOLS OF GOVERNANCE: PROSPECTS AND CHALLENGES	Samuel Akpadiagha Etuk, Daniel Etim Thomas	Akwa Ibom State Polytectnic, Ikot Osurua Akwa Ibom State, Nigeria; University of Nigeria, Enugu State, Nigeria.
ROLE OF PARIS AGREEMENT IN MITIGATING CLIMATE CHANGE	Priti Chaudhari Bhumika Sharma Dr Sanskriti Mishra	Sharda University, Greater Noida, Uttar Pradesh, India
CULTURAL IMPACT OF TRIBAL MIGRATION: A CASE STUDY OF PANGWALA TRIBE OF HIMACHAL PRADESH	Simmi Agnihotri Vijay Singh	Himachal Pradesh University, Shimla (India)

ONLINE / 13.07.2022 / HALL-2 / SESSION-3

LISBON TIME: 14:00-16:00

HEAD OF SESSION: VORYA SHABRANDI		
TOPIC TITLE	**AUTHORS**	**AFFILIATION**
PROBLEMS OF UNDERSTANDING HISTORY IN MODERN NOVEL	Tora Kamal Mammadova	Sumqayıt Devlet University, Azerbaijan
SIMILARITIES IN THE LIFE AND ACTIVITIES OF MAGJAN JUMABAY AND AHMAD JAVAD	Aliyeva Afiqe Ali Kizi	Sumqayıt Devlet Unuversitesi .Azerbaycan
THE BRAIN-BASED SCIENCE LEARNING STRATEGY AMONG PRE-SERVICE TEACHERS: AN EMPIRICAL STUDY	Aina, Jacob Kola	Physics Department, Nigeria
PROBLEMS OF MODERN SOCIETY IN SERGEY MINAEV'S NOVEL "SPIRITLESS"	Ramida Mirzafarova Natiq	Baku Slavic University, Azerbaijan
ROLE OF CONTACT TIES WITHIN THE CONTEXT OF CULTURAL INTERACTION BETWEEN EAST AND WEST	Suad Afandiyeva Arif Fatma Huseynova Ramiz	Baku Slavic University, Azerbaijan
COVID-19'S IMPACT AND ALTERNATIVE METHODS OF TEACHING AND LEARNING SCIENCE, TECHNICAL AND VOCATIONAL EDUCATION IN NIGERIA	Abdulgafar Opeyemi Abdulrahman Shola Sunday Olanipekun	Kwara State College of Education (Technical), Lafiagi, Nigeria
TEACHING METHODOLOGY OF THE SUBJECT "REVIVAL OF THE TRADITIONS OF INDEPENDENT STATEHOOD IN AZERBAIJAN IN IX-XI CENTURIES IN SECONDARY SCHOOL"	Mammadov Arif Mahammad oglu, Abdullayev Ibish Abil oglu	Baku State University, History Lankaran State University, Azerbaijan
THE ROLE OF MULTICULTURALISM IN AZERBAIJANI EDUCATION	Camila Quliyeva	Baku State University, Azerbaijan
REFLECTING THE OF UNDERSTANDING AND INTERPRETATION THE LINK BETWEEN THE PHILOSOPHICAL HERMENEUTICS OF DAZIN "BEING WEIGHT" MARTIN HEIDEGGER IS A DIFFERENT STEP THAN "METHODOLOGICAL HERMENEUTICS"	Vorya Shabrandi	University of Guilan, Iran

ONLINE / 13.07.2022 / HALL-3 / SESSION-3

LISBON TIME: 14:00-16:00

HEAD OF SESSION: FATIH KOÇTÜRK		
TOPIC TITLE	**AUTHORS**	**AFFILIATION**
EVALUATION OF THE EFFECT OF SPERM MORPHOLOGY ON EMBRYO DEVELOPMENT	İlhan Özdemir Işılay Sezen Ermiş Engin DEVECİ Şamil ÖZTÜRK	Atatürk University. Harran University Dicle University Çanakkale Onsekiz Mart University, Türkiye.
EVALUATION OF THE EFFECT OF ENDOMETRIAL INJURY ON IMPLANTATION SUCCESS IN IVF	İlhan Özdemir Işılay Sezen Ermiş Engin DEVECİ Şamil ÖZTÜRK	Atatürk University. Harran University Dicle University Çanakkale Onsekiz Mart University, Türkiye.
NÖROLOJİK SEMPTOMLARA YÖNELİK İNTERNET ARAMALARINA COVID-19 PANDEMİSİNİN ETKİSİ	Fatih Koçtürk	Gaziantep University, Türkiye
ANTIBIOTIC SUSCEPTIBILITY PATTERN IN INFECTED CUTANEOUS ULCERS IN A TERTIARY CARE FACILITY IN KARACHI,PAKISTAN	Saera Suhail Kidwai, Fatima zahra	Fazaia Ruth Pfau Medical College. Karachi . Pakistan
STRUCTURAL AND FUNCTIONAL STATE OF THE HEART AT THE INITIAL STAGES OF PROGRAM HEMODIALYSIS	Aytan Mammadzada, Shalala Ismayilova, Shafag Ibrahimova, Natavan Huseynova, Azada Rahimova	Azerbaijan Medical University, Azerbaijan
THE ROLE OF SERUM BETA 2 MICROGLOBULIN IN PREDICTING KIDNEY FUNCTION	Shalala Ismayilova, Samira Muradova , Aytan Mammadzada, Sevinj Mammadli, Svetlana Nagiyeva	Azerbaijan Medical University, Azerbaijan
DNA NANOTECHNOLOGY FOR REGENERATIVE THERAPEUTICS	Baig, Mirza Muhammad Faran Ashraf	The University of Hong Kong.Bahauddin Zakariya University (BZU), Multan, Pakistan
TREATMENT OF WILMS' NEPHROBLASTOMA CANCER CELLS VIA EGFR TARGETING OF DACTINOMYCIN LOADED DNA-NANOWIRES	Mirza Muhammad Faran Ashraf Baig	The University of Hong Kong.Bahauddin Zakariya University (BZU), Multan, Pakistan

ONLINE / 13.07.2022 / HALL-4 / SESSION-3



LISBON TIME: 14:00-16:00

HEAD OF SESSION: EMINE BAŞ		
TOPIC TITLE	**AUTHORS**	**AFFILIATION**
METAHEURISTIC APPROACHES FOR THE UNCAPACITATED FACILITY LOCATION PROBLEMS	Emine BAŞ	Selçuk University, Konya, Türkiye
BATTLE ROYALE OPTIMIZATION ALGORITHM	Emine BAŞ	Selçuk University, Konya, Türkiye
ACOUSTOELECTRIC CURRENT IN A QUANTUM WELL	Awadhesh Prasad	Veer Kunwar Singh University, India
ADVANCES IN BIODEGRADABLE CONDUCTING POLYMERIC MATERIALS FOR BIOMEDICAL APPLICATION: A REVIEW	Itum Ruti	Dikta Institute, Nepal
ON TOPOLOGICAL AND METRIC SPACES	Güzide ŞENEL	Amasya University, Türkiye
LOGIC EXERCISES	Güzide ŞENEL	Amasya University, Türkiye
A NEW APPROACH TO SOBER METRIC APPROACH SPACES	Güzide ŞENEL	Amasya University, Türkiye
ENHANCING BIG DATA SECURITY AND EFFICIENCY WITH CLOUD INTEGRATION ALGORITHMS (CIA) IN MULTIMEDIA APPLICATIONS	Dr.S.Gopalakrishnan	Siddhartha Institute of Technology and Sciences, Hyderabad, Telangana

ONLINE / 13.07.2022 / HALL-5 / SESSION-3

LISBON TIME: 14:00-16:00

HEAD OF SESSION: HANDE AYHAN GÖKCEK		
TOPIC TITLE	**AUTHORS**	**AFFILIATION**
ASSESSMENT OF SYRIAN REFUGEES' SOCIO-SPATIAL SEGREGATION IN ISTANBUL	Şafak ÇÖZE	Urban Planner, Istanbul Metropolitan Municipality
AN EXAMPLE OF A MIXED LIFESTYLE PROJECT FIKIRTEPE	S. İrem Dizdar	Yeni Yüzyıl University, Türkiye
KURUM BAKIMINDA KALMIŞ KİŞİLERİN GÖZÜNDEN KURUM SÜRECİ VE SONRASININ DEĞERLENDİRİLMESİ	Fatih KUCUR Özge KELEBEK	İstanbul University-Cerrahpaşa, Türkiye
A REVIEW ON MARKETING APPLICATIONS OF SMART(VR) ASSISTANTS DIRECTING CONSUMER BEHAVIOR AND EXPERIENCE	Hande AYHAN GÖKCEK	Istanbul Gelisim University, Türkiye
INNOVATION MANAGEMENT AND IMPLEMENTATIONS IN E-COMMERCE	Bilge TURP GÖLBAŞI	Istanbul Gelisim University, Türkiye

CONTENT

CONFERENCE ID	I
SCIENTIFIC COMMITTEE	II
PHOTO GALLERY	III
PROGRAM	IV
CONTENT	V

TITLE	AUTORS	NO
INVESTIGATION OF THE MEDIATOR ROLE OF MENTAL WORKLOAD IN THE RELATIONSHIP BETWEEN JOB SATISFACTION AND INTENTION TO LEAVE	Gökçe Özkılıççı Serpil Aytaç	1-7
ASSESSMENT OF THE DIAGNOSTIC EFFECTIVENESS OF TERAHERTZ RADIATION IN ORAL SOFT TISSUE LESIONS: PRELIMINARY FINDINGS	Esra Ece Çakmak Hakan Altan Emre Barış Kıvanç Kamburoğlu	8
IMAGING OF ORAL SOFT TISSUE LESIONS : CASE SERIES BY USING TERAHERTZ RADIATION, ULTRASONOGRAPHY AND HISTOPATHOLOGY	Esra Ece Çakmak Hakan Altan Emre Barış Kıvanç Kamburoğlu	9
TWO COMPARTMENTAL FRACTIONAL DERIVATIVE MODEL OF ANTIBIOTIC RELEASE FROM HYDROGELS AIMED FOR MEDICAL APPLICATIONS	Vesna Miskovic-Stankovic Teodor M. Atanackovic	10
DIELECTRIC CONSTANT CHANGE IN THE ANTERIOR TIBIAL MUSCLE INDUCED BY LOCAL ACUPUNCTURE STIMULATION	Manoela Gallon Pitta Flávia Belavenuto Rangon Kelly Zhang Elaine Caldeira de Oliveira Guirro João Eduardo de Araujo	11-12
THE CONCEPT OF HISTOTY IN THE CONTEMPORARY OFFICIAL RUSSIAN IMPERIALISTIC DISCOURSE	Vladimir Paperni	13
CONTEMPORARY CONCEPTS IN TEACHER EDUCATION AND NEW ROLES OF TEACHERS IN EUROPEAN DISCOURSE COMPETENCY STANDARDS	Jelena Đermanov Nataša Tančić	14-20
THE CONCEPT OF MULTIDISCIPLINARITY IN THE SYSTEM OF HELPING PROFESSIONS IN THE CONTEXT OF UNDERGRADUATE EDUCATION OF A SOCIAL WORKER AND A SPECIAL PEDAGOGUE	Lukáš Stárek	21-36
A CONTENT ANALYSIS STUDY ON THE LETTERS OF YOUNG LEARNERS OVER CORONAVIRUS	Murat KUVVETLİ İbrahim Yaşar KAZU Mehtap KAZAR	37-46

THE EFFECT OF ACUTE PHYSICAL EXERCISE APPLIED TO CHILDREN IN THE DEVELOPMENT PROCESS ON COGNITIVE FUNCTIONS	Furkan ÖĞET Yusuf BUZDAĞLI	47
INVESTIGSTION OF SOCIAL MEDIA USAGE DISORDERS OF STUDENTS IN SPORTS SCIENCES	Zafer GAYRETLİ İlker ÖZMUTLU	48-54
INVESTIGATION OF THE SPORTS FACILITIES OF THE YOUTH AND SPORTS PROVINCIAL DIRECTORATE IN TERMS OF THE NEEDS AND EXPECTATIONS OF THE STUDENTS STUDYING AT THE FACULTY OF SPORTS SCIENCES	Zafer GAYRETLİ İlker ÖZMUTLU	55-62
ANALYSIS OF POSTGRADUATE THESES ON LIFELONG LEARNING IN TURKEY	Ahmet ÇOBAN Fırat MUTLU	63-77
ELEMENTS OF THE GRAMMAR TRANSLATION METHOD IN UKRAINIAN MODERN TEACHING EXPERIENCE	Svitlana Zapolskykh Vasyl PUZANOV	78-79
INTERNATIONAL COOPERATION AND HIGHER EDUCATION IN AZERBAIJAN MODERN TRENDS OF INTERNATIONALIZATION.	A.T. Garayeva	80
TOPRAK DOLGU BARAJLARIN PROJELENDİRİLMESİNDE GEOTEKNİK ÇALIŞMALAR	Samet BAKIR Ertuğrul ORDU	81
THE PERIODIC STRUCTURAL RELATIONSHIP OF THE NORTH ATLANTIC OSCILLATION WITH THE OXFORD PRECIPITATION	Taner Mustafa CENGİZ Şeyma Ordu	82-83
OBTAINING AND CHARACTERIZING CONCRETE WITH SODIUM ALGINATE CAPSULES ADDITIONS	Alex Monserrat Pereira Costa, Alan Rodrigo Sorce, Marcos Vinicius Vieira Gaglieri, Eliana Cristina da Silva Rigo, Sylma Carvalho Maestrelli	84
PRESERVING THE JORDANIAN ARCHITECTURAL IDENTITY AND APPLYING THE ELEMENTS OF SUSTAINABILITY "THE NABULSI HOUSE"	Deya Aldeen Alrefai Ayten Özsavaş Akçay	85-96
QUALITATIVE ASSESSMENT OF SOILS OF THE MUGAN STEPPE OF THE AZERBAIJAN REPUBLIC	Shafa Alizade	97
THE USE OF RHEOLOGICAL TESTS TO EVALUATE SOIL CONDITIONING FOR EPB EXCAVATION	Guilherme de Oliveira Souza, Yasmin Carvalheiro Romero, Fábio Kazuyoshi Matsumura, Maria Eugênia Gimenez Boscov	98-107
OPTIMIZATION OF DELAY TIME AT SIGNALIZED ROAD INTERSECTIONS USING GENETIC ALGORITHM	Dilshad Mohammed	108
THE IMPACT OF PATHOLOGICAL CONDITIONS ON HISTORIC BUILDINGS: THE CASE OF ANCIENT MEDINA-	Hassan Soumadrass, Zitouni Beidouri, Khalid Zarbane	109

CASABLANCA, MOROCCO		
LAPAROSCOPIC APPROACH TO SEVERE LIVER INJURY IN A PATIENT WITH BLUNT ABDOMINAL TRAUMA	Hilmi Yazıcı	110
IMMUNOHISTOCHEMICAL EVALUATION OF PLACENTAS WITH VEGF ANTIBODY IN A COVID-19 POSITIVE TWIN PREGNANCY CASE	Fırat AŞIR, Fikri ERDEMCİ, Fatih TAŞ, Mehmet YILMAZ, Engin DEVECİ	111-117
UPREGULATION OF BRCA1 AND PPIP5K2 GENES AND PLATINUM DRUG RESISTANCE IN BOTH MILD AND SEVERE COVID-19 PATIENTS	Gizem Ayna Duran	118-125
ANTI-CANCER NATURAL COMPOUNDS AND THEIR MOLECULAR TARGETS ON TRANSCRIPTION FACTORS, EPIGENETIC MODIFICATIONS AND CANCER STEM CELLS	Mehmet Emin Arayici Yasemin Basbinar Hulya Ellidokuz	126
CYTOTOXICITY ANALYSIS OF DIFFERENT TREATED PORCINE DERMAL MATRIX: AN IN VITRO STUDY	Rodolfo Reda Alessio Zanza Maurilio D'Angelo Dario Di Nardo Luca Testarelli	127-128
CHARACTERISTICS OF CANCER STEM CELLS AS THERAPEUTİC TARGETS	Şeyda BERK	129-136
RUTİN OFTALMOLOJİ KLİNİĞİNDE KURU GÖZ	Aynura Sariyeva Aydamirov Ayna Sariyeva Ismayilov Duygu Topaktaş Emekli	137-141
IDENTIFICATION GENETIC VARIANTS OF LZTFL1 GENE RS11385942 ASSOCIATED WITH SEVER COVID-19 INFECTION IN IRAQI PATIENTS	Zhraa Razaq, Suad Gazi Jaafer Alkufi	142
ASSESSMENT OF HEALTH SYSTEM PERFORMANCES IN EUROPEAN UNION COUNTRIES DURING COVID-19	Fatih Durur Meryem Turgut Gökçen Özler Meliha Meliş Günaltay	143-147
ASSESSMENT OF BED UTILIZATION PERFORMANCE OF OECD COUNTRIES WITH THE PABON LASSO MODEL	Ferda Işıkçelik Fatih Durur Gökçen Özler Meliha Meliş Günaltay	148-152
BREAD CRISIS IN ISTANBUL (OCTOBER 17-19, 1935): INCIDENTS AND PROFITEERING IN BAKERIES	Mustafa Koç	153-161
AN EVALUATION OF PORTUGAL – TURKEY THROUGH THE EYES OF HANS CHRISTIAN ANDERSEN, A NORTHERN TRAVELER ON THE EAST-WEST AXIS	Fatma TOMBAK	162-178
FROM REGIONAL TO TRANSNATIONAL: THE JOURNEY OF VAISHNAV RELIGION AND BENGALI HINDU CULTURE	Tridib Khan	179

FEMALE UTOPIA IN “THE SOUND AND THE FURY”: THE MYTH OF PERSEPHONE	Dalila Karakaçi	180-183
THE CLASSICAL INDIAN DRAMA NARRATIVE AND RASA THEORY IN THE CONTEXT OF CINEMA: A CROSS-CULTURAL UNDERSTANDING WITH SOME KEY DIALECTS OF WESTERN SCHOLARSHIP	Santanu Sarkar Anuradha Choudry	184-199
ANALYSIS OF THE ART OF INTERROGATION IN GAGAUZ LITERATURE ON THE SEMANTIC PLANE	Leyla DİLEK	200-209
THE ROLE OF TECHNOLOGICAL TOOLS IN TODAY'S BAĞLAMA MAKING/REPAIR PROCESS	Ünal İMİK. Sinan HAŞHAŞ	210-221
REFLECTIONS OF TECHNOLOGICAL DEVELOPMENTS ON BAĞLAMA PERFORMANCE	Ünal İMİK Sinan HAŞHAŞ	222-230
ENHANCEMENT PHOTOCATALYTIC DEGRADATION OF METHYLENE BLUE ON GRAPHENE OXIDE INTERCALATED ZNAL–NO 3 LAYERED DOUBLE HYDROXIDES	Rahmah H. Al-Ammari, Salwa D. Al-Malawi	231
INFLUENCE OF SYNTHESIS CONDITIONS ON PHYSICO-CHEMICAL AND PHOTOCATALYTIC PROPERTIES OF SILVER NANOMATERIALS	Salwa D. Al-Malwi, Rahmah H. Al-Ammari	232
OPTIMIZATION OF ULTRASONIC-ASSISTED EXTRACTION OF RADICAL SCAVENGING ACTIVITIES FROM ORANGE PEEL WASTE USING RESPONSE SURFACE METHODOLOGY AND MULTI-RESPONSE DESIRABILITY FUNCTION	Nurcihan TAN ERKO, Şule DİNÇ ZOR, Güzin ALPDOĞAN, Ayşegül PEKSEL	233-234
MODIFICATION OF THE PULLULANASE WITH ENCAPSULATION AND INVESTIGATION OF STABILITY	Elif GEDIKOGLU Musa KAMACI Aysegul PEKSEL	235-236
INVESTIGATION OF THE PROPERTIES OF HAZELNUT SHELL POWDER ADDED POLYPROPYLENE FOAMS BY CHEMICAL FOAMING METHOD	Didem Betül İlhan Serkan Soncu Meral Akkoyun	237-242
PRODUCTION OF FLY ASH AND GLASS FIBER REINFORCED RIGID POLYURETHANE COMPOSITE FOAMS AND INVESTIGATION OF THEIR PROPERTIES	Fatma Güney Meral Akkoyun	243-251
ANALYSIS OF THE LENGTH OF DRY PERIODS FOR AGRICULTURAL PRODUCTION USING THE MARKOV CHAIN MODEL: CASE OF SYNOPTIC STATIONS IN BENIN	B. A. Darius Gnihatin, Aristide B. Akpo	252

DEVELOPMENT OF YIELD PREDICTION MODEL FOR GRAPES AND EXPERIMENTAL VALIDATION THROUGH ANDROID MOBILE APP UNDER AGRO CLIMATIC CONDITIONS BASED ON DISEASE MANAGEMENT	Eswari Alaguthevar	253-263
THERORETICAL STUDY OF THE DIELECTRIC PROPERTIES OF A BIOPOLYMER ENRICHED WITH SEVERAL BIOFILERS	Andreea Irina Barzic, Stoica Iuliana, Raluca Marinica Albu	264
NUMERICAL INVESTIGATION OF HEAT TRANSFER IN A RIBBED TRIANGULAR WAVY CHANNEL UNDER NANOFLUID FLOW	Selma Akçay	265-275
DEVELOPING A HYDROECONOMIC OPTIMIZATION MODEL FOR THE EUPHRATES BASIN	Ayça Aytaç M.Cihat Tuna M.Şahin Doğan	276
A LANGUAGE RECOGNITION SYSTEM FOR PHILIPPINES INDIGENOUS B'LAAN LANGUAGE USING HYBRID CONVOLUTIONAL AND RECURRENT NEURAL NETWORK	Patrick D. Cerna	277
DETERMINING CUSTOMER SATISFACTION INDEX FOR CIVIL AVIATION ORGANIZATIONS BASED ON FUZZY LOGIC AND SERVQUAL METHOD	Hakan Şimşek İrem Güvendiren Şevval SARI	278
STUDY TO IMPROVE SAFETY FOR REPAIR WORKSHOPS OF THE INTERNAL COMBUSTION ENGINES	Mai Duc Nghia, Doan Cong Thang	279-285
OCCUPATIONAL EXPOSURE TO DUST AND RESPIRATORY SYMPTOMS AMONG LATEX GLOVE WORKERS AT DIFFERENT WORKSTATIONS IN SENAWANG, NEGERI SEMBILAN	Putri Anis Syahira Mohamad Jamil, Nur Athirah Diyana Mohammad Yusof, Karmegam Karuppiah	286-295
MINING INDUSTRY AFTER COVID-19	Edmond Hoxha	296
FASHION-TECH, ECO-TECH AND HIGH-TECH IN CONTEMPORARY KNITTING	Alenka Pavko Čuden	297-303
INTERNATIONAL TOURISM AS A SOURCE OF INCOME GENERATION IN PORTUGAL	Carlos Rodrigues, Ana Campina	304-314
EVALUATION OF THE EFFECTS OF THE COVID-19 PANDEMIC ON THE MACROECONOMIC PERFORMANCE OF THE TURKISH ECONOMY	Cansel OSKAY	315-316
DO SHOCKS AFFECT FOREIGN VISITOR ARRIVALS PERMANENTLY OR TEMPORARILY? A RESEARCH ON RUSSIAN VISITORS TO TURKEY	Mehmet ERDOĞMUŞ	317

HOW DO MANAGERS PERCEIVE GROWTH IN A CRISIS CONTEXT? CASE OF MOROCCAN SMES	Kenza MORABBI Said OUHADI	318
ANALYSIS OF GROWTH INTENTION AND ITS INFLUENCE ON GOVERNANCE: CASE OF MOROCCAN FAMILY SME'S	Kenza MORABBI Said OUHADI	319
PRODUCT DONATION AS A REVERSE LOGISTIC PRACTICE: PERCEPTION IN THE MOROCCAN AGRO-FOOD INDUSTRY	MOUNAIM L'Houssaine SARMOH Aymane	320-321
THE EFFECT OF RETURN POLICY LENIENCY ON ONLINE PURCHASE INTENTION	MOUNAIM L'Houssaine SARMOH Aymane	322
COVID 19 | FOOD RETAILING AND HOME DELIVERY SERVICE: A PREFERRED ALTERNATIVE AND A CURRENT TREND THAT RESISTS THE CRISIS	Nahide DAKHCH	323
ANALYSIS OF THE EFFECTS OF PUBLIC EXPENDITURE AND TAXES ON ECONOMIC GROWTH	Levent AKSU	324-355
CULTURE AS A VECTOR FOR SOCIAL INNOVATION AND CREATIVE ECONOMY: APPLICATION CASES WITH BRAZILIAN COMMUNITIES	Erika M. Robrahn-González	356-364
DETERMINATION OF SOME PROBIOTIC PROPERTIES OF ENTEROCOCCUS STRAINS ISOLATED FROM RAW MILK	Zehranur YÜKSEKDAĞ Berat ÇINAR ACAR Ebru Şebnem YILMAZ	365
MITIGATION OF PLANT STRESS BY PHYTO-NANOTECHNOLOGY	Fadime KARABULUT	366-375
THE EFFECT OF PRE-L-TRYPTOPHAN TREATMENTS ON GERMINATION CHARACTERISTICS OF TOLERANT AND SENSITIVE MAIZE (Zea mays L.) CULTIVARS UNDER SALINITY STRESS	Philbert NDACAKOMEJE Nesrin COLAK Faik Ahmet AYAZ	376-387
EVALUATION OF AFLATOXIN M 1 LEVEL IN RAW MILK DURING WINTER 2021 IN KOSOVO	Arieta Camaj Ibrahimi Hata Dibrani Sopjani Nazmi Hasanaj	388
THE EFFECT OF NININ, LYSOZYME, CITRIC ACID AND LACTIC ACID IN BEEF PREPARATIONS CONTAMINATED WITH LISTERIA MONOCYTOGENES	Raziye Filiz Akkuş Ufuk Kamber	389-402
STORAGE CAPABILITY OF A BEVERAGE BASED ON UNCLARIFIED CHEESE WHEY FROM KHAINAK'S MILK	Dusheeva Nurgul S., Elemanova Rimma Sh., Musulmanova Mukarama Mukhamedovna, Mambetova Anara Shergazievna, Sabyrbekova Ainagul	403-408
DNA BARCODES FOR INSECTS	Ayşe Nur PEKTAŞ	409-414
GENETIC DIVERSITY IN THE MITOGENOME OF ENDANGERED VAQUITA DOLPHIN (Phocoena sinus)	Widya Pintaka Bayu Putra	415

GENITO-GENITAL RUBBING AND GROOMING IN RELATION TO ALLOMOTHERING IN A GROUP OF FEMALE CAPTIVE BONOBOS	Sarah Radtke Maryanne Fisher	416
ANALYSIS OF THE HEPATOPATHOLOGICAL ALTERATIONS INDUCED BY YANGONIN "YA" DIETARY SUPPLEMENTATION BY A SPECIAL SCORING SYSTEM (LIGHT AND TEM) MICROSCOPE AND BIOCHEMICAL TESTS	Mohammed Abdulabbas Hasan	417
MORTALITY RATE OF EUROPEAN BISON (Bison bonasus bonasus L 1758) IN ROMANIA IN 2004 – 2018	Milivoje Urošević Goran Stanišić Radomir Mandić Panče Dameski Darko Drobnjak	418-422
THE RELATIONSHIP BETWEEN INDIVIDUALIZED CARE PERCEPTIONS AND COMPASSION LEVEL OF NURSING STUDENTS	Sevgi PAKİŞ ÇETİN, Kıvan ÇEVİK	423-424
ÜNIVERSITE ÖĞRENCILERININ AKIL SAĞLIĞININ CINSIYETE GÖRE KARŞILAŞTIRILMASI	Mahsa Jostejouy Khoei	425-426
HEMŞİRELİK ÖĞRENCİLERİNİN KARİYER PLANLARININ İNCELENMESİ	Burcu TOTUR DİKMEN, Ezgi BAĞRIAÇIK, Nida AYDIN	427
CURRENT APPROACHES TO BEHAVIORAL AND CONSERVATIVE TREATMENT OF URINARY INCONTINENCE	Figen Kazankaya Selin Paker Şenay Ünsal Atan	428-429
THE ABSENCE OF SOCIAL SCIENCES AND THE PERVERSE EFFECTS OF THE LAW TO PREVENT AND COMBAT VIOLENCE IN SPORT IN ULTRA GROUPS	Daniel Seabra	430-434
CONSUMERS' AND CUSTOMERS' BEHAVIOR DEPENDING OF X, Y AND Z GENERATION	Radmila Janičić	435-436
EXAMINING THE EFFECTS OF BRAND LOVE AND CUSTOMER ENGAGEMENT ON VALUE COCREATION : A CONCEPTUAL MODEL PROPOSAL	SAADANE Khaoula, BOUCHRIHA Zineb, BERBOU Lahoucine, OUIDDAD Smail	437
CONSUMER VALUE CO-CREATION: OVERVIEW, TYPOLOGY AND CONCEPTUALIZATION ATTEMPT	Zineb BOUCHRIHA Khaoula SAADANE Smail OUIDDAD	438
CREATING ZONING ISLANDS WITH THE CONJUGATE APPROACH IN THE REVISION PROCESS OF ZONING PLANS	Selim Taşkaya	439-446
USE OF THERMOGRAPHY TO BODY TEMPERATURE MEASURE	André Luiz Leal Bevictori Carlos Nelson Elias Manuela Cunha Bastos Netto	447

AVALIAÇÃO DA DEGRADAÇÃO HIDROTÉRMICA DA ZIRCÔNIA COM RECOBRIMENTO DE PINTURA ELETROSTÁTICA	Ana Karine Rocha de Andrade Nattrodt Alessandro Brito Thomaz Carlos Nelson Elias, Vitor Shigueo Maciel Sakai, Juliana Lima Gonçalves	448-458
COMPORTAMENTO GALVÂNICO ENTRE LIGAS BIOMÉDICAS	Késia Ribeiro Francielly Soares Carlos Elias	459-464
INFLUENCE OF TOOTH PROFILE MODIFICATIONS ON GEAR TRANSMİSSİON ERROR	Emirhan Kartal Efe Savran Bahadır Karba Fatih Karpat	465-473
BICHECTOMY: A LONGITUDINAL STUDY ON THE ELECTROMYOGRAPHIC ACTIVITY OF THE MASSETER AND TEMPORALIS MUSCLES	Thamyres Branco, Alice Cardoso, Marcelo Palınkas, Nicole Bettıol, Selma Sıessere, Simone Regalo	474-475
DENIPLANT NUTRACEUTICALS - A SUPPORTIVE THERAPY AND ADJUVANT FOR THE FEMALE REPRODUCTIVE SYSTEM DYSBIOSIS	Major Gheorghe Giurgiu Med Manole Cojocaru Mihnea Andrei Nicodin	476
A NUTRACEUTICAL STRATEGY FOR PSORIATIC DISEASE: WHAT DOES THE FUTURE HOLD?	Major Gheorghe Giurgiu Med Manole Cojocaru	477
THE TEMPORARY PROTECTION REGIME OF THE EUROPEAN UNION: AN EVALUATION SPECIFIC TO THE RUSSIA-UKRAINE WAR	Selin BAŞER	478-479
THE EFFECT OF NEW COMMUNICATION TECHNOLOGIES ON JOURNALISM ETHICS: CITIZEN JOURNALISM	Sevinç KAHVECİ	480-481
NEW WORLD ORDER AFTER COVID 19	Mehmet Behcet PİKER	482-485
INFLUENCE OF BROADCASTING IN THE PROMOTION OF EBIRA CULTURE: A STUDY OF “AANI YEYE” PROGRAMME ON JATO FM	Ojo, Cornelius Segun, Onsachi, Favour Onozazi Ohunene	486-494
REASON AND REASONING IN LAW AND JURISPRUDENCE	Ahmad Deylami	495
EXECUTIVE ORDERS IN NIGERIA AS TOOLS OF GOVERNANCE: PROSPECTS AND CHALLENGES	Samuel Akpadiagha Etuk, Daniel Etim Thomas	496
ROLE OF PARIS AGREEMENT IN MITIGATING CLIMATE CHANGE	Priti Chaudhari Bhumika Sharma Dr Sanskriti Mishra	497
CULTURAL IMPACT OF TRIBAL MIGRATION: A CASE STUDY OF PANGWALA TRIBE OF HIMACHAL PRADESH	Simmi Agnihotri Vijay Singh	498-503
PROBLEMS OF UNDERSTANDING HISTORY IN MODERN NOVEL	Tora Kamal Mammadova	504-506

SIMILARITIES IN THE LIFE AND ACTIVITIES OF MAGJAN JUMABAY AND AHMAD JAVAD	Aliyeva Afiqe Ali Kizi	507-509
THE BRAIN-BASED SCIENCE LEARNING STRATEGY AMONG PRE-SERVICE TEACHERS: AN EMPIRICAL STUDY	Aina, Jacob Kola	510
PROBLEMS OF MODERN SOCIETY IN SERGEY MINAEV'S NOVEL "SPIRITLESS"	Ramida Mirzafarova Natiq	511
ROLE OF CONTACT TIES WITHIN THE CONTEXT OF CULTURAL INTERACTION BETWEEN EAST AND WEST	Suad Afandiyeva Arif Fatma Huseynova Ramiz	512
COVID-19'S IMPACT AND ALTERNATIVE METHODS OF TEACHING AND LEARNING SCIENCE, TECHNICAL AND VOCATIONAL EDUCATION IN NIGERIA	Abdulgafar Opeyemi Abdulrahman Shola Sunday Olanipekun	513
TEACHING METHODOLOGY OF THE SUBJECT "REVIVAL OF THE TRADITIONS OF INDEPENDENT STATEHOOD IN AZERBAIJAN IN IX-XI CENTURIES IN SECONDARY SCHOOL"	Mammadov Arif Mahammad oglu, Abdullayev Ibish Abil oglu	514
THE ROLE OF MULTICULTURALISM IN AZERBAIJANI EDUCATION	Cəmilə Quliyeva	515
REFLECTING THE OF UNDERSTANDING AND INTERPRETATION THE LINK BETWEEN THE PHILOSOPHICAL HERMENEUTICS OF DAZIN "BEING WEIGHT" MARTIN HEIDEGGER IS A DIFFERENT STEP THAN "METHODOLOGICAL HERMENEUTICS"	Vorya Shabrandi	516
EVALUATION OF THE EFFECT OF SPERM MORPHOLOGY ON EMBRYO DEVELOPMENT	İlhan Özdemir Işılay Sezen Ermiş Engin DEVECİ Şamil ÖZTÜRK	517-520
EVALUATION OF THE EFFECT OF ENDOMETRIAL INJURY ON IMPLANTATION SUCCESS IN IVF	İlhan Özdemir Işılay Sezen Ermiş Engin DEVECİ Şamil ÖZTÜRK	521-524
NÖROLOJİK SEMPTOMLARA YÖNELİK İNTERNET ARAMALARINA COVID-19 PANDEMİSİNİN ETKİSİ	Fatih Koçtürk	525
ANTIBIOTIC SUSCEPTIBILITY PATTERN IN INFECTED CUTANEOUS ULCERS IN A TERTIARY CARE FACILITY IN KARACHI,PAKISTAN	Saera Suhail Kidwai, Fatima Zahra	526
STRUCTURAL AND FUNCTIONAL STATE OF THE HEART AT THE INITIAL STAGES OF PROGRAM HEMODIALYSIS	Aytan Mammadzada, Shalala Ismayilova, Shafag Ibrahimova, Natavan Huseynova, Azada Rahimova	527-528
THE ROLE OF SERUM BETA 2 MICROGLOBULIN IN PREDICTING	Shalala Ismayilova, Samira Muradova, Aytan Mammadzada, Sevinj Mammadli,	529

KIDNEY FUNCTION	Svetlana Nagiyeva	
DNA NANOTECHNOLOGY FOR REGENERATIVE THERAPEUTICS	Baig, Mirza Muhammad Faran Ashraf	530
TREATMENT OF WILMS' NEPHROBLASTOMA CANCER CELLS VIA EGFR TARGETING OF DACTINOMYCIN LOADED DNA- NANOWIRES	Baig, Mirza Muhammad Faran Ashraf	531
METAHEURISTIC APPROACHES FOR THE UNCAPACITATED FACILITY LOCATION PROBLEMS	Emine BAŞ	532-536
BATTLE ROYALE OPTIMIZATION ALGORITHM	Emine BAŞ	537-541
ACOUSTOELECTRIC CURRENT IN A QUANTUM WELL	Awadhesh Prasad	542-545
ADVANCES IN BIODEGRADABLE CONDUCTING POLYMERIC MATERIALS FOR BIOMEDICAL APPLICATION: A REVIEW	Itum Ruti	546
ON TOPOLOGICAL AND METRIC SPACES	Güzide ŞENEL	547-551
LOGIC EXERCISES	Güzide ŞENEL	552-562
A NEW APPROACH TO SOBER METRIC APPROACH SPACES	Güzide ŞENEL	563-570
ENHANCING BIG DATA SECURITY AND EFFICIENCY WITH CLOUD INTEGRATION ALGORITHMS (CIA) IN MULTIMEDIA APPLICATIONS	S.Gopalakrishnan	571
ASSESSMENT OF SYRIAN REFUGEES' SOCIO-SPATIAL SEGREGATION IN ISTANBUL	Şafak ÇÖZE	572-582
AN EXAMPLE OF A MIXED LIFESTYLE PROJECT FIKIRTEPE	S. İrem Dizdar	583-584
KURUM BAKIMINDA KALMIŞ KİŞİLERİN GÖZÜNDEN KURUM SÜRECİ VE SONRASININ DEĞERLENDİRİLMESİ	Fatih KUCUR Özge KELEBEK	585
A REVIEW ON MARKETING APPLICATIONS OF SMART(VR) ASSISTANTS DIRECTING CONSUMER BEHAVIOR AND EXPERIENCE	Hande AYHAN GÖKCEK	586-599
INNOVATION MANAGEMENT AND IMPLEMENTATIONS IN E-COMMERCE	Bilge TURP GÖLBAŞI	600-609
STAINLESS STEEL ENTERAL TUBE GUIDE-WIRE COATING WITH GRAPHENE	Nathalia Rodrigues de O. Habib Pereira Francielly Moura de S. Soares Carlos Nelson Elias Bruno M. de Souza	610-615

INVESTIGATION OF THE MEDIATOR ROLE OF MENTAL WORKLOAD IN THE RELATIONSHIP BETWEEN JOB SATISFACTION AND INTENTION TO LEAVE

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ABSTRACT
Identifying employees' intentions to leave their jobs and taking measures against them should be at the top of the issues that employers should focus on. Especially, it is important to determine the factors that affect the intention to leave the job of white-collar employees who do what we can define as a qualified workforce. It is known that jobs with intense mental activities affect the psychological health of employees. This can lead to a decrease in job satisfaction and an increase in intention to leave. Measures to be taken in order to prevent losses caused by these situations will cause employees to think that they are valued, be satisfied with their work and decrease their intention to leave.

This study aims to investigate the role of mental workload in the relationship between job satisfaction levels and turnover intentions of white-collar workers working in the public and private sectors. Data were collected from 299 people who voluntarily participated in the research, using the survey method. The questionnaires used in the research are as follows: General Job Satisfaction Scale (Kuşluvan, Kuşluvan, 2005), to measure mental workload CarMen-Q Scale (Yavuz et al., 2020) and Intention to Leave Scale (Örücü, Özafşarlıoğlu, 2013).

The age range of the participants was between 19 and 62 (Mean = 36.31, N = 8.58) and 55.5% were female and 44.5% were male. Correlation analysis and structural equation model were used in the analysis of the data.

According to the findings, when the results of the correlation analysis were examined, there was a significant negative ($r = -.634$, $p < .01$) relationship between job satifaction and intention to leave, and there is a negative significant relationship between mental workload ($r = -.165$, $p < .01$). On the other hand, there is a positive and significant relationship between intention to leave and mental workload ($r = .209$, $p < .01$).

As a result of the analyzes to determine the mediator effect, mental workload variable has a partial mediating role in the relationship between job satisfaction and intention to leave ($\beta = -.018$, SE = .010, % 95 CI = -.0412, -.0008).

Keywords: Job Satisfaction, Intention to Leave, Mental Workload.

INTRODUCTION
Economic, social, cultural, technological changes and the competitive business environment lead to changes in working life and also impose extra duties and responsibilities on employees. This situation, called excessive workload, can bring negative consequences. Although the duties and responsibilities that work life imposes on employees have different meanings for

everyone, it is known that excessive workload negatively affects the productivity, work performance and job satisfaction of the employee.

It is a well-known fact that people spend a significant part of their time in business life and their lives here are closely related to their quality of life. Work-private life balance is considered important especially for white-collar employees who have high expectations in their lives outside of work. The extremely challenging aspects of business life cause this segment with a high level of education to seek alternatives, and these searches may ultimately lead to leaving the job. Considering today's economic conditions, it can easily be said that leaving the job is not an easy way for employees. Despite these limitations, the steps to be taken to determine the factors that affect the intention to leave the job of people who are in the position of continuing their current job and to eliminate these factors will benefit both the organizations and the employees, both economically and psychologically.

Mental workload, because of its focus on the impact of mental processes on work, is "a mental construct that reflects the mental tension arising from task performance" or "aligning human cognitive functioning and the conditions affecting it, and human-machine interaction in the workplace with human cognitive abilities and limitations" defines it as (Caine, 2007; Jex, 1998; Kalakoski, 2020).

Job satisfaction, which is called the emotional reaction of the employees towards their work, increases the happiness of the employee, the employee's commitment to his work and organization, maintaining the intention to stay at work, providing better quality service to customers, working efficiently, reducing work accidents, reducing financial losses caused by faulty production, increasing organizational citizenship behaviors. leads to improved performance and quality of life (Judge et al., 2017; Kış et al., 2016; Ravari et al., 2012).

Intention to leave is an action that occurs consciously and deliberately because of employees' dissatisfaction with their working conditions (Gürbüz, Bekmezci, 2012; Yalçınsoy, Işık, 2018). There are some factors that can trigger an employee's intention to leave. These; not being able to be included in the decision-making mechanisms at the workplace, being unable to take leave from the workplace due to low salary, boring work, inadequate supervision, and hard work (Smith et al., 2015). Besides these, job dissatisfaction (Demirci, 2019; Hellman, 1997), communication problems (Hopper, 2009; Özer et al., 2017), burnout (Çalışkan, Pekkan, 2019; Weisberg, 1994), not meeting career expectations (Taylor, 1999), stress (Barnes et al., 1998; Yenihan et al., 2014), mobbing (Aylan, Koç, 2016; Djurkovic et al., 2008), and excessive workload (Akçakanat, Uzunbacak, 2019) increase the intention to leave the job.

In the literature review, no study was found that aims to reveal the relationship between these variables and the intention to leave, and also examines the effect of mental workload on intention to leave. It is thought that the study is important in terms of revealing the effect of mental workload in the relationship between job satisfaction of white-collar employees and their intention to leave. For this reason, it is thought that this research will contribute to the elimination of the deficiency in the relevant literature.

RESEARCH AND FINDINGS

The sample of the study consisted of white-collar workers working in the public and private sectors. It consisted of 299 people in total. It was decided to collect the data of the study online, taking into account the current epidemic conditions and accessibility. Participants answered the questionnaires on a voluntary basis and anonymously.

In this study, to measure job-related emotions, General Job Satisfaction Scale (Total 5 items)

was developed by Brayfield & Rothe (1951) abbreviated by Yoon and Thye (2002) and adapted into Turkish by Kuşluvan and Kuşluvan (2005) were used. The Cronbach's alpha coefficient of the scale was .92. To measure mental workload "CarMen-Q Scale" which consists of 25 items and four sub-dimensions, the cognitive demands sub-dimension consists of 9 items, the temporal demands sub-dimension consists of 4 items, the performance demands sub-dimension consists of 5 items and the emotional demands sub-dimension consists of 7 items. Developed by Rubio-Valdehita et al. (2017), the Turkish adaptation of the scale was carried out by Yavuz et al. (2020). Cronbach Alpha coefficients that represent the weight of each scale on the overall factor (total score) are .92 for cognitive demands, .87, for temporal demands .81, for performance demands .86, and .91 for emotional demands. Lastly, the 3-item Intention to Leave Scale, developed by Mobley et al. (1978) and adapted into Turkish by Örücü and Özafşarlıoğlu (2013), was used to measure people's intention to leave the job. The Cronbach Alpha for the total scale was .89.

Data were analyzed using descriptive statistics, correlation analysis and mediation analysis. Reliability coefficients of all scales vary between .81 and .92, and all coefficients are within acceptable limits in social sciences. Descriptive statistics is given in Table 1.

SCALES		**Number of Items**	***M* ± *SD***	***α***	**Skewness and Kurtosis**
Intention to Leave Scale		3	8,15±3,4	,89	,231 / -,860
General Job Satisfaction Scale		5	18,12±4,5	,92	-,594 / ,075
CarMen-Q Scale		25	85,21±14,4	,92	-,433 / ,716
Sub-Dimensions	Cognitive Demands	9	34,53±6,5	,87	
	Emotional Demands	7	16,9±4,8	,91	
	Performance Demands	5	20,7±3,5	,86	
	Temporal Demands	4	13,11±3,8	,81	

Table 1. Descriptive Statistics (Confidence coefficients, Mean and Standard Deviations)

As a result of the correlation analysis, the highest correlation was found between 1% significance level and the negative relationship between job satisfaction and intention to leave (r = -.634; p <.01). Accordingly, there was a negative relationship between mental workload and job satisfaction (r =-.165; p <.01), and a positive significant relationship with intention to leave (r = .209, p <.01).

	1	2	3	4	5	6	7
1. Job Satisfaction	1						
2. Intention to Leave	**-.634***	1					
3. Mental Workload	**-.165***	**.209***	1				
4. Cognitive Demands	.109	-.02	.810*	1			
5. Emotional Demands	-.453*	.379*	.706*	.304*	1		
6. Performance Demands	-.03	.107	.756*	.538*	.361*	1	
7. Temporal Demands	-.205*	.213*	**.**794*	.467*	.543*	.543*	1

Table 2. Correlations between Scales and Variables

*p <.001

Another aim of this study is to investigate the mediating role of mental workload between job satisfaction and turnover intention. In order to determine whether the indirect effect was significant, bootstrap confidence interval values were checked. Bootstrap lower and upper bound must be above or below zero (Preacher, Hayes, 2008). In Table 3, it is seen that both bootstrap confidence intervals are below zero and mental workload has a partial mediating effect.

Table 3. Total, Direct, and Indirect Effect Values

Mental Workload Mediating Role	Total Effect	Direct Effect	Indirect Effect	Bootstrap BOLLCI-BOULCI
Job Satisfaction-Intention to Leave	-.4787	-.4653	-.013	-.0412, -.0008

As a result of the analyzes to determine the mediator role, mental workload variable plays a partial mediating role in the relationship between job satisfaction and intention to leave (β =-.018, SE = .010, %95 CI =-.0412,-.0008).

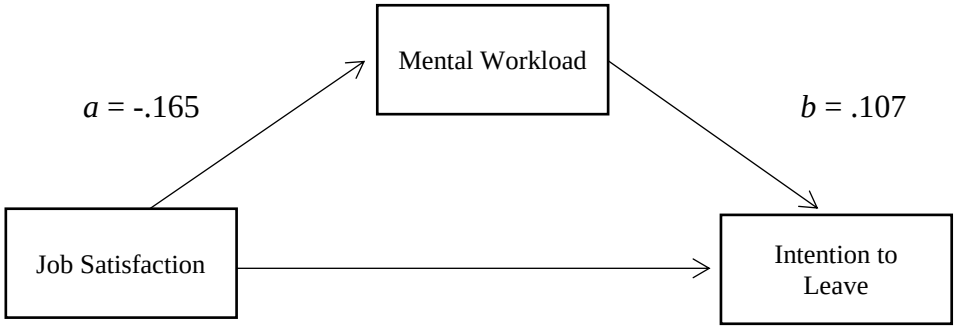

Figure 1. Mediation Model

CONCLUSION

The relationship between intention to leave and job satisfaction has been revealed in many studies (Aypar et al., 2018; O'Neill, Davis, 2011; Yücel, Koçak, 2018). In this study, a very strong and negative significant relationship was determined. In this study, the mental workload variable, which is thought to have a role in this relationship, is also discussed.

Mental workload which is briefly explained as the completion of the tasks undertaken by the

employee by using mental energy (Jung, 2001), causes problems such as stress, job dissatisfaction, and increased intention to leave (Altaf, Awan, 2011; Karadağ, Cankul, 2015). In our study, a similar result was obtained and it was understood that mental workload affected the intention to leave.

This study showed that mental workload plays a mediating role in the relationship between job satisfaction and intention to leave. In other words, the negative effects of job dissatisfaction on turnover intention are higher in white-collar workers with high mental workload.

In order to reduce the employees' intention to leave, the managers should first identify the negative situations that affect the job dissatisfaction of the employees and eliminate these negative situations. However, it is necessary to implement a management approach and organizational policies that will prevent the employee from being given a job that cannot handle.

This study is the first study to examine the relationship between mental workload, job satisfaction and intention to leave on white-collar workers and aims to contribute to the literature.

REFERENCES

Akçakanat, T. & Uzunbacak, H. H. (2019). Aşırı iş yükü algısının işten ayrılma niyeti üzerine etkisinde sürekli kaygının aracılık rolü. *Alanya Akademik Bakış, 3*(3), 215-230. https://doi.org/10.29023/alanyaakademik.558557

Altaf, A. & Awan, A. (2011). Moderating affect of workplace spirituality on the relationship of job overload and job satisfaction. *Journal of Business Ethics, 104*(1), 93-99. https://doi.org/10.1007/s10551-011-0891-0

Aylan, S. & Koç, H. (2016). Relationship between mobbing and intention to leave in hotel industry. *Journal of Tourism and Gastronomy Studies, 4*(1), 14- 20. https://doi.org/10.21325/jotags.2016116912

Aypar, S., Sökmen, A. & Ekmekçioğlu, E. B. (2018). İş tatmini ve işten ayrılma niyeti ilişkisi: Örgütsel özdeşleşmenin aracılık rolü. *Gazi Üniversitesi Sosyal Bilimler Dergisi, 5*(13), 116-124.

Barnes, L. L., Agago, M. O. & Coombs, W. T. (1998). Effects of job-related stress on faculty intention to leave academia. *Research in Higher Education, 39*(4), 457-469.

Brayfield, A. H. & Rothe, H. F. (1951). An index of job satisfaction. *Journal of Applied Psychology, 35*(5), 307-311.

Cain, B. (2007). A Review of the Mental Workload Literature. *Toronto, ON, Canada: Defense Research and Development Canada*

Çalışkan, A. & Pekkan, N. U. (2019). Sağlık sektörü çalışanlarında tükenmişlik duygusunun işten ayrılma niyetine etkisi: kişi-örgüt uyumunun aracılık rolü. *Business and Economics Research Journal, 10*(2), 469-481. https://doi.org/10.20409/berj.2019.180

Demirci, U. (2019). İş doyumu ile işten ayrılma niyeti ilişkisine istihdam şekillerinin etkisi. *Uluslararası Sosyal Araştırmalar Dergisi, 12*(62), 1246-1258. http://doi.org/10.17719/jisr.2019.3134

Djurkovic, N., McCormack, D. & Casimir, G. (2008). Workplace bullying and intention to leave: the moderating effect of perceived organisational support. *Human Resource Management Journal, 18*(4), 405-422. https://doi.org/10.1111/j.1748-8583.2008.00081.x

Gürbüz, S. & Bekmezci, M. (2012). İnsan kaynakları yönetimi uygulamalarının bilgi işçilerinin işten ayrılma niyetine etkisinde duygusal bağlılığın aracılık ve düzenleyicilik rolü. *İstanbul*

Üniversitesi İşletme Fakültesi Dergisi, 41(2), 189–213.
Hellman, C. M. (1997). Job satisfaction and intent to leave. The Journal of Social Psychology, 137(6), 677-689. https://doi/10.1080/00224549709595491
Hopper, M. L. (2009). Communication satisfaction, job satisfaction, organisational commitment and intention to leave [Yayımlanmamış Yüksek Lisans Tezi]. New Zealand: The University of Waikato.
Jex, H. (1988). *Measuring mental workload: Problems, progress, and promises*. İçinde P. Hancock & Meshkati (Eds.), Advances in Psychology (52, ss. 5-39). North-Holland.
Judge, T. A., Weiss, H. M., Kammeyer-Mueller, J. D. & Hulin, C. L. (2017). Job attitudes, job satisfaction, and job affect: A century of continuity and of change. *Journal of Applied Psychology, 102*(3), 356-374. https://doi/10.1037/apl0000181
Jung, H. S. (2001). Establishment of overall workload assessment technique for various tasks and workplaces. *International Journal of Industrial Ergonomics, 28*(6), 341-353. https://doi.org/10.1016/S0169-8141(01)00040-3
Kalakoski, V., Selinheimo, S., Valtonen, T., Turunen, J., Käpykangas, S., Ylisassi, H. & Paajanen, T. (2020). Effects of a cognitive ergonomics workplace intervention (cogerg) on cognitive strain and well-being: A cluster-randomized controlled trial. A Study Protocol. *Bmc Psychology, 8*(1), 1-16. https://doi.org/10.1186/s40359-019-0349-1
Karadağ, M. & Cankul, İ. H. (2015). Hekimlerde zihinsel iş yükü değerlendirmesi. *The Journal of Academic Social Science,* 35, 361-370. http://doi.org/10.9761/JASSS2883
Kış, A., Şad, S. N., Özer, N. & Atik, S. (2016). A meta-analysis of the relationship between burnout and job satisfaction of educational stakeholders. *Erzincan Üniversitesi Eğitim Fakültesi Dergisi, 18*(1), 160-183. http://doi.org/10.17556/jef.47774
Kuşluvan, Z. & Kuşluvan, S. (2005). Otel işletmelerinde iş ve işletme ile ilgili faktörlerin işgören tatmini üzerindeki görece etkisi: Nevşehir örneği. *Anatolia: Turizm Araştırmaları Dergisi, 16*(2), 183-203.
Mobley, W. H., Horner, S. O. & Hollingsworth, A. T. (1978). An evaluation of precursors of hospital employee turnover. *Journal of Applied Psychology, 63*(4), 408-414. https://doi/10.1037/0021-9010.63.4.408
O'neill, J. W. & Davis, K. (2011). Work stress and well-being in the hotel industry. *International Journal of Hospitality Management, 30*(2), 385-390. https://doi.org/10.1016/j.ijhm.2010.07.007
Örücü, E. & Özafşarlıoğlu, S. (2013). Örgütsel Adaletin Çalışanların İşten Ayrılma Niyetine Etkisi: Güney Afrika Cumhuriyetinde Bir Uygulama. *Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 10*(23), 335-358.
Özer, Ö., Şantaş, F., Şantaş, G. & Şahin, D. S. (2017). Impact of nurses' perceptions of work environment and communication satisfaction on their intention to quit. *International Journal of Nursing Practice, 23*(6), 1-8. https://doi.org/10.1111/ijn.12596
Preacher, K. J. & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3): 879-891.
Ravari, A., Mirzaei, T., Kazemi, M. & Jamalizadeh, A. (2012). Job satisfaction as a multidimensional concept: A systematic review study. *Journal of Occupational Health and Epidemiology, 1*(2), 95-102. http://doi.org/10.18869/acadpub.johe.1.2.95
Rubio-Valdehita, S., López-Núñez, M. I., López-Higes, R. & Díaz-Ramiro, E. M. (2017). Development of the carmen-q questionnaire for mental workload assessment. Psicothema,

29(4), 570-576. http://doi.org/10.7334/psicothema2017.151
Smith, W., Stanz, K. & Bussin, M. (2015). Retention preferences and the relationship between total rewards, perceived organisational support and perceived supervisor support. *Sa Journal of Human Resource Management, 30*(2), 1-13. https://doi.org/10.4102/sajhrm.v13i1.665
Taylor, D. (1999). Managing job satisfaction. *Australian CPA, 69*(1), 46-47.
Weisberg, J. (1994). Measuring workers' burnout and intention to leave. *International Journal of Manpower, 15*(1), 4-14. https://doi.org/10.1108/01437729410053590
Yalçınsoy, A. & Işık, M. (2018). Toksik liderlik ile örgütsel bağlılık ve işten ayrılma niyeti ilişkisine yönelik bir araştırma. *Gaziantep University Journal of Social Sciences, 17*(3), 1016-1025. https://doi.org/10.21547/jss.373835
Yavuz, M., Akça, M. & Küçükoğlu, M. T. (2020). Zihinsel iş yükünün ölçümü: Carmen-Q ölçeğinin Türkçe'ye uyarlaması. Journal of Yaşar University, 15(60), 675-691. https://doi.org/10.19168/jyasar.708357
Yenihan, B., Öner, M. & Çiftyıldız, K. (2014). İş stresi ve işten ayrılma niyeti arasındaki ilişki: Otomotiv işletmesinde bir araştırma. *Çalışma İlişkileri Dergisi, 5*(1), 38-49.
Yoon, J. & Thye, S. R. (2002). A dual process model of organizational commitment: Job satisfaction and organizational support. *Work and occupations, 29*(1), 97-124. https://doi/10.1177/0730888402029001005
Yücel, İ. & Koçak, D. (2018). İş tatmini ve işten ayrılma niyeti arasındaki ilişkide tükenmişliğin aracılık etkisi: Sağlık sektöründe bir çalışma. *Manas Journal of Social Studies, 7*(2), 297-321.

ASSESSMENT OF THE DIAGNOSTIC EFFECTIVENESS OF TERAHERTZ RADIATION IN ORAL SOFT TISSUE LESIONS: PRELIMINARY FINDINGS

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ABSTRACT

Objective: Our aim was to evaluate the diagnostic efficiency of Terahertz (THz) beams in intraoral soft tissue lesions by comparing them with the ultrasonography technique.

Study Design: Ethical Approval was obtained for the present study. Intraoral lesions of patients who were examined in Ankara University, Dentistry Faculty, Dentomaxillofacial Radiology Department were included in this study. A total of 30 oral mucosal lesions were assessed by using high frequency ultrasound ACUSON S 2000 (Siemens, Munchen, Germany) and by Terahertz Attenuated Total Reflection (ATR) method and characteristic and dimensional measurements of lesions were compared. Ultrasonography assessment was conducted by using a 15 MHz intraoperatif probe and excision of lesions were performed after ultrasonographic examination. After excision, assessment of excised lesions were conducted at our laboratory by use of Terahertz Attenuated Total Reflection (ATR) in the light. Only 1 researcher assessed the measurements twice between intervals. Measurements were compared by Bland & Altman and intraclass correlation coefficient (ICC). Significance level was set at $p< 0.05$.

Results: ICC values calculated for intraobserver agreement for all measurements were found to be statistically significant ($p <0.001$). In general, for ultrasound measurements we found a mean difference ranging between -0.120 and +0.230 mm in comparison to THz.

Conclusion: THzcan be suggested as a promising technology and an adjunct to common imaging modalities in the assessment of oral soft tissue lesions.

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IMAGING OF ORAL SOFT TISSUE LESIONS: CASE SERIES BY USING TERAHERTZ RADIATION, ULTRASONOGRAPHY AND HISTOPATHOLOGY

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ABSTRACT

Introduction: In recent years, there has been an intense interest in biomedical imaging applications based on Terahertz (THz) wavelengths due to its advantages such as non-invasiveness and non ionizing radiation.

Case Presentation and Differential Diagnosis: A total of 10 intraoral lesions were evaluated by using ACUSON S 2000 (Siemens, Munchen, Germany) color doppler ultrasonography unit with a 15 MHz intraoperative probe. The borders of the lesion, vascular supply and internal structure were evaluated. After ultrasonography excision of lesions were performed under local anesthesia and histopathological examination and spectroscopy by using Terahertz Attenuated Total Reflection (ATR) in the light were performed. On ultrasonographic examination, 6 of the lesions showed a heterogeneous hyperechogenity with well-defined margins and posterior acoustic shadow with no vascularity and lesions were diagnosed as fibroma histopathologically showing hyperkeratosis, hyperplasia of epidermis, proliferation of fibroblasts and hyaline degeneration in partial hyperplastic collagen. 3 of these lesions demonstrated hypoechoic lesion with well-defined hyperechoic borders, with some isoechoicnity with internal vascularization were diagnosed as peripheral giant cell granuloma histopathologically showing epithelioid cells, and macrophages and its derivatives and granuloma formation. And 1 lesion showed heterogeneous echogenic internal structure with clear hyperechoic border without vascularization on ultrasonographic evaluation and Histopathologically diagnosed as oral focal mucinosis showing as a well-circumscribed but non-encapsulated myxomatous connective tissue. In addition, by using Terahertz method imaging characteristics of the 10 lesions were shown and determined by using our laboratory settings.

Conclusion: Terahertz images were found to be promising in terms of assessing intraoral soft tissue lesions a new imaging system.

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TWO COMPARTMENTAL FRACTIONAL DERIVATIVE MODEL OF ANTIBIOTIC RELEASE FROM HYDROGELS AIMED FOR MEDICAL APPLICATIONS

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ABSTRACT

This study presents a new two compartmental model with, recently defined General fractional derivative. We review that concept of General fractional derivative and use the kernel function that generalizes the classical Caputo derivative in a mathematically consistent way. The generalization that we propose uses kernel with integrable singularity that, for special choice of parameters reduce to the classical case of kernel used in Riemann-Liouville fractional calculus. The general fractional derivative defined in this way, satisfies the condition that guaranties that the fundamental theorems of the calculus are satisfied. Those condition are known as "Sonin" condition. The advantage of the proposed fractional derivative, as compared with classical aproach is the existence of an additional parameter in the kernel, that provides the possibility for better approximation of the experimental results. We have used this model to study the release of gentamicin in poly(vinyl alcohol)/gentamicin (PVA/Gent) hydrogels. The poly(vinyl alcohol) (PVA) hydrogels were obtained by physical cross linking of PVA dispersion using freezing-thawing method, and then were swollen in gentamicin (Gent) solution at 37 C^o during 48 h in order to obtain the PVA/Gent hydrogel. The concentration of released gentamicin was determined using a high-performance liquid chromatography (HPLC) coupled with mass spectrometer (MS). Next, we formulate a generalized two compartmental Pharmacokinetic model to study the time evolution of the gentamicin in PVA/Gent hydrogels. The advantage of the model is the existence of an additional parameter, coming from the General fractional derivative, as compared with classical fractional compartmental models. The model proposed here is superior in comparison to the classical (integer order) linear two compartmental model as well as classical fractional order two compartmental model, in modelling the experimental results that we have obtained in this stydy.

Keywords: Fractional kinetics; General fractional derivative; Gentamicin; Hydrogel.

DIELECTRIC CONSTANT CHANGE IN THE ANTERIOR TIBIAL MUSCLE INDUCED BY LOCAL ACUPUNCTURE STIMULATION

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ABSTRACT

This study aims to evaluate the acupuncture effect on the tissue water at the acupuncture Stomach 36 point (ST36) by dielectric constant measurement. The Research Ethics Committee of the Hospital das Clínicas of the Faculty of Medicine of Ribeirão Preto, University of São Paulo (HC-FMRP/USP), and the Clinical Trials approved this blind randomized controlled clinical trial.

The study included 120 healthy subjects aged between 18 and 38 of both sexes, randomized into six groups (n=20):

Control + XS Probe (depth 0.5mm) or Probe M (depth 2.5mm) or Probe L (depth 5mm): volunteers without acupuncture stimulation, submitted to impedance and dielectric constant evaluation at point ST36;

Acupuncture + XS Probe or Probe M or Probe L: volunteers with acupuncture stimulation at point ST36, submitted to impedance and constant dielectric evaluation.

Acupuncture was performed at point ST36 point located in the Lower Limbs, inferior to the patella on the anterior margin of the tibia. Stimulation was performed with the volunteers in the supine position, with an extension of the legs, using sterile and disposable needles (0.25 x 30 mm, size), for 20 minutes, at a depth of 0.5 inches, in order to obtain the De Qi, sensation.

MoistureMeterD device was used to assess the dielectric constant. This measurement is non-invasive and uses a manual probe that touches the skin surface for 10 seconds and indicates the dielectric value. The procedure occurred in the initial assessment (baseline), assessment 2 (20 minutes after acupuncture), and assessment 3 (40 minutes after acupuncture). We used an

Analysis of Variance (ANOVA) of repeated measures to analyze the results. Tukey's post-test analyzed differences between groups. The significant P-value was <0.05.
The analysis showed a statistically significant decrease in the dielectric constant at a depth of 0.5mm (XP probe) after 20 and 40 minutes of acupuncture stimulation compared to the initial assessment ($F_{8,287}$: 24,79; $P<0.05$). However, the different depths or probes used do not present any significant change.
Of the three probes used, only the XS can evaluate acupuncture impact on the tissue water, and we could observe a decrease in the dielectric constant values at point ST36.

Keywords: Acupuncture, dielectric constant, tissue water.

THE COCEPT OF HISTOTY IN THE CONTEMPORARY OFFICIAL RUSSIAN IMPERIALISTIC DISCOURSE

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ABSTRACT

In 1989, Francis Fukuyama proclaimed the triumph of Western ideas of political and economic liberalism over the communist ideology in the communist countries as the beginning of "the end of history". Three decades after this utopic proclamation, it became clear that in Post-Soviet Russia, this inheritor of the collapsed Soviet empire, not Western *ideas* (i.e. certain principles of political and economic practices) had won but rather Western *discourse* – only speaking about these ideas, and just for a short period of time. The openly anti-liberal, authoritarian contemporary Russian political regime has gradually stoped using the Western liberal discourse and replaced it with neo-imperialistic political discourse which is based on a very specific concept of the Russian *history*. According to this concept, in all stages of its history, Russia is inherent in absolute moral and religious superiority over all other countries and is endowed with religious and moral mission to dominate over its neighbors (and its neighbors are potentially all, since “eternal Russia” has no borders). This pseudo-historical concept is supported by creating of numerous pseudo-historical stories about the great predecessors (from Vladimir the Great, Ivan the Terrible, and Peter the Great till Stalin) of the modern Russian political leadership and their great victories, which modern leaders are always ready to repeat. Caracteristic in this context is that the war against Ukraine is officially interpreted as a war against Nazism, i.e. like a repeat of the war against Nazi Germany.

The proposed report will analyze the basic presuppositions and peculiarities of the (fake)histotical component of the contemporary Russian political discourse, its real historical roots in different epochs (from the Middle Ages to the Soviet time) and its functions in the Russian political practices and propaganda.

Keywords: history, discourse, Russia, imperialistic, war, Ukrainre

CONTEMPORARY CONCEPTS IN TEACHER EDUCATION AND NEW ROLES OF TEACHERS IN EUROPEAN DISCOURSE COMPETENCY STANDARDS

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ABSTRACT
Political, economic and cultural changes in the world and in our country have resulted in increasing attention, and thus numerous researches in the field of education, professional development and new roles of teachers in the educational process. are important in setting priorities in professional development. In this paper, the relevant documents are especially considered when it comes to teacher education. In accordance with the mentioned documents, the paper accepted the view that the reform should move towards the "professionalization" of the teaching profession. However, the mentioned professionalization, in addition to providing professional competencies related to the areas in which they teach, must include knowledge of those specific knowledge, such as pedagogical - psychological and methodological knowledge, modern technologies and evaluation mechanisms. Since competencies are a dynamic phenomenon that depends on individual, social and material context, but also time, it is necessary to continuously think about the competencies of teachers necessary for life in the 21st century. Finally, the paper points out new tendencies in pedeutology, especially concentrated on models of teacher education according to European standards.

Keywords: pedeutology, teachers, competencies, European standards

INTRODUCTION
In the modern world, which is characterized by numerous and accelerated changes, the importance of synchronizing the educational system and the school as its institutional framework and timely and adequate response to newly arrived social changes is especially emphasized. This process of consolidation takes place and will take place in a visible and measurable way on the plan of the "manifesto curriculum". However, internal, pedagogical reform, the implications of which are located in the school itself, has a prominent importance in the general changes. In that process of thinking, research, modeling and redesigning the system of upbringing and education, a respectable aspect belongs to the positioning of the role, functions and competences of the teacher as a significant factor in the educational process (Tančić, 2021).

In order to realize the aspirations of modern society in the context of preparing young generations in accordance with the goals and tasks set for education and personal development, at the state and international level, continuous changes and improvement are needed, especially when it comes to international harmonization of goals, educational standards and developing teacher competencies. The goal is to standardize teacher education systems and the quality of

education in general. The requirements defined in this way are particularly related to the system of educational standards of students and teacher competencies. In this context, there is a consensus of authors that highly developed competencies of teachers are a decisive factor in the quality of student education (Hattie, 2008). This general attitude remains as a decisive factor, although the roles of teachers are changing to a great extent: from the former role of a source of knowledge to the roles of: planner, motivator, organizer of conditions and creator of the environment in which the student becomes the subject of learning. In order to develop students' abilities, desirable educational attitudes and values, teachers are expected to improve existing and develop new competencies through initial education and professional training. The new role of the teacher defined in this way requires a complex, interdisciplinary study and observation from different perspectives, angles and viewpoints of psychology, pedagogy, sociology, philosophy, culturology and pedeutology. Life and work in a modern society of rapid changes and fierce competition require a new type of knowledge, skills, values and attitudes, i.e. new competencies of the individual that emphasize the development of innovation, creativity, problem solving, development of critical thinking, information literacy, social and other competencies (Jurčić, 2014). The paper points out the importance of defining new roles and improving the competencies of teachers in the context of lifelong learning.

TEACHER COMPETENCES - THEORETICAL CONSTRUCT

The concept of teacher competencies in education is multidimensional, and the content of teacher competencies is expanding every day. We list some definitions of teacher competencies, which are mentioned in various relevant sources. The term competencies has become a common term in almost all countries, which is used in different meanings. Its conceptual definition is somewhat more complex. First of all, it can be said that these are... "the abilities to perform a job"... (Romainville, 1990), or... "the general abilities of action that are based on the knowledge, experiences, values and dispositions that the individual has developed" through education (Coolahan, 1996). It is sometimes emphasized that competencies are "the abilities to perform tasks and roles that are required to achieve expected standards" (Day, 1999). They define the concept of teacher competencies as "a set of knowledge, skills and values that are necessary for each individual to function as a successful member of the community" (Key Competencies, 2002). In a similar way, the competences of teachers are determined by other authors, often stating that it is knowledge, abilities, skills, experience and values that make up the ability of an individual to successfully perform certain tasks and roles. Weinert (2001) defines them as abilities and skills based on knowledge, which are reflected in solving various problems. The level of success in performing tasks and roles, in accordance with the set standards, is often cited as a criterion for the development of certain competencies.

In the literature, there is a whole galaxy of diverse classifications of competencies that should be possessed by future teachers. They start from different criteria and areas that teachers deal with today. Some of the competencies required of teachers are categorized into five basic areas: use and development of professional knowledge; communication and interaction with students; planning, programming and teaching management; observation and assessment of student progress; planning and evaluation of continuous professional development (Kostović, 2006).

The classification provided by (Paser, 2008) emphasizes two dimensions of teacher competencies: 1) Didactic-psychological competencies, or the teacher's ability to teach students how to control and direct their cognitive processes. 2) Didactic-pedagogical competencies, or the teacher's ability to adapt his actions to the level and way of functioning of each student, as

well as the ability to encourage students to exchange and cooperate in the learning process. In the last few decades, with the increasingly rapid development of science and technology and the strengthening of the concept of lifelong education, another new competence of the teaching profession is becoming increasingly important - readiness for lifelong learning and education (Paser, 2008). In strategic documents at the global level, the necessity of changes in relations in accordance with modern trends in education is emphasized, in order to overcome a certain inertness of teaching practice and introduce changes in educational systems in the world. should be concretized through thinking about their own work as guides in assessing the needs of employees in education and determining priorities in professional development. Teacher competencies are defined in relation to learning goals and outcomes and should provide professional standards for what teaching is considered successful.

"The key competence of modern education is expressed in the syntagm of competences for lifelong education, because in united Europe this competence is at the top of those that constitute the goal in the education process" (Gojkov et al., 2006: 22). Education and upbringing have a special role in encouraging the development of human potential for the acquisition of competence as a general ability of an individual. Competences, according to the modern understanding, are interpreted as a set of potentials and capacities for achieving personal goals and professional roles in the modern school context.

EUROPEAN DISCOURSE OF TEACHER COMPETENCES

Many countries around the world point to the importance of quality education for individual and collective well-being. The focus of educational policies is aimed at the affirmation of laws that advocate innovation, the application of which ensures competence in dealing with newly arrived changes and challenges of the 21st century. The awareness of the increasing complexity of the teacher's role gave rise to numerous analyzes of the current situation and recognition of new needs in the teacher education system. The new paradigm on their education offers the most important documents in which this educational policy is formulated. The key documents that appear already in the nineties are: Learning and teaching: towards a learning society (EC publication Teaching and learning: towards learning society, 1995) and the OECD declaration from 1998 "Lifelong learning for all" (Life long learning for all, 1998). They form the foundation for the development of educational policy in the European Union. After 2000, the European Union emphasized the importance of lifelong learning in several documents: the Lisbon Declaration (2000), the EU Memorandum on lifelong learning, 2000, the Green Paper on teacher education in Europe, etc. (Vizek-Vidović, 2005).

The Green Paper on teacher education in Europe (Buchberger et. al, 2000) is a study that represents the main document and refers to the reflection on this pedeutological problem. It is written in five chapters and presents a detailed insight into the state of education with an emphasis on changing values and attitudes, demographic changes, the changed role of the state in the education sector, as well as implications for the education sector and teacher training and development strategies. Within the fourth and fifth chapters, the possibilities of reforming the teacher education system were pointed out. The basic premise of these changes is the orientation of teachers for self-education and permanent education in the context of lifelong learning. The authors of the study indicate that despite the fact that the importance of quality teacher education is recognized, a static approach still dominates in Europe, which implies a weak connection between certain actors (higher education institutions and school practice). The document emphasizes that the direction of the reform should go towards the

"professionalization" of the teaching profession, which undeniably includes the creation of a broad base of scientifically based knowledge about learning and teaching. Also, in the Green Book, a synthesis of the characteristics of various models of "professional training of teachers" and continuous professional development developed by some European countries is given through three perspectives: the perspective of trends; initiative perspective; the "administrator" perspective.

According to this document (Green paper on teacher education in Europe, 2000; Buchberger et. al, 2000) changes in education in most countries of the European Union are reflected in:

- redefining the goals and purposes of teacher education programs (the emphasis is on focusing on key competencies);
- content of the curriculum (orientation towards managing knowledge instead of mastering the structures of scientific disciplines);
- focusing on connecting higher education institutions and current school practice
- the new organizational structure of the program;
- changes in the development of the program at the institutional level;
- requirements for professional development of higher education teachers involved in the process of initial teacher education;
- introduction of internal and external evaluation in order to ensure the quality of study programs for teacher education

In the document Education and Training: The Success of the Lisbon Strategy Hinges on Urgent Reforms (Education and Training - The Success of the Lisbon Strategy Hinges on Urgent Reforms), the European Commission determined a list of key competences of teachers classified into several categories, in order to provide assistance to educational policy makers at regional and local plan, and in accordance with which teachers should (Education and training, 2010):

They work with others professionally: it is a professionalism that is based on the values of social inclusion and nurtures the potential of each child/student. It is necessary for them to have knowledge about human development, to work with children as individuals, to encourage their development and to allow them maximum participation in the environment. Also, they should work in a way that will develop awareness of learning about cooperation through learning and teaching;Work with knowledge, technology and information: through professional development activities, teachers should be empowered for different approaches, confirming knowledge, giving feedback, transferring knowledge and using technology. Pedagogical skills should enable them to create and manage a stimulating environment for learning, with the freedom and ability to choose from the offered and available forms and content of education;

They work with and in the environment: teachers contribute to the preparation and responsibility of children and students for the role of European citizens. Teachers should promote mobility, encourage intercultural respect and understanding. Also, they should understand the factors that create social cohesion and exclusion in society and be aware of the ethical dimensions of a knowledge-based society, be able to work with the local community, as well as with partners and stakeholders in education. The European Commission further issues the necessary principles with the aim of ensuring the improvement of efficiency in education: a highly qualified profession, it is understood that teachers are highly educated in their field, as well as possessing the necessary pedagogical competences; profession within the context of lifelong learning, implies that teachers should recognize the importance of professional development and lifelong learning, as well as that educational institutions provide them with

the availability of the latest innovations in the field of their profession, in order to keep up with scientific achievements, thus encouraging them and helps their professional development, mobile profession, refers to supporting teachers to participate in EU projects, as well as to spend some time studying and working in other countries with the aim of professional development and improvement; a profession based on partnership, implies that teacher education institutions organize partnerships with schools, the local environment and centers for teachers, as well as that teacher education should provide teachers with the knowledge needed for practice. Partnership in education should focus on practical skills and on scientific and academic foundations, which should provide teachers with competence and confidence (Education and training, 2010).

Long-term and continuous improvement of the education system is not only a possibility, but a necessity. Teachers are at the center of that process, not as implementers of externally devised approaches, but as key actors who ensure high-quality education for all who participate in education. It is necessary to clearly state what this means in terms of the capacities and values that a teacher should acquire during his career. The improvement of teachers' competences precisely defined by the creators of the educational authority directs the path from their initial formation as well as the subsequent professional growth on the way to realizing the complex role of the teacher of the 21st century.

NEW ROLES OF TEACHERS IN THE MODERN SCHOOL

The traditional school and the teaching teacher will certainly remain a feature with which the 20th century ends. The third millennium is looking for new teachers. In fact, changes in the social context are the cause of the fact that teachers have to accept some new roles, change some existing roles, redefine them or abandon some completely. The new roles of teachers represent today a frequent research problem of many authors. The most general definition of the concept of role refers to "the system of activities whose performance is expected from a person occupying a certain position, and as expected behavior, the role can be: prescribed or normative (defined by law, statute) and customary or traditional (occurring in societies and resting on the cultural norms and customs of those societies)" (Havelka, 1998: 99-100). In the modern school context, the roles of teachers are defined from a different perspective on the educational process. Today, in theoretical discussions, there is more and more talk about different teacher roles, which, apart from the differences in number, also differ according to their essence. In this light, today we cannot say that there is one generally accepted classification of teachers' roles, so the roles of teachers are defined and observed according to different criteria. All of this points to the fact how complex the teaching profession is and what roles a teacher needs to fulfill in order to fulfill all the tasks that modern society imposes on him.

Mann and his colleagues (Mann et al, 1970) gave one of the oldest classifications of teacher roles. According to these authors, the basic criterion for the classification of teachers' roles was the direct work in teaching, that is, the mutual relationship between teachers and students in the teaching process. According to the taken classification criteria, six teacher roles were identified, classified as follows: (1) teacher as an expert, whereby the teacher's function is reduced to the transmission of information and data from the content of a certain teaching discipline; (2) the teacher as a formal authority (3) the teacher as a mediator and transmitter of socialization (4) the role of the teacher as a facilitator (helper) (5) the teacher as an ego-ideal (model); and (6) the teacher as a person and part of the teacher-student relationship, according to which the

teacher uses his experiences and feelings in the teaching relationship with the students, in order to convey to them different learning strategies, desirable forms of behavior, and the like.

Due to its systematicity and comprehensiveness, the American psychologist Lindgren's (1976) classification of teacher roles has long been considered one of the generally accepted ones. Lindgren sees the role of the teacher in relation to the professional activity defined according to the goals of society, but also in relation to the teacher as a person. Although according to this author, there are numerous criteria that determine the roles of the teacher, he presented the teacher's roles in three categories (Lindgern, 1976 according to: Laketa and Vasilijević, 2012: 102; Bjekić, 1999): in relation to teaching where he ensures that students acquire knowledge, skills and habits and creating positive circumstances for learning; in relation to others (students, colleagues) and through self-expressive roles where he emphasizes the need and the teacher's desire to expand his knowledge in scientific fields, engage in research, read professional literature, in other words to improve professionally...

Although the views of the authors (Suzić, 2005; Hirvi, 1996; Mann, 1970) who dealt with the nature of the role of teachers in educational work are rather uneven, which indicates the complexity of the teaching profession, and the many demands that teachers have to meet in the conception of modern school systems should answer, it can be seen that in the presented classifications of teacher roles, the most dominant one is the one that the teacher fulfills in class. All are mutually conditioned, connected and very complex, polyvalent and subject to quantitative and qualitative changes. It can be concluded that the realization of each role is conditioned by the teacher's education in certain fields, his professional training, methodical, pedagogical and psychological knowledge, and personal characteristics. All the mentioned roles are mostly conditioned by the professional development of teachers.

CONCLUSION

Teacher competences represent a support in the development of the quality of education and are very important in assessing the needs of employees in education and determining priorities in professional development. As a type of professional standards, they form the basis of documents that regulate the system of professional training of teachers. In this paper, the documents Green paper on teacher education in Europe (Green paper of teacher education in Europe), Education and Training - The Success of the Lisbon Strategy Hinges on Urgent Reforms (Education and Training - The Success of the Lisbon Strategy Hinges on Urgent Reforms)).In accordance with the mentioned documents, the paper accepts the position that the reform should move towards the "professionalization" of the teaching profession, which implies building a broad base of scientifically based knowledge about learning, teaching and research methodology. However, the aforementioned professionalization, in addition to providing professional competencies related to the areas from which they teach, must also include those that make up the specificity of the teaching profession: pedagogical, psychological, didactic knowledge, knowledge of teaching and learning methods, knowledge of teaching technology, evaluation system and knowledge cultural and educational context in which the institution operates (Tančić, 2021).

As competencies represent a dynamic phenomenon that depends on the specific conditions of the individual, social and material context, as well as time, it is necessary to continuously reflect on the competencies of teachers necessary for life in the 21st century. In accordance with the identified competencies, it is necessary to design and implement qualitatively different fundamental and permanent teacher education. And finally, as a result of all of the above, there

is a transformation of the teaching, learning and teaching process.

LITERATURE

Buchberger, F., Campos, B., Kallos, D., & Stephenson, J. (2000). Green paper on teacher education in Europe. *High Quality Teacher Education for High Quality Education and Training. Umea: TNTEE*.

Coolahan, J. (1996). Competencies and knowledge. In: *Key Competencies for Europe. Report of the Symposium* (27-30).

Council of Europe (2002). Council Resolution of 27 June 2002 on Lifelong Learning (2002/C 163/01). *Official Journal of the European Communities*, 1-3.

Day, C. (1999). *Developing teachers: the challenges of lifelong learning*. London: Farmer Press. Gojkov, G., Grandić, R., Milutinović, J., Negru, A., Paser, V., & Stojanović, A. (2006). Ciljevi–kompetencije učitelja i vaspitača. *Vršac: Viša škola za obrazovanje vaspitača*.

Havelka, N. (1998). Uloga nastavnika i učenika u osnovnoj školi. U: Naša *osnovna škola budućnosti*, Beograd. Zajednica učiteljskih fakulteta Srbije. 99-163.

Hirvi, V. (1996). Change Education Teacher Training. In Tella. S. *Teacher education in Finland* (11-19). Helsinki: University of Helsinki

Jurčić, M. (2014). Kompetentnost nastavnika–pedagoške i didaktičke dimenzije. *Pedagogijska istraživanja*, *11*(1), 77-93.

Kostović, S. (2006). Kompetencije nastavnika kao dimenzija profesionalnog razvoja nastavnika – pretpostavka pedagoškog menadžmenta. U: *Evropske dimenzije promena obrazovnog sistema u Srbiji*, Knjiga 2 (str. 33–41). Novi Sad: Filozofski fakultet, Odsek za pedagogiju i Univerza v Ljubljani, Pedagoška fakulteta.

Laketa, N. i Vasilijević, D. (2012). *Obrazovanje i usavršavanje nastavnika*. Užice: Učiteljski Fakultet Mann, R. ., Arnold, S. , Binder, J. ., Cyntrynbaum, S., Newman, B. , Ringwald, B., Ringwald, J. & Rosenwein, R. (1970): *The Collage Classrom – Conflict, Change and Learning*, New York: John Wiley and Sons.

Romainville, M. (1999). Quality evaluation of teaching in higher education. *Higher Education in Europe*, *24*(3), 415-424.

Suzić, N. (2005). *Pedagogija XXI veka*. Banja Luka: TT-centar.

Tančić, N. (2021). Determinante profesionalnog razvoja nastavnika u inkluzivnom školskom kontekstu. Doktorska disertacija. Filozofski fakultet, Novi Sad.

Vizek Vidović, V., Vlahović-Štetić, V., Pavin, T., Rijavec, M., Miljević-Riđički, R., i Žižak, A. (2005). *Cjeloživotno obrazovanje učitelja i nastavnika: višestruke perspektive* (No. 15). Institut za društvena istraživanja u Zagrebu.

Weinert, F. E. (2001). Concept of competence: A conceptual clarification.OFS

THE CONCEPT OF MULTIDISCIPLINARITY IN THE SYSTEM OF HELPING PROFESSIONS IN THE CONTEXT OF UNDERGRADUATE EDUCATION OF A SOCIAL WORKER AND A SPECIAL PEDAGOGUE

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ABSTRACT
Abstract: The professional paper entitled "The concept of multidisciplinarity in the system of helping professions in the context of undergraduate education of social worker and special pedagogue" deals with the importance of professional cooperation in the context of helping professions. It thus defines the helping profession in general and then focuses on the profession of social worker and special pedagogue in the context of the helping profession. Legislative and personal preconditions for the performance of the profession of social worker and special pedagogue are defined in the context of the importance of mutual cooperation, in order to support the social integrity of man / individual. Within the framework of Czech legislation, this is a specific feature where a special pedagogue can perform the work of a social worker. The importance of interdisciplinary cooperation with regard to the education of the child / pupil is not neglected. The paper presents quantitative research in the research part, 501 responses from students of the bachelor's degree program in special education in the context of higher education were processed and focused on their attitudes and views not only on the profession as such but also on the importance of university practice and professional identity.

Keywords: field cooperation, help and support, practice, profession, professional training.
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INTRODUCTION
The life aspects cause that every human being is facing to diverse social factors such as environment, people, groups, culture, political factors. These factors influence not only growing up but the rest of their life, and their choice of profession as well.
The terms multidisciplinary and interdisciplinary, together with other terms such as multiorganisational and inter-organisational are viewed by Kaňak (2018) as very similar, almost the same. Whether one defines the terms the same or differently as others, all professionals involved in the decision process must communicate with a similar goal that is the best possible for a client. According to Nancarrow et. al (2013), it is important to distinguish between the terms inter/multi-professional, which are terms used for the cooperation of professionals from diverse fields, and the terms inter/multidisciplinary, which are used for the cooperation of professionals with non-professionals.
An important role for clients is played by the support resulting from professional cooperation. Professionals can share their knowledge, competencies, abilities and skills. They can offer very complex help that a client demands and needs. The concept of multidisciplinary was introduced between 1970–1980 by professionals who worked in social services dedicated to people with mental health disabilities and by professionals who worked in services for people with diabetes.

(They cooperated.) The growing interest in this approach led to the creation of many definitions focused on cooperation with an interdisciplinary, multidisciplinary and transdisciplinary approach (Madge & Khair, 2000).

Ovretveit (1997) describes a multidisciplinary approach as when "two or more people from diverse fields communicate and cooperate towards common goal" (Ovretveit, 1997, p.12). The common goal is in this case a positive result for a client. The professional cooperation should start at the beginning of planning the goal, organising the path towards the goal. All of this ensures better communication and organisation of the help. Working teams have a significant role in multidisciplinary cooperation. Working teams can be categorised as follows (Ovretveit 1997):

- client's teams – the professionals take care of the individual client, but they communicate and discuss the client's situation;
- changing teams – each professional helps individually and sends a client to another professional.

Currently, there are no similar definitions for the multidisciplinary approach available, either in Czech or foreign literature.

Firstly, either a social worker and a special pedagogy needs any kind of professional training, also searching for a multidisciplinary system which is based in different disciplines getting information and helps to resolve a problem. This multidiscipline consists of a field of disciplines that open opportunities to have a good formation in these professions. In addition, these have a theoretical foundation and a practical side in these areas of social activities. Therefore, theory and practice are correlated, every discipline need these two factors, although the mechanisms conducive to changes and transformations of different elements.

Therefore, a special pedagogy and a social worker need, and education based on diversity of disciplines from history to planning, like history of education, educational psychology, educational planning… which have a common goal: the study of situations and educational facts. Moreover, humans are multidimensional, we are at the same time biological, psychic, social, affective, rational… Definitely, society has historical, economic, sociological, religious, and educational dimensions, so these helping professions are related with others human dimensions they cannot be isolated from these, since the way and the complexity of understanding this system, is given by different factors that complement the entire society.

Even though, these multidiscipline do not determine these professions, but rather they themselves use the "material" provided by the different sciences to complete and discover different aspects of their job. On the other hand, we could say that special pedagogy focuses on the entire population while social work focuses on a specific population with a certain problematic social situation. Even so, these two are really connected, each contributes to the other.

Every discipline collaborates in these helping professions in the analysis of educational phenomena in the didactic field. In addition, they need a study of the history and evolution of the society in this area since, the society, is the key to understanding the development of the human being in pedagogy and social education. The ability to help others is given with correct training that determines the ability to understand and teach a healthy education. On the other hand, we can say that social work is an area of the practical part of social pedagogy so it belongs to a discipline that complements special pedagogy, although both can be disciplines that encompass pedagogical science. Moreover, an educational pedagogical fact is never simple, very often it is incomplete. The multidisciplinary explanation is therefore essential in the field

of pedagogy, given the complexity of the phenomena to be analyzed and understood. In this sense, pedagogy, together with the other areas of knowledge, requires a general culture to emancipate humanistic education. It is not possible to specialize in one of the educational sciences without having an overview of the facts and educational situations, as well as of the techniques used by many sciences for the study of man as the center of a nature and complex educational universe.

So, the concept of multidiscipline in this area is considered necessary for the development of pedagogy in all its forms. Social work and special pedagogy are branches of pedagogy that have been developed from the different disciplines that complement it. Besides, sciences promote the need to discover, connect and relate different disciplines for their better development, that is, in this case there is a multidiscipline that is related to each other to provide information for better training. There is a practical and a theoretical part, and both are connected since without the theory the practice cannot be applied and without the practice the theory cannot be used.

In addition to, every social worker and special pedagogue need certain characteristics to offer the service they provide in different aspects that are given by an enriching and complete training, as well as present the different techniques provided by the disciplines that perform it, accompanied by the necessary skills to carry out this profession. The essential elements are determined by each one and the effort that is put into training to achieve greater success. In other matters, is important to have good qualities in these jobs, like applying different techniques to each person, spending time with the people served… Also know what our patients need to carry out a correct follow-up, and for them it is necessary to know the other well: their history from their childhood, their qualities, ambitions, highlight their capacities… among many others. Another quality that I highlight and consider that these professionals must have is to be patience which it is a virtue that with it a satisfactory job can be done, it begins with the basics in which we act doing a common good. The other person should feel comfortable and supported by us, just as they learn, we also learn from them. Each one gives us something different that with experience we can improve our learning and be able to apply it in future jobs.

MULTIDISCIPLINARY TEAM

Kuzníková (2013) defines the multidisciplinary team as a team of professionals when everyone has a crucial role, but together they are not able to reach an agreement because each has an individual goal with a client.

The term multidisciplinary approach can define a team of people, where everyone has a different field of focus and different goals. Even though the member of the multidisciplinary team can meet, discuss and communicate their goals are different and independent of each other. Consequently, there is a higher possibility for conflicts (Robertson, 2020). On the other hand, Swientozielskyj et. al (2015) see a multidisciplinary approach as the connection of diverse fields. In this instance, the author discusses providers of health, school, and social services. Through cooperation, information sharing, the search for a perspective and drawing from diverse disciplines, professionals attempt to achieve the complex care for a client. The cooperation of all professionals allows the care to be comprehensive and connected throughout all fields. The individual aspects of care across diverse disciplines do not negate each other but ensures the understanding of individuals' needs, whether they are in the health, educational or welfare field. The common goal for all professionals allows the process of sharing important information about an individual. Therefore, in the future, the needs can be met, and a client can

feel comfortable.

The multidisciplinary approach can be seen in real-time in one of the significant projects of transformation in psychiatric care in the Czech Republic. It is the cooperation of professionals from diverse social services and institutions that aim to offer help and support in all fields of an individual's life such as health care, social services, education, housing, etc. It is important that all professionals from different fields cooperate involve the offices and department of social structure. The professionals, through sharing information and cooperation, attempt to help a client and their family (Mental Health Reform, 2017).

Another no less important aspect is the legal level. "Modern trends in the history of democracy and the rule of law represent requirements for the active participation of citizens in creating an environment of legal stability and legal certainty, especially in relation to the protection of human rights and freedoms. Very complicated systems of legal rules are being created to guarantee the full and unviolated exercise of human rights and freedoms and, on the other hand, the fulfilment of legal obligations" (Víšek, Kroupa, 2020, p. 174).

With regards to starting a multidisciplinary team, it is important to take several steps. The first step is assigning the purpose of the team. Furthermore, it is important to write a report where the purpose of the team is described. It should include the common values, beliefs, and rules observed and respected by every member. Therefore, meeting the goals should be in accordance with this protocol. Finally, the last step is the decision about who is contributing to the cooperation and when. During the team's foundation phase, it is crucial to establish an environment for healthy and strong relationships in the teams based on clearly defined and limited roles and competencies of each team member. The professions are distinguished by their values, working methods, and statutes. They work with diverse knowledge and information and use various conceptual frames and discourse thay can lead to conflict inside of the team. "The team members must be able to understand and explain their formal responsibility. They have to be responsible towards their team and define with other team members their field of work in the team" (Nicholson et al., 2000, p. 43).

Hanušová and Hellebrandová (2006) based on their experiences have described ten steps for functioning interdisciplinary cooperation:

- Create a functioning team with competent professionals, where the respect and contribution of each member are taken into account;
- With the help of rules, the functioning of a team can be ensured; the best is a written agreement. Kuzníková (2011) highlights that the agreement should be understandable and approved by all members. It should contain realistic goals, tools and options, how these goals can be met;
- Ensure effective communication which allows presentation of the members' own opinions and attitudes, and simultaneously all members should be aware of others' opinions and attitudes;
- Ensure mutual respect of defined competitions and options of other members' multidisciplinary team;
- Gain knowledge about offered services, institutions, organisations, and other providers not only in the region;
- Ensure partners' approach in the team, based on mutual respect and trust;
- Educate the team members or to offer them further development of their education. Allow reciprocal education between members;
- Create methodologies, manuals, and strategies;

- Offer proper of help to a client, which will be due to steps 1–9 effective and with a clear goal.

The related fields for special pedagogy, where the multidisciplinary approach is applied, are pedagogy, sociology or social work. Another field closely related to special pedagogy is psychology and its subcategories such as developmental psychology and cognitive psychology. Multidisciplinary cooperation includes the relation between special pedagogy and medicine – for example paediatrics and neurology. Renotiérová (2005, p.24) states "findings another scientific field that has the normative character of a helping science. These fields help a disabled person determine and set their own goals. This can be discovered by searching for the optimal methods, approaches, attitudes, and norms. However, mainly it should be logic, ethic, law, and aesthetic." As with any other cooperation the multidisciplinary approach has advantages that are evident to team members as well as clients. On the other hand, there are some drawbacks, risks or barriers which can occur while using the multidisciplinary approach.

The positives for multidisciplinary approach organised by author Hrdá (2018), Swientozielskyj et al. (2015):

- Improvement in quality of care after one
- Effective and productive work of the team
- Gaining a broader overview of the problem
- Vocational enriching of professionals
- Cooperation while searching for a solution, new ideas
- Faster and more effective help for a client
- The feeling of certainty for the client's family
- Sharing and transferring important information.

Possible barriers in using the multidisciplinary approach include:

- Lack of time for building the trust between professionals and a client
- Nonuniform use of terminology (medicine – patient, education – pupil, social services – client)
- Undervaluing and disrespecting of vocational fields of other professionals
- Time burden and keeping meetings with every member of the multidisciplinary team
- The non-legislative definition of multidisciplinary teams
- Problems with sharing sensitive materials about a client.

For purpose of this text is adequate to use the definition from Matějček (2008) who includes identity as a primary human psychological need and sees it as important for gaining social value and social placement. From gaining the identity rise the health consciousness of myself and self-acceptance.

"The questions for building stable identity are part of all professions. Professional identity or collective identity is one of the three identity types (next to self-identity and group identity), which are closely linked together. Moreover, the need for identity is one of the main five psychological needs (Kovařík, Pazlarová, 2013). Identity is some "inner process which people use to compare themselves with other" (Geist, 2000, p.88)." (Elichová, 2017, p. 28).

Thus, identity should be seen as a source for motivation, which can influence social interaction such as:

- Inner responsibility to define relationships with surroundings;
- own right which drives needs and interests;
- reasonings and actions;

- a tool to control reality and correlate with the creation of self-respect.

Term identity is well known, and people use it in everyday life. However, after defining the term we can see that it is more complex and the importance of identity in human life is significant.

Definition of collective identity can be seen as "collective self-understanding of people, who claims it is important to observe goals and use specific tools and strategies for a profession." (Matoušek, 2012, p.512). "Common goal is an important aspect of professional identity. The workers can have diverse motivations, attitudes. However, they should adore one goal, towards which their profession is heading, and they should feel the urge to be in this professional group. Also, they should feel the need to differ from other groups." (Růžičková & Musil, 2009, p.80-81).

"Discussion about professional identity can be led towards two different directions. The first direction is towards understanding professional identity as part of a worker's social identity, which interacts with their understanding and other outside influences. The second direction is towards the question 'what is social work?'. More likely what are the specific aspects which differ this profession from other helping professions" (Šámalová, 2019, p. 39).

One of the exploratories approached toward professional identity presents Mareš (1996 and 2013) he has adjusted the work of Kelchtermans, who divided a teacher's professional identity into three dimensions:

1. The retrospective dimension of professional identity is divided to:
- self-picture, self-respect, self-evaluation,
- professional motivation,
- understanding of a task.

2. Current me, who has the same dimension as retrospective me, present in present.
3. Prospective dimensions of professional me are understood as professional perspective:
- my professional career,
- future paths of my pupils,
- the perspective of our school.

Strengthening of professional identity is an ongoing process of realizing own professionality. This means notifying myself in a teacher role, need of autonomy, initiatives for equal responsibility amount, the equal need of self-control, and bigger amount of self-engagement (Lukášová, 2015).

The professional identity is closely linked with professional ethics, consistent familiarising with professional ethos and values has practical meaning for the pedagogical worker also. Thus, it can help to stop and think about values that are required for the profession (Stárek, 2021).

The professional identity is linked and created by basic identity also. However, another crucial element is a professional ethic which is connected to professionality. In relation to the topic of this paper is important to mention the legal dimensions also. "… nowadays intensions in history of democratic and legal states introduce demand for citizens' active participation is the creation of legal stable environment and legal security in relation towards the human right and freedom protection. There are created complicated frameworks that should guarantee the full and non-district performance of human rights and freedom. Plus, the fulfilment of human/citizen duties." (Víšek, Kroupa, 2020, p. 174).

The student's achievement and furthermore the professional performance is related to the evaluation which can a student experience at placement. There are methods for assessing the employees which are based on diverse aspects and rules, which use different principles and

criteria. Of course, each method has pros and cons. Methods of assessment can be divided into groups based on their focus, areas of assessment, or time diversity. The first assessment an employee experience when they are applying for the job (Zpěvák, Víšek, Kohout, Fiala, 2016).

RESEARCH SURVEY

The questionnaire survey was part of the exploratory project of the School of special pedagogy "The exploratory analysis of a strategy to solve and realize pedagogical placement at the School of special pedagogy". The aim of the analysis was to draw on the view of undergraduate students at the School of special pedagogy at the University Jan Amos Komensky Prague s.r.o. Thus, highlight the students' opinion on professional identity in the context of placement which is conducted during their studies.

Furthermore, other aims were established:

- To elicit sociodemographic structure of students at the Schools of special pedagogy.
- To chart students' motivation for choosing their major and future career.
- To describe the relationship between practice and professional identity.

Data collection

The method for data collection was a questionnaire. It is often used method in the pedagogical, sociological, and psychological fields. A questionnaire is used to collect information, perspectives, and ideas about a topic. According to Chraský (2016), a questionnaire is a process of asking or written questions and receiving written answers. It is a list of in advance prepared questions that are organized in an elaborate system. Thus, the questions are answered in written form by a respondent. Plus, this method allows a researcher to collect a bigger amount of data (Punch, 2008). Every respondent has received the same set of questions, this is important for assessing the results. Another advantage of the chosen method is the easier and quicker way of data collection. Also, the respondent can answer more personal questions which could be inappropriate in personal contact. The reason for choosing a questionnaire was the ability to gain more diverse respondents. The respondents were students at the University of Jan Amos Komesky Prague s.r.o. and mainly from the School of special pedagogy, who study undergraduate courses Special pedagogy or Re-socializing and penitentiary pedagogy either full-time or part-time. The questionnaire included open and closed questions. The pilot testing was conducted; thus, some changes were made in formulating the questions. The questionnaire was provided online throughout the Microsoft forms from November 2020 till February 2021. Overall, 628 students were asked to participate and 501 has answered. Thus, 80% of respondents took part which we consider as a significant achievement.

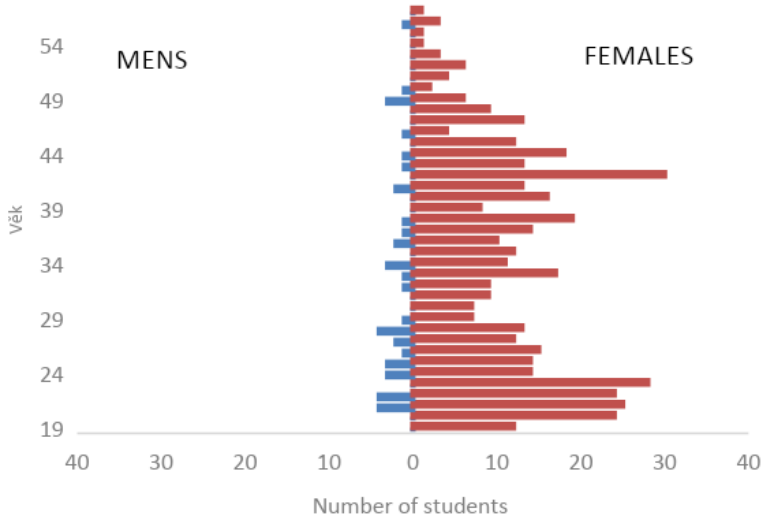
By coding and description of output data file – transforming output data file i.e., cleaning the data, transforming, and coding value of all transfiguration was created outputting data file. The data file is customs' friendly and whether it is needed it can be further used or expanded. The outputting data file was analysed. By descriptive analysis were discovered basic frequencies and relations between transfigurations were. Furthermore, the results were presented in form of tables and graphs. Thus, the results in this paper are presented here and they are from this questionnaire.

RESULTS

Sociodemographic structure of students

The questionnaire was filled out by 501 students including 41 men (8%) and 459 females (92%). The age pyramid in graph 1 "Respondents' structure based on age and gender" presents

respondents' age layout. Only one-third of students at levels 1-3 are under 26 years. The other two-thirds are older, 6% is in age 42 years. Almost 5% is older than 50 years. The average students' age is 33 years. Thus, the average and the median age of students at special pedagogy major is higher. The age median which separates students' population equal in half is in the case of special pedagogy students for 6 years higher than within students of re-socializing and penitential pedagogy (34 vs. 24 years).



Graph 1. Respondents' structure based on age and gender (own data processing)

Based on graph 1 is obvious that the study at these majors is not attractive only for high school graduates, moreover for middle-aged workers who might need to supplement their education while working. This statement is supported by table 2 "Respondents' structure based on their motivation for studies and motivation for the choice of their profession". Similarly, the structure of respondents based on their achieved education shows one-fifth of students have studied as a form of continuing studies. The biggest part 59% of respondents graduated from specialized high school. Plus, most of the respondents (92%) study Special pedagogy majors, and only 8% of respondents study Re-socializing and penitential pedagogy majors. It is important to highlight that the Re-socializing and penitential pedagogy is a new course offered since 2019. Whereas the Special pedagogy major has tradition and history. Half of the respondents are at the 1st level, more than one-fourth is at the 2nd level, and 22% is at the 3rd level of their studies.

Achieved education	Abs.	%
Specialized high school	293	58,5
High school	100	20,0
Specialized college or extra year to gain A-levels	87	17,4
Undergraduate course (Bachelor)	10	2,0
Postgraduate course (Mgr., Ing.)	11	2,2
Full postgraduate (Ph.D.)	0	0,0
Major		
Special pedagogy	461	92,0
Re-socializing a penitential pedagogy	40	8,0
Level		
I.	258	51,5
II.	133	26,5
III.	110	22,0

Table 1 Respondents' structure based on their achieved education, major and level of study *(own data processing)*

Motivation for studies and the choice of their profession

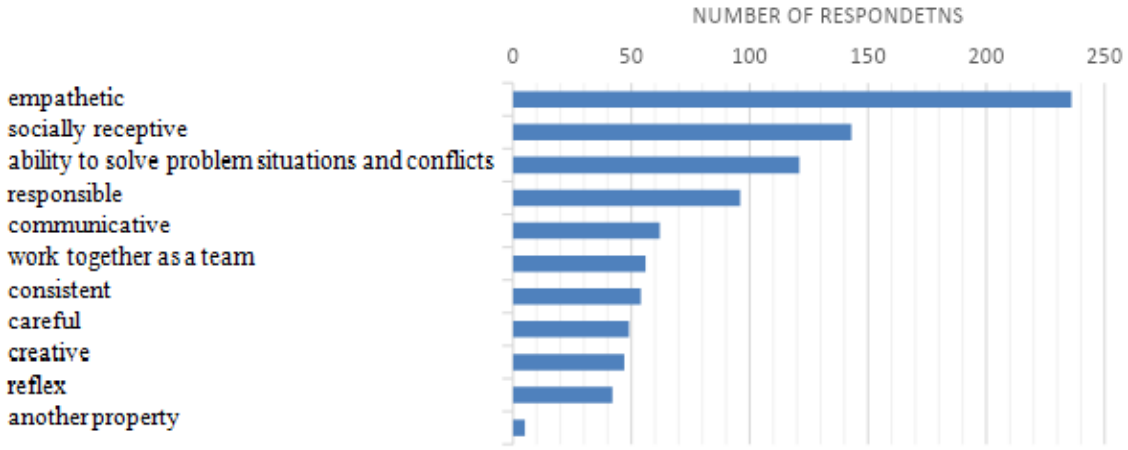
The questionnaire asked for respondents' motivation to study their major and their motivation for the chosen profession also. As shown in table 2 "Respondents' structure based on their motivation for studies and motivation for the choice of their profession" almost half of the students have decided to study this major to increase their education and qualification and almost one-third to increase their knowledge and orientation in their field. More than 6% of respondents have chosen their professional identity creation as their main motivation. To increase their financial income have chosen only 5 respondents (1%) and better position at job market have chosen only 2 students (0,5%). Also is interesting to investigate the motivation for the chosen profession (Table 2, second part). The categories are more equal than in motivation for studies. The biggest group of respondents 34% have chosen this major to be able to help and support the major's target group. Almost one-fourth of students identify these majors as professional interesting. For 18% of students, the most significant motivation is the need to enrich their education to be able to work in their current workplace. The personal experience whit target group from family or close friends have 18% of respondents.

Motivation for studies	Abs.	%
to increase qualification	244	48,7
to gain more knowledge and orientation in field	154	30,7
impulse for further studies	39	7,8
creation of professional identity	32	6,4
development of personal qualities in life-long education	21	4,2
increase of finance income	5	1,0
getting to know more people in the field	2	0,4
better position at job market	2	0,4
personal motivation – family member with disability	2	0,4
Motivation for choice of this profession		
motivation to help and support target group of these majors	169	33,7
professionally interesting work which I would like to do	119	23,8
need to increase the level of achieved education	91	18,2
personal experience with target group from family	89	17,8
previous volunteering or charity experience	18	3,6
this a field where I can always find a job	12	2,4
professional prestige	3	0,6
media influence	0	0,0

(Own data processing)

Another question which was in the questionnaire was a student's evaluation of personal assumptions. Almost half of the students identified empathy as the most important personal quality (47%). As graph 2 "Evaluation of student's personal assumptions at these majors" shows not any other personal quality was identified as often as empathy. The second most important was social awareness which was identified by 24% of respondents. The third was the ability to solve problematic situations and conflicts (24%). Nevertheless, responsibility,

communication, consistency, and teamwork are important as well.
Graph 2 Evaluation of student's personal assumptions at these majors

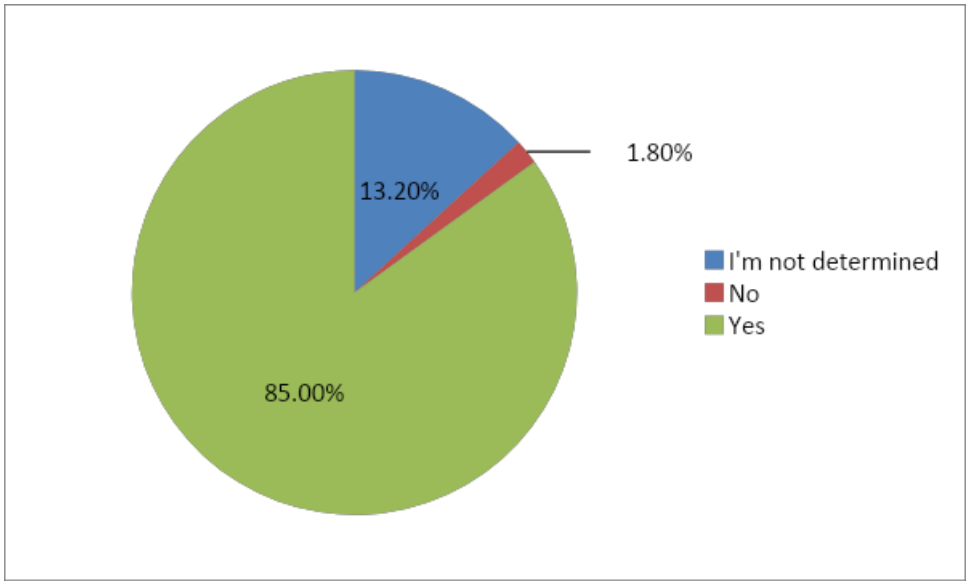


(Own data processing)

Professional identity

Some of the questions asked about professional identity. Most of the students recognize the influence of placement on their creation of professional identity. Only 20% of respondents think that placement does not influence the creation of professional identity (graph 3 "Understanding influence of placement on the creation of professional identity").

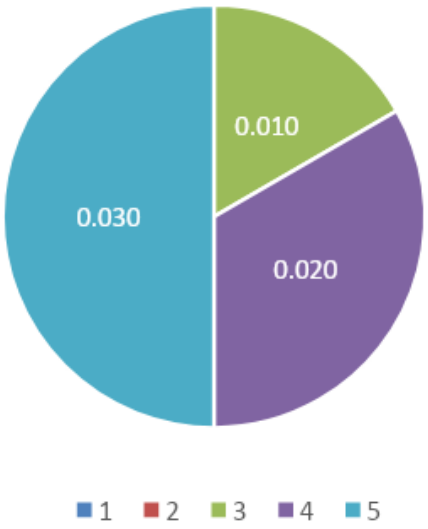
Graph 3. Understanding influence of placement on the creation of professional identity



(Own data processing)

However, more than four-fifths are convinced about the importance of professional identity for their studies and future career. None of the respondents does think that professional identity is not important (graph 4 "The importance of professional identity).

Graph 4 The importance of professional identity (1=not at all; 5= very important)



(Own data processing)

In relation to studies the professional identity means for 40% of respondent professional level of knowledge, abilities, and experiences. For almost one-third of respondents the professional identity means positive relationship towards their work with high level of expertise and human approach towards target group. For rest of the respondents the professional identity means personal approaches, goals in their profession, or moral and other values (see table 3 "The meaning of professional identity with regards to studies").

Table 3. The meaning of professional identity with regards to studies

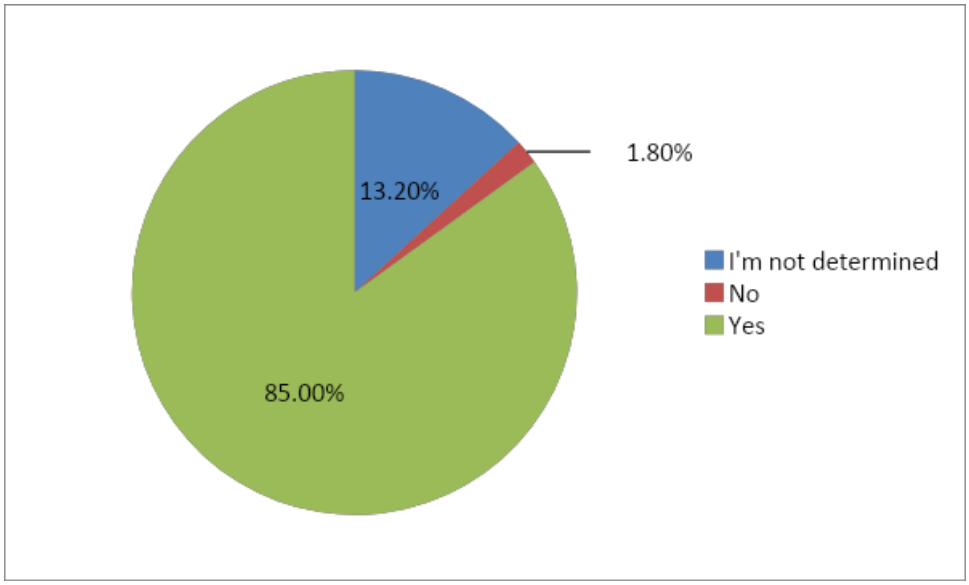
The meaning of professional identity with regards to studies	**Abs.**	**%**
Professional level of expertise, knowledge and abilties	203	40,5
Positive attitude towards work and high level of human approach	162	32,3
Own attitude and goal in the profession	45	9,0
Achieved education and quality placement	43	8,6
Moral and other values	17	3,4
Adequate set of boundaries	11	2,2
Multidisciplinary and cooperation with colleagues	11	2,2
Increase of social credits in the society	6	1,2
Recognition of the profession in the society	3	0,6

(Own data processing)

Employability in the field

Graph 4 shows "Employability in the field after successful graduation" significant part of students 85% are planning to work in their professional field after successful graduation. More than 13% of respondents are undecided and only 2% of respondents are not planning to work in the field.

Graph 4. Employability in the field after successful graduation



(Own data processing)

The students' minimum explains that they are not planning to work in this field because they are increasing their education to be able to work at their current workplace. Plus, some of the respondents are working at primary schools and they want to gain more knowledge about and be able to apply it i.e., during inclusion at their schools.

More than 73% of students are or plan to do their placement at their current workplace (Table 4). Only 5,5% of students are working in an institution where they could their placement, but they prefer to do their placement in different provisions.

Table 4. Students based on their placement in their current workplace

Placement at current workplace	**Abs.**	**%**	**% of working students**
Yes	338	67,5	73,8
No, I do not work in this provision	95	19,0	20,7
No, I do work in this provision but during my placement I want to discover something different	25	5,0	5,5
I am not working while I study	43	8,6	–
Total	**501**	**100,0**	**100,0**

(Own data processing)

Relationship between placement and professional identity

The following aim was to describe are advantages of placement from students' view.Students assessed criteria and they have assigned them the level of importance. As the average students have identified the level of practical abilities. Almost two-thirds of students have agreed that this is a very important factor.

95% of students see placement as a crucial part of their studies. The professional identity identifies 85% of respondents as an important tool. Also, 76% of respondents agree with the fact that placement has a significant influence on their creation of professional identity. Therefore, we can ask whether the understanding of professional identity differs based on the

level where students' study. Based on this following question was developed.

H0: There are no differences in understanding the importance of placement based on the students' level.

HA: There are differences in understanding the importance of placement based on the students' level.

Firstly, the contingency table of the relationship of the importance of professional identity between the level of studies (Table 5). Followed by construction equal associations.

Table 5. The Contingency relation table of the importance of professional identity based on the level of studies. (2=not important, 5= very important).

Level of studies		**The importance of professional identity**				**Total**
		2	3	4	5	
1	Quantity	4	30	101	123	258
	%	1,6%	11,6%	39,1%	47,7%	100,0%
2	Quantity	3	21	57	52	133
	%	2,3%	15,8%	42,9%	39,1%	100,0%
3	Quantity	2	17	38	53	110
	%	1,8%	15,5%	34,5%	48,2%	100,0%
Total	Quantity	9	68	196	228	501
	%	1,8%	13,6%	39,1%	45,5%	100,0%

(Own data processing)

As we can observe in the contingency table there are no visible differences in understanding the importance of professional identity across the levels of studies. Also, the counted chi-quadrat = 4,43 neither significance = 0,618 not allow the total rejection of hypothesis. Therefore, we can accept the zero hypothesis and claim, that there are not any differences in understanding the importance of placement while studies.

However, it is possible professional identity is created by age nor the lower level of studies, and by placement can be meant the professional placement which can a student has done somewhere else also. Thus, a new zero hypothesis will be made:

H0: There are not any differences in understanding the importance of placement based on students' age.

HA: There are differences in understanding the importance of placement based on students' age.

The new contingency table was calculated and equal values of association were calculated also (Table 6).

Table 6. The contingency table of relationship between students' age and professional identity (2= not important; 5= very important).

Students' age		The importance of professional identity				Total
		2	3	4	5	
TO 24 years	quantity	4	24	61	49	138
	%	2,9%	17,4%	44,2%	35,5%	100,0%
25–33 years	quantity	2	15	47	52	116
	%	1,7%	12,9%	40,5%	44,8%	100,0%
34–42 years	quantity	3	16	52	71	142
	%	2,1%	11,3%	36,6%	50,0%	100,0%
43 years and more	quantity	0	13	36	56	105
	%	0,0%	12,4%	34,3%	53,3%	100,0%
Total	quantity	9	68	196	228	501
	%	1,8%	13,6%	39,1%	45,5%	100,0%

(Own data processing)

In this combination, chi-quadrat reaches higher values (=12). However, the significance does not reach a enough high value (=0,214). Therefore, the zero hypotheses cannot be accepted. However, the chi-quadrat is sometimes a too harsh solution, and it cannot identify some relations. Thus, it is important to acknowledge other indexes. In this case, all other indexes which indicate relations between two ordinal transfigurations that accomplish favourable values (Somers´ d, Kendalls´ tau, and Gamma have calculated values more favourable values of testes statistic = 0,002). Therefore, the zero hypothesis can be rejected and can be claimed there are differences in understanding the importance of placement based on students' age.

CONCLUSION

The respect and positive attitude towards other workers from different organisations is the basic component for effective cooperating relation. For establishing team cooperation is crucial that other members accept individual differences, learn to understand, respect others and build personal relationships with other members of the teams. Every member is important and can bring something unique to the team.

The multidisciplinary practice is unique even in the challenges which are involved. The cooperation of people from various fields brings differences for example in values, language, the ways of dealing with problems, strategies and diverse elements of professional behaviour. The barriers to effective cooperation are mainly in the field of trust, responsibility, communication, and fight for power (Stárek, 2021).

Nowadays, placement is a more significant part of studies not only in employability but in the international perspective of improving educational quality. Mainly, by highlighting the need for practical training at diverse provisions. A placement helps with the creation and development of a professional identity. Therefore, the attention to professional identity was paid because single moments, experiences, abilities, feelings, reflections, and other aspects which students experience can help or harm one in their professional career and future employability. Thus, a placement is a place for applying theoretical knowledge and realizing whether the student made the right choice to study their major. Also, it can be seen as motivation

for those who are not studying types to finish their studies, so they will be able to do their profession.

Development and quality of placement is not the only result of university but a student who is representing university also. A placement is a place where a student can open the door for other students to do the same placement. A permanently developing portfolio of cooperating institutions on diverse activities such as projects, conferences, and expert seminars generates knowledge of professions' multifarious. Plus, it generates acknowledgement about cooperation and the ability to share the information which assesses a student, a university, and their expertise.

BIBLIOGRAPHY

CHRÁSKA, Miroslav. *Metody pedagogického výzkumu*. Praha: Grada Publishing, a.s., 2016. ISBN 978-80-247-5326-3.

ELICHOVÁ, Markéta. *Sociální práce – Aktuální otázky.* Praha: Grada Publishing, a.s., 2017. ISBN 978-80-271-0080-4.

HANUŠOVÁ, Jaroslava, HELLEBRANDOVÁ, Kateřina. *Interdisciplinární spolupráce*. Praha: Vzdělávací institut ochrany dětí, 2006. ISBN 80-86991-79-2.

HELUS, Zdeněk. *Sociální psychologie pro pedagogy.* Praha: Grada Publishing, a.s., 2015. ISBN 978-80-247-4674-6.

HRDÁ, Karolína. *Multidisciplinární tým v akci.* Praha: Domov Sue Ryder, 2018. ISBN 978-80-907-1900-2.

KAŇÁK, Jan a kol. *Mezioborová spolupráce v kontextu sociálních služeb: rámec, faktory, postup*. Říčany: TCMD, 2018. ISBN 978-80-270-4110-7.

KUZNÍKOVÁ, Iva. *Sociální práce ve zdravotnictví*. Praha: Grada, 2011. ISBN 978-80-247-3676-1.

LUKÁŠOVÁ, Hana. *Učitelské sebepojetí a jeho zkoumání.* Zlín: Univerzita Tomáše Bati ve Zlíně, Fakulta humanitních studií, 2015. ISBN 978-80-7454-552-8.

MADGE, Sally a KHAIR Kate. Multidisciplinary teams in the United Kingdom: problems and solutions. *International Pediatric Nursing*. W. B. Saunders company, 2000, 15(2):131-4.

MAREŠ, Jiří. *Pedagogická psychologie.* Praha: Portál, 2013. ISBN 978-80-262-0174-8.

MAŘÍKOVÁ, Hana, PETRUSEK, Miloslav, VODÁKOVÁ, Alena. *Velký sociologický slovník.* Praha: Karolinum (nakladatelství), 1996. ISBN 80-7184-310-5.

MATĚJČEK, Zdeněk. *Co děti nejvíc potřebují.* Praha: Portál, 2008. ISBN 978-80-7367-504-2.

MATOUŠEK, Oldřich et al.. *Metody a řízení sociální práce.* Praha: Portál, 2013. ISBN 978-80-262-0213-4.

NAKONEČNÝ, Milan. *Psychologie osobnosti*. Praha: Academia, 2009. ISBN 978-80-200-1680-5.

NANCARROW, Susan A., Andrew BOOTH, Steven ARRIS, Tony SMITH, Pam ENDERBY a Alison ROOTS. Ten principles of good interdisciplinary team work. *Human Resources for Health* [online]. 2013, 10 May 2013, 11(19) [cit. 2020-04-24]. DOI: https://doi.org/10.1186/1478-4491-11-19. ISSN 1478-4491. Dostupné z: https://humanresources-health.biomedcentral.com/articles/10.1186/1478-4491-11-19#citeas

NICHOLSON, Diana et al.. Working Relationships and Outcomes in Multidisciplinary Collaborative Practice Settings. *Child and Youth Care Forum*. 2000, 29(1), s. 43. ISSN 1573-3319.

OVRETVEIT, John et al.. *Interprofessional Working in Health and Social Care*. Basingstoke:

Palgrave Macmillan, 1997. ISBN 9780333645536.
PUNCH, F. Keith. *Základy kvantitativního šetření.* Praha: Portál, 2008. ISBN 978-80-7367-381-9.
REFORMA PÉČE O DUŠEVNÍ ZDRAVÍ: Strategie reformy psychiatrické péče [online]. Praha, 2017, Duben 2017 [cit. 2020-01- 14]. Dostupné z: http://www.reformapsychiatrie.cz/wpcontent/uploads/2017/04/MZ_psychiatrie_pruvodce_final.pdf
RENOTIÉROVÁ, Marie. *Základy speciální pedagogiky I.* Olomouc: Univerzita Palackého v Olomouci, 2005. ISBN 80-244-1083-4.
ROBERTSON, Duncan. Multidisciplinary Team: Encyclopedia of Aging. *Encyclopedia.com [online]*. Mar 12 2020 [cit. 2020-04-23]. Dostupné z: https://www.encyclopedia.com/medicine/anatomy-and-physiology/anatomy-andphysiology/multidisciplinary-team#34022002757
RŮŽIČKOVÁ, Daniela, MUSIL, Libor. (2009) Hledají sociální pracovníci kolektivní identitu? *Sociální práce/Sociálna práca: Časopis pro teorii, praxi a vzdělávání v sociální práci*. 3/2009, 79-92.
ŠÁMALOVÁ, Kateřina. Vzdělávání jako zdroj profesní identity. *In: Sborník příspěvků z mezinárodní konference konané u příležitosti Světového dne sociální práce s názvem Vývoj kvality a efektivity výkonu sociální práce*, pp. 38-41. Praha: Ministerstvo práce a sociálních věcí ČR, 2018. ISBN 978-80-7421-185.
STÁREK, L. a kol. *Speciálně pedagogická praxe jako významný komponent pregraduální přípravy studentů - Student praxe profese/Special education work placement as a crucial component of undergraduate student preparation - Student practice profession.* Praha: Univerzita Jana Amose Komenského Praha s.r.o., 2021. ISBN 978-80-7452-208-6.
STÁREK, Lukáš. *Vybrané aspekty ovlivňující edukační proces dítěte.* Praha: Univerzita Jana Amose Komenského Praha s.r.o., 2021. ISBN 978-80-7452-203-1.
SWIENTOZIELSKYJ, Susan a kol. *Service Component Handbook - MDT Development: Working toward an effective multidisciplinary/multiagency team [online]*. 2015 [cit. 2020-04-23]. Dostupné z: https://www.england.nhs.uk/wp-content/uploads/2015/01/mdt-dev-guid-flatfin.pdf
VÍŠEK, Jiří a KROUPA, Petr. Moderní právní stát, stabilita práva a právní jistota. KRZYŽANKOVÁ (EDS.), Katarzyna Žák. *Právo jako multidimenzionální fenomén: Pocta Aleši Gerlochovi k 65. narozeninám*. Plzeň: Vydavatelství a nakladatelství Aleš Čeněk, 2020. ISBN 978-80-7380-797-9.
ZPĚVÁK, Aleš, KOHOUT, Martin, VÍŠEK Jiří a FIALA, Zdeněk. The Importance of Personnel Evaluation Activities of the Armed Forces — Evaluation Methods, Taking Into Account Certain Aspects of Czech Private Law. *Internal Security [online]*. 2016, 8(2), 7-18 [cit. 2017-10-17]. DOI: 10.5604/01.3001.0010.2267. ISSN 2080-5268. Dostupné z: http://internalsecurity.pl/gicid/01.3001.0010.2267
ZPĚVÁK, Aleš. Recentní aspekty podnikatelské činnosti v oblasti sociálních služeb. In *Quo Vadis, sociální práce v ČR II* (kolektivní monografie). Praha: Institut pro veřejnou správu, 2019. s. 29-36, 115 s. ISBN 978-80-86976-49-5.

GENÇ ÖĞRENCİLERİN KORONAYA YAZDIKLARI 100 MEKTUBUN İNCELENMESİ

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ÖZET

Covid-19'un etkileri günümüzü etkilemektedir. Her alanı etkilediği gibi eğitim alanı da koronavirüs tarafından etkilenmiş, okullar kapatılmış, uzaktan eğitim sistemine geçilmiştir. Peki, bu durum tam olarak öğrencilerde ne gibi bir duygu durum değişikliği meydana getirmiştir? Tam olarak bu konuyu detaylı bir şekilde incelemek adına bu çalışmada, üniversite, lise ve ortaokul düzeyindeki 14-25 yaş aralığında bulunan öğrencilerin 2019-2020 yıllarında yaşadıkları öğrenim deneyimlerini ve tecrübelerini detaylı bir biçimde incelenmiştir. Araştırma kapsamında üç araştırmacı tarafından incelenen 140 mektubun hepsi mektup formatında yazılmadığı için 58 mektup elenerek 82 mektup tematik içerik analizi tekniği ile incelenmiştir. Analiz sonucunda elde edilen veriler IBM SPSS 26.0 kullanılarak frekans-yüzde olarak hesaplanmıştır. Araştırmanın güvenilirliğini sağlamak adına araştırmacılar tarafından benzer alt temalar oluşturuluncaya kadar katılımcıların kodlanması gerçekleştirilmiş ve kodlama güvenilirliği %100 oluncaya kadar kodlama işlemi gerçekleştirilmiştir. Araştırma sonuçlarına göre, öğrencilerin olumlu ya da olumsuz düşünceleri ortaya çıkmış ve 5 alt tema oluşturulmuştur. Günümüze kadar yapılan çalışmalar örgün eğitimde belirli bir seviyeyi baz alarak benzer çalışmalar gerçekleştirmişlerdir. Ancak, bu çalışma sadece lise, üniversite ya da ortaokul değil tüm gençlerin ortak düşüncelerini ortaya çıkaran ve bulguları detaylı bir biçimde irdeleyen özgün bir çalışma olarak nitelendirilebilir. Gelecekte yapılacak olan çalışmalarda ise yetişkin veya yaşlı insanların görüşlerini almak adına bir çalışma gerçekleştirilebilir.

Anahtar Kelimeler: genç öğrenciler, görüşler, içerik analizi, koronavirüs, mektup.

A CONTENT ANALYSIS STUDY ON THE LETTERS OF YOUNG LEARNERS OVER CORONAVIRUS

ABSTRACT

The impacts of COVID-19 alter our present day. As it impacts each sector, the field of education was also afflicted by the coronavirus. Schools were suspended, and the distance education system was launched. So, what type of mood shift did this event bring about among the young learners? In order to analyzed this topic in depth, in this research, the learning experiences and experiences of students between the ages of 14 and 25 at the university, high school and

secondary school level in 2019-2020 were analyzed in detail. As not all of the 140 letters assessed by three researchers were written in letter format, 58 letters were removed, and 82 letters were analyzed using a thematic content analysis approach. The data generated by the study were computed as frequency-percentage using IBM SPSS 26.0. In order to assure the dependability of the study, the participants were coded until comparable sub-themes were generated by the researchers, and the coding procedure was carried out until the coding reliability was 100 percent. According to the findings of the study, positive or negative ideas about the students developed and 5 sub-themes were established. Investigations undertaken up to now have carried out comparable studies based on a specific level of formal education. However, this research may be regarded as an innovative study that discloses the common opinions of all young people, not only those in high school, university, or secondary school, and scrutinizes the data in depth. In future investigations, a study may be carried out to collect the views of adults or older people.

Keywords: content analysis, coronavirus, letters, opinions, young learners.

INTRODUCTION

The rapid evolution of the coronavirus expanded the inequalities in the education sector internationally. Although the coronavirus pandemic is fresh, it also poses a poisonous impact on civilization. The COVID-19 epidemic has produced academic interruptions and worldwide health problems that have been exceedingly difficult to control by global health systems. As of today, no country or race throughout the planet is free from the coronavirus pandemic, and the whole world looks exhausted by the pace of the spread and the deadly impacts of COVID-19. The coronavirus outbreak knows no bounds, and the impact is huge and quick. Just a few months after the onset of the illness, it has significantly impacted the lives of the whole globe, with people around the world being obliged to'stay at home','monitor self separation', work and study from home. It has hindered the freedom of individuals to migrate, trade, or interact. Not only has COVID-19 caused a complete lockdown in several nations throughout the globe, but it has also prompted the death of thousands of individuals, particularly women and the elderly (Onyema, et al., 2020).

COVID-19 affected various areas in the 21st century, especially the education field. In terms of education, coronaviruses pose disadvantages as well as advantages. One of the biggest advantages is that the transition to the distance education process is beneficial in that many people are connected to the information apart from time and space. As stated by Kazu & Kuvvetli, (2021) technological developments in recent years have the potential to open new doors in the field of education. On the other hand, many believed it had negative impacts on our daily lives, with increased health problems and a lack of attention to the content. So, is distance education really advantageous? In the literature, there is little research on this issue. For instance, the structure of distance education helps one to urge learners to tackle obstacles as the very format of such training is exciting for pupils. Furthermore, any pupil may reach the instructor for guidance at any moment, which significantly enhances the accessibility of information and enhances the amount of response in the teacher-student relationship. Effective distance learning consists of a trustworthy system that delivers online distance learning courses utilising appealing distance learning methodologies. Families and their school-age kids notice that innovation may enhance their distant learning environment. Nonetheless, it was established (Danchikov, Prodanova, Kovalenko, & Bondarenko, 2021) that there exist correlations between

logistical constraints and remote learning. These impediments encompassed difficulty in utilising distance learning and inadequate training of students; unhappiness with the form of distance learning; and the inadequacy of distance learning to suit the requirements of students.
Up until now, much research has tried to get the opinions of people all over the world to obtain information on COVID-19 and its effects on their educational situations (Kazu, Yalçın, & Yalçın, 2022). For instance, in a research (Marek & Chew, 2021), teachers' experiences were gathered to collect their views on converting from face-to-face education to distance education and the challenges brought with it. In the research, individuals with greater experience as digital teachers felt extensively equipped than teachers who had less experience with technology. Additionally, some discovered that adolescents adjusted well, while others were unsatisfactory. However in this research, it was aimed to discover the young learners' opinions over educational and daily effects of coronavirus in a detailed way.

LITERATURE REVIEW

Numerous research has been undertaken about the assessment of e-learning participants (distance learning) to quantify the effectiveness of utilising distance learning technologies. As an example, the use of digital technologies (course recorders, inquiry instruments, student response platforms and augmented worlds) on the perceived influence on independent learning, recurrence, and response in Higher Education were studied. Some scholars (Tautz, Sprenger, & Schwaninger, 2021) assess the effectiveness of informational system adoption using the DeLone and McLean approach to analyse the content, system throughput, perceived advantages and student viewpoints. Other research have been carried to ascertain the assignment of the COVID-19 global epidemic online course by using Lengthened Acceptance and Use of technology (ETAM) and the Delone and McLean IS Increased Effectiveness and productivity by testing several variables, namely the user interface, convenience and ease of use, perceived value, correct data, technology readiness, behavioural intention, and exact use were analysed by Structural Equation Modeling (Prasetyo, et al., 2021).
The World Health Organization has stated that Covid-19, which is a global epidemic that is increasingly contagious as a result of the developments in logistics and transportation and the ability of people to travel easily due to the effects of globalization and the developments in logistics and transportation, is gradually spreading and becoming a global threat (Kazu & Kuvvetli, Uzaktan Eğitim ve Pandemi Süreci, 2021). During the coronavirus period, people continued their education by staying at home, and while some stated that this situation was more efficient, others stated that they felt worse, that they could not get enough efficiency in attending classes, and that they did not have sufficient technological opportunities. In a study (Doğan, 2020), it was aimed to determine how university students were affected by the virus during the quarantine days while staying at home by examining 100 letters written by university students to Corona (Covid-19). It is aimed at an "Examination of the Effect of COVID-19 on the Daily Life and Education of Undergraduate Students." In the "2020 Spring" term at Yıldız Technical University, participating students were asked to write a "Letter to Corona". Participants consisted of male and female students between the ages of 18 and 25. Although the times are as different as the number of letters, it has been seen that the common anxiety is actually the fear of death. It was emphasised by the participants that this epidemic is perhaps an opportunity to take a journey within ourselves, to review ourselves, or to meet with ourselves before we move on to the new world order. However, in this study, only students studying at the university level were examined, and no study was conducted at the high school, secondary

school, and university level as a whole. Therefore, this study aims to obtain the views of young students in detail with a comprehensive study at high school, secondary school and at the university level.

In a research, (Zouhairi & Benbelli, 2022) it was stated that the usage of the letter enables gathering a storyline which provides space for the intimacy and the sentiments (for example, fury, anger, pity), especially via the selection of periods of silence, of the communication. Therefore, it was decided to be one of the best method to be selected to gather the opinons of young learners over education during coronavirus pandemic was collecting letters.

In terms of the effects of coronavirus over the young people over the years have still been a question (Kazu, Kazu, & Kuvvetli, 2022). In the literature there are some research over the effects of coronavirus over education, however there are little research covering a detailed research for young learners including the data collection tool "letters". Therefore, in this research, the perceptions of the young people over distance learning during the coronavirus pandemic were analyzed through their letters. The main research questions are as follows:

RQ1. What are the detailed opinions / responses of young learners aged between 14-25 attending secondary school and high school over Covid-19 and its' effects on their daily lives?

RQ2. What are the detailed opinions / responses of young learners over Covid-19 and its' effects on their educational lives?

METHOD

Research Design

This research was designed with a qualitative research phenomenology pattern and was carried out by asking a question to the students in an electronic environment. In the phenomenological design, it is aimed to reveal common practices and to define and explain the meanings created by the participants (Annels, 2006). In this design, answers are generally sought for the following two questions: What are the perceptions/experiences regarding this phenomenon? What are the environment and conditions in which the experiences related to this phenomenon occur? (Creswell & Poth, 2013). In this context, the phenomenon discussed in the study is the phenomenon of Covid-19. content analysis design, one of the qualitative research methods, was used. Content analysis is the careful, detailed and systematic examination and interpretation of data with the aim of determining the patterns, themes, prejudices and meanings related to the essence of the research (Doğan, 2020). For this reason, this pattern was preferred to investigate the letters in depth.

Participants and Context

A total of 145 participants took part in the research, however, letters that were not in the letter format were eliminated, therefore 82 letters remained. Out of 82 participants, 40 participants were females and 42 participants were males. The convenient sampling method was administered to select the participants. 54 of the participants were high school students, 23 were university students and 5 were middle school students (Özmen & Karamustafaoğlu, 2019). 34% of the participants were mostly students in the 14-year-old age group.

The following characteristics were examined for the criteria of the letters chosen:

- Letters must include at least 250 words.
- Letters must at least have a title.
- Letters must be relevant to the current issue.

DATA COLLECTION TOOL

The letters were gathered both online through google forms and face-to-face on a written document in order to gather the views of the participants over coronavirus during the pandemic.

DATA ANALYSIS

It is not feasible to standardise data analysis techniques in qualitative research; alternatively, this condition may restrict the qualitative researcher (Strauss, 1987). In this research, the analysis began as soon as the data was obtained (Miles & Huberman, 1994). It is divided into three sections that focus on the data analysis stage: "data reduction," "data display," and "drawing conclusions and verification." In this approach, the data sets are initially examined and categorised by the researcher. While categorising the data, ideas and topics that are relevant according to the study question were utilised. In parallel, an academician, a master's student and a field specialists evaluated the data. These analytical findings were compared; attention was taken to obtain an agreement in the remarks offered by the researchers. After the evaluation process was completed, the agreement between the evaluators was evaluated. Interrater reliability calculation was calculated using the formula (consensus / (agreement + disagreement) x 100) and the process continued until the reliability was 100 percent (Miles & Huberman, 1994).

In this investigation, the data were provided without any remarks, the role of the researcher in the research process and the preliminary encounters connected to the scenario researched, respondents, social surroundings were reported. Both interviews and observations were conducted. The data analysis was carried out by three researchers. How the documents are studied, how the findings acquired are merged and presented are given out in full. The titles provided to the letter were also studied in their own context.

FINDINGS

In this part, the results gained as a consequence of the study are reported. The results are presented together for the convenience and simplicity of comparison. Comments on the results were offered. The responses supplied to the question were studied independently for each student, and in the light of the results, how and how the pupils were impacted by the COVID-19 epidemic was disclosed.

Content analysis was performed on the answers given to the following research question:

- What has the pandemic brought you? What have you gained and what have you lost? Write your thoughts in the form of an essay by giving an original title.

By considering the data holistically; The results of the content analysis revealed themes, sub-themes and opinions in line with the answers given to the participant's opinions for the question asked. Opinions are stated as students (S), S1, S2, S3....

The concepts that are extracted from the content analysis of the letters written by the students and that the students often focus on and the topics they highlight are as follows:

The themes created by the jury were despair, death/separation fear, love-miracle-joy, warming up, purification / reality. The letters of the students were examined under the determined themes.

82 The titles of the letter are as follows:

1- Miracle, **2-** Health, **3-** A Pandemic Effect, **4-** Appreciation and Justice, **5-** What Two Years Give and Receive, **6-** Dear corona, **7-** Lost Times, **8-** Damnation**, 9-** Concern, 10- Your Name

Is Just as Crazy as Your Own, **11-** Death, **12-**Dear Corona**, 13-** Misery, **14-**Features of Corona, **15-** Have We Changed, **16-** Psychological Impact, **17-** Patience, **18-** Dystopia, **19-** Free time, **20-** Corhome, **21-** What The Korana Does, **22-** Loveless, **23-** Lost, **24-** What the Pandemic Has Shown, **25-** What the pandemic has given to me, **26-** Boredom, **27-** Damnation, **28-** Change in Life, **29-** Impecuniosity, **30-** corona introducing the mask, **31-** Corona and earthquake, **32-** Prohibitions, **33-** Thief of Time and Hope, **34-** Callous Without Love, **35-** The Importance Of Health, **36-** Innovations Outside The Usual Life, **37-** I Am The Pandemic, 38- Contribution, 39- Lost, **40-** Pandemic, **41-** The Impact Of The Pandemic, **42-** What The Pandemic Has Brought To Us, **43-**Corona And Education, **44-** Time To Pass, **45-** Global War, **46-** The Benefits Of Corona For Me, **47-** The Pandemic From My Perspective, **48-**Pandemic And Family, **49-** Before And After, **50-** The End, **51-** Oh Corona!, **52-** Lost My Friends, **53-** Teacher, **54-** New Rules, **55-** Vacation, **56-** Psychological Problems, **57-** Lots of Family Time, **58-** Loss of Education, **59-** Difficult times with school, **60-** low marks from the exam, **61-** family ties, **62-** Thanks, **63-** Hygiene, **64-** Nothing, **65-** taught new things, **66-** Sorrow, **67-** Death and freedom, **68-** Tyranny, 69- Torture, **70-** Being Social, **71-** Unknown, **72-** Psychological Disorder, **73-** Loss of Communication, **74-** Heavy diseases, **75-** Love and Joy, **76-** Difficult times, **77-** Missed my relatives, **78-** Missing Friends, **79-** A new type of exam, **80-** a new world order, **81-** Revenge, **82-** New normal.

When the titles of a hundred letters are examined, along with the fear against corona; there is a reproach, a call and a sympathetic approach.

82 Letters Written by Young People to Corona

The content analysis of how students are affected by Covid-19 has been made and the following themes have been extracted are listed as items. The topics given to the letter were analyzed and the theme was extracted. It is also possible to see these theme titles in the letter titles.

Created Themes According to the Letters

Table 1. Student Testimonials for Themes

Themes (Categories)	**Direct Quote**
Theme 1: "Love"- "Gratitude"- "Joy"	**S2:** *I say dear corona Dear because you have reminded us of the values we have forgotten; greetings, hugs, and most importantly, how beautiful it is to spend time with our loved ones and more... Thanks to you, we have understood the importance of health workers, regardless of their position, who work day and night for us. Yes, we did, but if you hadn't come, we wouldn't have noticed any of this. Because having forgotten our values that were so beautiful and many more, you came and reminded us. Of course, besides this good side, you have caused the death of millions of our people. You have exhausted the health workers we appreciate very much. You left your families, especially your children, alone. But we will not forget that there can never be roses without thorns.* **S17:** *I will still try to find a positive side in everything, I consider my own life a miracle because as one of the people chosen by that virus, I might not be writing these. Maybe it helped me to try to live life more meaningfully, to be more connected to my loved ones, to set my priorities. There are*

(f=23, 34%)	*endless lessons we can even learn :)) Hoping to see that everyone is aware of some things and lives healthier, more loving, happier, connected to each other, With love.* **S20:** *Many things are solid, for example, the difficulties we face in life, we should take a lesson about what to do, the pandemic can be a global war, but it is a lesson in every line, the pandemic has increased the respect of people's love for each other, many things, we understood the value well, we tried to understand the pandemic better ourselves.* **S24:** *First of all, I want to talk about your benefits for us because this part will be a little short. We are so grateful that we learned the names of the ministers of health and national education thanks to you. Thanks to you, we watched a lot of movies, read books, got together with our families more, for example, I wore a mask for the first time in my life and we had a very long vacation. This holiday had more bad sides for us. Being away from school has made us very lazy. We were doing live lessons, but I don't think it's much use. Because most of the students did not attend the classes. Another sad part is that you took our loved ones from us. I did not lose anyone from my family, but so many people lost their loved ones, and it really saddened me. Anyway, you spent 2 years with us, with more bitterness and sweetness, and you are still with us. You didn't help us much, dear Corona, you did a lot of damage, but you contributed a lot to nature and this world. It was good for the world to stay away from people. At least it was less damaged, I thank you very much on her behalf, but I still don't love you, please go now.* **S29:** *The pandemic has helped people strengthen family bonds.* **S30:** *The pandemic has actually given us a lot, reminding us one by one the value of the family, the fear of losing them, the importance of education, and what a blessing actually traveling is.* **S32:** *What the pandemic has given me; At first, I think it positively affected my reading habit during the pandemic process. I read more books and it was more productive on that subject. Apart from that, I spent more time with my family. I can say that I spent a full year and a half with my family. I can say that this strengthened our family unity. Finally, there was the economic aspect of the pandemic that it gave me. I realized more about the value of money. About where and how much I can spend. In short, I became more frugal about money.*
Theme 2: Despair (f=17, 25%)	**S9:** *I want to erase your name from my memory of your period in my life because you ruined everything. You instilled fear in me, anxiety, unhappiness and hopelessness gripped my heart all because of you. I thought you wouldn't end, you wouldn't go, I don't know if it was your fault or the media's, but now it's happened. I missed most things because of you, why did you come, why did you yearn for me to my family, to my hometown, to roam freely outside, you took away from me for a while to live like a miss without being afraid... You were bad, but you just remembered to appreciate. I didn't love you, go away, go away, disperse like black clouds over all humanity, go away, please go .... you imprisoned children at home,*

	from their education, from their games. You're so bad. Look, I'm very angry with you, not only me, I think everyone is angry with you. But I won't be as bad as you. I'm sorry if I made you long with what I wrote, but please know that I am a human and it is my right to live freely. goodbye virus called covit goodbye..... **S19:** *The pandemic has had a negative impact on the lives of many people. I am one of these people. While I was attending the first grade at university, my life order was disrupted. Although we have started training again, nothing is the same as before. Education has taken a big hit. In economic terms, our purchasing power has decreased a lot compared to 2 years ago. People are psychologically very worn out. They still can't gather. Stress is too much of nervous hopelessness in people. A great depression prevails. The pandemic has taken a lot away.*
Theme 3: Death- Fear of Separation (f=15, 22%)	**S2:** *We will do what is necessary. We will always protect our values. We will expel you first from our country and then from the world. And we will hold fast to our values. We will always be with our health workers. Never again will we allow a bad cause, your descendant, to remind us of our values, to tell us the value of our health care workers. Because we get it! if we forget, we understand that people like you will come! we understood that if we forget, the price would be the death of millions of our people! By Allah's leave, we will never make concessions to you or to those like you again, because we have understood! Wassalam ...* **S8:** *Of course, besides this good side, you have caused the death of millions of our people.* **S18:** *For example, due to the pandemic, the death of people increased and we lost many of our relatives, education or many businesses were disrupted, we were very bored during this time period, our relations with our relatives or relatives were cut and many problems came up in people's health, in short, I wish this pandemic to pass as soon as possible and people to regain their health.*
Theme 4: Restrictions (f=8, 12%)	**S12:** *Maybe I don't want to be vaccinated by a foreign enemy country. Also, corona has restricted my freedom.so you ruined the best period of my beloved corona life, my 15 years old. All I want from you is to disappear as soon as possible. I just understood what difficulties the doctors are going through.* **S65:** *The pandemic made people lose their loved ones, disrupted the education process of students and disrupted life, but at the same time, it reminded us how valuable it is to simply walk on the road, how beautiful the time spent with friends and relatives is, and the value of being able to walk around freely outside in a healthy way.* **S70:** *If we say that the pandemic period has affected our lives in many ways; we gained freedom and showed how invaluable it is to be free. What caused us to lose our educational life disrupted our freedom to go out We have seen how being at home badly affects people socially and psychologically that there is more free time than it is*

Theme 5: Purification-Reality (f=5, 7%)	**S82:** *When the pandemic was in the first place, I thought it would be a lot of fun, but the reality was a little different, of course. First of all, from all the problems we had in live lessons, to the boredom we experienced at home all day, the feeling of emptiness we experienced was all these days without quality...* **S55:** *Stress is too much of nervous hopelessness in people. A great depression prevails. The pandemic has taken a lot away.*

In line with the data obtained, it was seen that positive thoughts were more dominant. In the theme of Love-Thanks-Joy (f=23), it was seen that there were more of these feelings in the letters. The least created theme was purification-reality (f=5). When the opinions were examined, it was seen that young people were in joy because they were in the understanding of holiday during the restriction period. In others, it is seen that people despair due to situations such as losing their relatives or families.

CONCLUSION

The concepts that were extracted from the content analysis of the letters written by the participants and that the students emphasized frequently and the titles they highlighted are thought-relieving. Although the letters are as different as the people, times and the number of letters, it is seen that the common sense is love / joy / thanks in essence. The main reason of this could be the optimistic view of the learners. On the other hand, the least frequently repeated theme was on the purification – reality part. The main reason for this could be the boredom learners experienced, additionally the feeling of emptiness they acquired. In a similar study carried out, more than the feeling of emptiness, the fear of death was more obtainable for adult learners rather than young learners (Doğan, 2020).

Although humanity have never assumed about dying, it is comprehended from the subject matter of the letters that they instinctually accept the death of older population as more normal. Since this pandemic mainly affects older adults, it is apparent in the letters that the topic of death is an inherent part of existence, although deaths are treated more naturally at first. Although there is yet no conclusive evidence regarding the source and reality of the pandemic, the fact that the transition to the new global order, which is often referenced, should not be overlooked is another outcome stressed in the letter. For this reason, the notion that there is a worldwide pandemic or that its origins is tied to animals, that it is produced with human people and that it has awful intentions is often underlined in the letters. It was highlighted by the attendees that this pandemic is a chance to take a voyage inside ourselves and to examine ourselves before moving on to the new global order.

In conclusion, the results obtained from the letters written by young people over coronavirus, it was determined that young people felt loveful, joyful and happy primarily because they stayed away from their workloads and responsibilities, however, they had fearful feelings because they lost their relatives as time passed. The use of letters in future studies can reveal the hidden feelings of the participants. For this reason, it is important that the letters are used in future studies.

REFERENCES

Annels, M. (2006). Triangulation of Qualitative Approaches: Hermeneutical Phenomenology and Grounded Theory. *Journal of Advanced Nursing Research*, *56*(1), 55-61. doi:https://doi.org/10.1111/j.1365-2648.2006.03979.x

Creswell, J. W., & Poth, C. N. (2013). *Qualitative Inquiry & Resaerch Design: Choosing Among Five Approaches (Third Edition).* New York: Thousand Oaks CA: Sage.
Danchikov, E. A., Prodanova, N. A., Kovalenko, Y. N., & Bondarenko, T. G. (2021). Using Different Approaches to Organizing Distance Learning During the COVID-19 Pandemic: Opportunities and Disadvantages. *Linguistics and Culture Review, 5*(1), 587-595.
Doğan, S. (2020). Üniversite Öğrencilerinin COVID-19'a Yazdıkları 100 Mektubun İncelenmesi. *Türk Dünyası Araştırmaları, 126*(248), 25-40.
Kazu, İ. Y., & Kuvvetli, M. (2021). Dijital Oyun Temelli Yabancı Dil Öğreniminde Dil Beceri Alanlarının Değerlendirilmesi. In A. P. Karabulut (Ed.), *İstanbul International Modern Scientific Research Congress -II December 23-25, 2021 | Istanbul, Türkiye* (pp. 17-27). İstanbul: IKSAD.
Kazu, İ. Y., & Kuvvetli, M. (2021). Uzaktan Eğitim ve Pandemi Süreci. In B. G. Şen, *21. Yüzyılda Eğitim Sosyolojisi Yaklaşımları* (pp. 263-287). Konya: Eğitim Yayınevi.
Kazu, İ. Y., Kazu, H., & Kuvvetli, M. (2022). Evaluation of Studies on Language Skill Areas of Digital Game-Based Foreign Language Learning. *Social Science Development Journal, 7*(29), 117-127.
Kazu, İ. Y., Yalçın, C., & Yalçın, C. (2022). Yabancı Dil Öğretmenlerinin Gözünden Pandemi Döneminde Yabancı Dil Öğretimi. *Millî Eğitim Dergisi, 51*(234), 1661-1682.
Marek, M. W., & Chew, C. S. (2021). Teacher Experiences in Converting. *International Journal of Distance Education Technologies, 19*(1), 40-60.
Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis: An Expanded Source Book.* Thousand Oaks: CA: Sage Publications.
Onyema, E. M., Eucheria, N. C., Obafemi, F. A., Sen, S., Atonye, F. G., Sharma, A., & Alsayed, A. O. (2020). Impact of Coronavirus Pandemic on Education. *Journal of Education and Practice, 11*(13), 108-121.
Özmen, H., & Karamustafaoğlu, O. (2019). *Eğitimde araştırma yöntemleri.* Ankara: Pegem Akademi.
Prasetyo, Y. T., Ong, A. K., Concepcion, G. K., Navata, F. M., Robles, R. A., Tomagos, I. J., . . . Redi, A. A. (2021). Determining Factors Affecting Acceptance of E-Learning Platforms during the COVID-19 Pandemic: Integrating Extended Technology Acceptane Model and DeLone & McLean IS Success Model. *Sustainability, 13*(8365), 1-16.
Strauss, A. L. (1987). *Qualitative Analysis For Social Scientists.* London: Cambridge University Press.
Tautz, D., Sprenger, D. A., & Schwaninger, A. (2021). Evaluation of four digital tools and their perceived impact on active learning, repetition and feedback in a large university class. *Computers & Education, 175*(104338), 1-13.
Zouhairi, A., & Benbelli, S. (2022). Letters to Coronavirus: Attempting a Dialog with the Virus in Time of Anthropocene Crisis. *HAL*, 1-14.

GELİŞİM SÜRECİNDEKİ ÇOCUKLARA UYGULANAN AKUT FİZİKSEL EGZERSİZİN BİLİŞSEL FONKSİYONLAR ÜZERİNE ETKİSİ

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ÖZET
Bilişsel performans üzerinde yapılan önceki araştırmalar, akut fiziksel egzersizin yetişkinlerde bilişsel işlevi iyileştirdiğini öne sürse de, gelişim sürecindeki çocuklara uygulanan akut fiziksel egzersizin bilişsel fonksiyonlar üzerindeki etkileri hakkında çok az şey bilinmektedir. 8 ve 12 yaşındaki erkek çocuklarda reaksiyon tepkileri ve hata oranları değerlendirilmiştir. Çocuklar deney ve kontrol gruplarına rastgele atanmıştır. Tüm testler laboratuvar ortamında bireysel olarak yapıldı. Spesifik olarak, hem kontrol hem de deney koşulları aynı sıcaklık ayarlı odada gerçekleştirilmiştir, testler her zaman günün aynı saatinde yapılmıştır. Her iki grup da müdahaleden hemen önce ve sonra stroop görevini tamamlamışlardır. Kontrol grubuyla karşılaştırıldığında, egzersiz durumundaki çocuklar, basit göreve kıyasla seçim için daha iyi bir sonuçla, hem reaksiyon süresinde hem de karar verme doğruluğunda önemli bir gelişme gösterdi. Bu bulgular, akut olarak uygulanan fiziksel egzersizin gelişim sürecindeki çocuklarda bilişsel işlevler üzerinde etkisi olduğunu göstermektedir.

Anahtar Kelimeler: Çocuk, Bilişsel Performans, Stroop, Egzersiz

THE EFFECT OF ACUTE PHYSICAL EXERCISE APPLIED TO CHILDREN IN THE DEVELOPMENT PROCESS ON COGNITIVE FUNCTIONS

ABSTRACT
Although previous research on cognitive performance has suggested that acute physical exercise improves cognitive function in adults, little is known about the effects of acute physical exercise on cognitive function in developing children. Reaction responses and error rates were evaluated in 8- and 12-year-old boys. Children were randomly assigned to the experimental and control groups. All tests were performed individually in a laboratory setting. Specifically, both control and experimental conditions were performed in the same temperature-regulated room, tests were always conducted at the same time of day. Both groups completed the stroop task just before and after the intervention. Compared with the control group, children in the exercise condition showed a significant improvement in both reaction time and decision-making accuracy, with a better outcome for choice compared to the simple task. These findings show that acutely applied physical exercise has an effect on cognitive functions in children in the developmental process.

Keywords: Child, Cognitive Performance, Stroop, Exercise.

SPOR BİLİMLERİ ALANINDA ÖĞRENİM GÖREN ÖĞRENCİLERİN SOSYAL MEDYA BOZUKLUKLARININ İNCELENMESİ

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ÖZET

Çalışmanın amacı, Spor bilimleri alanında öğrenim gören öğrencilerin sosyal medya bozukluklarının çeşitli değişkenler aracılığıyla incelenmesidir. Çalışmanın araştırma grubunu Trabzon ve Avrasya Üniversitelerinin spor bilimleri alanında öğrenim gören 146 Erkek, 54 Kadın olmak üzere toplam 200 öğrenci oluşturmaktadır. Çalışmada nicel bir yöntem olan tarama modeli kullanılmıştır. Çalışmada veri toplama aracı olarak araştırmacılar tarafından hazırlanan 'Kişisel Bilgi Formu' ile Van den Eijnden, Lemmens ve Valkenburg (2016)'un geliştirmiş, Savcı, Ercengiz ve Aysan (2018)'ın Türkçeye uyarlamış olduğu 'Sosyal Medya Bozukluğu Ölçeği (SMBÖ)' kullanılmıştır. Sosyal medya bozukluğu ölçeği 5'li likert tipindedir. Tek alt boyuttan ve toplam 9 maddeden oluşmaktadır. Ölçeğin Cronbach Alpha iç tutarlık katsayısı 0,70 olarak bulunmuştur. Verilerin analizinde SPSS20 paket programı kullanılmıştır. Öncelik araştırma bulgularına Kolmogorov Smirnov testi ve Shapiro-Wilk testi ve ayrıca Skewness ve Kurtosis değerlerine göre normallik dağılımları yapılmış ve verilerin normal dağılmadığı ortaya çıkmıştır. Buna göre ilişkisiz ölçümler için Mann Whitney U testi ve Kruskal Wallis H testi kullanılmıştır. Çalışma sonucunda araştırma grubunun sosyal medya bozukluk düzeyleri ile sınıf değişkeni günlük sosyal medya kullanım süresi ve sosyal medya hesap sayısı değişkenleri arasında anlamlı farklılık bulunurken, cinsiyet değişkeni açısında anlamlı farklılık bulunmamıştır. Sonuç olarak sosyal medyanın çok fazla kullanılmasının üniversite öğrencileri üzerinde olumsuz etkileri olduğu söylenebilir.

Anahtar Kelimeler: Sosyal Medya, Bağımlılık, Öğrenci.

INVESTIGATION OF SOCIAL MEDIA DISORDERS OF STUDENTS IN SPORTS SCIENCES

ABSTRACT

The aim of the study is to examine the social media disorders of students studying in the field of sports sciences through various variables. The research group of the study consists of a total of 200 students, 146 male and 54 female, studying in the field of sports sciences at Trabzon and Eurasia Universities. Scanning model, which is a quantitative method, was used in the study. In the study, the 'Personal Information Form' prepared by the researchers as the data collection

tool and the 'Social Media Disorder Scale (SMDS)' developed by Van den Eijnden, Lemmens and Valkenburg (2016) and adapted into Turkish by Savcı, Ercengiz and Aysan (2018) used. The social media disorder scale is in the 5-point Likert type. It consists of a single sub-dimension and a total of 9 items. The Cronbach Alpha internal consistency coefficient of the scale was found to be 0.70. SPSS20 package program was used in the analysis of the data. First of all, normality distributions were made according to the Kolmogorov Smirnov test and Shapiro-Wilk test, as well as Skewness and Kurtosis values, and it was found that the data were not normally distributed. Accordingly, the Mann Whitney U test and Kruskal Wallis H test were used for unrelated measurements. As a result of the study, there was a significant difference between the social media disorder levels of the research group and the class variable, daily social media usage time and the number of social media accounts, but no significant difference was found in terms of the gender variable. As a result, it can be said that excessive use of social media has negative effects on university students.

Keywords: Social Media, Addiction, Student.

GİRİŞ

Günümüzde internet, sosyal medya ve mobil teknolojiler artık hayatımızın bir parçası haline gelmiştir. Sosyal medya, kendi sınırları içerisinde bilgisayar, tablet ve akıllı telefon kullanabilen herkesin ilgi odağı haline gelmiştir (Hazar, 2011). Özellikle genç nüfus kolay ve hızlı erişebilen bir kitle iletişim aracı olan internet ve sosyal medyayı gün geçtikçe daha sık kullanmaktadırlar. Bu araçlar yalnızca iyi bir bilgi kaynağı olmakla kalmayıp, sosyal etkileşimler gibi birçok diğer amaçlar için de iyi bir kaynak haline gelmişlerdir (Singh ve Barmola, 2015).

Sosyal medya kullanma ihtiyacının nedenleri; sosyal çevresi daha az olan bireyler, başkalarıyla bağlantı kurmak, ilişkiler geliştirmek, coğrafi olarak birbirinden uzak insanlarla temas halinde olmak isteyebilir veya çok fazla bağlantısı olan (aile, arkadaş gibi) bireyler bu ilişkileri ortaya çıkarmayı amaçlayabilirler (Cooper, 2016). Ayrıca iletişim ve bağlantı geliştirmenin yanı sıra, bireylerin içinde bulunduğu ortam huzurlu değilse ve bazı sorunlar varsa bu durumdan kaçmak için daha çok sosyal medyayı kullanma eğilimi vardır (Hazar, 2011).

Sosyal medya sayfalarının hızlı artışı, sosyal ilişkilerimizin normal şekilde olduğu kadar, sunma ve algılama şeklimizde de bir farklılığa neden olmuştur. Sosyal medya ortamı, günlük hayatta duygularını ifade edemeyen ya da dikkat çekmek isteyen kişilerin duygu durumlarını yansıtmak için paylaşımda bulunabilecekleri bir alan haline gelmiştir. Kişiler günlük yaşamda kendilerini anlatmakta zorluk çekerken, sosyal medya platformları sayesinde kendilerini istedikleri zaman ve istedikleri şekilde ifade edebileceklerini düşünmektedirler (Ünlü, 2018).

Ayrıca sosyal medya ve internet kullanımındaki bu ani artışın birkaç nedeni var. Ayrıntılı olası nedenler Whiting & Williams (2013) da belirtilmiştir. Sosyal medyayı belirli bir süre kullanmak, insanların hayatını bir dereceye kadar verimli hale getirebilir. Öte yandan, sosyal ağ sitelerinde çok fazla zaman geçirmek ailevi ve sosyal bağları zayıflatabilir, hatta bozabilir ve bu da yaşam hedeflerine ulaşamama ile sonuçlanabilir. Sosyal medya kullanıcı sayısındaki ciddi artış ile birlikte aşırı kullanım ve sosyal medya bağımlılığı ile ilgili sorunlar ortaya çıkabilmektedir. İletişim türlerinin çeşitliliği nedeniyle sosyal medya bağımlılarının sayısı artmaktadır (Avcu ve ark. 2019).

Sosyal medya bağımlılığı ele alındığında, sosyal medya bağımlılığının artık alışılagelen bir sorun olmadığı ve küresel bir salgın hastalık haline geldiği söylenebilir. Dünyanın dört bir

yanındaki insanlar sosyal medyaya çok fazla dâhil olabilir ve sosyal medyayı kullanarak çok zaman geçirebilir. Bu nedenle sosyal medya dünya genelinde milyonlarca insanın hayatını olumsuz etkilemektedir (Sarıçam ve Adam Karduz, 2018).

Alan yazınında da görüldüğü üzere bireylerin internet aracılığı ile sosyal medya mecralarında çok fazla zaman geçirmenin başta sosyal ilişkiler olmak üzere birçok alanda olumsuz etikler doğurdu görülmektedir. Bu bilgilerden yola çıkarak araştırmada Spor bilimleri alanında öğrenim gören öğrencilerin Sosyal medya bozukluklarının belirlenmesi amaçlanmıştır.

YÖNTEM

Araştırma Modeli: Bu araştırma nicel araştırma yöntemlerinden tarama modeli ile yapılmıştır. Tarama modeli, geçmişte ya da halen var olan bir durumu var olduğu şekliyle betimlemeyi amaçlayan araştırma yaklaşımlarına denir (Karasar, 2011).

Araştırma Grubu: Araştırma grubunu Trabzon Üniversitesi Spor Bilimleri Fakültesi'nde ve Avrasya Üniversitesi Egzersiz ve Spor Bilimleri bölümünde öğrenim gören ve tesadüfi yöntemle seçilmiş 146 Erkek, 54 Kadın olmak üzere toplam 200 öğrenci oluşturmaktadır.

Veri Toplama Araçları: Araştırmada veri toplama aracı olarak araştırmacılar tarafından oluşturulan kişisel bilgi formu ve Van den Eijnden, Lemmens ve Valkenburg (2016)'un geliştirmiş, Savcı, Ercengiz ve Aysan (2018)'ın Türkçeye uyarlamış olduğu 'Sosyal Medya Bozukluğu Ölçeği (SMBÖ)' kullanılmıştır. Sosyal medya bozukluğu ölçeği 5'li likert tipindedir. Tek alt boyuttan ve toplam 9 maddeden oluşmaktadır. Ölçeğin Cronbach Alpha iç tutarlık katsayısı 0,70 olarak bulunmuştur. Bu araştırmada ise Cronbach Alpha iç tutarlık katsayısı 0,82 olarak bulunmuştur.

Verilerin Analizi: Araştırma verilerinin çözümünde ve yorumlanmasında öncelikle araştırma bulgularına Kolmogorov Smirnov testi ve Shapiro-Wilk testi ve ayrıca Skewness ve Kurtosis değerlerine göre normallik dağılımları yapılmış ve verilerin normal dağılmadığı ortaya çıkmıştır. Buna göre ilişkisiz ölçümler için Mann Whitney U testi ve Kruskal Wallis H testi kullanılmıştır.

BULGULAR

Bu bölümde araştırma grubundan elde edilen verilerin istatistiki olarak yorumlanmasına yer verilmiştir.

Tablo 1. Cinsiyet Değişkenine Göre Araştırma Grubunun Sosyal Medya Bozukluklarını gösteren Mann-Whitney U Testi sonuçları

	Cinsiyet	n	Sıra Ortalaması	Sıra Toplamı	U	P
SMBO Ölçeği	Kadın	54	112,30	6064,00	3305,00	0.079
	Erkek	146	96,14	14036,00		

***p<0,05**

Tablo 1'de görüldüğü gibi araştırma grubunun medya bozuklukları ile cinsiyet değişkeni arasında anlamlı farklılığa rastlanmamıştır (p>0,05). Bu sonuca göre kadın ve erkek katılımcıların sosyal medya bozukluklarının cinsiyet açısından bir fark oluşturmadığı sonucuna ulaşılmıştır.

Tablo 2. Sınıf Değişkenine Göre Araştırma Grubunun Sosyal Medya Bozukluklarını gösteren Kruskal-Wallis Testi Sonuçları

	Sınıf	n	X	Ss	Sıra Ort.	Kruskal-Wallis H.			Anlamlı Fark
						sd	X^2	p	(Mann Whitney U Testi)
SMBO Ölçeği	1. sınıf	80	15.89	5.54	93,53	3	11.781	***0.008**	**3. sınıf>1. Sınıf (0.004)**
	2. sınıf	31	14.87	5.20	82,55				
	3. sınıf	41	19.29	6.60	125,30				**3. sınıf>2. Sınıf (0.002)**
	4. sınıf	48	17.21	6.89	102,53				

***p<0,05**

Tablo 2'de araştırma grubunun medya bozuklukları ile sınıf değişkeni arasında anlamlı bir farklılığa rastlanmıştır (p<0,05). Bu sonuca göre farkın hangi gruplar arasından kaynaklandığını belirlemek amacıyla Mann Whitney U testi yapılmış ve sonuçta 1.sınıf, 2.sınıf ve 3. Sınıfta okuyan öğrenciler arasında 3.sınıf öğrencileri lehine anlamlı farklılık bulunmuştur.

Tablo 3. Sosyal Medya Kullanım Süresi Değişkenine Göre Araştırma Grubunun Medya Bozukluklarını gösteren Kruskal-Wallis Testi Sonuçları

	Süre	n	X	Ss	Sıra Ort.	Kruskal-Wallis H.			Anlamlı Fark
						sd	X^2	p	(Mann Whitney U Testi)
SMBO Ölçeği	1 saatten az	15	15.89	5.54	57,03	3	30,789	***0.000**	**C>A (0.000) C>B (0.000) D>A (0.001) D>B (0.001) D>C (0.031)**
	1-3 saat	92	14.87	5.20	85,61				
	4-6 saat	82	19.29	6.60	118,43				
	7 saat ve üstü	11	17.21	6.89	150,64				

***p<0,05 (A:** 1 saatten az, **B:** 1-3 saat, **C:** 4-6 saat, **D:** 7 saat ve üstü)

Tablo 3'te araştırma grubunun medya bozuklukları ile günlük ortalama sosyal medya kullanım süresi değişkeni arasında anlamlı bir farklılığa rastlanmıştır (p<0,05). Bu sonuca göre farkın hangi gruplar arasından kaynaklandığını belirlemek amacıyla yapılan Mann Whitney U testi sonucunda 4-6 saat arası sosyal medya kullananların 1 saatten az ve ve 1-3 saat aralığında kullananlara göre, 7 saat ve üstü kullananların ise 1 saatten az, 1-3 saat ve 4-6 saat arasında kullananlara göre sosyal medya bozuklukları yüksek çıkmıştır.

Tablo 4. Hesap Sayısı Değişkenine Göre Sosyal Medya Araştırma Grubunun Sosyal Medya Bozukluklarını gösteren Kruskal-Wallis Testi Sonuçları

	Hesap Sayısı	n	X	Ss	Sıra Ort.	Kruskal-Wallis H.			Anlamlı Fark
						sd	X^2	p	(Mann Whitney U Testi)
SMBO Ölçeği	1	37	17,54	7,60	102,58	6	16,114	***0.013**	**D>B (0.003) E>B (0.007) E>G (0.048)**
	2	75	15,19	5,37	86,03				
	3	51	16,78	5,54	103,83				
	4	22	20,23	7,32	129,23				
	5	11	18,91	4,25	132,32				
	6	2	15,00	0,00	91,50				
	7	2	11,00	1,41	37,75				

***p<0,05 (A:** 1, **B:** 2, **C:** 3, **D:** 4, **E:** 5, **F:**6, **G:**7, **H:**8

Tablo 4'te araştırma grubunun medya bozuklukları ile sosyal medya hesap sayısı değişkeni arasında anlamlı bir farklılığa rastlanmıştır (p<0,05). Bu sonuca göre farkın hangi gruplar arasından kaynaklandığını belirlemek amacıyla Mann Whitney U testi yapılmıştır. Sonuçta 4 sosyal medya hesabı olanların 2 sosyal medya hesabı olanlara göre, 5 sosyal medya hesabı olanların 2 sosyal medya hesabı olanlara göre ve 5 sosyal medya hesabı olanların 7 sosyal medya hesabı olanlara göre yüksek çıkmıştır.

TARTIŞMA VE SONUÇ

Bu bölümde analiz sonucunda elde edilen verilerin alan yazını ile birlikte yorumlanmasına yer verilmiştir.

Araştırma grubunun medya bozuklukları ile cinsiyet değişkeni arasında anlamlı farklılığa rastlanmamıştır (p>0,05). Bu sonuca göre kadın ve erkek katılımcıların sosyal medya bozukluklarının cinsiyet açısından bir fark oluşturmadığı sonucuna ulaşılmıştır. Alan yazında benzer çalışmalara rastlanmıştır. Caz ve Bardakçı (2019)'nın, Aydın (2016)'ın ve Gürültü (2016)'nün ve Bedir (2016)'in yaptıkları çalışma sonuçlarında da sosyal medya bozuklukluları açısından kadın ve erkek katılımcılar açısından bir farklılığa rastlanmamıştır. Sonuç olarak sosyal medya kullanımının cinsiyet üzerinde bir etkiye sahip olmadığı bir başka deyişle kadın ve erkek katılımcıların sosyal medyayı kullanım oranlarının benzer olduğu söylenebilir.

Araştırma grubunun medya bozuklukları ile sınıf değişkeni arasında anlamlı bir farklılığa rastlanmıştır. Araştırma bulgularında 3. Sınıf öğrencilerinin sosyal medya bozuklukları 1. ve 2. sınıf öğrencilerine göre daha yüksek çıktığı görülmüştür. Yapılan benzer araştırmamalarda ise Durar (2018) ve Cavga (2019) bulgularında sınıf değişkeni açısından anlamlı farklılıklar bulmuşlardır. Bu sonuçlar araştırma bulgularımızla paralellik göstermektedir. Araştırma sonucunun 3. sınıflar lehine farklılaşmasının nedenleri arasında özellikle öğrencilerin üniversitenin ilk yıllarında bulunduğu şehri ve okuduğu üniversiteyi tanıma, arkadaş edinme, adaptasyon süreci gibi nedenlerle sosyal medyanın geri planda kaldığı düşünülebilir. Ayrıca 4. Sınıfta ise artık mesleki kariyer ve gelecek kaygısı gibi nedenlerden dolayı öğrencilerin sosyal medyayı 3. Sınıf öğrencilerine göre daha az kullandıkları söylenebilir.

Araştırma grubunun medya bozuklukları ile günlük ortalama sosyal medya kullanım süresi

değişkeni arasında anlamlı bir farklılığa rastlanmıştır. Günlük sosyal medya kullanım süresi arttıkça medya bozukluk düzeylerinin de yükseldiği görülmüştür. Yapılan benzer çalışma sonuçları incelendiğinde Kırık ve arkadaşları (2015), Becan (2018) ve Çiftçi (2018) çalışma sonuçlarında günlük internet kullanım süresi arttıkça sosyal medya bozukluklarının da arttığı sonucuna ulaşmışlardır. Bu sonuçlara göre sosyal medyada geçirilen sürenin artması bireylerin sosyal medyaya olan bağımlılıklarının artmasına neden olduğundan sosyal medya bozukluklarının da artmasına neden olduğu söylenebilir.

Araştırma grubunun medya bozuklukları ile sosyal medya hesap sayısı değişkeni arasında anlamlı bir farklılığa rastlanmıştır. Sosyal medya hesap sayısının artması sosyal medya bozukluğunun da arttığı sonucunu ortaya koymuştur. Bu sonuca göre sosyal medya hesap sayısının artmasıyla birlikte bireylerin sosyal medyada geçirilen sürenin artmasına paralel olarak sosyal medya bağımlılığının da ortaya çıkmasına neden olacağı söylenebilir. Ne tekim Ergenç (2011), Hazar (2011) ve Balcı ve Gölcü (2013) bu sonucu destekler biçimde araştırma sonuçları ortaya koymuşlarıdır.

Bu araştırmanın sonucunda Spor Bilimleri alanında öğrenim gören öğrencilerin sosyal medya bozuklukları cinsiyet değişkeni açısından anlamlı farklılık göstermezken, sınıf değişkeni, sosyal medya kullanım süresi ve sosyal medya hesap sayısı değişkeni açısından anlamlı farklık bulunmuştur.

KAYNAKLAR

Avcu, A. , Ulaş, E. & Sevim, E. (2019). Sosyal medya bozukluğu ile ilgili yaşam doyumu ve psikolojik dayanıklılıkta arabulucu faktörler olarak kişilik özelliklerinin yol analiz modeli. Online Journal of Technology Addiction and Cyberbullying, 6(2), 17-35.

Aydın, İ. E. (2016). Üniversite öğrencilerinin sosyal medya kullanımları üzerine bir araştırma: Anadolu Üniversitesi örneği. Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 6(35), 373-386.

Balcı, Ş. & Gölcü, A. (2013). Türkiye'de üniversite öğrencileri arasında facebook bağımlılığı: Selçuk Üniversitesi örneği. Selçuk Üniversitesi Türkiyat Araştırmaları Dergisi, (34), 255-278.

Becan, C. (2018). Sosyal medya bağımlılığının haber takibi motivasyonları üzerine etkisi. Erciyes Üniversitesi İletişim Fakültesi Akademik Dergisi, 5(3), 238-256.

Bedir, A. (2016). Sosyal medya kullanımının üniversite öğrencilerinin akademik başarılarına ve tutumlarına etkisi (Yayımlanmamış yüksek lisans tezi). Atatürk Üniversitesi, Eğitim Bilimler Enstitüsü, Erzurum.

Cavga, Z. (2019). Lise öğrencilerinde aile yaşam doyumu ile psikolojik dayanıklılık ve sosyal medya kullanım bozukluğu arasındaki ilişkinin incelenmesi (Yayımlanmamış yüksek lisans tezi). İstanbul Sabahattin Zaim Üniversitesi, Sosyal Bilimler Enstitüsü, İstanbul.

Caz, Ç., & Bardakçı, S. (2019). Sosyal medya bozukluğu: Üniversite öğrencileri üzerine bir araştırma. OPUS International Journal of Society Researches, 10(17), 1100-1124.

Cooper, S. (2016). Effects of problematıc technology use, rutgers, The State Unıversıty of New Jersey, The Graduate School Of Applıed And Professıonal Psychology, New Jersey.

Çiftçi, H. (2018). Üniversite Öğrencilerinde Sosyal Medya Bağımlılığı. MANAS Sosyal Araştırmalar Dergisi, 7(4) , 419-433.

Durar, E. (2018). Üniversite öğrencilerinde sosyal medya bağımlılığının depresyon ve sosyal fobi ile ilişkisi (Yayımlanmamış yüksek lisans tezi). Kafkas Üniversitesi, Sağlık Bilimleri Enstitüsü, Kars.

Ergenç, A. (2011). Web 2.0 ve sanal sosyalleşme: Facebook örneği (Yayımlanmamış yüksek lisans tezi). Maltepe Üniversitesi, Sosyal Bilimler Enstitüsü, İstanbul.

Gürültü, E. (2016). Lise öğrencilerinin sosyal medya bağımlılıkları ve akademik erteleme davranışları arasındaki ilişkinin incelenmesi (Yayımlanmamış yüksek lisans tezi). Marmara Üniversitesi, İstanbul.

Hazar, Ç.M. (2011). Sosyal medya bağımlılığı-bir alan çalışması. İletişim Kuram ve Araştırma Dergisi, 32, 151 - 175.

Karasar, N. (2011). Bilimsel araştırma yöntemleri. Ankara: Nobel Yayınları.

Kırık, A. M., Arslan, A., Çetinkaya, A. & Gül, M., (2015). A quantitative research on the level of social media addiction among young people in Türkiye. International Journal of Science Culture and Sport (IntJSCS), 3(3), 108-122.

Sarıçam, H. & Adam Karduz, F. F. (2018). Sosyal medya kullanım bozukluğu ölçeği'nin türk kültürüne uyarlanması: Geçerlik ve güvenirlik çalışması. Journal of Measurement and Evaluation in Education and Psychology, 9(2), 116-135.

Savcı, M., Ercengiz, M. & Aysan, F. (2018). Ergenlerde sosyal medya bozukluğu ölçeğinin Türkçe uyarlaması. Arch Neuropsychiatry, 55(3), 248-255.

Singh, N. ve Barmola, K. C. (2015). Internet addiction, mental health and academic performance of school students/adolescents. The International Journal of Indian Psychology, 2(3), 98-108.

Ünlü, F. (2018). Orta yaş üstü bireylerde sosyal medya bağımlılığı ve sosyal izolasyon. PESA Uluslararası Sosyal Araştırmalar Dergisi, 4(1), 161-172.

Van den Eijnden, R. J. J. M., Lemmens, J. S., & Valkenburg, P. M. (2016). The social media disorder scale. Computers in Human Behavior, 61, 478–487.

Whiting, A. & Williams, D. (2013). Why people use social media: a uses and gratifications approach.Qualitative Market Research: An International Journal, 16(4), 362-369.

GENÇLİK VE SPOR İL MÜDÜRLÜĞÜNE AİT SPOR TESİSLERİNİN SPOR BİLİMLERİ ALANINDA ÖĞRENİM GÖREN ÖĞRENCİLERİN İHTİYAÇ VE BEKLENTİLERİ AÇISINDAN DEĞERLENDİRİLMESİ

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ÖZET

Bu araştırmanın amacı, Trabzon ili Gençlik ve Spor İl Müdürlüğü'ne ait spor tesislerinin fiziksel özelliklerinin Spor Bilimleri Fakültesi öğrencilerinin ihtiyaç ve beklentileri açısından değerlendirilmesidir. Araştırma grubunu 2020-2021 Eğitim öğretim yılında Trabzon Üniversitesi Spor Bilimleri Fakültesi'nde farklı sınıflarda öğrenim gören ve tesadüfi yöntemle seçilmiş 110 kadın, 55 erkek olmak üzere toplam 165 öğrenci oluşturmaktadır. Tarama modeli ile yapılan araştırmada veri toplama aracı olarak araştırmacı tarafından geliştirilen kişisel bilgi formu ve Demiröz (2009) tarafından geçerlilik ve güvenirliliği yapılan "Spor Tesisleri ve İşletmeciliği" ölçeği kullanılmıştır. 3'lü likert tipinde olan ölçek toplam 28 maddeden oluşmaktadır. Veriler IBM SPSS 21 programına aktarılmış ve istatistiki analizler yapılmıştır. Verilere normallik testlerinden Shapiro-Wilk testi uygulanmıştır. Cinsiyet ve lisans durumu değişkenlerine ait verilerin analizinde Independent T testi uygulanmıştır. Bölüm ve spor branşı değişkenleri analizinde One Way Anova testi uygulanmıştır. One Way Anova testi sonucunda anlamlı farklılıkların hangi gruplar arasında olduğunu belirlemek için Post Hoc testlerinden Tukey yapılmıştır. Çalışma bulgularında katılımcıların tesis yeterlilik puanları ile cinsiyet, lisans durumu, öğrenim gördükleri bölüm ve spor branşları değişkenleri arasında istatiksel olarak anlamlı bir farklılığa rastlanmamıştır. Çalışma bulguları doğrultusunda cinsiyet, lisanslı sporcu olma durumları, öğrenim gördükleri bölüm, spor branşları ve kullandıkları tesislerin tesis yeterliliği puanlarında belirleyici olmadığı sonucuna varılmıştır.

Anahtar Kelimeler: Spor Tesisi, Öğrenci, İhtiyaç.

EVALUATION OF THE SPORTS FACILITIES OF THE PROVINCIAL DIRECTORATE OF YOUTH AND SPORTS IN TERMS OF THE NEEDS AND EXPECTATIONS OF STUDENTS IN THE FIELD OF SPORTS SCIENCES

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ABSTRACT
The purpose of this research is to evaluate the physical properties of the sports facilities of the Trabzon Provincial Directorate of Youth and Sports in terms of the needs and expectations of the students of the Faculty of Sports Sciences. The personal information form developed by the researcher and the "Sports Facilities and Management" scale, which was validated and reliable by Demiröz (2009), were used as data collection tools in the research conducted with the scanning model. The scale, which is a 3-point Likert type, consists of 28 items in total. The research group consists of a total of 165 students, 110 females and 55 males, selected by random method and studying in different classes at Trabzon University Faculty of Sport Sciences in the 2020-2021 academic year. In the analysis and interpretation of data; The conformity of the data to the normal distribution was tested with the OneSample Kolmogrov-Smirnov Test, and then, according to these data, Paired Samples t Test was used for related samples and independent samples t test was used for independent samples. P was taken as the level of significance ($P<0.05$). As a result of the research, no significant difference was found in terms of the gender variable of the participants, the variable of being a licensed athlete, the effect of the distance between the facilities and their homes on their doing sports, the variable of the department they studied and the variable of sports branches.

Keywords: Sports Facility, Student, Need.

GİRİŞ

Spor, insanlığın varoluşundan beri hayatta kalabilme mücadelesinin bir yansıması olarak ortaya çıkarken, daha sonraki dönemlerde toplumlar arası ilişkileri geliştiren, sevgi ve barışı temsil etmekte olan etkinlikler haline gelmiştir. Günümüzde artık spor olgusu çok yönlü bir hale gelmiştir. Bu durum giderek daha fazla önem kazanmakta ve hatta ulusların yönetiminde ulusal bir politika haline gelmiştir (Kale ve Erşen, 2003). Spor eğitimi sporda başarı için çok önemlidir. Sporun gelişmesi ve kalkınması, köklü ve bilimsel olarak hazırlanmış eğitim programlarının yanı sıra spor tesislerinin yaygınlaşmasına ve işler hale getirilmesine bağlıdır (Çöndü, 1999). Sporu toplumumuzun vazgeçilmez bir tutkusu ve yaşam biçimi haline getirmek için öncelikle çocuklarımıza ve gençlerimize spor yapma alışkanlığı kazandırmak, sporu sevdirmek, spor yapmalarını sağlayacak ortam ve imkânları yaratmak zorundayız. Sigara, uyuşturucu, kumar gibi kötü alışkanlıklar yerine hoşgörülü, sosyal ve üretken, vatanını ve milletini seven insanlar olarak yetişmeleri sağlanmalıdır. Bu ortamın en önemli parçalarından biri de eğitim ve öğretim kurumlarıdır (Small, 2006). Gelişen toplumlarımızda insanların yaşamları ve ihtiyaçları değiştikçe, buna paralel olarak sporda da farklılıklar meydana gelmiş ve bunun neticesinde farklı spor tesislerine ihtiyaç duyulmuştur (Nacar, 2011). Bir ülkede sporun gelişip, yaygınlaşıp yaygınlaşmadığını anlamak için spor ortamının oluşturulup oluşturulmadığına ve sayıca yeterli olup olmadığına bakmak gerekir. Çünkü bir ülkenin spor bakımından gelişmesi için uygun nitelikte ve yeterli sayıda spor ortamının oluşturulması gereklidir (Aksoy, 2006). Bilindiği üzere spor ortamı; spor sahaları ve tesisleri, spor araç ve gereçleri, spor eğitmenleri ve yöneticileri ile spor eğitim ve organizasyonlarını kapsamaktadır (Salman, 1992).

Avrupa ve diğer gelişmiş ülkelerde yapılan yeni tesislerde sadece spor olayının icra edileceği yerin düşünülmediği, bunların yanı sıra seyircilere yönelik çok büyük kolaylık ve imkânların

sağlandığı görülmektedir. Örneğin, lüks oturma yerleri, restoranlar, fast-food yerleri, içecek bölümleri, dinlenme salonları vb. pek çok yer salonla birlikte ele alınmaktadır. Bunların yanı sıra, salonların giriş çıkış kolaylığı, giriş çıkış emniyeti, hareket serbestliği için alanların geniş tutulması kaliteli skor boardlar ve dev ekranlar da düşünülmesi gereken unsurlar olarak ele alınmaktadır (Argan ve Katırcı, 2002). Günümüzde spor, Gençlik ve Spor Genel Müdürlüğü bünyesinde yürütülmekte ve Spordan Sorumlu Devlet Bakanlığı'na bağlı bu kurumda faaliyetlerini devam ettirmektedir (Keten, 1993).

Gençlik ve Spor Genel Müdürlüğü'ne bağlı spor tesisleri, Tesisler Daire Başkanlığı'nın projelerinde uyguladığı özelliklerde inşa edilmektedir. Spor ortamının bir devlet politikası olarak kurulması ve geliştirilmesi Anayasamızın 59. maddesinde belirtilmiştir. Ayrıca 3289 sayılı Gençlik ve Spor Genel Müdürlüğü Teşkilat ve Görevleri Hakkında Kanun'da; Beden eğitimi, gençlik ve spor faaliyetleri için gerekli gençlik merkezleri, kamplar, sahalar ve tesislerin yapımını ve işletilmesini ve bu tesislerin vatandaşların hizmetine sunulmasını görevlendirmiştir (Aksoy, 2006). Spor tesislerinin varlığı hem spora olan talebi hem de spor programlarının üretimini ve hizmetlerden yararlanma becerisini etkilemektedir (Ekenci ve İmamoğlu, 2002). Geliştirilmiş olan spor programının uygulama bölümünde uzmanlaşma çok önemlidir. Herkesin her işi verimli veya etkili bir şekilde yapma zorluğu karşısında, spor tesislerinde katılımcıya doğrudan veya dolaylı hizmet veren her çalışanın kendi alanında asgari niteliklere ve kaliteye sahip olması gerekmektedir. Çünkü spor tesislerinde sunulmakta olan hizmetin kalitesi büyük ölçüde müşteri memnuniyeti ile kontrol edilebilmektedir (İkizler, 2000).

Bu araştırmada, Trabzon ilinde Gençlik ve Spor İl Müdürlüğü'ne ait spor tesislerinin fiziksel özelliklerinin Spor Bilimleri Fakültesi öğrencilerinin ihtiyaç ve beklentileri açısından değerlendirilmesi amaçlanmıştır.

MATERYAL VE YÖNTEM

Araştırma Modeli: Araştırma tarama modelinde tasarlanmıştır. Tarama modeli, geçmişte ya da halen var olan bir durumu var olduğu şekliyle betimlemeyi amaçlayan araştırma yaklaşımlarına denir (Karasar, 2011).

Araştırma Grubu: Araştırma grubunu Trabzon Üniversitesi Spor Bilimleri Fakültesi'nde öğrenim gören ve çalışmamıza gönüllü olarak katılmayı kabul eden 110 kadın, 55 erkek olmak üzere toplam 165 öğrenci oluşturmaktadır.

Veri Toplama Araçları: Verilerin elde edilmesi için araştırmacılar tarafından geliştirilen kişisel bilgi formu ve Demiröz (2009) tarafından geliştirilen 'Tesis Yeterlilik Ölçeği' kullanılmıştır. Veri toplama aracının ilk bölümünde öğrencilerin cinsiyet, yaş, sınıf, bölüm, ilgilenilen spor branşı, spor yılı, tesis kullanımı, lisanslı sporcu olup olmadığı, spor tesisi kullanım süresi, spor tesisi kullanım sıklığı ve spor tesisleri ve mesafeleri hakkında bilgileri içeren demografik özellikler, ikinci bölümde, spor tesislerinin fiziksel özellikleri ile ilgili (0) Katılmıyorum, (1) Kararsızım, (2) Katılıyorum, şeklinde 3'lü likert tipinde ve 28 maddeden oluşan 'Tesis Yeterlilik Ölçeği' sunulmuştur. Bu araştırmada Cronbach Alpha iç tutarlık katsayısı 0,93 olarak bulunmuştur.

Verilerin Analizi: Veriler IBM SPSS 21 programına aktarılmış ve istatistiki analizler yapılmıştır. Verilere normallik testlerinden Shapiro-Wilk testi uygulanmıştır. Cinsiyet, lisans durumu ve tesisler ile evleri arasındaki mesafenin spor yapmalarına etkisi değişkenlerine ait

verilerin analizinde Independent T testi uygulanmıştır. Sınıf, bölüm, spor branşı ve kullandıkları tesis değişkenleri analizinde One Way Anova testi uygulanmıştır. One Way Anova testi sonucunda anlamlı farklılıkların hangi gruplar arasında olduğunu belirlemek için Post Hoc testlerinden Tukey yapılmıştır.

BULGULAR

Tablo 1. Tesis Yeterlilik Ölçeği Puanlarının Dağılımı

	Madde Sayısı	n	Ort.	Ss	Çarpıklık	Basıklık	Min.	Mak.
TYÖ	28	165	2.10	0.47	-0.07	-0.53	1.00	3.00

Araştırmaya konu olan spor bilimleri alanında öğrenim gören öğrencilerin TYÖ'nden elde edilen puanların aritmetik ortalaması 2.10, standart sapması 0.47'dir. Ayrıca spor bilimleri alanında öğrenim gören öğrencilerin TYÖ ölçeğinden ulaşılan puanlarının normallik varsayımını sağlayıp sağlamadığına ilişkin çarpıklık ve basıklık katsayıları hesaplanmıştır (Tablo 1). Bu katsayı değerleri Tablo 1'de görüldüğü üzere TYÖ ölçeğinde çarpıklık -0.07 iken basıklık değeri ise -0.53 olarak hesaplanmıştır. TYÖ ölçeğinden elde edilen verilerin normal dağılım varsayımını sağlamış olduğunu ve bu sonuç neticesinde parametrik testler uygulanmıştır.

Tablo 2. Cinsiyet Değişkenine Göre Araştırma Grubunun Tesis Yeterliliği Ölçeğinden Aldıkları Puanların Karşılaştırılması (Independent T Testi)

	Cinsiyet	n	$\bar{x}$	Ss	t	Sd	p
TYÖ	Kadın	110	2.12	0.48	0.50	163	0.66
	Erkek	55	2.08	0.45			

*p<0.05

Tablo 2 incelendiğinde araştırma grubunun cinsiyet değişkenine göre Tesis Yeterliliği Ölçeğinden aldıkları puanların ortalamalarında anlamlı fark bulunmamıştır (p>0.05).

Tablo 3. Spor Branşı Değişkenine Göre Araştırma Grubunun Tesis Yeterliliği Ölçeğinden Aldıkları Puanların Karşılaştırılması (One Way Anova Testi)

	Spor Branşı	n	$\bar{x}$	Ss	F	P	Anlamlı Fark
TYÖ	Güreş	2	1.79	0.96	1.49	0.10	-
	Futbol	60	2.05	0.47			
	Basketbol	7	2.00	0.51			
	Voleybol	18	1.93	0.45			
	Hentbol	10	2.00	0.48			
	Yüzme	13	2.07	0.39			
	Judo	7	2.23	0.37			
	Taekwondo	8	2.27	0.42			

Tenis	7	2.37	0.38
Kayak	1	1.71	-
Dağcılık	5	2.44	0.48
Masa Tenisi	1	2.96	-
Karate	2	2.79	0.05
Kick Boks	4	1.87	0.43
Wushu	1	1.96	1.96
Badminton	4	2.14	2.14
Boks	9	2.18	2.18
Atletizm	6	2.43	2.43

*p<0.05

Tablo 3 incelendiğinde araştırma grubunun Spor Branşı değişkenine göre Tesis Yeterliliği Ölçeğinden aldıkları puanların ortalamalarında anlamlı fark bulunmamıştır (p>0.05).

Tablo 4. Lisanslı Sporcu Durumu Değişkenine Göre Araştırma Grubunun Tesis Yeterliliği Ölçeğinden Aldıkları Puanların Karşılaştırılması (Independent T Testi)

	Lisanslı Sporcu Durumu	n	$\bar{X}$	Ss	t	Sd	p
TYÖ	Evet	113	2.06	0.48	1.63	163	0.49
	Hayır	52	2.19	0.43			

*p<0.05

Tablo 4 incelendiğinde araştırma grubunun lisans durumu değişkenine göre Tesis Yeterliliği Ölçeğinden aldıkları puanların ortalamalarında anlamlı fark bulunmamıştır (p>0.05).

Tablo 5. Bölüm Değişkenine Göre Araştırma Grubunun Tesis Yeterliliği Ölçeğinden Aldıkları Puanların Karşılaştırılması (One Way Anova Testi)

	Bölüm	n	$\bar{X}$	Ss	F	P	Anlamlı Fark
TYÖ	Öğretmenlik	84	2.04	0.49	2.10	0.13	-
	Spor Yön.	61	2.20	0.44			
	Antrenörlük	20	2.11	0.44			

*p<0.05

Tablo 5 incelendiğinde araştırma grubunun Bölüm değişkenine göre Tesis Yeterliliği Ölçeğinden aldıkları puanların ortalamalarında anlamlı fark bulunmamıştır (p>0.05).

TARTIŞMA VE SONUÇ

Araştırma grubunun cinsiyet değişkenine göre Tesis Yeterliliği Ölçeğinden aldıkları puanların ortalamalarında anlamlı fark bulunmamıştır (p>0.05). Bu sonuca göre katılımcıların kadın ya da erkek olmaları spor tesislerini yeterli görmeleri açısından bir farklılık oluşturmadığı sonucuna ulaşılmıştır. Yapılan benzer çalışma sonuçları incelendiğinde; Baş, Çelik ve Solak (2017) çalışmalarında cinsiyete göre bir değişiklik olmadığını saptamışlardır. Demirel (2013)

rekreasyonel spor/fitness programı sunan işletmelerdeki hizmet kalitesi boyutlarının incelendiği çalışmasında cinsiyet bakımından algılanan hizmet kalitesinin tüm alt boyutlarında istatistiksel olarak anlamlı bir farklılık olmadığı tespit edilmiştir. Bu çalışmalara araştırma bulgularımızla benzerlik göstermektedir. Farklı sonuçların ortaya konulduğu araştırmalarda mevcuttur. Greenwell ve Pastore (2004)'nin yapmış olduğu araştırma sonucunda kadın katılımcıların kalite algılarının erkeklere göre anlamlı bir şekilde farklı olduğunu bulmuşlardır. Theodorakis ve arkadaşları (2004) ise araştırma sonuçlarına göre, Erkekler katılımcı tesis ve hizmetler boyutundaki sorulara daha yüksek puanlar verdikleri tespit edilmiştir. Kurtoğlu (2006)'nın çalışma sonuçlarında erkek ve kadın müşteriler arasında kadınların daha olumlu görüş beyan ettikleri ve kadınların hizmet kalitesinden daha memnun olduklarını tespit etmiştir. Ergin ve arkadaşları da (2010) araştırmalarında algılanan hizmet kalitesinin tüm boyutlarında kadınlar lehine anlamlı farklılaşma oluştuğunu belirlemişlerdir. Bahsedilen bu araştırma sonuçları çalışma sonucumuzla çelişmektedir.

Çalışma sonucunda kadın ve erkek katılımcılar arasında bir farklılığın ortaya çıkmamasının nedeni spor tesislerinden faydalanan ve var olan imkânlardan tüm katılımcıların ortak bir algıya sahip olduklarının neden olduğu söylenebilir.

Araştırma grubunun Spor Branşı değişkenine göre Tesis Yeterliliği Ölçeğinden aldıkları puanların ortalamalarında anlamlı fark bulunmamıştır ($p>0.05$). Bu sonuca göre katılımcıların mevcut tesislerin yeterliği algısı açısından bir farklılığa neden olmadığı görülmüştür. Yapılan benzer bir çalışma sonucu araştırma bulgularımızla örtüşmektedir. Koç ve arkadaşları (2021) araştırma sonuçlarında katılımcıların spor branşları bazında algıladıkları spor tesisleri yeterliği açısından bir farklılığa rastlanmadığı sonucunu ortaya koymuşlardır.

Bu sonuçlara göre araştırma yapılan ilin spor tesisleri anlamında yeterli düzeyde olduğu söylenebilir. Katılımcıların yaptıkları spor branşına yönelik alt yapı, tesis ve araç-gereçlerin ihtiyaçlara cevap verdiği ve bu duruma paralel olarak da katılımcıların yeterlilik algıları anlamında bir farklılığa neden olmadığı söylenebilir.

Araştırma grubunun lisans durumu değişkenine göre Tesis Yeterliliği Ölçeğinden aldıkları puanların ortalamalarında anlamlı fark bulunmamıştır ($p>0.05$). Bu durum katılımcıların lisanslı sporcu olup olmaları açısından spor tesislerinin yeterliği algıları arasında bir farkın olmadığı sonucunu ortaya koymuştur. Fakat sıra ortalamalarına baktığımızda lisanslı olmayan sporcuların lisanslı sporculara göre daha yüksek puanlara sahip olduğu görülmektedir. Benzer bir çalışmada ise Sancar (2020) araştırma bulgularımızı destekler sonuçları ortaya koymuştur. Katılımcılar arasında anlamlı bir farkın çıkmamasının nedeni olarak ise lisanslı spor yapanların diğerlerine göre bir branşta aktif sporcu olmalarından kaynaklı düzenli olarak antrenman yapmaları ve müsabakalara katılmaları, özellikle başka bölgelerdeki spor tesislerini görmelerinden dolayı kıyaslama yapmaları gibi nedenler bu sonuçların ortaya çıkmasına neden olabilir.

Araştırma grubunun Bölüm değişkenine göre Tesis Yeterliliği Ölçeğinden aldıkları puanların ortalamalarında anlamlı fark bulunmamıştır ($p>0.05$). Bu sonuca göre katılımcıların Beden eğitimi ve spor öğretmenliği, Spor yöneticiliği ve Antrenörlük eğitimi bölümlerinde öğrenim görmelerinin Spor tesisleri yeterliği açısından bir farklılığa neden olmadığı sonucuna ulaşılmıştır. Bu durumun temel sebepleri arasında öğrencilerin bölümleri farklılık gösterse de eğitim sisteminin birbirlerine paralel olması, aynı şartlarla ve aynı ortamlarda spor faaliyetlerinde bulunmaları ve aynı imkânlardan faydalanmaları gibi faktörler bu sonucun ortaya çıkmasına neden olduğu söylenebilir.

Sonuç olarak; Spor bilimleri alanında öğrenim gören öğrencilerin Trabzon Gençlik ve Spor İl

müdürlüğü bünyesindeki spor tesislerinin yeterliğinin farklı değişkenler aracılığı ile belirlenmesinin hedeflendiği çalışma sonucunda araştırma grubunun cinsiyet, spor branşı, lisanslı sporcu olup olmama durumu ve bölüm değişkenleri açısından bir farklılığa rastlanmamıştır.

KAYNAKLAR

Aksoy, M. T. (2006). Gençlik ve spor genel müdürlüğü bünyesinde bulunan spor salonlarının kullanıcı ihtiyaçlarını karşılama düzeyinin belirlenmesi (Yayımlanmamış yüksek lisans tezi). Abant İzzet Baysal Üniversitesi, Sosyal Bilimler Enstitüsü, Bolu.

Argan, M. & Katırcı, H. (2002). Spor pazarlaması, Nobel Yayınevi, Ankara.

Baş, M, Çelik, A. & Solak, N. (2017). Spor işletmelerinde algılanan hizmet kalitesi üzerine bir araştırma. Gaziantep Üniversitesi Spor Bilimleri Dergisi, *2*(4), 1-11.

Çöndü, A. (1999). Beden eğitimi ve sporda özel öğretim yöntemleri. Ankara: Nobel Yay. Dağıtım Ltd. Şti.

Demirel, H. (2013). Rekreasyonel Spor/Fitness programı sunan işletmelerde hizmet kalitesi (Yayımlanmamış doktora tezi). Gazi Üniversitesi Sağlık Bilimleri Enstitüsü, Ankara.

Demiröz, V. M. (2009). Gençlik ve Spor İl Müdürlüğü' ne ait spor tesislerinin, fiziksel özelliklerinin ve işletmecilik anlayışının, sporcu ve antrenörlerin ihtiyaç ve beklentileri açısından değerlendirilmesi (Kahramanmaraş ili örneği) (Yayımlanmamış yüksek lisans tezi). Kahramanmaraş Sütçü İmam Üniversitesi, Sosyal Bilimler Enstitüsü, Kahramanmaraş.

Ekenci, G. & İmamoğlu, F. (2002). Spor işletmeciliği. İstanbul: Nobel Yayın Dağıtım.

Ergin, B. M., İmamoğlu, A.F., Tunç, T., Akpınar, S. & Çon, M. (2010). Üniversite spor merkezlerinde hizmet kalitesi boyutlarının algı ve önem düzeylerinin incelenmesi. Spor ve Performans Dergisi, *2*(1), 41- 49

Greenwell, F. & Pastore, D. L. (2004). Perceptions of the service experiance: Using demographic and psychographic variables to identify customer segments. Sport Marketing Quarterly, 11, 233-241.

İkizler, C. (2000). Sporda sosyal bilimler. İstanbul: Alfa Yayınevi.

Kale, R. & Ersen, E. (2003). Beden eğitimi ve spor bilimlerine giriş. Ankara: Nobel Yayın Dağıtım.

Karasar, N. (2011). Bilimsel araştırma yöntemleri. Ankara: Nobel Yayınları.

Keten, M. (1993). Türkiye' de spor. Ankara: Polat Ofset.

Koç, H., Aslan, B. & Ertutar, M. Ö. (2021). Akademisyen görüşlerine göre üniversite spor tesis yeterlilik düzeylerinin incelenmesi (Doğu Anadolu Bölgesi örneği). Spormetre Beden Eğitimi ve Spor Bilimleri Dergisi, *19*(3), 107-115.

Kurtoğlu, T. (2006). Spor hizmetleri konusunda halkın yerel yönetimlerden beklentileri (Yayımlanmamış yüksek lisans tezi). Mersin Üniversitesi, Sosyal Bilimleri Enstitüsü, Mersin.

Nacar, E. (2011). Türk spor eğitiminde spor tesislerinin yeterlilik düzeylerinin belirlenmesi (Yayımlanmamış doktora tezi). Fırat Üniversitesi, Sağlık Bilimleri Enstitüsü, Elazığ.

Salman, M. (1992). Ülkemizde gençlik ve spor genel müdürlüğüne ait olan spor salonlarının kapasite ve dağılım yönünden değerlendirilmesi ve mevcut durumun tespiti (Yayımlanmamış doktora tezi). Marmara Üniversitesi, Sağlık Bilimleri Enstitüsü, İstanbul.

Sancar, L. Ö. (2020). Lise öğrencilerinin boş zamanlarını değerlendirmeleri açısından okullardaki beden eğitimi ve spor imkân ve eksikliklerine ilişkin görüşlerinin incelenmesi

(Batman İli örneği). Batman Üniversitesi Sosyal Bilimler Enstitüsü, Batman.

Small, E. (2006). Çocuk ve spor. Çev. Şenoğuz, H. P. İstanbul: Optimist Yayınları.

Theodorakis, N., Alexandris, K., Rodriguez, P. & Sarmento, P. J. (2004). Measuring customer satisfaction in the context of health clubs in Portugal. International Sports Journal, 8(1), 44-53.

TÜRKİYE'DE HAYAT BOYU ÖĞRENMEYLE İLGİLİ YAPILMIŞ LİSANSÜSTÜ TEZLERİN ANALİZİ

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ÖZET

Bilgi ve teknoloji çağı olarak kabul edilen 21. yüzyıldaki hızlı gelimler hayat boyu öğrenmenin önemini arttırmıştır. Hayat boyu öğrenme bireysel gelişimi esas alsa da toplumsal ve ekonomik gelişim de bu öğrenmenin kapsamındadır. Türkiye ekonomik olarak gelişmekte olan ülkeler grubunda yer alırken, nüfus olarak Avrupa'nın en genç nüfusuna sahip ve sürekli göç alan ülkelerindendir. Sahip olunan potansiyel gücün ortaya çıkarılması ve toplumsal sorunların önüne geçilmesinin yollarından biri hayat boyu öğrenmeye gereken önemin verilmesidir. Bu alandaki eksikliklerin tespiti ve giderilmesi alanda yapılacak çalışmalarla sağlanabilmektedir.

Hayat boyu öğrenme zaman içerisinde kavramsal tanım olarak değişikliğe uğrasa da temelde aynı anlamı niteleyen "halk eğitimi", "yetişkin eğitimi", "sürekli eğitim" gibi isimlerle anılmıştır. Gelişmiş ve gelişmekte olan ülkelerin yanında uluslararası birçok kuruluş için de önemli bir gündem maddesi olan bu kavram; küreselleşme ve teknolojinin gelişimiyle önemi daha da artmıştır. Bu çalışmada gelişmekte olan ülkeler kategorisinde yer alan Türkiye'de hayat boyu öğrenme ile ilgi yapılmış lisansüstü tezlerin özelliklerini betimlemek amaçlanmıştır. Bu amaç çerçevesinde aşağıdaki sorulara cevap aranmıştır:

Türkiye'de hayat boyu öğrenme konulu lisansüstü tezlerin;

1.Yıllara,
2.Üniversitelere,
3.Araştırmacıların cinsiyetine,
4.Türüne (YL, DR),
5.İlgili olduğu bilim dalına,
6.Konusuna,
7.Yöntem türüne,
8.Örneklem grubuna,
9.Veri toplama aracına göre dağılımı nasıldır?

Türkiye'de hayat boyu öğrenme ile ilgili tamamlanmış lisansüstü tezlerin incelendiği bu çalışmada nitel araştırma yaklaşımının benimsendiği bu çalışmada yöntem olarak "Doküman İnceleme Yöntemi" kullanılmıştır. Araştırmanın verileri, Yüksek Öğretim Kurulu Tez Veri Tabanından elde edilmiştir. Sadece internet üzerinden hizmet veren bu veri tabanında "yaşam boyu öğrenme" anahtar kelimesi ile arama yapılmıştır. Araştırma erişime açık olan tezlerle sınırlandırılmıştır. Veri tabanının taranması sonucunda hayat boyu öğrenmeyle ilgili yazılmış 43 teze ulaşılmıştır. Araştırmanın veri setini oluşturan 43 tezin analizleri "İçerik Analizi" yöntemiyle betimlenmiştir. Araştırmada varılan sonuçlarından hareketle önerilere de yer verilmiştir.

Anahtar kelimeler: Hayat Boyu Öğrenme, Lisansüstü, Yüksek Lisans Tezi, Doktora Tezi.

ANALYSIS OF POSTGRADUATE THESES RELATED TO LIFELONG LEARNING IN TÜRKIYE

ABSTRACT

Rapid developments in the 21st century, which is accepted as the age of information and technology, have increased the importance of lifelong learning. Although lifelong learning is based on individual development, social and economic development is also within the scope of this learning. While Türkiye is in the group of economically developing countries, it is one of the countries with the youngest population in Europe and constantly receiving immigration. One of the ways to reveal the potential power and prevent social problems is to give the necessary importance to lifelong learning. The determination and elimination of deficiencies in this area can be achieved by studies to be carried out in the field.

Although lifelong learning has changed as a conceptual definition over time, it has been called with names such as "public education", "adult education", "continuous education", which basically describe the same meaning. This concept, which is an important agenda item for many international organizations as well as developed and developing countries; its importance has increased with the development of globalization and technology. In this study, it is aimed to describe the characteristics of postgraduate theses on lifelong learning in Türkiye, which is in the category of developing countries. Within the framework of this purpose, answers to the following questions were sought:

What are the distribution postgraduate theses on lifelong learning in Türkiye according to

1. Years,
2. Universities,
3. The gender of the researchers,
4. Type (MSc, PhD),
5. Related to the branch of science,
6. Its subject,
7. Type of method,
8. The sample group,
9. The data collection tool?

In this study, in which the completed postgraduate theses on lifelong learning in Türkiye were examined, the "Document Analysis Method" was used as the method in this study, in which the qualitative research approach was adopted. The data of the research were obtained from the Thesis Database of the Council of Higher Education. This database, which serves only on the internet, was searched with the keyword "lifelong learning". The research is limited to the theses that are open to access. As a result of scanning the database, 43 theses written about lifelong learning were reached. The analysis of 43 theses constituting the data set of the research was described using the "Content Analysis" method. Based on the results of the research, suggestions are also included.

Keywords: Lifelong Learning, Postgraduate, Master's Thesis, Ph.D. Thesis.

GİRİŞ

Bilgi ve teknoloji çağı olarak kabul edilen 21. yüzyıldaki hızlı değişimler hayat boyu

öğrenmenin önemini arttırmıştır. Hayat boyu öğrenme bireysel gelişimi temel alsa da toplumsal ve ekonomik gelişim de bu öğrenmenin kapsamındadır. Türkiye ekonomik olarak gelişmekte olan ülkeler grubunda yer alırken, nüfus olarak Avrupa'nın en genç nüfusuna sahip ve sürekli göç alan ülkelerindendir. Sahip olunan potansiyel gücün ortaya çıkarılması ve toplumsal sorunların önüne geçilmesinin kestirme yollarından biri hayat boyu öğrenme olarak görülmektedir. Bu alandaki eksikliklerin tespiti ve giderilmesi alanda yapılacak çalışmalarla sağlanabilmektedir. Bu araştırmada, Türkiye'de hayat boyu öğrenmeyle ilgili yapılmış tezlerinin incelenmesi ve genel eğilimlerinin belirlenmesi amaçlanmıştır. Nitel araştırmalardan doküman inceleme yönteminin kullanıldığı bu çalışmada verilerin analizinde içerik analiz tekniği kullanılmıştır. Araştırmanın evrenin, Yükseköğretim Kurulu (YÖK) Ulusal Tez Merkezi'nde erişime açık 43 lisansüstü tez oluşturmaktadır. Bu tezler, hazırlandıkları yıl, üniversite, araştırmacıların cinsiyeti, türü (YL, DR), ilgili olduğu bilim dalı, araştırma konusu, yöntemi, örneklem grubu ve veri toplama aracına göre analiz edilmiştir.

İnsanoğlu için hayat ve öğrenme birbirlerini etkileyen ve birbirini tamamlayan kavramlardır. Tarih boyunca insanların nasıl öğrendiği, nasıl daha iyi öğrenebileceği, öğrenmeyi etkileyen süreçler ve ilk öğrenmenin ne zaman başladığı ile ilgili sorulara cevap aranmıştır. Sacher (2021), López Ramón Y Cajal (2019), Mennella ve diğerleri (2001) ve Partanen ve diğerleri (2013) çalışmalarında, öğrenmenin doğum öncesi dönemde başladığını belirtmişlerdir. Öğrenme, bireylerin çevresine uyum sağlaması, varlığını sürdürmesi ve yaşam şartlarını iyileştirebilmesi için ihtiyaç duyduğu en önemli becerilerin başında gelmektedir. Bu nedenle, hayat boyu öğrenme bireyler için bir gerekliliktir (Göksan ve diğerleri, 2009). "Hayat boyu öğrenme" teriminin çok çeşitli bağlamlarda kullanılması ve geniş bir alana sahip olması nedeniyle farklı şekillerde tanımlanmıştır. Bu yüzden bu kavramın, işlevsel hale getirilmesi ve uygulanması yaygın olarak gerçekleştirilememiştir (Aspin ve Chapman, 2000). İnsanlar için vazgeçilmez olan hayat boyu öğrenme; halk eğitimi, kitle eğitimi, yaygın eğitim, temel eğitim, toplum eğitimi, sosyal eğitim, sürekli eğitim, popüler eğitim gibi farklı kavramlar üzerinden tanımlanmaya çalışılmıştır. Hayat boyu öğrenme, örgün ve yaygın eğitim süreçlerinde gerçekleşen öğrenme pratiklerini kapsayan bir kavramdır. Örgün eğitimin bir alternatifi değil, örgün eğitimde eksik ve yetersiz kalan öğrenmelerin sonradan tamamlanması veya daha önce keşfedilmemiş yeteneklerin ortaya çıkarılması (Göksan ve diğerleri, 2009) sürecidir.

HAYAT BOYU ÖĞRENMENIN KAPSAMI VE TARIHSEL GELIŞIMI

Hayat boyu öğrenme, bireyin doğumundan ölümüne kadar geçen süreçte ihtiyaç duydukları tüm bilgi, değer, beceri ve anlayışı edinmelerini amaçlar. Her koşul ve ortamda insan potansiyelinin geliştirilmesi ve bu gelişim için gerekli önlemlerin alınması için politikalar belirlenmesini öngörür. 1960 yılında UNESCO'nun düzenlediği konferansta "Hayat Boyu Öğrenme" kavramıyla ilgili temel çerçeveler sunulmuştur. UNESCO'nun 1996 yılına kadar Hayat boyu öğrenme yerine sıklıkla hayat boyu eğitim kavramını kullandığı görülmüştür. Bu kavram ile ilgili en detaylı tanım, Fransa Eski başbakanı Edgar Faure'nin (1972) raporunda yer almaktadır. Literatürde Faure raporu olarak ta bilinen bu rapor 1972 UNESCO konferansında "olmayı öğrenmek" adıyla yayınlanmıştır. Faure ve diğerleri (1972) bu raporda hayat boyu eğitimi, öğrenen toplumların kalbi olarak görmektedir. Kendini gerçekleştirme, demokrasinin teşvikçisi, gelişim ve değişmenin tetikleyeni ve dünya vatandaşı olma hayat boyu öğrenmenin reformist çıktılarıdır. Faure'nin bu raporu birçok araştırmacı tarafından önemli bir başlangıç noktası olarak kabul edilmektedir. Joachim (1996) Faure raporunu pedagojik reform hareketinin ikincisi olarak nitelerken, Boshier (2004) ise örgün eğitime meydan okuma olarak

tanımlamıştır. Hayat boyu eğitimin öneminin vurgulandığı raporda aşağıdaki tavsiye ve uyarılara yer verilmiştir (Akkuş, 2008):

- Eğitimde okul yaşı sınırlarının genişletilmesi,
- Eğitim, yaşam kalitesini artıran bir araçtır bu bakımdan tüm toplumun erişimi için gerekli koşullar sağlanmalıdır,
- Günlük hayattaki ihtiyaçlarımız ile bağlantılı eğitim politikalarının geliştirilmesi, dikkate alınması,
- Eğitim ile ilgili kararlara öğretmenlerin, işçilerin, ailelerin ve toplum üyelerinin katılması,
- Eğitimle ilgili planlamada, yönetimde ve hedef belirlemede açık fikirli olunmalıdır.

Almanya'da 1951 yılında kurulan UNESCO Eğitim Enstitüsü, Faure Raporunun ardından hayat boyu öğrenmeye odaklanmış ve sonrasında ismini UNESCO Hayat Boyu Öğrenme Enstitüsü olarak değiştirmiştir. 2000'li yıllardaki önemli gelişmelerden biri Dakar'da (Senegal) düzenlenen "Dakar Eylem Çerçevesi" konferansıdır (UNESCO, 2000). Bu konferansta hayat boyu öğrenmeyi teşvik etmek için altı gelişimsel hedef belirlenmiştir. Bunlar:

- Dezavantajlı çocuklar için erken çocuklukta bakım ve eğitiminin genişletilmesi ve iyileştirilmesi,
- 2015 yılına kadar tüm çocukların, özellikle kız çocukların kaliteli, ücretsiz ve zorunlu ilköğretime erişimini ve bu eğitimi tamamlamasını sağlamak,
- Tüm gençlerin ve yetişkinlerin öğrenme ihtiyaçlarının, uygun öğrenme ve yaşam becerileri programlarına eşit erişimini sağlamak,
- 2015 yılına kadar özellikle kadınlar için yetişkin okuryazarlık seviyelerinde iyileşme ve tüm yetişkinler için temel ve sürekli eğitime eşit erişim sağlanması,
- Kızların temel eğitime erişimini ve bu eğitimde başarılı olmasını sağlamaya odaklanarak, 2005 yılına kadar ilk ve orta öğretimde cinsiyet eşitsizliklerinin ortadan kaldırılması ve 2015 yılına kadar eğitimde cinsiyet eşitliğinin sağlanması,
- Eğitim kalitesini her yönüyle iyileştirmek ve özellikle okuryazarlık, aritmetik ve temel yaşam becerilerinin geliştirilmesine odaklanmak.

Hayat boyu öğrenmenin gelişim evresiyle ilgili bir diğer rapor ise Delors'un (1972) "Learning, The Treasure Within" adlı raporudur. Faure raporundan 24 yıl sonra yayınlanan bu raporda, hayat boyu eğitim yerine hayat boyu öğrenmenin önemi vurgulanmıştır (Delors, 1996). Eğitim yerine öğrenmeye vurgu yapılan bu raporda kurumlar yerine bireyler ön planda tutulmuştur. Hayat boyu öğrenmede kurumların yerine bireyin rolünün vurgulanması bireylere düşen sorumluluğu arttırmıştır. Hayat boyu öğrenmede sistemin kalbi bireydir ve hayat boyu öğrenmenin gerçekleşmesi bireylerin öğrenmeyi üstlenme sorumluluğuna ve motivasyon derecesine bağlı (Arslan, 2019) görülmüştür. Öğrenen birey yerine öğrenen toplum vurgusunun yapıldığı rapor Elfert (2015) tarafından UNESCO'nun hümanist ve evrensel eğitim hakkındaki görevini teyit ettiği için önemli görülmektedir. Raporda küreselleşen dünyada yaşanan gerilimler, kuşaklar arası çatışmalar için hayat boyu öğrenmenin önemi vurgulanmıştır (Delors, 1996). Eğitim, bireylere kendi kültürlerini öğrenmenin yanında dünyadaki kültürlere karşı saygılı olmayı öğretmelidir. Hayat boyu öğrenme için müfredata yeni konular eklemek yerine, eğitimi herkes için kolay ulaşılabilir kılmak aktif bir sivil toplum inşa etmek için kilit öneme sahiptir. Delors'un raporundan sonra Avrupa Birliği'nin 1996 yılını yaşam boyu öğrenme yılı olarak ilan etmesi hayat boyu öğrenmeye olan ilginin uluslararası boyutu hakkında önemli bir göstergedir. Avrupa Komisyonu 30 Ekim 2000'de hayat boyu öğrenmeyi teşvik etmek için bir muhtıra yayınlamıştır. Muhtıra, üye devletleri kendi yetki alanları dâhilinde, herkes için hayat

boyu öğrenmeyi teşvik etmek amacıyla tutarlı stratejiler ve pratik önlemler belirlemeye davet etmiştir (CotEC, 2000). İlgili muhtıra, hayat boyu öğrenme ile ilgili uygulamaları özetlemenin yanında, hayat boyu öğrenmeyle ilgili önemli mesajlar içermektedir. Bu mesajlar şunlardır:

- Bilgi toplumuna sürekli katılım için gerekli becerilerin kazanılmasını sağlamak,
- Bireyin gelişimine yönelik yapılan yatırımları arttırmak,
- Hayat boyu öğrenmenin sürekliliği için politikalar üretmek,
- Hayat boyu öğrenmeye katılımının ve sonuçlarının anlaşılması için politikalar geliştirmek,
- Avrupa'da yaşayan herkesin yaşamları boyunca öğrenme fırsatları hakkında kaliteli bilgiye ve tavsiyeye kolayca erişebilmesini sağlamak,
- Öğrencilere bilişim tabanlı tesisler aracılığıyla yaşam boyu öğrenme fırsatları sağlamak.

Bireyin bilgi, yetenek, beceri ve yetkinliklerini geliştirmek için hayatı boyunca girişimde bulunduğu her türlü öğrenme etkinlikleri hayat boyu öğrenmenin kapsamındadır. Sadece okulla sınırlı kalmayıp, mesleki eğitim ve becerilerin kazanılmasını sağlayan kurslar da bu kapsamdadır. İşte bu yüzden hayat boyu öğrenme demografik değişkenlerine bakılmaksızın toplumu ilgilendiren herhangi bir yerde gerçekleşebilmektedir (Aksoy, 2013).

Yaşam boyu öğrenme temel becerilerin güncellenmesi yoluyla kişilere yeni imkânlar yaratmasının yanında kişisel gelişim içinde fırsatlar barındırmaktadır. Nordstrom and Merz (2006) yayınladıkları kitaplarında yaşam boyu öğrenmenin yararlarını şöyle ifade etmişlerdir:

1. Kendinizi gerçekleştirmek için size zengin fırsatlar sunar,
2. Sosyal çevre edinmemize ve değerli arkadaşlıklar kurmamıza yardımcı olur,
3. Doğal yeteneklerimizin farkına varmaya ve bunları geliştirmemize yardımcı olur,
4. Zihnimizi açar ve bu durum zihnin yaşlanmasını geciktirir,
5. Merak duygusunu canlandırır,
6. Bilgeliği ve özgüveni artırır,
7. Dünyayı daha iyi bir yer yapmamız için bize fırsatlar sunar,
8. Değişime uyum sağlamamıza destek olur olur,
9. Hayatımızdaki eksik anlamları tamamlamamıza yardımcı olur,
10. Hayat boyu öğrenme, bize toplumun gelişmesine katkı sağlamak için fırsat sunar ve toplumda yer edinmemizi sağlar.

Hayat boyu öğrenmeyle ilgili tanımlar değişse de yaşanan değişimler hayat boyu öğrenmeyi zorunlu hale getirmiştir. Volles (2016) "hayat boyu öğrenmenin kökenleri yetişkin eğitiminde yatmaktadır; uluslararası kuruluşların 1970'ler, 1980'ler ve 1990'lar boyunca koruduğu hayat boyu öğrenmeye hümanist yaklaşımı, 1920'lerde yetişkin eğitimi ile ilgili kavramlara dayanmaktadır" şeklinde belirtmiştir.

HAYAT BOYU ÖĞRENMEYI ÖNEMLI HALE GETIREN NEDENLER

Bireyler, yaşamlarında büyük ve küçük değişimlerle karşı karşıya kalırlar. Küçük ya da önemsiz diyebileceğimiz değişikliklere bizler farkında olmadan uyum sağlayabiliyoruz. Ancak hayat serüvenimiz sadece küçük değişimlerden oluşmamaktadır (Disessa ve Sherin, 1998). Uyum sağlamak zorunda olduğumuz ve uyum sağlarken zorlandığımız değişimler de olmaktadır. Dünya savaşları, sanayi devrimleri, küreselleşen dünya ve rekabetçi ekonomi modeli büyük değişimler olarak nitelendirilebilir. Bu değişimler yaşadığımız çevreyi, kullandığımız araç-gereçleri, bilgi-beceri düzeyini ve iş hayatımızı etkilemektedir. Tamamen yeni olan bu tür durumlarla karşılaştığımızda bunlara uyum sağlamak için yeni davranışlar ve becerilere gereksinim duyarız. Bu tür değişikliklere uyum sağlayamazsak, geçmişe takılıp

kalabilir, mutsuzluğa ve umutsuzluğa kapılabiliriz. Toplumlar bu tür değişimlere uyum sağlamak için farklı metotlar geliştirmişlerdir. Hayat boyu öğrenme bu metotlar arasında en etkili olarak görülmektedir. Volles (2016), Avrupa Birliği'nin hayat boyu öğrenmeyi, yüksek işsizlik, düşük inovasyon ve girişimcilik eksikliği gibi birçok hastalığın tedavisi için bir süreç olarak gördüğünü belirtmektedir. Aspin ve Chapman'a (2000) göre, değişimlere ayak uydurmak, değişimler arası geçişlerde geçişleri sarsıntısız atlatmak sahip olduğumuz bilgi ve becerilerle doğru orantılıdır. Hayat boyu öğrenme, değişimlerle beraber ortaya çıkan sorunları gidermede tampon görevini üstlenmektedir.

Hayat boyu öğrenme mevcut sorunlara çözümler sağlamanın yanında gelecekte karışılabilecek sorunlara çözüm geliştirmek için de perspektifler sunar. Longword (2003) "Lifelong Learning in action Transforming Education in the 21st Century" isimli kitabında gelecekte karışılabilecek sorunların çözümünde hayat boyu öğrenmenin önemini vurgulayarak şu ifadelere yer vermiştir:

- Temel küresel demografik sorunlar: Kaynakları gittikçe tükenen dünyamızda, gelişmiş toplumlardaki yaşlanan nüfus artışına karşılık dünyanın yoksul bölgelerindeki insanların kaynaklara ve eğitime ulaşmalarında karşılaştıkları zorluklar hayat boyu öğrenmeyi daha çok önem kılmaktadır.
- Televizyon ve medyanın insanların düşünce, fikir ve algılarının gelişimi üzerindeki yaygın etkisi, gelişmiş ve geri kalmış toplumlarda etkili bir propaganda aracı olmasının yanında, eğlence aracı olarak gerçeklerden uzak sanal dünya yaratması bilinçli seçim yapma ve sorumluluk alma duyusunu olumsuz etkilemektedir.
- Çevresel zorunluluklar: Dünya kaynaklarının tükenmesi ve yenilenebilir enerji ihtiyacı, ekosistemlerin yok edilmesi ve sürdürülebilir kalkınma talebi.
- Bilim ve teknolojinin tüm dallarındaki yeni gelişmeler, bir yandan örgütsel ve kişisel gelişim için çeşitli yeni fırsatlar sunarken, diğer yandan temel değerlerin sorgulanmasını teşvik ediyor.
- İnternet ve iletişim teknolojisinin kullanım alanlarının artmasıyla gerçekleşen bilgi patlaması.
- Artan bireyselleşme ve Batı toplumunun bazı bölümlerinde geleneksel olarak çoğu insana anlam ve tatmin sağlayan dini ve aile yapılarının çöküşü.

HAYAT BOYU ÖĞRENMENIN AMACI

Bilim ve teknolojideki gelişmelerin yanında küreselleşen dünya ve rekabetçi ekonomi modeli bireylerin sahip olması gereken bilgi ve becerilerin sayısını arttırmıştır. Yaşanan hızlı değişimler ve bu değişimlere uyum sağlama zorunluluğu farklı öğrenme ve eğitim türlerine yönelimi sağlamıştır. Öğrenmenin sadece okulla sınırlı olmadığı, beşikten mezara kadar devam eden, yaşam kalitesini artırmak için bilgi üreten bir eğitim sistemi modern dünyada zorunluluk halini almıştır. Hayat boyu öğrenme, doğumdan ölüme kadar öğrenmeyi ve bireysel gelişimi merkeze alır. Ayrıca kişisel tatmin için gerekli olan bilgi ve becerilerin sürekli gelişimini ve arttırılmasını teşvik etmek için bireylere yaşamları boyunca her türlü öğrenme fırsatını sağlamaktadır. Okul, topluluk, ev ve işyeri öğreniminin en iyi özelliklerinin entegrasyonu, hayat boyu öğrenmeyle sağlanabilir (Kommers ve Fischer, 1999). Hayat boyu öğrenme birey, toplum ve ülke ekonomisini içeren birçok fayda sağlamanın yanında becerilere, akademik ve kişisel gelişime yol açar (Laal ve diğerleri, 2014). Milli Eğitim Bakanlığı'nın (MEB) yayınladığı "Hayat Boyu Öğrenme Strateji Belgesi'nde hayat boyu öğrenmenin amacı ile ilgili şu ifadeler yer almaktadır: Birey için çok amaçlı öğrenme ortamlarına erişmesiyle ilgi ve ihtiyaçları doğrultusunda bilgi, beceri ve deneyimlerini arttırmak; kazanımlarını

değerlendirmek ve kendi öğrenme faaliyetlerini planlayıp yönetir duruma getirmek (MEB, 2009). Aspin and Chapman (2000), yaşam boyu öğrenmenin üç temel amacının olduğunu belirtmişlerdir:

- Bireylerin kişisel gelişimlerini ve kendini gerçekleştirmelerini sağlamak,
- Ekonomik gelişmeyi ve ilerlemeyi sağlamak,
- Sosyal katılım ve demokrasi anlayışının geliştirilmesi.

Teknolojik gelişmelere bağlı yaşanan değişim, her alanda etkisini hissettirse de en çok istihdam konusunu etkilemektedir. Bu gelişim ve değişimler bazı meslekleri ortadan kaldırırken diğer taraftan yeni meslek alanlarını ortaya çıkartmaktadır. Bunun yanında bazı mesleklerde de yapı değişikliğine sebep olmakta ve beraberinde yeni bilgi ve becerileri gerekli kılmaktadır. Hayat boyu öğrenme, yeni istihdam alanlarına yönelik bilgi ve beceri sağlarken diğer taraftan mevcut mesleklerin güncel yeterliliklerinin kazanmasına olanak sağlamaktadır (Gündoğan, 2003). Güllüpınar ve Gökalp (2014), hayat boyu öğrenmenin meslek edindirmedeki istikrarına dikkat çekmişlerdir. Hayat boyu öğrenme, çalışanların iş yaşamlarında radikal değişimler sağlamasının yanında kişinin her an istihdam edilmesine olanak sağlamaktadır. Ayrıca hayat boyu öğrenme, ülkelerin karşı karşıya oldukları işsizlik ve kalkınma sorunlarına yönelik en ulaşılabilir çözüm olarak görülmektedir. Küresel ekonomi içinde rekabet edebilmek için gerekli olan eğitimli birey ihtiyacı, karşılanması güç bir ihtiyaçtır. Bu riskleri aşmak ve istihdamda sürekliliği sağlamanın en kestirme yolu hayat boyu öğrenmedir. Yaratıcılığın ve yeniliğin hayati bir unsuru olarak görüldüğü günümüzde Candy (2002) hayat boyu öğrenmenin amaçlarını şöyle sırlamaktadır:

- Teknolojiye uyum sağlama,
- Bireysel ve toplumsal ilerleme sağlama,
- Değişim ve zorluklarla başa çıkma,
- Yeni beceriler geliştirme,
- Bireyin refahını arttırma,
- Seyahat ve dil fırsatlarına olanak sağlama.

Rekabetçi ekonominin yanı sıra dünyanın geri kalanına karşı ideolojik, siyasi ve kültürel hâkimiyet alanları düşünüldüğünde hayat boyu öğrenmenin öneminin daha da arttığını vurgulayan Medel-Añonuevo ve diğerleri (2001), hayat ve öğrenmeyle ilgili aşağıdaki hipotezleri sıralamışlardır:

- Hayat boyu öğrenme, başta yoksulluk olmak üzere, insanların hem makro hem de mikro düzeyde karşılaştıkları hemen hemen her kriz için uygun bir çözüm olarak kolayca sunulabilir.
- Riskler hayatın her köşenin arkasında bolca gizlenir. Risklerle etkili bir şekilde başa çıkmak için öğrenmeye ihtiyaç vardır.
- Eğitim ürün odaklı iken, öğrenme süreç odaklıdır. Günümüzde öğrenmeye ayrılan zaman ve öğrenmeye duyulan ihtiyaç artmaktadır.

Biesta ve Leary (2012) ise, hayat boyu öğrenmenin bireysel ve toplumsal amaçlarına yönelik şu ifadelere yer vermişlerdir: Hayat boyu öğrenme bireye istihdam imkânı ve topluma aktif katılım sağlar; vatandaşlık bilinciyle sosyal ve toplumsal sorunları çözme sorumluluğu yükler. Yaşamın devam ettiği her yerde öğrenmeye ihtiyaç duyulur. Bu ortamlar, okullar ve üniversiteler olabileceği gibi, sosyal yaşam alanları ve iş yerleri de bu ortamlara örnek gösterilebilir. Bazı öğrenmeler resmi programlar aracılığıyla formal olarak gerçekleşirken bazıları da informal olarak gerçekleşir. Bireyin demografik değişkenleri ve ekonomik durumu öğrenmeye engel değildir. İnsanları diğer canlılardan ayıran en önemli özellik her yerde her durumda öğrenebilmeleridir. Hayat boyu öğrenme, bireyi her koşulda öğrenmesini ve kendini

geliştirmesini sağlamayı amaçlamaktadır (Güneş ve Deveci, 2021).

Bilgi ve teknoloji çağı olarak kabul edilen 21. yüzyıldaki hızlı gelimler hayat boyu öğrenmenin önemini arttırmıştır. Hayat boyu öğrenme bireysel gelişimi esas alsa da toplumsal ve ekonomik gelişim de bu öğrenmenin kapsamındadır. Türkiye ekonomik olarak gelişmekte olan ülkeler grubunda yer alırken, nüfus olarak Avrupa'nın en genç nüfusuna sahip ve sürekli göç alan ülkelerindendir. Sahip olunan potansiyel gücün ortaya çıkarılması ve toplumsal sorunların önüne geçilmesinin yollarından biri hayat boyu öğrenmeye gereken önemin verilmesidir. Bu alandaki eksikliklerin tespiti ve giderilmesi alanda yapılacak çalışmalarla sağlanabilmektedir.

Hayat boyu öğrenme zaman içerisinde kavramsal tanım olarak değişikliğe uğrasa da temelde aynı anlamı niteleyen "halk eğitimi", "yetişkin eğitimi", "sürekli eğitim" gibi isimlerle anılmıştır. Gelişmiş ve gelişmekte olan ülkelerin yanında uluslararası birçok kuruluş için de önemli bir gündem maddesi olan bu kavram; küreselleşme ve teknolojinin gelişimiyle önemi daha da artmıştır. Bu çalışmada gelişmekte olan ülkeler kategorisinde yer alan Türkiye'de hayat boyu öğrenme ile ilgi yapılmış lisansüstü tezlerin özelliklerini betimlemek amaçlanmıştır. Bu amaç çerçevesinde aşağıdaki sorulara cevap aranmıştır:

Türkiye'de hayat boyu öğrenme konulu lisansüstü tezlerin;

1. Yıllara,
2. Üniversitelere,
3. Araştırmacıların cinsiyetine,
4. Türüne (YL, DR),
5. İlgili olduğu bilim dalına,
6. Konusuna,
7. Yöntem türüne,
8. Örneklem grubuna,
9. Veri toplama aracına göre dağılımı nasıldır?

Türkiye'de hayat boyu öğrenme ile ilgili tamamlanmış lisansüstü tezlerin incelendiği bu çalışmada nitel araştırma yaklaşımının benimsendiği bu çalışmada yöntem olarak "Doküman İnceleme Yöntemi" kullanılmıştır. Araştırmanın verileri, Yüksek Öğretim Kurulu Tez Veri Tabanından elde edilmiştir. Sadece internet üzerinden hizmet veren bu veri tabanında "Hayat/Yaşam boyu öğrenme" anahtar kelimesi ile arama yapılmıştır. Araştırma erişime açık olan tezlerle sınırlandırılmıştır. Veri tabanının taranması sonucunda hayat boyu öğrenmeyle ilgili yazılmış 43 teze ulaşılmıştır. Araştırmanın veri setini oluşturan 43 tezin analizleri "İçerik Analizi" yöntemiyle betimlenmiştir.

BULGULAR

Araştırma kapsamında analiz edilen 43 lisansüstü tezle ilgili elde edilen bulgular araştırma sorularına göre sıralanmıştır. Bulgular, tablo formatında yüzde ve frekans değerleri ile ifade edilmiştir.

Yıllara Göre Tezlerin Durumu

Hayat boyu öğrenme ile ilgili tezlerin yıllara göre dağılımına ilişkin bilgiler Tablo 1'de yer almaktadır.

Tablo 1. Yıllara göre tezlerin dağılımı

Yıl	f	%
2008	1	2,32
2009	1	2,32

2010	1	2,32
2011	1	2,32
2012	2	4,65
2013	2	4,65
2014	3	6,97
2015	5	11,62
2016	3	6,97
2017	4	9,30
2018	5	11,62
2019	5	11,62
2020	3	6,97
2021	7	16,27
Toplam	43	100,00

Tablo 1'de görüldüğü gibi, 2008-2021 yılları hayat boyu öğrenme ile ilgili hazırlanan tezlerin sayısı 43'tür. 7 tezle 2021 yılı ilk sırayı alırken; 5'er tezle 2015, 2018 ve 2019 yılları ikinci sırada; 4 tezle 2017 yılı üçüncü sırada; 3'er tezle 2014, 2016 ve 2020 yılları dördüncü sırada; 2'şer tezle 2012 ve 2013 yılları beşinci sırada; 1'er tezle de 2008, 2009, 2010 ve 2011 yılları son sırada yer almaktadır.

Üniversitelere Göre Tezlerin Durumu

Hayat boyu öğrenme ile ilgili tezlerin üniversitelere göre dağılımına ilişkin bilgiler Tablo 2'de yer almaktadır.

Tablo 2. Üniversitelere göre tezlerin dağılımı

Üniversite	**f**	**%**
Gazi Üniversitesi	5	11,62
Kocaeli Üniversitesi	2	4,65
Kütahya Dumlupınar Üniversitesi	1	2,32
İstanbul Bahçeşehir Üniversitesi	1	2,32
Marmara Üniversitesi	3	6,97
Toros Üniversitesi	1	2,32
Bartın Üniversitesi	4	9,30
Cumhuriyet Üniversitesi	3	6,97
Çukurova Üniversitesi	1	2,32
Boğaziçi Üniversitesi	1	2,32
Akdeniz Üniversitesi	2	4,65
Mersin Üniversitesi	1	2,32
Necmettin Erbakan Üniversitesi	2	4,65
İstanbul Aydın Üniversitesi	3	6,97
Dokuz Eylül Üniversitesi	2	4,65
Koç Üniversitesi	1	2,32
İstanbul Arel Üniversitesi	1	2,32
Fırat Üniversitesi	2	4,65
Ankara Üniversitesi	1	2,32

Sakarya Üniversitesi	1	2,32
Recep Tayyip Erdoğan Üniversitesi	1	2,32
Kırklareli Üniversitesi	1	2,32
Gaziantep Üniversitesi	1	2,32
Sağlık Bilimleri Üniversitesi	1	2,32
İstanbul Üniversitesi	1	2,32
Toplam	43	100,00

Tablo 2'de görüldüğü gibi, hayat boyu öğrenme alanında yapılan tezlerde sayısal açıdan 5 tezle Gazi Üniversitesi ilk sırada yer alırken, 4 tezle Bartın Üniversitesi; 3'er tezle Marmara, Cumhuriyet ve İstanbul Aydın Üniversiteleri; 2'şer tezle Kocaeli, Akdeniz, Dokuz Eylül ve Fırat üniversiteleri; 1'er tezle de Kütahya Dumlupınar, İstanbul Bahçehehir, Toros, Çukurova, Boğaziçi, Mersin, Koç, İstanbul Arel, Ankara, Sakarya, Recep Tayyip Erdoğan, Kırklareli, Gaziantep, Sağlık Bilimleri ve İstanbul üniversiteleri yer almaktadır.

Araştırmacıların Cinsiyetine Göre Tezlerin Durumu

Hayat boyu öğrenme ile ilgili tezlerin araştırmacıların cinsiyetine göre dağılımına ilişkin bilgiler Tablo 3'te yer almaktadır.

Tablo 3. Araştırmacıların cinsiyetine göre tezlerin dağılımı

Cinsiyet	**f**	**%**
Kadın	24	55,81
Erkek	19	44,19
Toplam	43	100,00

Tablo 3'te görüldüğü gibi, hayat boyu öğrenme ile ilgili tezler hazırlayanlardan 24 tezle kadınlar ilk sırada yer alırken, 19 tezle erkeler ikinci sırada yer almaktadır.

Türüne (YL, DR) Göre Tezlerin Durumu

Hayat boyu öğrenme ile ilgili tezlerin türüne (YL, DR) göre dağılımına ilişkin bilgiler Tablo 4'te yer almaktadır.

Tablo 4. Türüne (YL, DR) göre tezlerin dağılımı

Tez Türü	**f**	**%**
Yüksek Lisans	36	83,72
Doktora	7	16,28
Toplam	43	100,00

Tablo 4'te görüldüğü gibi, hayat boyu öğrenme ile ilgili tezlerden 36 tezle yüksek lisans tezleri ilk sırada yer alırken 7 tezle doktora tezleri ikinci sırada yer almaktadır.

İlgili Olduğu Bilim Dalına Göre Tezlerin Durumu

Hayat boyu öğrenme ile ilgili tezlerin ilgili olduğu bilim dalına göre dağılımına ilişkin bilgiler Tablo 5'te yer almaktadır.

Tablo 5. İlgili olduğu bilim dalına göre tezlerin dağılımı

Bilim Dalı	**f**	**%**
Sağlık Bilimleri	3	6,98
Turizm İşletmeciliği	1	2,33

Öğretim Teknolojileri	2	4,65
İşletme	3	6,98
Yabancı Diller	2	4,65
Eğitim Yönetimi	2	4,65
Uygulamalı Sanatlar	1	2,33
Eğitim Programları	17	39,53
Ekonomi	1	2,33
Sosyal Bilimler	9	20,93
Çevre Bilimleri	2	4,65
Toplam	43	100,00

Tablo 5'te görüldüğü gibi, hayat boyu öğrenme ile ilgili tezlerden ilgili olduğu bilim dalı açısından 17 tezle eğitim programları bilim dalı ilk sırada yer alırken, 9 tezle sosyal bilimler ikinci sırada; 3'er tezle sağlık bilimleri ve işletme üçüncü sırada; 2'şer tezle öğretim teknolojileri, yabancı diller, eğitim yönetimi ve çevre bilimleri dördüncü sırada; 1'er tezle de turizm işletmeciliği, uygulamalı sanatlar ve ekonomi bilim dalları son sırada yer almaktadır.

Araştırma Konusuna Göre Tezlerin Durumu

Hayat boyu öğrenme ile ilgili tezlerin araştırma konusuna göre dağılımına ilişkin bilgiler Tablo 6'da yer almaktadır.

Tablo 6. Araştırma konusuna göre tezlerin dağılımı

Konu	**f**	**%**
Sağlık	4	9,30
İstihdam	1	2,32
Yeterlik	3	6,97
Beceri eğitimi	3	6,97
Kültür-dil gelişimi	3	6,97
Eğitim sorunları	3	6,97
Hukuksal altyapı	3	6,97
Algı, tutum ve yeterlik düzeyleri	15	34,88
Öğrenme eğilimi ve kaygı	1	2,32
Mesleki doyum	2	4,65
Öğrenme yeterlilikleri	1	2,32
Öğrenme eğilimi ve mesleki tükenmişlik	1	2,32
Öğrenme eğilimi	1	2,32
Dijital yeterlikler	2	4,65
Toplam	43	100,00

Tablo 6'da görüldüğü gibi, hayat boyu öğrenmeyle ilgili tezlerden 15'i algı, tutum ve yeterlik düzeyleri konusuyla ilk sırada yer alırken, 4 tez sağlık; 3'er tez yeterlilik, beceri eğitimi, kültür-dil gelişimi, eğitim sorunları ve hukuksal alt yapı konusuyla ikinci sırada; 2'şer tezle mesleki doyum ve dijital yeterlikler konusuyla üçüncü sırada; 1'er tezle de istihdam, öğrenme eğilimi ve kaygı, öğrenme yeterlikleri, öğrenme eğilimi ve mesleki tükenmişlik, öğrenme eğilimi konusuyla son sırada yer almaktadır.

Yöntem Türüne Göre Tezlerin Durumu

Hayat boyu öğrenme ile ilgili tezlerin yöntem türüne göre dağılımına ilişkin bilgiler Tablo 7'te yer almaktadır.

Tablo 7. Yöntem türüne göre tezlerin dağılımı

Yöntem	f	%
Nicel	12	27,90
Nitel	23	53,48
Karma	8	18,62
Toplam	43	100,00

Tablo 7'de görüldüğü gibi, hayat boyu öğrenme ile ilgili tezlerde yöntemi nitel olanlar 23 tezle ilk sırada yer alırken, nicel olanlar 12 tezle ikinci sırada; 8 tezle de karma yöntem olanlar son sırada yer almaktadır.

Örneklem Grubuna Göre Tezlerin Durumu

Hayat boyu öğrenme ile ilgili tezlerin örneklem grubuna göre dağılımına ilişkin bilgiler Tablo 8'te yer almaktadır.

Tablo 8. Örneklem grubuna göre tezlerin dağılımı

Örneklem grubu	f	%
Öğretim Elemanı	1	2,32
İşveren	1	2,32
Üniversite Öğrencisi	6	13,95
Arşiv	9	20,93
Öğretmen -Öğrenci	1	2,32
Öğretmen	8	18,60
Eğitim Yöneticisi	4	9,30
Yönetici-Öğretmen	1	2,32
Öğrenci	4	9,30
Politikacılar	1	2,32
Sağlık Çalışanları	1	2,32
Polis	1	2,32
Yerel Halk	5	11,62
Toplam	43	100,00

Tablo 8'de görüldüğü gibi, hayat boyu öğrenme ile ilgili tezlerden örneklemini arşiv oluşturanlar 9 tezle ilk sırada yer alırken, örneklemi öğretmenler olanlar 8 tezle ikinci sırada; örneklemi üniversite öğrencisi olanlar 6 tezle üçüncü sırada; örneklemi yerel halk olanlar 5 tezle dördüncü sırada; örneklemi eğitim yöneticisi ve öğrenci olanlar 4'er tezle beşinci sırada; örneklemi öğretim elemanı, işveren, öğretmen-öğrenci, yönetici-öğretmen, politikacılar, sağlık çalışanları ve polis olanlar da 1'er tezle son sırada yer almaktadır.

Veri Toplama Araçlarına Göre Tezlerin Durumu

Hayat boyu öğrenme ile ilgili tezlerin veri toplama araçlarına göre dağılımına ilişkin bilgiler Tablo 9'da yer almaktadır.

Tablo 9. Veri toplama araçlarına göre tezlerin dağılımı

Veri toplama araçları	f	%
Ölçek	13	30,23
Doküman İnceleme	9	20,93
Görüşme	6	13,95
Ölçek ve Görüşme	4	9,30
Anket	5	11,62
Anket ve Görüşme	1	2,32
Anket ve Ölçek	4	9,30
Deney	1	2,32
Toplam	43	100,00

Tablo 9'da görüldüğü gibi, hayat boyu öğrenme ile ilgili tezlerden veri toplama aracı ölçek olanlar 13 tezle ilk sırada yer alırken, doküman incelemesi olanlar 9 tezle ikinci sırada; görüşme olanlar 6 tezle üçüncü sırada; anket olanlar 5 tezle dördüncü sırada; ölçek ve görüşme, anket ve ölçek olanlar 4'er tezle beşinci sırada; deney olanlar da 1'er tezle son sırada yer almaktadır.

SONUÇ VE ÖNERİLER

Türkiye'de hayat boyu öğrenme ile ilgili yapılmış tezlerin incelenmesini konu alan bu araştırmada elde edilen bulgulardan hareketle şu sonuçlara ulaşılmıştır:

Hayat boyu öğrenme ile ilgili yapılmış tezler, yıllara göre homojen bir dağılım göstermemektedir. Ancak diğer yıllara göre 2021 yılındakilerinin sayısının daha fazla olduğu görülmüştür.

Hayat boyu öğrenme ile ilgili yapılmış tezler, üniversitelere göre homojen bir dağılım göstermemektedir. Bununla birlikte yeni kurulan üniversitelerden Bartın Üniversitesi dışındaki diğer tüm üniversiteler arasında kuruluşu eski olanlarda hayat boyu öğrenme ile ilgili yapılan tezlerin sayısı daha fazladır.

Hayat boyu öğrenme ile ilgili tez yapanlardan kadın araştırmacıların sayısının erkek araştırmacılara göre daha fazla olduğu sonucuna varılmıştır.

Hayat boyu öğrenme ile ilgili yüksek lisans düzeyinde yapılmış tezlerin sayısının doktora düzeyinde yapılanlardan daha fazla olduğu görülmüştür.

Hayat boyu öğrenme ile ilgili yapılmış tezlerin çoğu eğitim programları ve sosyal bilimler dalları ile ilgilidir.

Hayat boyu öğrenme ile ilgili yapılmış tezlerden konusu algı, tutum ve yeterlik düzeyleri olanların sayısının daha fazla olduğu görülmüştür.

Hayat boyu öğrenme ile ilgili yapılmış tezlerden nitel yöntem kullanılanların sayısı diğer kullanılan yöntemler olan nicel ve karma yöntemden oldukça fazladır.

Hayat boyu öğrenme ile ilgili yapılmış tezlerden örneklem grubu arşiv, öğretmen, üniversite öğrencisi, yerel halk, eğitim yöneticisi ve öğrenci olanlar ilk beş sırada yer almaktadır.

Kullanılan veri aracı açısından ilk sıralarda çoğunlukla ölçek, doküman inceleme, görüşme ve anket aracını kullanan hayat boyu öğrenme ile ilgili tezlerin sayısı daha fazladır.

Araştırmanın bu sonuçlarından hareketle şu önerilerde bulunmak mümkündür:

Üniversiteler başta doktora olmak üzere lisansüstü düzeyde hayat boyu öğrenme ile ilgili tezlere daha çok yönlendirmelidir. Yapılacak tez belirli alanlarda gelişi güzel yoğunlaşmasından çok toplumsal ihtiyaç ve beklentilere göre gerekli konulara yönelik olmalıdır. Tezlerde örneklem grubunda çeşitliliğe gidilmesi, hayat boyu öğrene ile ilgili toplumsal bilincin artmasına katkı sağlayacaktır.

KAYNAKÇA

Akkuş, N. (2008). Yaşam boyu öğrenme becerilerinin göstergesi olarak PISA 2006 sonuçlarının Türkiye açısından değerlendirilmesi (Publication Number 231419) Hacettepe Üniversitesi]. Ankara.

Aksoy, M. (2013). Kavram olarak hayat boyu öğrenme ve hayat boyu öğrenmenin Avrupa birliği serüveni. Bilig, 23-48. https://dergipark.org.tr/tr/pub/bilig/issue/25367/267740

Arslan, F. (2019). Öğretmenlerin yaşam boyu öğrenme düzeyleri ve özyönetimli öğrenme düzeyleri arasındaki ilişkinin incelenmesi: karma yöntem. Sakarya Üniversitesi.

Aspin, D. N., & Chapman, J. D. (2000). Lifelong learning: concepts and conceptions. International Journal of Lifelong Education, 19(1), 2-19. https://doi.org/10.1080/026013700293421

Biesta, G., & Leary, T. (2012). Have lifelong learning and emancipation still something to say to each other? Studies in the Education of Adults, 44(1), 5-20. https://doi.org/10.1080/02660830.2012.11661620

Boshier, R. (2004). Meanings and manifestations of the anarchist-utopian ethos in adult education, Adult Education Research Conference, https://newprairiepress.org/aerc/2004/papers/10

Candy, P. C. (2002). Lifelong learning and information literacy. Retrieved October, 20, 2004.

CotEC [Commission of the European Communities], (2000). A memorandum on lifelong learning. In (pp. 36 p.). Brussels.

Delors, J. (1996). Learning: the treasure within: report to UNESCO of the International Commission on Education for the Twenty-first Century (9231032747).

Disessa, A. A., & Sherin, B. L. (1998). What changes in conceptual change? International Journal of Science Education, 20(10), 1155-1191. https://doi.org/10.1080/0950069980201002

Elfert, M. (2015). UNESCO, the Faure Report, the Delors Report, and the Political Utopia of Lifelong Learning. European Journal of Education, 50. https://doi.org/10.1111/ejed.12104

Faure, E., United Nations Educational, S., Organization, C., Education, U. I. C. o. t. D. o., Herrera, F., Kaddoura, A.-R., Lopes, H., Petrovsky, A., Rahnema, M., & Ward, F. (1972). Learning to be: the world of education today and tomorrow [Faure report] (9231010174). http://unesdoc.unesco.org/images/0000/000018/001801e.pdf

Göksan, T. S., Uzundurukan, S., & Keskin, S. N. (2009). Yaşam boyu öğrenme ve Avrupa Birliği'nin yaşam boyu öğrenme programları. İnşaat Mühendisliği Eğitimi Sempozyumu, 143, 143-151.

Güneş, F., & Deveci, T. (2021). Yetişkin Eğitimi ve Hayat Boyu Öğrenme. Pegem Akademi.

Joachim, H. K. (1996). Bildung im 21. Jahrhundert Vermächtnis und Chance auf dem Wege in die Lerngesellschaft. Bildung und Erziehung, 49(jg), 363-382. https://doi.org/10.7788/bue-1996-jg29

Kommers, P., & Fischer, G. (1999). Lifelong Learning - More Than Training.

Laal, M., Laal, A., & Aliramaei, A. (2014). Continuing Education; Lifelong Learning. Procedia - Social and Behavioral Sciences, 116, 4052-4056. https://doi.org/10.1016/j.sbspro.2014.01.889

Longworth, N. (2003). Lifelong learning in action: Transforming education in the 21st century. Routledge.

López Ramón Y Cajal, C. (2019). Antenatal study of the Heschl's gyrus: The first step to understanding prenatal learning. Medical Hypotheses, 130, 109290. https://doi.org/10.1016/j.mehy.2019.109290

MEB. (2009). Hayat Boyu Öğrenme Strateji Belgesi. Retrieved from http://ecvet.ua.gov.tr/Uploads/f7699346-4182-4730-8282-a61938751493.pdf
Medel-Añonuevo, C., Ohsako, T., & Mauch, W. (2001). Revisiting Lifelong Learning for the 21st Century.
Mennella, J. A., Jagnow, C. P., & Beauchamp, G. K. (2001). Prenatal and postnatal flavor learning by human ınfants. Pediatrics, 107(6), e88-e88. https://doi.org/10.1542/peds.107.6.e88
Nordstrom, N. M., & Merz, J. F. (2006). Learning later, living greater; the secret for making the most of your after-50 years. Sentient Boulder CO Publishing.
Sacher, R. (2021). Vorgeburtliches Lernen: Warum wissen Babys, was sie wissen? [Brief Communication]. Prenatal learning: why do babies know what they know?, 59(3), 202-204. https://doi.org/10.1007/s00337-021-00795-6
UNESCO. (2000). Dakar Framework for Action: Education for All. Meeting Our Collective Commitments. Dakar,Senegal: EFA Forum Secretariat, UNESCO
Volles, N. (2016). Lifelong learning in the EU: changing conceptualisations, actors, and policies. Studies in Higher Education, 41(2), 343-363. https://doi.org/10.1080/03075079.2014.927852

ELEMENTS OF THE GRAMMAR TRANSLATION METHOD IN UKRAINIAN MODERN TEACHING EXPERIENCE

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ABSTRACT
Historically, the practice of combining several foreign language teaching methods has not been common. Usually methodologists and educators concentrated on only one method. So, in the USSR time, the sum of theoretical and practical developments and the general conjuncture of society made the grammar-translation method that main method. The students were given a text that they read in sequence. This was followed by a translation as close as possible to the text, the grammatical structure was memorized without taking into account the context and possible situations of its application in real communication. The students memorized long lists of words, stereotyped conversational topics, and they studied the foreign language as if it were dead, because the average citizen of the USSR would hardly have had the opportunity to communicate with a foreigner, and the authorities believed that such communication was harmful. In most cases, there was no goal to teach to speak a foreign language, since there was no such need.
In independent Ukraine, as in the rest of the free world, the communicative method has become the main method of teaching English. Relying on high-quality foreign manuals and methodological materials on the communicative method that flooded into Ukraine after the fall of the Iron Curtain, the number of people speaking English within the country increased quite quickly. However, with the transition of Ukraine to the Bologna system and the introduction of widespread testing, it turned out that only the means of the communicative method are clearly not enough and must be used in the students' preparation in a combination with elements from other methods. Thus, some elements of the grammar translation method in the context of modern teaching practice not only do not look archaic, but can even increase the degree of personal orientation of modern education.

The use of the elements of the grammar-translation method suggests that the percentage of tasks formulated by this method should not exceed 50% of the lesson time. We choose the best elements of the grammar-translation method. For example, we use it to see how vocabulary functions directly in the text, we learn and reinforce grammatical structures, by reading the text we consolidate knowledge of the pronunciation and spelling of words. Unlike the Soviet period, we take only those texts which are of interest to the entire group of students and even give as an individual task the translation of texts which are of interest to a particular student, thus we increase the personal motivation of students and make learning more real life-oriented and student-oriented. Also a very effective exercise is a mini-competition for the best translation of

a small text or its fragment, the spirit of competition stimulates students in many ways and helps develop their translation skills. We also use the high accuracy of translations obtained using the grammar-translation method in specific preparation for tests. We see that the grammar-translation method in its pure form is not suitable for modern education and is outdated, but its elements, adapted to the solution of modern issues, can help the main, communicative method close some of its weaknesses.

Keywords: teaching, grammar translation method, communicative method , USSR, Ukraine, Bologna system.

INTERNATIONAL COOPERATION AND HIGHER EDUCATION IN AZERBAIJAN MODERN TRENDS OF INTERNATIONALIZATION.

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ABSTRACT

The process of globalization creates a need for a new level of professionals. Globalization, integration and internationalization of education are the characteristic world trends of recent decades. At present, the solution to this problem is associated with the internationalization of education and is developing rapidly among higher education institutions around the world.

The main component of the internationalization process is academic mobility, the participation of students, teachers and pedagogical staff in exchange and internship programs abroad, international research projects, as well as the development of joint curricula, intensive courses for foreigners, summer and winter schools, etc. The main forms and directions of international cooperation of higher education institutions of different countries are similar, but foreign experience can be useful for Azerbaijani higher education institutions. Internationalization is one of the key components in ensuring the competitiveness of modern higher education institutions. The importance and role of internationalization is growing rapidly, and the implementation of relevant strategies and transformations requires more professionalism from higher education staff and managers.

One of the main priorities of Azerbaijan's education policy is to turn the country's universities into a brand, an educational center for the entire region. At the same time, due to the rapidly changing educational paradigms, it is important to constantly study international experience. At the same time, it is necessary to develop a national strategy for the internationalization of higher education in order to form new directions of international development of higher education institutions.

Keywords: internationalization of higher education; International cooperation; university development strategy; academic mobility, development of corporate governance standards.

TOPRAK DOLGU BARAJLARIN PROJELENDİRİLMESİNDE GEOTEKNİK ÇALIŞMALAR

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ÖZET

Toprak Dolgu Barajlar gibi önemli ve büyük yatırım gerektiren yapılarda ön incelemenin gereği hem ekonomi hem de güvenlik açısından büyük önem arz etmektedir.

Baraj yerinin yanlış seçimi ve/veya inşaat aşamasında kil çekirdeğin uygun şekilde oluşturulmaması pek çok mühendislik problemi yaratmaktadır. Bu problemler inşaat sırasında ve hatta tüm yapı ömrü boyunca etkili olabilmektedir. Bunların önceden tespit edilmesi arazi ve laboratuvar çalışmalarının birlikte yapılması ile mümkündür.

Bu türde dolgu barajların projelendirmesinde yapılan çalışmamızda, baraj gövdesini oluşturacak dolgu malzemesinin geoteknik açıdan uygunluğu yapılan çeşitli deneylerle araştırılmıştır.

Böylelikle ileride yapılacak olan toprak dolgu barajların planlama, proje ve inşa çalışmaları aşamasında mühendislere yol gösterici olması amaçlanmıştır.

Barajlarda dolgu stabilitesi, temel zeminin özellikleri ile dolgunun uygun inşa edilmesine büyük oranda bağlıdır. Temel zeminin yapı, cins ve özellikleri ile yeraltı suyunun durumu, dolgunun yüksekliği, dolgunun inşaatında· kullanılacak zeminin cins ve özellikleri v.s. gözönüne alınarak yapılan bu çalışmada, Homojen Toprak Dolgu Barajın inşa aşamasında gerekli olan jeolojik çalışmaları ile zemin etüdlerinin kapsam ve metodlarına değinilmektedir. Bu çalışmanın ışığı altında, tasarım aşamasındaki bir barajın Mühendislik Jeolojisi ve Geoteknik özelliklerini belirlemeyi ve elde edilebilecek verileri ilgili kişi ve kuruluşların yararlarına sunmayı amaçlamaktadır.

KUZEY ATLANTİK SALINIMI'NIN OXFORD YAĞIŞLARI İLE PERİYODİK YAPISAL İLİŞKİSİ

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ÖZET

Dünya iklimini geniş coğrafi alanlarda etkileyen büyük ölçekli salınımlardan birisi olan Kuzey Atlantik salınımı (NAO) iklim değişkenleri üzerinde etkili olmaktadır. Kuzey Atlantik Salınımı indeksi (NAOI) İzlanda civarında bulunan alçak basınç sistemindeki deniz seviyesi basıncının normalize anomalileriyle, Azor adaları civarında bulunan yüksek basınç sistemindeki deniz seviyesi basıncın normalize anomalilerinin farkı olarak tanımlanmıştır. Bu çalışmada yakın zamanda geliştirilmiş dalgacık dönüşümü yaklaşımı NAOI'ne ve bu basınç merkezi yakınında bulunan Oxford yağış verilerine uygulanarak, NAOI ile Oxford yağışlarının zamansal ve periyodik yapısının tespit edilip birbirleriyle ilişkisinin araştırılması amaçlanmıştır. Bu iki değişkenin periyodik bileşenlerin araştırılması sürekli dalgacık dönüşümü ve global dalgacık spektrumu ile yapılmıştır. Bulunan periyodikliklerin zamansal olarak değişimi de ortaya konulmuştur. Kuzey Atlantik Salınımı İndeksi ile yağışın periyod analizi; aylık, kış olarak ifade edilen Aralık-Ocak-Şubat (AOŞ) formunda oluşturulmuş veri setleri için yapılmıştır. Aylık NAOI ve yağışlarda bir yılın altında güçlü kısa dönem aylık periyodlar her iki değişkende de baskın bulunurken, kış formların indeks verilerinde ise on yılın üstünde uzun dönem baskın yıllık periyodlar belirlenmiştir. Kış aylarının global spektrumları, her iki değişken arasında, korelasyon değeri 0,90 olarak ilişkili olduğu görülmüştür. Zaman ölçeği analizi, NAOI ile Oxford yağış serilerinin temel periyodikliklerinin 10 yıldan az olaylar olduğunu göstermiştir. NAOI döngüsel olarak diğer klimatolojik değişkenlerle irdelendiğinde tespit edilecek periyodik ilişkilerin iklimle ilgili akademik çalışmalar açısından önemli olacağı düşünülmektedir. Bu çalışmanın sonuçları, daha önceki NAO ve iklim değişkenleri arasındaki çalışmalar ile tutarlıdır. Aylık NAOI ile kış mevsim yıllık NAOI'lerinin farklı periyodik yapılarının olmasının nedenleri daha özel analizler yapılarak gelecek çalışmalarla sürdürülebileceği söylenebilir.

Anahtar kelimeler: Kuzey Atlantik Salınımı, dalgacık dönüşümü, periyodik analiz, global dalgacık spektrumu.

THE PERIODIC STRUCTURAL RELATIONSHIP OF THE NORTH ATLANTIC OSCILLATION WITH THE OXFORD PRECIPITATION

ABSTRACT

The North Atlantic oscillation (NAO), which is one of the large-scale oscillations affecting the world climate in wide geographical areas, has an impact on climate variables. The North Atlantic Oscillation index (NAOI) is defined as the difference between the normalized anomalies of sea level pressure in the low pressure system around Iceland and the normalized

anomalies of sea level pressure in the high pressure system around the Azores. In this study, it is aimed to determine the temporal and periodic structure of NAOI and Oxford precipitation and investigate their relationship with each other by applying the recently developed wavelet transform approach to NAOI and Oxford precipitation data located near this pressure center. The investigation of the periodic components of these two variables was carried out by continuous wavelet transform and global wavelet spectrum. The temporal variation of the found periodicities is also revealed. The North Atlantic Oscillation index and the period of rainfall analysis; monthly, expressed as a winter December-January-February (DJF) have been made to the data sets created in the form. Strong short-term monthly periods below one year in monthly NAOI and precipitation predominate in both variables, while long-term dominant annual periods above ten years have been determined in the index data of winter forms. Global spectra of winter months were found to be correlated with a correlation value of 0.90 between both variables. Time scale analysis has shown that the main periodicity of the NAOI-related precipitation series are events of less than 10 years. It is thought that, when the NAOI is cyclically examined, the determined periodic structure is expected to be important for academic studies on climate. The results of this study are consistent with previous studies of NAO and climate variables. The reasons for the different periodic structures of the monthly NAOI and the annual NAOI of the winter season can be further studied by making more specific analyzes in the future.

Keywords: North Atlantic Oscillation, wavelet transform, periodical analysis, global wavelet spectrum

OBTAINING AND CHARACTERIZING CONCRETE WITH SODIUM ALGINATE CAPSULES ADDITIONS

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ABSTRACT

In civil construction concrete is used on a large scale, and often molded together with a steel reinforcement to complete its tensile strength. When inserted in situations of great efforts, some pathologies occur, being one of the main, the cracks, responsible for the future oxidation of the reinforcement, reducing its resistance in the structure and a wear of it. The addition of biomineralizing bacteria has been investigated, due to their metabolism that generates the precipitation of calcium carbonate, responsible for sealing the fissure. However, organisms are fragile to survive the chemical reaction of concrete, creating the necessity of protection through encapsulation. This research involved obtaining and characterizing sodium alginate capsules through intumesation tests, generating a way for the survival of bacteria inside the concrete until the moment of its use. Concrete specimens were prepared and valiated using andreassen coefficient of 0.30 and 0.37 and varying the content by 1.0% and 1.5% in sodium alginate capsules. The methodology adopted to obtain sodium alginate capsules proved to be adequate for the insertion process in the specimens. The investigated formulations obtained abatement values between 18 and 25 cm, reaching a fluid consistency, according to the NBR NM 67 standard. It was also observed that the presence of sodium alginate did not interfere with the good consistency results obtained. Higher additions of sodium alginate capsules favored a decrease in void and porosity index and an increase in mechanical resistance.

Keywords: concrete, sodium alginate, biomineralization, mechanical resistance, fluidity.

PRESERVING THE JORDANIAN ARCHITECTURAL IDENTITY AND APPLYING THE ELEMENTS OF SUSTAINABILITY "THE NABULSI HOUSE"

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ABSTRACT
Architectural identity articulates the style and culture of societies and the knowledge of traditional architecture for any region from the correct and intelligent use of surrounding and available materials. This paper aims to study the architectural identity in the Jordanian house, identity preservation, and ways to apply sustainability to buildings and interior spaces. A case study will be conducted to learn about materials, alternative sources, renewable energy sources, and methods used in local architecture to reach sustainable environmental solutions while preserving traditional architecture. The study follows a qualitative method implemented in two phases: literature review and case studies by analysing the construction site, materials used, interior space, and methods for applying sustainability principles. and focus on the elements of sustainability and architectural identity in the construction of buildings in Jordan, due to the lack of studies and solutions on this subject. A traditional house in the city of Irbid, north of Jordan, was chosen as "the Nabulsi House". The study's findings propose that elements of sustainability and traditional construction principles be applied to interior architecture and new buildings, such as using natural ventilation and heating technologies and adopting the courtyard concept. Other options for collecting rainwater and making a water well exist. These methods can be used for existing structures and modern architectural technologies. The research recommendations focus on designing and maintaining new structures while keeping the architectural identity in mind and applying traditional architectural principles.

Keywords: Architecture, Identity, Traditional architecture, Sustainability, Jordan.

ÖZET
Mimari kimlik, toplumların tarzı ve kültürünü ve çevredeki ve mevcut malzemelerin doğru ve akıllı bir şekilde kullanılmasından dolayı her bölge için geleneksel mimari bilgisini ifade eder. Bu incelemenin amacı Ürdün evindeki mimari kimliği, kimlik korumayı ve bina ve iç mekanlara sürdürülebilirlik uygulama yollarını araştırmaktır. Malzeme, alternatif kaynaklar, yenilenebilir enerji kaynakları ve geleneksel mimariyi korurken sürdürülebilir çevre çözümlerine ulaşmak için yerel mimaride kullanılan yöntemler hakkında bilgi edinmek için bir durum incelemesi yapılmıştır. Araştırma, iki aşamada uygulanan nitel bir yöntemi izlemektedir: İnşaat alanını, kullanılan malzemeleri, iç mekan ve sürdürülebilirlik ilkelerini uygulama yöntemleri ile ilgili literatür taraması yaparak alan çalışmaları yapılmıştır. Ayrıca, bu konuyla ilgili çalışmaların ve çözümlerin eksikliği nedeniyle Ürdün'de bina inşaatında sürdürülebilirlik ve mimari kimliğin öğelerine odaklanılmıştır. Ürdün'ün kuzeyindeki Irbid kentindeki

geleneksel bir konut, "Nabulsi Evi" olarak seçilmiştir. Araştırmanın bulguları, sürdürülebilirlik ve geleneksel inşaat ilkelerinin unsurlarının iç mimariye ve doğal havalandırma ve ısıtma teknolojilerinin kullanılması ve avlu konseptinin benimsenmesi gibi yeni binalara uygulanmasını önermektedir. Yağmur suyu toplamak ve su kuyusu yapmak için diğer seçenekler mevcuttur. Bu yöntemler mevcut yapılar ve modern mimari teknolojiler için kullanılabilir. Araştırma, mimari kimliği göz önünde bulundurarak, geleneksel mimari ilkeleri uygulayarak yeni yapılar tasarlamaya ve korumaya yönelik önerilere odaklanmaktadır.

Anahtar Kalimeler: Mimarlık, kimlik, geleneksel mimari, Sürdürülebilirlik, Ürdün.

Aim of the study:

This paper aims to study the architectural identity and sustainability in the Jordanian house, identity preservation and ways to apply sustainability to buildings and interior spaces. A case study will be conducted to learn about materials, alternative sources, renewable energy sources, and methods used in local architecture to reach sustainable environmental solutions while preserving traditional architecture.

Problem Statement:

The problem of the study revolves around the architectural identity and its impact due to the contemporary global architecture, which imposed a strong presence and wide spread, which directly affects the architectural identity of the place, and the lack of interest in applying the elements of sustainability in Jordan.

Scope of the study:

The purpose of the study is to focus on the elements of sustainability and architectural identity in the construction of buildings in Jordan, due to the lack of studies and solutions on this subject, and the need to pay attention to architectural identity and sustainability in modern-day. In addition to provide suggestions and possible solutions.

Limitation of the study:

In this study, it is expected that there will be limitations in the methodology by collecting information about the case study, but these limitations are limited to taking pictures and visiting the place at the present time, and it is possible to influence the results of this study. But someone will be used to collect the photos.

Methodology of the study:

The study follows the qualitative approach in two phases:

Literature review: Literature references will include definitions and solutions for architectural and traditional identity and sustainability, and identification of elements affecting identity, from a body of literature (books, theses, journals, papers).

Case study: The research will monitor a case of traditional buildings that follow the local identity in their design and application of sustainability. The method of data analysis for statistical analysis, the data will be disassembled, coded, and tabulated. The notes will then be placed on the tables, as well as notes from pictures, drawings, and sketches, which will be emptied into special tables, and the results will be analysed by filling in the information in statistical tables to arrive at the study's final results.

2- Literature review:

2-1 Architecture and Identity:

Architecture is part of the identity of each community and carries the message, concept, and characteristics attributed to the community where it was born [Torabi & Brahman, 2013]. And according to Rapaport: "identity is the ability to distinguish and identify an element from another. It is a feature of environment that does not change in different situations. This feature can be physical features such as situations. This feature can be physical features such as be specific activities or practices in the environment or its functions" [Torabi & Brahman, 2013].

2-2 Sustainability:

"Sustainable architecture isn't a prescription. It is an approach, an attitude. It should not really even have a label. It should just be architecture" [Maxman S, 1993]. Sustainable architecture, eco-friendly building, eco cities, eco houses, planning process architects, urban planners and designers are increasingly considering how their work will address issues of sustainability and environmental protection, as well as global climate change [Salman, 2019].

2-3 The main elements of traditional houses in Jordan

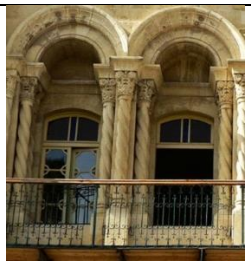
In Jordan, old houses had openings (wall cupboards) in the walls are used to hold hand processed food [Asfour, 2008]. Moreover, to save money (which he earned Farms in the summer harvest period) there are also a special place to put furniture, blankets and carpets used to cover floors in winter. Also, there was a jar in a corner of the house where water was stored [Rousan & Al-Rajoub, 2010]. While the house yard was sometimes used breeding livestock and birds and a water well to collect them rain water through this box through the channel that up to the wall, there is a construction toilet unit, the place available for ovens to produce bread. big houses it was their hospitality, guesthouses separate from house [Rousan & Al-Rajoub, 2010]. The house was surrounded by a stone wall and mud contains a large main entrance in the form of arches, small openings and doors [Matrouk, 2011].

According to the literature reviews, researchers provide studies and solutions on the sustainability of architectural identity in all of its forms, but due to a lack of proposals in Jordan, the goal is to demonstrate the importance of architectural identity and sustainability in Jordan today, as well as the needs of the local community for it, and to focus on the application of sustainability and preservation methods on the architectural identity, in order to achieve sustenance. As a result, it is critical to communicate to Jordan's building engineers, architects, and designers that, sufficient information and educate the community about its application. And some contemporary cases may give us important lessons about how to consider architectural identity in ongoing projects taking into account the local environment. And The traditional Jordanian house is a great example of how to design harmoniously in the Muslim and Ottoman style [Salman, 2019]. In addition, the heritage houses are considered ancient architectural arts that reflect the development of civilization in the history of Jordan, and witnessed a decisive event that distinguished the Jordanian identity and modern Jordan [Asfour, 2008]. Most of the traditional buildings are located in a few Jordanian cities, such as Amman, Irbid and Salt. The builders came from neighbouring towns such as Nablus, Beirut and Damascus [Salman, 2019].

3- Elements of identity in Jordanian architecture:

The impact of intellectual and technological progress on the world, as well as an increase in the number of newly graduated architects from Jordanian universities, resulted in a significant development and change in architecture in Jordan at the turn of the century. As a result, new building materials and advanced building technologies have emerged, where a diversity of visions, cultures, and intellectual concepts, as well as how they are applied in architecture, contribute to the evolution of architectural formalities and meaning. Buildings during this time

period were notable for their various types and new forms, but they are all part of a shared heritage in various ways and styles.
The following are two major architectural trends in Jordan today [Rjoub, 2016]:
1. The first architectural trend in the modern world that called for openness to the world and keeping up with progress. Supporters of the trend have attempted to portray their project ideas as having nothing to do with local culture, environmental, or social factors. This has an impact on Jordan's architectural identity.
2. A return to the past and discovery of the richness of culture, architectural values, local and regional heritage, and traditional resources was the second trend. Heritage is viewed as a starting point for renewal and modernity, as well as a means of identifying the characteristics and distinct types of Jordanian architectural identity.

Element	Photo	Description	Evaluation
Door	 	The doors of traditional houses in Salt, Jordan. Jordan Post Entrance.	Arched doors dating back to the Islamic style.
Window	 	The windows of the Karak school, the Ottoman era. Modern windows follow architectural identity.	Using the arch shape in windows.
Material	 	Oak-wood Stone local Ma'an, Jordan.	The use of local and raw building materials, stone cement, and bricks.

Arches	 	The grand Greco-Roman ruins of Jerash Al Manara, A Luxury Collection Hotel, Aqaba	Follow the traditional architectural character.
Interior space	 	The inner courtyard of the Queen Rania Center. Al-Balqa University	Usage of open space at the maximum level. using natural lighting as possible through windows and courtyard.

Table 1. Elements of Architecture Identity in Jordan.

4- Case Study

4-1 The Nabulsi House:

Nabulsi House is located in Jordan, Irbid city. The building has an open yard inside it like the old Syrian houses, where the building takes three sides of the yard [Rousan & Al-Rajoub, 2010]. The Ministry of Tourism and Antiquities has restored the construction of the Nabulsi House and the development of Irbid's city centre. The house AL Nabulsi was submitted to the municipality of Irbid in the framework of a cooperation between the municipality and the Ministry of Tourism in 2008 [Asfour, 2008].

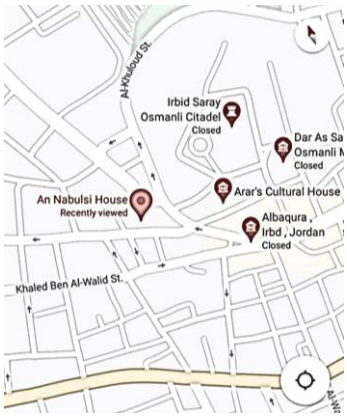


Fig1: Location (By Google Map)

The building consists of (a ground floor, first floor, and an interior yard in the middle) [Matrouk, 2011], it has multiple aesthetics like the sculptured stone on the exterior facade and coloured glass on the interior and exterior windows. While the interior yard has a high lemon tree with a beautiful fountain [Matrouk, 2011], the building has four entrances; three of them are on the

eastern side, but they are closed now. The fourth entrance is on the southern side of the building and is the one that is being used [Asfour, 2008]. The building has two units separated by stairs making two different houses, one of them is on the ground floor, and the other is on the first floor [Asfour, 2008]. Through analysing the style and the technique of the exterior building and the different geometric forms of the top windows, it has been clear that this building was built in successive periods [Asfour, 2008]. The ground floor was built in one period, and the top floor was built in two phases: the first southern side and the eastern side holding suits [Asfour, 2008]. The southern entrance opens in one of the rooms that lead to the interior yard. The main entrance on the eastern side leads to the stairs and two separate accesses, one of them is for the reception room connected to the rest of the house by an interior door. The other access opens to another reception room [Asfour, 2008]. On the one hand, the ground floor contains three rooms: the southern unit has three rooms, two of them are accessible from the inner courtyard, and they were replaced to be bathrooms later [Asfour, 2008]. In the middle room, where the main entrance is on the southern side, the third room is located on the south-eastern side (reception room). Furthermore, it is the only room with its original Syrian flooring materials, and probably other rooms had the same flooring materials too [Asfour, 2008]. While the eastern unit is separated from the southern unit by stairs (main entrance), it contains three rooms: western doors and window openings facing the garden [Asfour, 2008]. A room in the north unit has a node opening onto the garden through a semi-circular arc. It should be noted that the doors and windows of all these rooms have a rectangular shape with an Islamic-styled arch above [Asfour, 2008].



Fig 2: South facade of the building.



Fig 3: East facade of the building.

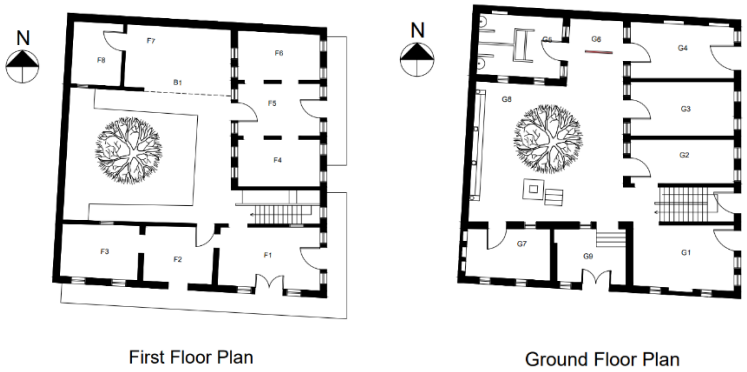


Fig 4: Ground floor, *the researcher redrawn the sketch drawing using AutoCAD.*

Fig 5: First floor, *the researcher redrawn the sketch drawing using AutoCAD.*



Fig 6: The inner courtyard of the building.

5- Building:

5-1 Building Site:

The construction site plays an essential role in the durable design of the building, where it can protect the building from light and wind. Each region has a specific way of directing the building in accordance with the climate of this region. Most buildings in the city of Irbid face south to receive direct sunlight and natural lighting, so that solar energy gains height in the building. There are many advantages to understanding the building site where it can indicate any information about the structure, where site selection is as important as the energy efficiency of the building itself [Ali, Alsairat, 2010].

As for the location, the case study was located far from the floodplain. It is also located in the center of Irbid city, which makes it close to most of the service sites such as shopping centers, retail stores, farmers, and markets. Also, in terms of transportations, being located downtown made it easy to transport by foot or by public transportations since the house's location is close to the bus stations and taxi routes. The site's traditional houses were planted with trees open to fresh air, and the building's orientation helps get the most of the sun and wind direction, which helps in the natural temperature control inside the houses. The builders also ensured that the rain water of each house well, and a simple network ran through the house to collect the rain water during the winter.

5-2 Building Materials:

Since building materials play a fundamental role in the sustainable practice of architecture and design. the cases of this study were analyzed to ascertain the scope of the sustainable approach applied in these vernacular houses. Most of the energy consumed comes from the extraction of building materials and their transportation on the site. The previous problem was overcome in the traditional houses in the city of Irbid through the use of local and raw building materials [Alhaddad & Alshboul, 2010]. This practice reduced power consumption at start-up during the building process. Moreover, because construction materials were known to builders, it was easy for them to make and build without the need for additional labor.

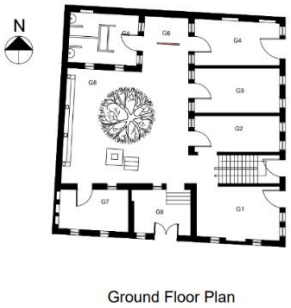
Materials used to build traditional houses in Jordan are mainly local. Also, the construction works of the houses are usually local. Local construction materials include stone, concrete, bricks and materials. As mentioned earlier, in the northern part of Jordan, which is the case of Irbid, most of the stone used in construction was the basalt stone available in the area [Maxman S, 1993]. that the use of construction materials that create structures that are more respectful of the environment improves sustainability as a concept (Attia. 2015). it can be seen that the thermal insulation of building materials used in traditional buildings has been shown to be much better in terms of sustainability compared to a modern building in the same area (Alzoubi & Almalkawi, 2019).

The properties of building	Photos	Description	Evaluation
Sustainable site planning and design	  	- The building faces the sun from east and west during sunset. - Pictures show plants inside the building. - Indoor courtyard Storage of rain water. - External yards of the building and construction site.	- Exploiting natural lighting and heat sources. - Cultivation of the open and indoor yard with local plants. - Preparing roofs and floors to collect rainwater. - The building is close to markets and public services
Materials	    	- Stone (Black, White). - Stained glass. - Iron. - The wood. - Marble.	- The use of black and white local stone in interior and exterior facings and floors. - Arches and windows with stained glass. - The use of iron bridges in the ceiling. - The interior doors are made of wood. - Marble water fountains**.**
Interior spaces	   	- Distribution of rooms on the ground floor. - All rooms overlook the inner courtyard. - Living rooms. - Planted trees. - Entrances and exits.	- Distribution of rooms on the sides and in the middle of the inner courtyard. - The house has 4 entrances. - The spacious area in the inner courtyard.

Sustainable resource efficiency	   	- Bishop. - Floors. - Building Materials.	- Sustainability of the floors that were created from stone. - The use of iron bridges to strengthen and sustain ceilings. - Quality local materials. - Distribution of indoor and outdoor spaces.
Identity	   	- Windows. - Arches. - Distribution of interior spaces. - Building materials. - Decoration.	- Use of local raw materials. - Strategies for applying traditional architecture. - Providing privacy in the distribution of interior spaces according to the culture and identity of the place. - Jordanian architectural character in design.

Table 2. Assessment of architecture identity and sustainable features and strategies for case study.

5-1-2 Interior and Architectural Planning:

The elements of building	Photo	Description	Evaluation
The plan	 Ground Floor Plan	- Ground floor plan. - First floor plan.	- The ground floor contains 4 entrances, five rooms, a bathroom, an area for the main entrance, an open room (G6) used as a dining area, and the inner courtyard that contains a fountain, a water well and trees planted in the middle. - The first floor contains 7 rooms, a bathroom, a terrace for the rooms on the

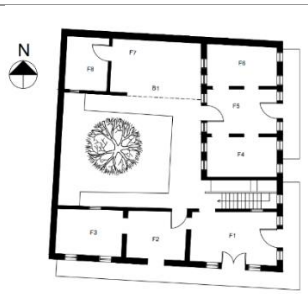
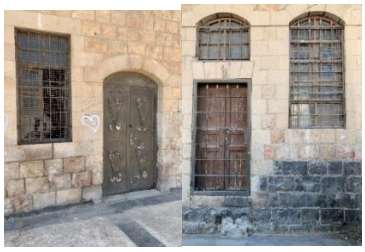
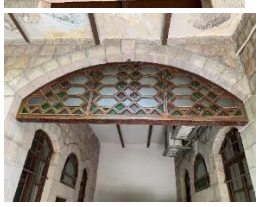
	 First Floor Plan		east and south side, and from the inside the corridors overlooking the inner courtyard on the ground floor.
Entrance and Exit		- The main entrance. - Guest room entrance. - The entrance to the staircase. - The entrance to one of the rooms on the north side.	- The main entrance contains a space shown in the G9 section for the privacy of the house. - Separate entrance to the guest room from the east side of the house G1. - The staircase serves the two floors for ease of movement and for services.
Windows	 	- The windows are high. - Rectangular in shape. - Above them are arches.	- Follow the local identity to give the building the Jordanian architectural identity in terms of window shapes. - Each room has indoor and outdoor windows. - Designed in this size to take advantage of natural lighting and ventilation.
Arches and decorations	  	- Arches. - Windows. - Entrance and exit arches. - The fountain. - Stained glass.	- Follow local identity in designing windows and arches. - Stained glass denotes Islamic architecture. - The fountain was an essential part of every home, so these parts are important in reflecting the architectural identity.

Table 3. Assessment of the building and sustainability components of the case study.

6- Results and Conclusions:

In this study, traditional Jordanian architecture through the Nabulsi House is analyzed in terms of sustainable design and the importance and preservation of architectural identity, and through three aspects: construction site, interior space planning, sustainability, and building materials. Because the building applies many sustainability principles and elements of sustainability have been implemented by users in the area because it was low cost and simple in design. It can be seen in most traditional Jordanian buildings, and the importance of the analysis focuses on the fact that these strategies are easy to implement in modern buildings for ease of construction and maintenance, and the application of elements of Jordanian architectural sustainability, including those that help cool and heat buildings and save energy during the annual seasons. The focus of traditional architecture in Jordan is on reducing energy use and making use of natural resources, in addition to natural heating and ventilation. Before construction, the building directives must be observed in order to make the most of the movement of the sun, wind and natural resources, the use of local materials such as clay, stone and wood, and the design of ventilation openings from the south (for the climate of Jordan). And the use of the inner courtyard for natural air circulation inside the building. These results are similar to literature references in terms of sustainability and providing a better living environment without using energy while preserving the traditional architectural identity. Therefore, it is preferable to use building materials from the surrounding and local environment and to orient the building towards the south, because the wind direction in Jordan is mostly from the south throughout the year. Providing open spaces within the building helps maintain sustainability, quality of life and environmental aspects. This study supports the preservation of the Jordanian architectural identity and traditional buildings. The elements of sustainability and the principles of the traditional building can be applied in terms of interior architecture and new structures, such as the implementation of the concept of the courtyard and the use of natural ventilation and heating methods. And ways to collect rainwater and create a water well. These methods can be implemented in modern buildings and using modern architectural technologies. Research proposals focus on suggesting ways to create and maintain new buildings, taking into account the architectural identity, and making use of the principles of traditional architecture.

References:

[1] Torabi, Z., & Brahman, S. (2013). Effective factors in shaping the identity of architecture. *Middle-East Journal of Scientific Research*, *15*(1), 106-113

[2] Kupatadze, I. (2014). Ethics vs. aesthetics in sustainable architecture. *WIT Transactions on the Built Environment*, *142*, 553-562.

[3] Maxman S., Shaking the Rafters, Earthwatch, July/Aug. pp.11; 1993.
[4] Ayman Dawood Salman1, Osamah Ibrahim Khalaf and Ghaida Muttashar Abdulsahib, 2019. An adaptive intelligent alarm system for wireless sensor networks. Indonesian Journal of Electrical Engineering and Computer Science ,Vol. 15, No. 1, July 2019, pp. 142~147
[5] Y. S. Asfour, The History and Archaeology of Jordan, 2nd ed. Amman, Jordan: Al-Mujtamaa Al-Arabi, 2008
[6] A. Rousan and A. K. Al-Rajoub, [Irbid: Archaeological historical and heritage study], 1st ed. Amman Jordan, 2010.
[7] M. Matrouk and J. Goussous, "Recipient cognition and house identity in Jordanian architecture," Anthropologist, vol. 13, no. 4, pp. 271–281, 2011.
[8] GHAIDA MUTTASHAR ABDULSAHIB and OSAMAH IBRAHIM KHALAF, 2018. AN IMPROVED ALGORITHM TO FIRE DETECTION IN FOREST BY USING WIRELESS SENSOR NETWORKS.International Journal of Civil Engineering and Technology (IJCIET) - Scope Database Indexed.Volume:9, Issue:11, Pages:369-377.
[9] H. H. Ali and S. F. Al Nsairat, "Developing a green building assessment tool for developing countries - Case of Jordan," Build. Environ., vol. 44, no. 5, pp. 1053–1064, May 2009.
[10] M. I. Alhaddad and A. A. Alshboul, "Application of Sustainability Measures to Vernacular Architecture in Jordan A comparative study," in First International Conference on sustainability and the future, 2010, pp. 1–13.
- Mahmud, G. H., Yang, Z., & Hassan, A. M. (2013). Experimental and numerical studies of size effects of Ultra High-Performance Steel Fibre Reinforced Concrete (UHPFRC) beams. *Construction and Building materials*, *48*, 1027-1034.
- Rjoub, A. (2016). The relationship between heritage resources and contemporary architecture of Jordan. Architecture Research, 6(1), 1-12.
- Rababe'h, S. (2010). Nabataean Architectural Identity and its Impact on Contemporary Architecture in Jordan. Dirasat, Engineering Sciences, 37(1), 27-52.

QUALITATIVE ASSESSMENT OF SOILS OF THE MUGAN STEPPE OF THE AZERBAIJAN REPUBLIC

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ABSTRACT

An important structural element of soil protection is the organization of constant monitoring of the state of the soil cover and the assessment of signs and regimes that are important for the optimal and rational use of land resources. Research conducted on the qualitative assessment of the soil cover of the Mugan steppe, which is considered one of the zones of intensive agriculture in our republic, is of great relevance and is of great importance for the development of grain and vegetable growing, the cultivation of which are the most promising areas in agriculture in this region. The results of a qualitative assessment of the soils of the Mugan steppe are presented in this thesis. The Mugan plain is located in the southeastern part of the Kura-Araz lowland of Azerbaijan. The area of the Mugan steppe of Azerbaijan is 505,000 hectares of the zone. In order to fulfill the tasks of studying the soil cover in the study area in 2018–2021, we conducted the field soil investigations, put 24 soil profiles, summarized fund materials of soil studies performed by specialists from the Institute of Soil Science and Agrochemistry and the results of our own research. When developing the soil assessment of the Mugan steppe, we were guided by such methodological guidelines as "Methodological recommendations for the assessment of soils carried out in Azerbaijan", "Soil assessment", "Methodological guidelines for the assessment of soils under vineyards in the Azerbaijan SSR", as well as a mathematical analysis of many years of statistical and experimental material collected on the object of study. According to the results of studies by V.R. Volobuev, R.H. Mamedov, M.E. Salaev and others, the following types of soils are common in the study area: gray-brown (chestnut), alluvial-meadow, meadow-gray, meadow-swamp and salines. According to the methodology, gray-brown dark soils with the highest parameters were chosen as the standard of internal diagnostic features in the soils of this zone, and the level of fertility of other soils was determined in relation to it. The assessment of the soils of the Mugan plain was carried out for 10 types and subtypes of soils; gray-brown ordinary (88 points) and dark meadow-gray (87 points) soils have higher fertility compared to other types of soils. Light gray-meadow, meadow-swamp, light-meadow gray soils have low fertility (bonitet points 60, 45, 68). It should be taken into account that there are some natural factors (erosion, salinization, alkalinization, granulometric composition, irrigation, cultivation, etc.), under the influence of which the level of soil fertility increases or decreases. Such factors are not constant, they are changeable and therefore, according to the methodology, they should not be taken as a standard, they are taken into account as correction factors.

Keywords: Mugan steppe, soil quality, bonitet scores, fertility.

THE USE OF RHEOLOGICAL TESTS TO EVALUATE SOIL CONDITIONING FOR EPB EXCAVATION

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ABSTRACT
Earth Pressure Balance (EPB) tunnelling machines use the excavated soil to stabilize the excavation front. Chemical additives may be added to the excavated soil to ensure that pressure is adequately transmitted to the tunnel face, minimize wear and tear of the equipment and prevent clogging of the screw conveyor that removes the excess material. This process is called soil conditioning and the most used additive is a foam primarily composed of SLES (sodium lauryl ether sulfate), a surfactant also found in cleaning products. The amount of additive is estimated during EPB operation by visual and tactile inspections; however, operation efficiency might be improved by evaluations with rheological tests. This research intends to contribute to the safe and economical use of soil conditioning, presenting a comparison of the efficacy of three rheological tests – squeeze flow, flow table, and mini-slump – to quantify the change in workability of conditioned soils. The tested materials were kaolin and a mixture of kaolin and silica fine sand (40%-60% by dry weight), to which SLES was added at the contents of 0.625% and 0.333% (by weight). Six replicates for each test and material combination allowed for the assessment of repeatability and reproducibility. Results show that plasticity changes with small quantities of SLES mixed to the soil were within the efficacy ranges of the mini-slump and flow table tests. The flow table is the most repeatable and reproducible of the three tests, followed by mini-slump, while the strength of the investigated materials was higher than the maximum capacity of the squeeze flow press.

Keywords: Soil conditioning; tunnelling; rheology; flow table; mini-slump; squeeze flow.

INTRODUCTION
The past decades have shown an increase in the number and size of underground constructions worldwide (Ritter et al, 2013), part of expansion projects of high-speed rail, road and subway systems planned in and around major population centers. Many of these excavations use tunnel boring machines (TBMs), as this construction process allows for minimal disturbance and

settlement of the ground surface and can be applied at shallow depths, in soils with low resistance and below the water level (Maidl et al., 2012). These machines can be purpose-built to account for specific ground conditions, making them the preferred tunnel construction method in mega-cities (Goel et al., 2012).

TBMs can be divided into two categories: those designed to dig through hard rock and TBMs that excavate soil, of which the earth pressure balance type is the most used in urban projects (Goel et al., 2012; Galli, 2017; Herrenknecht AG., 2021). Earth Pressure Balance Machines (EPBs) are TBMs suitable for digging through unstable ground such as clay, silt, sand, or gravel (Yun, 2019). Their development started in the 1970s in Japan, based on blind shields, and the first application took place in Tokyo, in 1974 (Maidl et al., 2012).

Current EPB machines, shown in Figure 1, support the tunnel face with a slurry mixture formed by the excavated material (Galli, 2017; Maidl et al., 2012). The cutting wheel scrapes the ground, and the loosened material builds up behind it in the excavation chamber, applying pressure to the exposed face and preventing collapse. To regulate the pressure, the muck is slowly removed by a screw conveyor as the TBM advances and excavates more soil, ensuring that the amount of slurry in the excavation chamber remains relatively constant (Galli, 2017; Herrenknecht AG, 2021).

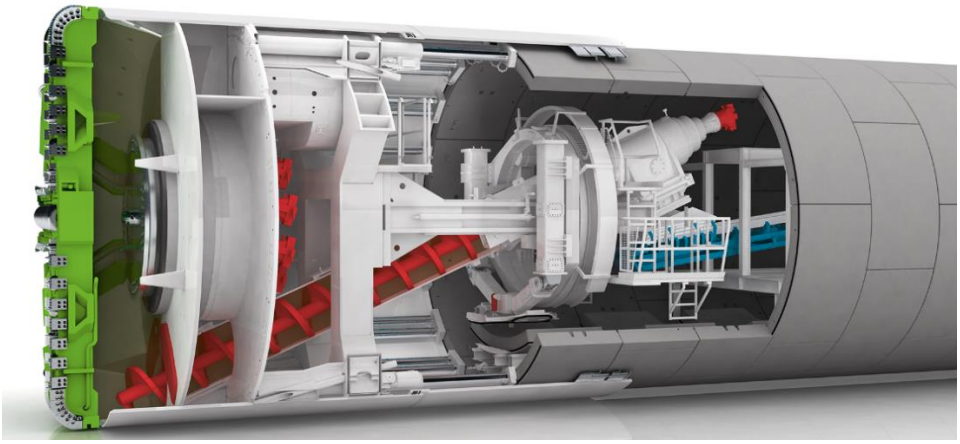

Figure 1: Cross-section of an EPB tunnel boring machine

Originally, EPBs were originally designed for soils with predominance of clay and silt (Maidl et al., 2012), To extend the application of EPBs to coarse-grained soils, the excavated soil needs to be mixed with additives to become an effective support medium, a process called soil conditioning (Galli, 2017; Langmaack, 2000; EFNARC, 2005). Injection nozzles positioned throughout the cutter head, in the excavation chamber and along the screw conveyor, spray the additives into the soil and the rotation of the excavation chamber ensures a homogenous mix (Thewes & Budach, 2010; Classen, 2014).

Conditioning increases soil workability and reduces wear and tear on the tunnel boring machines, allowing for faster and safer excavations (Galli, 2017). Another objective of soil conditioning is to reduce the clogging potential of the excavated material, one of the major reasons for standstills in tunnel construction, especially in overconsolidated clayey soils (Feinendegen et al., 2011).

Different additives can be used to condition soil: water, bentonite suspensions, polymer solutions, foams, or some combination of these products; the choice must satisfy the specific needs of the project and characteristics of the soil (EFNARC, 2005; Peila, 2014; Thewes &

Budach, 2010). The conditioned soil needs to present suitable flow behavior or workability to ensure flow through the excavation chamber and the screw conveyor (Galli, 2017; Galli & Thewes, 2014).

Foam is the most widely used form of application of chemical additive, given its flexibility, ease of use and ability to be used as a delivery method for the dispersion of other additives (Galli, 2017), and the most used surfactant is sodium laureth sulfate (SLES), whose molecular formula is $CH_3(CH_2)_{10}CH_2(OCH_2CH_2)_nOSO_3Na$ (Grenni et al., 2019). According to Thewes & Budach (2010), foam is more suitable for conditioning coarse and mixed-grained soils, and also for stickier clays to reduce clogging; however, water, polymers, and bentonite suspensions are more often used to condition fine-grained soils such as clays and silts.

To monitor the excavation, a great number of digital sensors are employed throughout the TBM, collecting over a thousand data points every few seconds (Kosowatz, 2021; Robbins, 2021; Herrenknecht AG, 2021). Current EPB monitoring focuses on several key parameters to evaluate efficiency and safety, some of which are related to soil conditioning, such as the pressure at the end of the screw conveyor and foam properties (Aguiar & Babendererde, 2021). The length of the screw is defined in the design phase to create a pressure gradient and reduce the slurry pressure to atmospheric as it is extracted from the excavation chamber. If the slurry does not exit the conveyor at the correct pressure, it might indicate the conditioned soil has not achieved the desired consistency or an obstruction somewhere along the screw (Dang & Meschke, 2020; Talebi et al, 2015).

To avoid any obstructions and to ensure the muck paste has the specified consistency, specific foam variables are monitored i.e., foam injection ratio (FIR), foam expansion ration (FER) and foaming solution (C_f). These values allow operators to manipulate a few soil properties and make the excavation process faster and safer (Galli, 2017; EFNARC, 2005).

The foaming solution represents the mass ratio between the solution's total mass (water plus surfactant) and surfactants in the foaming solution (Equation 1). The foam expansion ratio indicates indirectly the volume of compressed air mixed with the foaming solution (Equation 2), while the foam injection ratio determines the volume of foam (under working pressure) injected in a given volume of soil (Equation 3).

$$C_f = 100 \times \frac{m_{surfactant}}{m_{foam\ solution}} \quad \text{(Equation 1)}$$

$$FER = \frac{V_{foam}}{V_{foam\ solution}} \quad \text{(Equation 2)}$$

$$FIR = 100 \times \frac{V_{foam}}{V_{soil}} \quad \text{(Equation 3)}$$

The foam can also be visually inspected. Its consistency can be easily evaluated by disconnecting one of the foam lines and spraying the conditioning agent onto a wall. The ideal consistency varies according to ground conditions and comparison with the designed foam mixture can inform operators if the correct mixture is being injected into the soil (Aguiar & Babendererde, 2021). The excavated soil can also be visually inspected as it leaves the screw conveyor: it must be uniform and solid enough to be transported out of the excavation area via belt conveyor. During excavation, visual and tactile inspections are often used to verify foam consistency and dispersion into the soil, which is not a precise method. Methods for reliably quantifying the change in soil properties brought by conditioning are yet to be more thoroughly investigated.

This paper aims to evaluate the applicability of rheological tests as indicators for the amount of additive added into mixed soils for EPB excavation by investigating their repeatability and reproducibility. Three rheological tests, identified by Oliveira (2018) as possible candidates for better evaluating the soil-foam mixture, were selected for this research: squeeze flow, flow table and mini-slump.

METHODOLOGY

Two control materials were selected based on literature: a commercial kaolin and a mixture of 40% kaolin and 60% standardized fine sand by dry weight. The Atterberg limits were determined for both materials, and the rheological tests were carried out at the liquid limit.

The soils were tested at their natural state and after addition of SLES in two different concentrations: 0,625% and 0,333% by wet weight. Different operators conducted six tests each independently, resulting in 18 total tests, to evaluate the tests' repeatability and reproducibility.

The squeeze flow test, pictured in Figure 2 consists of the compression of a disk-like specimen between two parallel plates at a constant rate of deformation. Initially developed to evaluate the workability of self-compacting concrete, this test records the force applied by the hydraulic press while the material deforms at a constant rate.

Specimens had 100mm in diameter and 10mm in height and were all molded immediately before each test with the aid of templates that ensured the correct dimensions and placement on the base plate. Initial tests were conducted with three distinct rates of deformation: 0.1 mm/s, 1.0mm/s and 3.0mm/s; to investigate the influence of deformation rate on soil behavior. Due to equipment constraints, the maximum deformation allowed in these tests was 5mm and the maximum force applied was 950N.

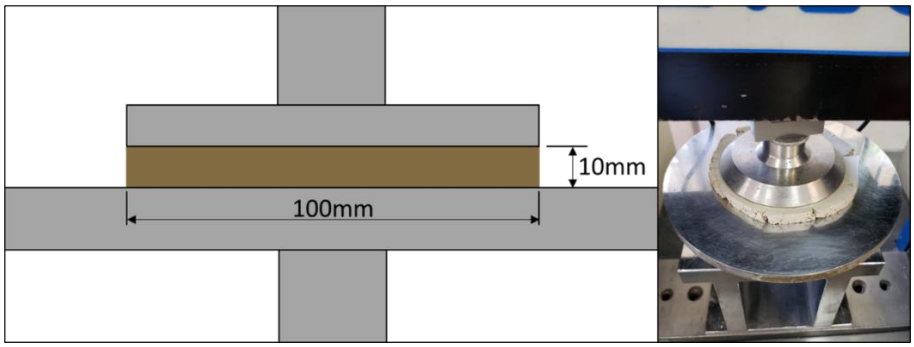

Figure 2: Squeezze flow test apparatus

The flow table test followed procedures described in NBR 13276 (ABNT, 2016) and ASTM C1437 (ANSI, 2020) with an adaptation to the number of blows (20, according to suggestion of Oliveira, 2018, instead of 30). The conditioned soil was molded in a conical trunk mold (Figure 3) in three layers of approximately equal thickness. The first layer was compacted by 15 blows of a socket, the second layer compacted by 10 blows and the final layer only received 5 blows. Due to the tendency of kaolin to adhere to the metallic mold, the mold was coated with a release agent before each test. The top of the specimen was rectified with a metallic ruler or spatula and the mold was removed vertically as to preserve the specimen's shape.

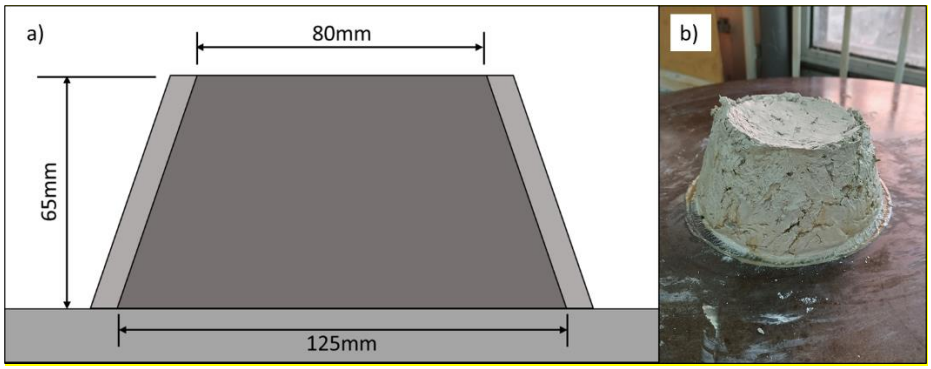

Figure 3: Mold and specimen used in mini-slump and flow table tests

Immediately after the mold's removal, the height of the specimen was measured with a pachymeter, determining the slump as the difference between the heights of soil specimen and mold. Then, the flow table's lever was used to apply 20 blows to the same specimen, as suggested by Oliveira (2018), at a rate of 1 per second. After the last blow, the pachymeter was used to measure the diameter of the soil in three separate positions equally spaced, and the result was calculated as the average of those values. A total of six specimens were tested for each combination of material and SLES concentration.

RESEARCH AND RESULTS

At first, the influence of the deformation rate on the squeeze flow results was investigated. For this step, both materials were tested with no chemical additives. As seen in Figure 4, the imposed rate of deformation does not influence remarkably the obtained curves of the sand-kaolin mixture. All tests reached the maximum capacity of the equipment (950 N), illustrating the effect of sand grains on soil strength. For the kaolin, Figure 5 shows that curves are practically coincident for rates of deformation 0.1 mm/s and 1.0 mm/s, and forces are slightly higher for 3.0 mm/s.

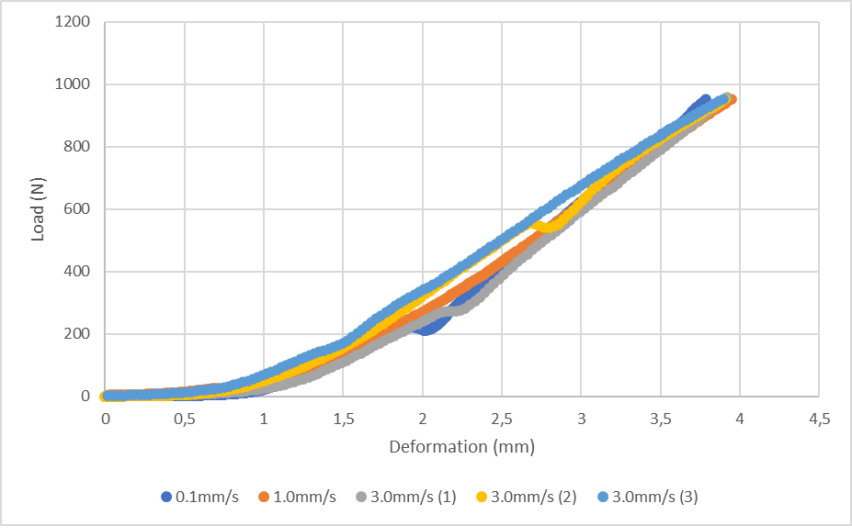

Figure 4: Squeeze flow results for the sand-kaolin mixture at different deformation rates

Given these results and considering that the deformation rate of 3.0 mm/s is too fast to allow for visual inspections during the test, the rate of 1.0 mm/s was selected for further tests.

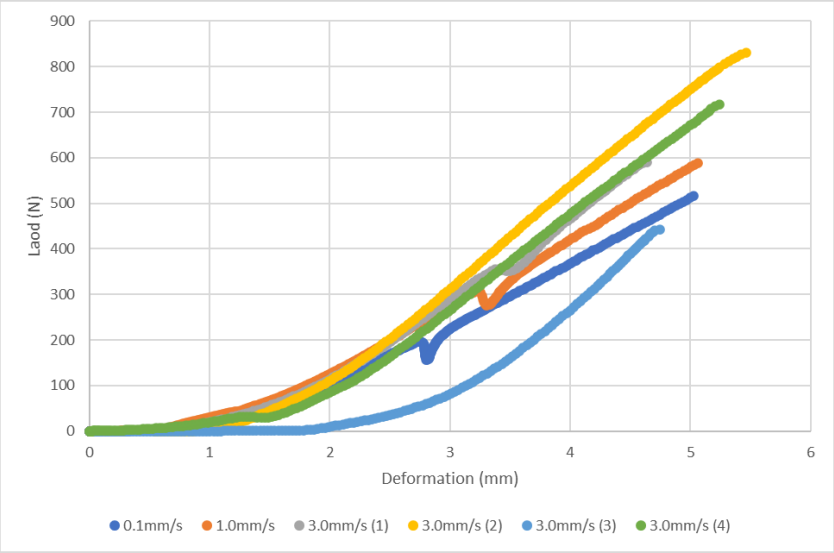

Figure 5: Squeeze flow results for the kaolin at different deformation rates

To simulate soil conditioning, SLES was mixed into the materials at concentrations of 0,625% and 0,333%. These conditioned soils were then tested at a deformation rate of 1.0mm/s, resulting in the curves shown in Figure 6.

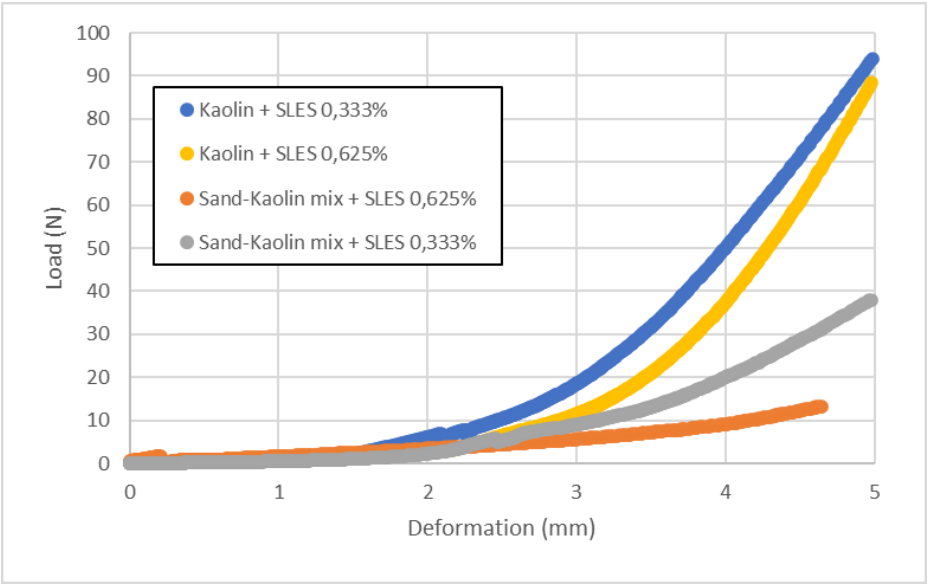

Figure 6: Squeeze flow results for different concentrations of SLES

The addition of SLES to both materials resulted in significant reduction of strength, as expected, since SLES is used in soil conditioning partly to reduce the soil's strength and make excavation easier. The maximum strength for unconditioned kaolin at 1.0 mm/s was 600 N. while for the conditioned kaolin this value was 90 N. The unconditioned kaolin-sand mixture reached the equipment's limit (950 N), while the maximum measured force for conditioned mixture ranged from 12 to 38 N.

Due to the equipment constraint, the squeeze flow test is disadvised for the proposed objective and no further tests to verify repeatability and reproducibility were carried out.

In the mini slump tests, the unconditioned materials had no slump; however, as shown in Figure 7, the additive had a large effect on workability. This effect is more pronounced in the sand-kaolin mixture, as seen in the squeeze flow tests. All combinations of soil and SLES

concentration presented consistent results with small standard deviations, especially for the sand-kaolin mixture, attesting to its repeatability.
However, the tendency of kaolin to adhere to metallic surfaces made the measuring of the specimen's height a bit uncertain. As the mold was lifted, some parts of the specimen would stick to it, altering the geometry and creating an irregular top surface. The use of a release agent greatly reduced this effect, but it was still present in all tests.

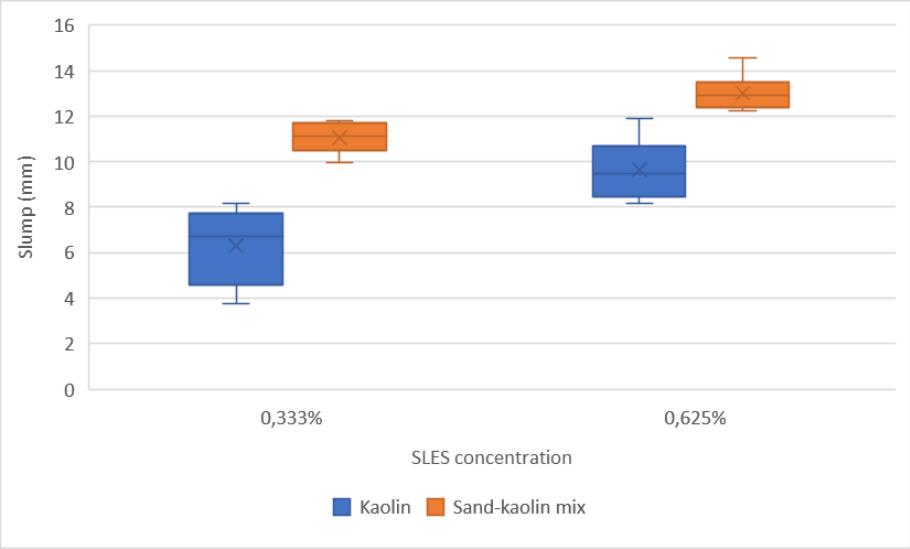

Figure 7: Mini-slump results for different concentrations of SLES

Afterwards, the mini-slump tests were repeated independently by other operators in order to evaluate the test's reproducibility. The results are shown in Figure 8 for one combination of soil and SLES concentration and, even though most results were similar, the standard deviation is much higher when the tests were executed by technicians with less practice.

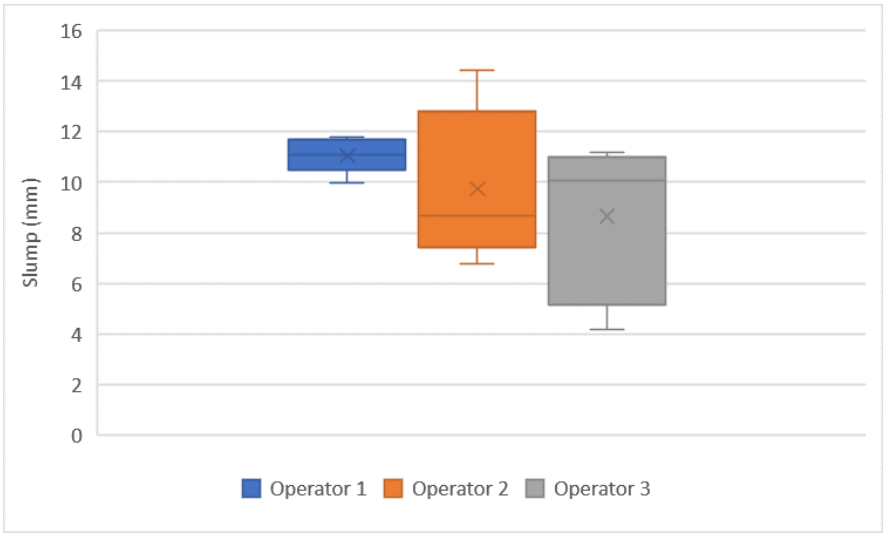

Figure 8: Mini-slump results for different operators

The same effect on soil workability was seen in the flow table tests. Both soils presented greater flow as the SLES concentration increased. As seen on the previous tests, SLES has a more evident effect on the sand-kaolin mixture than on kaolin, as the additive minimizes friction between sand particles. Figure 9 shows that all flow table tests are repeatable, obtaining

consistent results with small standard deviations for all combinations.

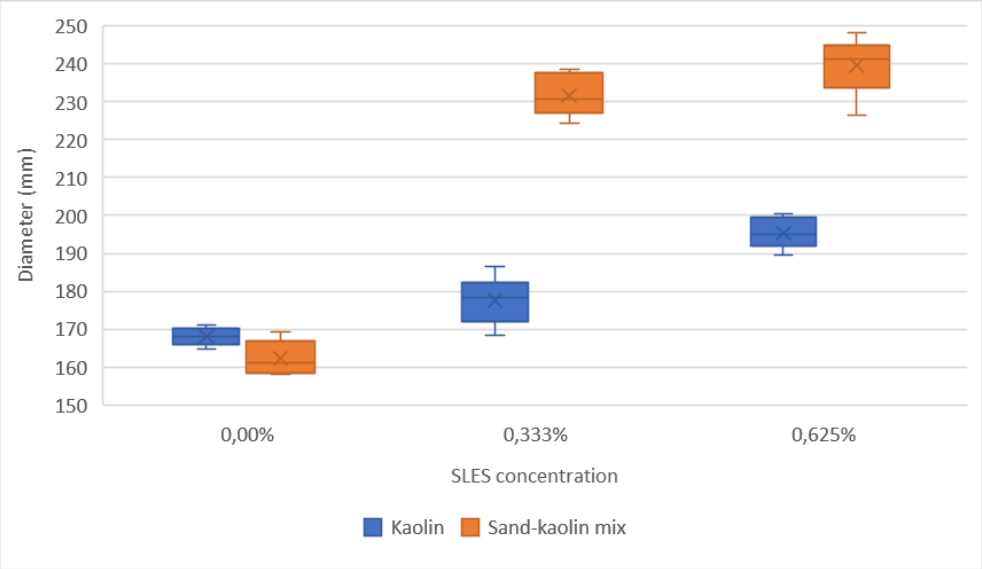

Figure 9: Flow table results for different concentrations of SLES

The comparison of results of multiple operators for the same combination of soil and SLES concentration makes the importance of having an experienced crew apparent: the standard deviation was similar for all operators, but operators 1 and 3 had more practice with this method and, as a result, achieved similar averages while operator 2 could not reach the same values. This is possibly due to the blows not being mechanized, and the operator manually having to activate the mechanism in the precise rhythm specified in the technical standard, impairing the reproducibility of this test.

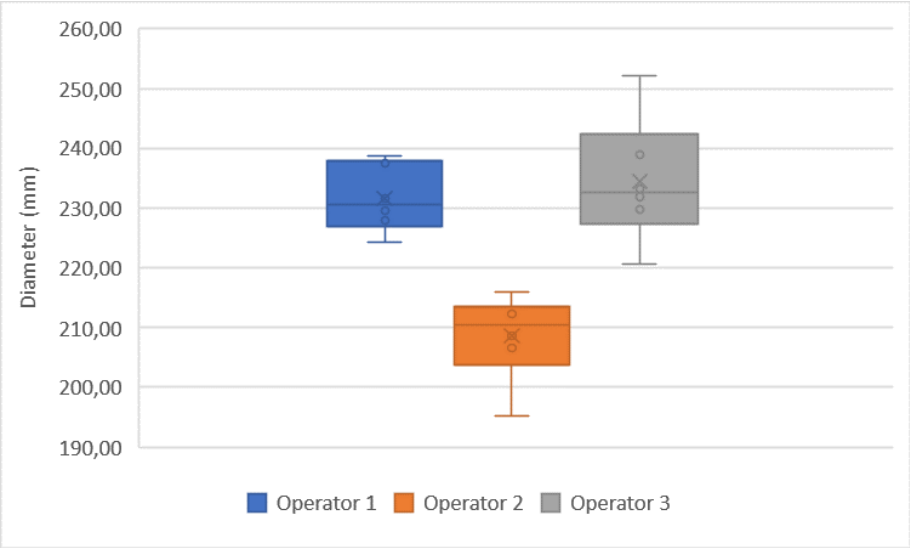

Figure 10: Flow table results for different operators

CONCLUSION

All three test methods were able to adequately represent the workability and consistency of a soil conditioned for EPB excavations. However, the squeeze flow test was unable to measure the strength of the coarser soil in its natural state, leading to uncertainties as to how much the material's workability has changed. Thus, the squeeze flow test cannot be recommended as it might not be able to adequately portray the initial condition of the soil that will be excavated. Both the mini-slump and the flow table tests could adequately measure the workability of the

materials before and after the additive was introduced. The mini-slump test showed good reproducibility, with similar averages from different operators but varying standard deviations, while the flow table showed good repeatability, with low standard deviations for all operators but varying averages. Comparisons between technicians of different practice levels show that a well-experienced team will be able to achieve accurate results if they are all familiar with the methodology.

REFERENCES

Aguiar, Gustavo; Babendererde, Lars. Acompanhamento técnico de uma TBM: Controles operacionais e identificação de problemas. [S.I.]: CBT, 2021. 52 slides. Available in: https://youtu.be/z4FWWecKpY4. Accessed in: 3 may 2021.

American National Standards Institute. **ASTM C1437**: Standard Test Method for Flow of Hydraulic Cement Mortar. ANSI, 2020c.

Associação Brasileira de Normas Técnicas. NBR 13276: Argamassa para assentamento e revestimento de paredes e tetos - Determinação do índice de consistência. ABNT, 2016.

Classen, J. (2014). *Challenges and Solutions Related to the Interaction of Soil Conditioning and Main Drive on Large Diameter EPB TBM's*. *August 2013*, 1–12.

Dang, T. S., & Meschke, G. (2020). Influence of muck properties and chamber design on pressure distribution in EPB pressure chambers – Insights from computational flow simulations. *Tunnelling and Underground Space Technology*, *99*(March 2019), 103333. https://doi.org/10.1016/j.tust.2020.103333

de Oliveira, D. G. G. (2018). *EPB Excavation and Conditioning of Cohesive Mixed Soils : Clogging and Flow Evaluation*. Queen's University, Kingston, Ontario, Canada.

EFNARC. (2005). *Specification and Guidelines for the use of specialist products for Soft Ground Tunnelling*.

Feinendegen, M., Ziegler, M., Weh, M., & Spagnoli, G. (2011). Clogging during EPB-tunnelling: Occurrence, classification and new manipulation methods. *World Tunnel Congress 2011, January*, 12. https://doi.org/ISBN 978-951-758-531-6 ISSN 0356-9403

Galli, M. (2017). *Rheological Characterisation of Earth-Pressure-Balance (EPB) Support Medium Composed of Non-Cohesive Soils and Foam* (Issue July).

Galli, M., & Thewes, M. (2014). Investigations for the application of EPB shields in difficult grounds / Untersuchungen für den Einsatz von Erddruckschilden in schwierigem Baugrund. *Geomechanik Und Tunnelbau*, *7*(1), 31–44. https://doi.org/10.1002/geot.201310030

Goel, R. K., Singh, B., & Zhao, J. (2012). Underground Metro and Road Tunnels. In *Underground Infrastructures* (pp. 125–172). https://doi.org/10.1016/b978-0-12-397168-5.00008-0

Grenni, P., Barra Caracciolo, A., & Patrolecco, L. (2019). Site-specific protocols of evaluating environmental compatibility of spoil material produced by EPB-TBMs. *Tunnels and Underground Cities: Engineering and Innovation Meet Archaeology, Architecture and Art-Proceedings of the WTC 2019 ITA-AITES World Tunnel Congress*.

Herrenknecht AG. EPB Shield. 2021. Available in: https://www.herrenknecht.com/en/products/productdetail/epb-shield/. Accessed in: 28 may 2021.

Kosowatz, John. Big Data Spurs Autonomous Tunneling. 2021. Available in: https://www.asme.org/topics-resources/content/big-data-spurs-autonomous-tunneling. Accessed in: 8 june 2021.

Langmaack, Lars. (2000). Advanced Technology of Soil Conditioning in EPB Shield Tunnelling. Proc. North American Tunnelling 2000 Conf.

Maidl, B., Herrenknecht, M., Maidl, U., & Wehrmeyer, G. (2012). *Mechanised Shield Tunnelling* (2nd ed.). Ernst & Sohn.

Peila, D. (2014). Soil Conditioning for EPB Shield Tunnelling. *KSCE Journal of Civil Engineering*, *18*(3), 831–936.

Ritter, S., Einstein, H. H., & Galler, R. (2013). Planning the handling of tunnel excavation material - A process of decision making under uncertainty. *Tunnelling and Underground Space Technology*, *33*, 193–201. https://doi.org/10.1016/j.tust.2012.08.009

Robbins. History. 2021. Available in: https://www.robbinstbm.com/about/history/. Accessed in: 4 june 2021.

Talebi, K., Memarian, H., Rostami, J., & Alavi Gharahbagh, E. (2015). Modeling of soil movement in the screw conveyor of the earth pressure balance machines (EPBM) using computational fluid dynamics. *Tunnelling and Underground Space Technology*, *47*, 136–142. https://doi.org/10.1016/j.tust.2014.12.008

Thewes, M., & Budach, C. (2010). Soil Conditioning with foam during EPB tunnelling. *Geomechanik Und Tunnelbau*, *3*(3), 256–267. https://doi.org/10.1002/geot.201000023

Yun, B. (2019). Underground Construction. In *Underground Engineering* (pp. 117–204). https://doi.org/10.1016/b978-0-12-812702-5.00004-9

OPTIMIZATION OF DELAY TIME AT SIGNALIZED ROAD INTERSECTIONS USING GENETIC ALGORITHM

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ABSTRACT

Traffic congestion is one of the most significant issues in big cities worldwide that dissatisfy inhabitants. This matter has remarkably unavoidable impacts on human's daily life regarding lost travel time and human health that resulted from increasing delay, traffic congestion, and air pollution. Therefore, promising new techniques and methodologies, which mitigate traffic congestion, play an essential role in improving the life situation and transportation systems in main cities, specifically in their central business district. This study aims to apply traffic signal time optimization for an intersection by using the Genetic Algorithm technique with the help of MATLAB. The selected signalized intersection is a three-leg intersection located on an arterial street in Duhok City and works in pre-timed signal timing mode. The results improved the Level of Service (LOS) of the intersection by optimizing delay time and the green time of each phase which, as a consequence, optimum cycle lengths are guaranteed.

THE IMPACT OF PATHOLOGICAL CONDITIONS ON HISTORIC BUILDINGS: THE CASE OF ANCIENT MEDINA-CASABLANCA, MOROCCO

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ABSTRACT

The concept of conservation of historic buildings in Morocco has been launched for years. These buildings have their own historical, cultural, social, aesthetic, architectural and even symbolic values that need to be protected. The objective of this paper is to identify the main anomalies that can occur in historic buildings in Morocco, analyzing their causes and estimating the influence of pathological situations on the functionality of the buildings. This information is essential to support qualified, conscientious and sustainable rehabilitation interventions on historic building complexes with homogeneous constructive characteristics.

Keyword: Historic buildings, Pathology, Anomalies.

LAPAROSCOPIC APPROACH TO SEVERE LIVER INJURY IN A PATIENT WITH BLUNT ABDOMINAL TRAUMA

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ABSTRACT

Backgrounds

With laparoscopic surgery were becoming more popular in surgical practice, laparoscopic approaches in trauma patients had increased. Non-operative management is the standard treatment algorithm in patients with blunt abdominal trauma who are hemodynamically stable and had a liver injury. However, if a surgical intervention is needed in this group, laparoscopy is a safe and feasible method for exploration, irrigation, and treatment. In this study, we aimed to present a case of liver injury in blunt abdominal trauma and its management with laparoscopic surgery.

Case Report

A 22-year-old male was admitted to the Emergency Unit of a tertiary center following a truck accident. The patient was hemodynamically stable at admission. Computerized Tomography (CT) showed a Grade IV liver laceration with hemoperitoneum. The patient was transferred to the observation room. After three hours, the patient's hemoglobin value decreased from 14.6 g/dl to 8.4 g/dl and, the mean arterial blood pressure decreased to 60 mmHg. The patient's heart rate increased to 125, and peritonitis occurred in the abdominal examination. Emergent laparoscopy was performed to the patient. Grade IV liver laceration with no active bleeding was observed. After peritoneal irrigation, surgery was terminated

Discussion

With the developments in the minimal invasive procedures, laparoscopic approaches were used more frequently in trauma patients. In the referral and experienced centers, laparoscopy could be an appropriate way to avoid unnecessary laparotomies.

Keywords: Blunt Trauma, Liver, Laparoscopy

COVİD-19 POZİTİF İKİZ GEBELİK VAKASINDA PLASENTALARIN VEGF ANTİKORUYLA İMMUNOHİSTOKİMYASAL DEĞERLENDİRİLMESİ

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ÖZET

Giriş: Koronavirüs (Covid-19) hastalığı ilk olarak 2019 yılında Çin'de ortaya çıkmış ve tüm dünyada küresel bir sağlık sorunu haline gelmiştir. Pandemiye dönüşen bu enfeksiyona bağlı ölümler günümüzde halen devam etmektedir. Covid-19 enfeksiyonu, gebeler ile birlikte fetüs ve yeni doğan bebekler üzerinde olumsuz etkiler göstermektedir. Çalışmamızda, gebelik döneminde akut Covid-19 geçiren vakadan, ikiz doğum sonrası alınan plasenta örneklerinin, vasküler endotelyal büyüme faktörü (VEGF) primer antikoru kullanılarak, immunohistokimyasal yöntemlerle incelenmesi amaçlanmıştır.

Materyal ve Metot: Çalışmamızda, doğum esnasında Covid-19 PCR testi pozitif olan ve ikiz doğum gerçekleştirmiş bir gebenin plasenta örnekleri, histopatolojik ve immünohistokimyasal yöntemlerle incelendi. Plasentadan alınan kesitler, literatüre uygun protokol yöntemleriyle hematoksilen-eozin ve VEGF primer antikoru ile boyandı. Yapılan rutin histolojik takip ve immünohistokimyasal boyamalardan sonra elde edilen preparatlar, ışık mikroskobu altında değerlendirildi.

Bulgular: Plasenta kesitlerinde histopatolojik olarak; koryonik villus dejenerasyonu, fibrinoid depozisyon artışı, decidual vaskulopati, vasküler dilatasyon ve konjesyon gözlendi. İmmünohistokimyasal değerlendirme sonucunda ise; özellikle maternal plağın bulunduğu yerlerde desidual hücrelerin nukleus çaplarında küçülme ile birlikte yoğun VEGF ekspresyonu görüldü. Ayrıca dilate damarların endotel hücrelerinde, koryonik villuslarda ve sinsityal alanlarda yoğun VEGF ekspresyonu tespit edildi.

Sonuç: Endotel hasarı, Covid-19 enfeksiyonunun ayırt edici özellikleri arasında yer alır. Bu hasarın, Covid-19 enfeksiyonunun şiddetini anlamada gösterge olduğu düşünülmektedir. Bunu destekleyici olarak SARS-CoV-2 enfeksiyonunun plasentada malperfüzyon dahil bazı plasental

anormalliklere yol açabileceği bildirilmiştir. VEGF ise vasküler endotelyal hücreler için son derece spesifik bir mitojen olarak kabul edilmektedir. Yapılan çalışmalar, hipoksik koşullarda ve preeklampsi vakalarında, VEGF ekspresyonunda artış olduğunu göstermektedir. Nitekim Covid-19'lu plasentalarda vasküler anormalliklere yol açtığını gösterdiğimiz çalışmamızda, histopatolojik bulgulara destekleyici olarak, VEGF primer antikorunun da yüksek seviyede eksprese olması literatürü desteklemektedir. Buna göre Covid-19'lu gebelerde plasentadaki vasküler hasarın gösterilmesinde, VEGF ekspresyon seviyeleri marker olarak kullanılabilir.

Anahtar Kelimeler: Covid-19, plasenta, VEGF, ikiz gebelik

IMMUNOHİSTOCHEMİCAL EVALUATİON OF PLACENTAS WİTH VEGF ANTİBODY İN A COVİD-19 POSİTİVE TWİN PREGNANCY CASE

ABSTRACT

Introduction: The Coronavirus (Covid-19) disease first appeared in China in 2019 and has become a global health problem all over the world. Deaths due to this infection, which turned into a pandemic, continue today. The Covid-19 infection has negative effects on pregnant women as well as fetuses and newborn babies. Our study, it was aimed to examine the placenta samples taken after twin delivery from a case who had acute Covid-19 during pregnancy, using vascular endothelial growth factor (VEGF) primary antibody, by immunohistochemical methods.

Materials and Methods: In our study, placenta samples of a pregnant woman who had a positive Covid-19 PCR test during delivery and who had twin births were examined by histopathological and immunohistochemical methods. Sections taken from the placenta were stained with hematoxylin-eosin and VEGF primary antibody using protocol methods by the literature. The preparations obtained after routine histological follow-up and immunohistochemical staining were evaluated under the light microscope.

Results: Histopathologically, in the placenta sections; chorionic villus degeneration, increased fibrinoid deposition, decidual vasculopathy, vascular dilatation, and congestion were observed. As a result of immunohistochemical evaluation; Intense VEGF expression was observed with a reduction in the nuclear diameters of decidual cells, especially where there was a maternal plaque. In addition, intense VEGF expression was detected in the endothelial cells of dilated vessels, chorionic villi, and syncytial areas.

Conclusion: Endothelial damage is among the distinguishing features of Covid-19 infection. This damage is considered to be indicative of understanding the severity of the Covid-19 infection. In support of this, it has been reported that SARS-CoV-2 infection may cause some placental abnormalities including malperfusion in the placenta. VEGF is considered a highly specific mitogen for vascular endothelial cells. Studies show that there is an increase in VEGF expression in hypoxic conditions and preeclampsia cases. In our study, where we showed that it causes vascular abnormalities in placentas with Covid-19, the fact that VEGF primary antibody is also expressed at high levels supports the literature, in support of histopathological findings. Accordingly, VEGF expression levels can be used as markers in demonstrating vascular damage in the placenta in pregnant women with Covid-19.

Keywords: Covid-19, placenta, VEGF, twin pregnancy

GİRİŞ

Koronavirüs (Covid-19) hastalığı ilk olarak 2019 yılında Çin'de ortaya çıkmış ve zaman içerisinde tüm dünyayı tehdit eden küresel bir sağlık sorunu haline gelmiştir (1). En nihayetinde pandemiye dönüşen bu hastalıktan kaynaklı olarak enfekte olmuş kişi ve bu enfeksiyona bağlı ölümler günümüzde halen devam etmektedir (2). Söz konusu hastalık ilk defa Hubei eyaletine bağlı olan Wuhan şehrinde, hastaneye başvuran kişilerde tespit edilmiştir (3). Koronavirüs enfeksiyonunun semptomları arasında titreme, öksürük, nezle, boğazda ağrı, nefes alma güçlüğü, kaslarda ağrı, mide bulantısı, kusma ve ishali saymak mümkündür (4).

İlk kez görülen viral hastalıklar, başta enfeksiyon riski taşıyanlar tarafından, toplumda endişe ile karşılanır. Bu durum sadece gebeleri değil, fetüsü de etkileyebilir. Covid-19 enfeksiyonunun en önemli yönlerinden bir tanesi, gebe kadınlar ile birlikte fetüs ve yeni doğan bebekler üzerinde gösterdiği etkidir (5). Söz konusu enfeksiyonun ilk ortaya çıktığı dönemde yapılan araştırmalar, gebe kadınların Covid-19 enfeksiyonuna yakalanmakla birlikte çoğu kadının bu hastalığı son derece hafif semptomlarla ya da herhangi bir semptom göstermeden atlattığını ortaya koymuştur. Ayrıca gebe kadınların hastalığa yakalanma oranlarında diğer bireylere göre herhangi bir farklılık olmadığı görülmüştür (6).

Hastalığın dünyaya yayılması, SARS-CoV-2 genomunun yeni genetik suşlarla sonuçlanan mutasyonlar geliştirmesi ile sonuçlandı. Bu varyantlar "endişe verici varyantlar" şeklinde isimlendirildi. Bahsi geçen varyantlara örnek olarak Alfa (B.1.1.7), Beta (B.1.351), Gamma (P.1) ve Delta (B.1.617.2) türleri sayılabilir (7). Yeni varyantların ortaya çıkması ile birlikte yapılan araştırmaların neticesinde, Covid-19 enfeksiyonunun anne adaylarında ciddi rahatsızlıklara yol açabileceği, yeni doğan komplikasyonlarıyla birlikte gebeliğin olumsuz sonuçlanmasına neden olabileceği ortaya konulmuştur (8).

Yapılan araştırmalar SARS-CoV-2 plasentitisini oluşturan patolojik anormalliklerin plasentada malperfüzyon gelişmesine ve yetersiz kalmasına neden olabileceğini, bu durumun çok ciddi plasental yıkımla sonuçlanabileceğini göstermiştir. Bu vakalarda meydana gelen intrauterin ve perinatal ölümlerin doğrudan veya dolaylı olarak plasentanın yetersiz kalmasından veya fetal hipoksik iskemiden kaynaklandığı düşünülmektedir. Bununla birlikte fetüste meydana gelen ölümlerde, SARS-CoV-2 tutulumunun rolü net değildir (9).

Covid-19 enfeksiyonunun ayırt edici özelliklerinden bir tanesi endotel tabakasında yaptığı hasarlanmadır. Bunun yanında yaygın tromboz, mikroanjiyopati ve endotel hasarından kaynaklı görülen neo-anjiyogenezle birlikte vasküler hasarlar da enfeksiyonun ayırt edici özellikleri arasında sayılabilir. Endotel tabakasında meydana gelen hasarın boyutu ve büyüklüğü Covid-19 enfeksiyonunun ne kadar şiddetli seyrettiğinin göstergelerinden bir tanesi olabilir. Bunun yanında endotelin bu denli önemli bir belirteç olması, söz konusu komplikasyonların tedavi edilmesi için kendisini ilgi çekici bir hedef haline getirmiştir (10).

Vasküler endotelyal büyüme faktörü (VEGF), vasküler endotelyal hücreler için son derece spesifik bir mitojen olarak kabul edilir. Hipoksiye cevap olarak aktive olmuş onkogenler ve çeşitli sitokinlerce VEGF ekspresyonun arttığı görülmektedir. Bunun yanında VEGF'in, endotelyal hücre profilerasyonunu indükleme, hücre göçünü destekleme ve apoptozu inhibe etme gibi işlevleri vardır. VEGF'in, kan damarlarının geçirgenliğini arttırdığı, anjiyogenezin indüklenmesini sağladığı ve vaskülogenezin düzenlenmesinde de aktif rol oynadığı bilinmektedir (11). Farelerde VEGF geninin sadece bir alelinin dahi bozulmasının kardiyovasküler gelişim bozukluğuna neden olduğu ve bu durumun embriyonik ölüme yol açtığı ifade edilmektedir (12).

VEGF'in plasentadaki ekspresyonu ile ilgili çalışmalar olmakla birlikte, gebelik sürecinde

VEGF'in gerek villuslarda gerekse de desiduada yerleşimini tam olarak açıklayan verilere rastlanmamıştır. Bununla birlikte bazı araştırmalarda gebelik döneminin ilk üç ayında VEGF mRNA varlığı, villusun sitotrofoblast, sinsityotrofoblast ve Hofbauer hücrelerinde zayıf olarak tespit edilmiştir (13). Yine yapılan bazı çalışmalarda özellikle preeklemptik gebelerde VEGF ekspresyonunun kontrol grubuna göre önemli oranda yüksek olduğu ortaya konulmuştur (14). Çalışmamızda, gebelik döneminde akut Covid-19 geçiren vakadan, ikiz doğum sonrası alınan plasenta örneklerinin, histopatolojik ve immunohistokimyasal (VEGF primer antikoru) yöntemlerle incelenmesi amaçlanmıştır.

MATERYAL VE METOT

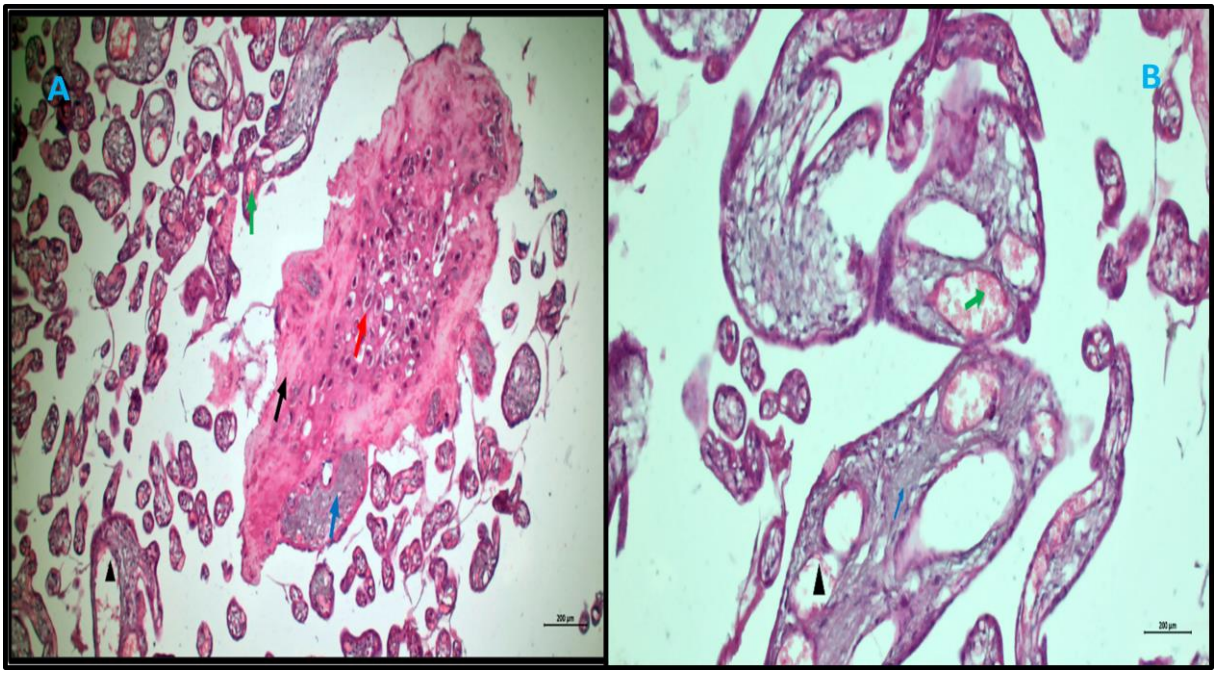
Doğum esnasında Covid-19 PCR testi pozitif olan ve ikiz doğum gerçekleştirmiş bir gebenin plasentası alınarak ve rutin histopatolojik takipten geçirilerek sıvı parafine gömüldü ve oda ısısında korunarak katılaşması sağlandı. Ardından mikrotom yardımıyla 5 µm kalınlığında kesitler alınan doku örnekleri boyama işlemine hazır hale getirildikten sonra Hematoksilen & Eozin (H&E) ile boyandı.

Rutin histolojik takip işlemi uygulanan plasenta örneklerinden mikrotom ile alınan 5 µm kalınlığındaki kesitlerde, VEGF antikor boyamaları protokol yöntemlerine uyularak uygulandı ve işlem sonunda kesitler kapatılarak oda ısısında kurumaya bırakıldı. Yapılan rutin histolojik takip ve immünohistokimyasal boyamalardan sonra elde edilen kesitler, ışık mikroskobu altında incelenerek değerlendirmeleri yapıldı.

BULGULAR

Histopatolojik Bulgular

Hematoksilen Eozin boyası uygulanmış olan plasenta kesitlerinde yapılan değerlendirmenin sonucunda, koryonik villus dejenerasyonu, fibrinoid depozisyonda artış, sinsityal düğümlerde artış ve vasküler dilatasyonla birlikte konjesyon geliştiği gözlendi (Şekil 1A ve 1B).

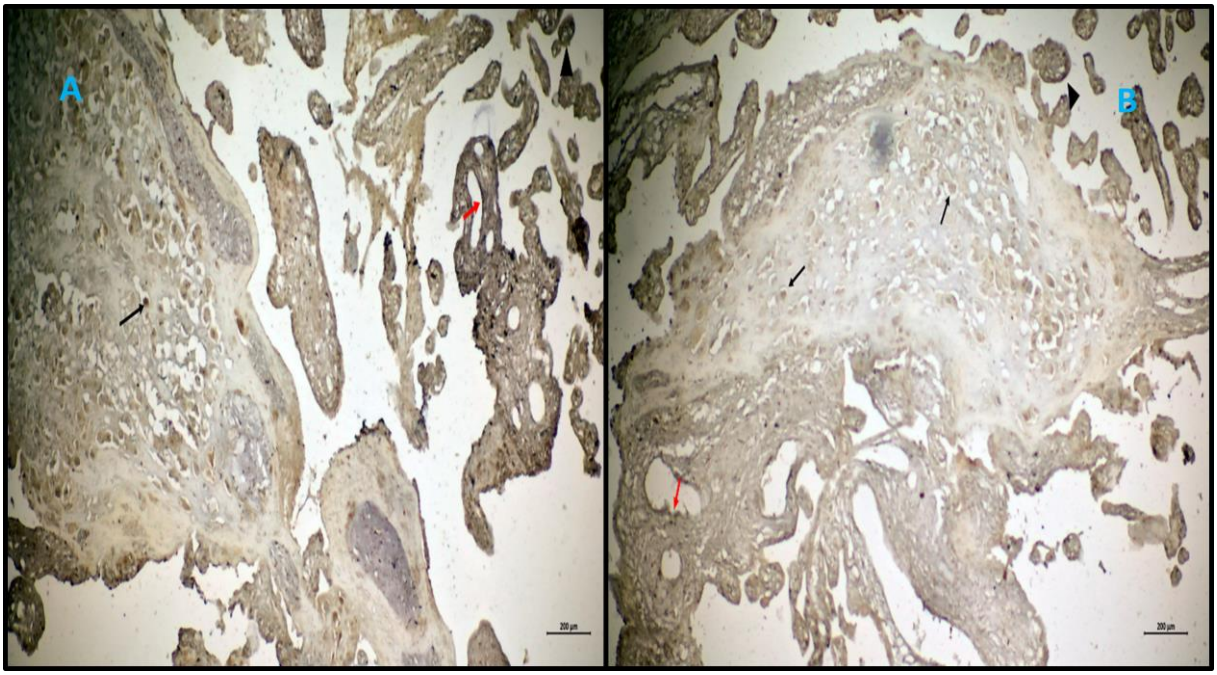


Şekil 1. Plasentaya ait kesitlerde Hematoksilen Eozin ile boyanma

İmmünohistokimyasal Bulgular

Plasentanın VEGF antikoru ile immünohistokimyasal değerlendirme sonucunda, özellikle

maternal plağın bulunduğu yerlerde desidual hücrelerin nukleus çaplarında küçülme ile birlikte yoğun bir şekilde VEGF ekspresyonunun pozitif olduğu görüldü. Ayrıca dilate damarların endotel hücrelerinde ve koryonik villuslarda yoğun VEGF ekspresyonu ile sinsityal alanlarda pozitif VEGF ekspresyonu olduğu tespit edildi (Şekil 2A ve 2B).



Şekil 2. Plasentaya ait kesitlerde VEGF'in immunohistokimyasal boyanması

TARTIŞMA

Plasenta, gebelik dönemi boyunca anne ile fetüsün iletişimini sağlayan ve fetüsün gelişimi için son derece elzem olan birçok maddenin anneden fetüse geçişini sağlayan çok özel bir organdır. Plasenta fetal gelişim esnasında lazım olan gerek biyokimyasal gerekse de immünolojik elementlerin dengeli olmasını sağlar. Bununla birlikte fetüsün birçok enfeksiyondan korunması için de son derece kritik bir öneme sahiptir (15).

ACE2 ile birlikte TMPRSS2, SARS-COV-2'nin hücre içine girebilmesi için çok önemli bir role sahiptir. Bunun yanında ACE2 ve TMPRSS2'nin plasentanın gelişimi esnasında beraber eksprese edildikleri bilinmektedir. Bu durum doğal olarak plasentayı söz konusu virüs için bir hedef haline getirir. Yapılan pek çok çalışmada bu virüsün plasentada çeşitli histopatolojik değişikliklere neden olduğu ortaya konulmuştur. Bununla birlikte virüsün vertikal geçişi tam anlamıyla netleştirilememiştir. Net olamamakla birlikte ortaya konan veriler bahse konu virüsün fetüs üzerinde dolaylı olarak çeşitli etkiler gösterebileceğini ortaya koymaktadır (16). Çalışmamızda, literatürle uyumlu olarak plasentada koryonik villus dejenerasyonu, fibrinoid depozisyonda ve sinsityal düğümlerde artış, plasentadaki damar yapılarında dilatasyon ve konjesyon görüldü.

VEGF'in embriyogenez, iskelet büyümesi ve üreme fonksiyonları esnasında fizyolojik anjiyogenez için anahtar düzenleyici olduğu bilinmektedir. Bununla birlikte VEGF'in çeşitli tümörler, intraoküler neovasküler bozukluklar ile patolojik anjiyogenezle ilişkili olduğu ortaya konulmuştur (17). Plasentanın doğal bir şekilde gelişmesi ve işlevini yerine getirebilmesi için, trofoblastların maternal desiduayı istila etmesi, akabinde çok miktarda ve organize bir şekilde vasküler büyümenin olmasını gerektirmektedir. VEGF ailesi VEGF-A, VEGF-B ve VEGF-C gibi vasküler endotelyal büyüme faktörlerini içermektedir. Buna karşılık VEGF ailesinin ne denli önemli olduğu ve işlevlerinin tam olarak neler olduğu hakkında yeterince bilgi

bulunmamaktadır (18).

Preeklamptik gebelerin plasentaları üzerinde yapılan araştırmaların neticesinde söz konusu gebelerin plasentalarında kontrol gruplarına oranla VEGF ekspresyonunun yüksek olduğu tespit edilmiştir (19). Çalışmamızda, özellikle maternal plağın bulunduğu yerlerde desidual hücrelerin nukleus çaplarında küçülme ile birlikte yoğun bir şekilde VEGF ekspresyonunun pozitif olduğu görüldü. Genişlemiş damarların endotel hücrelerinde ve koryonik villuslarda yoğun VEGF ekspresyonu ile sinsityal alanlarda VEGF pozitif reaksiyonu olduğu tespit edildi. Nitekim Covid-19'lu plasentalarda vasküler anormalliklere yol açtığını gösterdiğimiz çalışmamızda, histopatolojik bulgulara destekleyici olarak, VEGF primer antikorunun da yüksek seviyede eksprese olması önemlidir. Buna göre Covid-19'lu gebelerde, plasentadaki vasküler hasarın gösterilmesinde, VEGF ekspresyon seviyeleri marker olarak kullanılabilir.

SONUÇ

Her ne kadar bir solunum yolu enfeksiyonu olarak geçse de Covid-19 hastalığı birçok sistemi ve organı etkileme ve patolojik durumların gelişmesine neden olabilmektedir. Yapmış olduğumuz çalışmanın neticesinde Covid-19 hastalığının birçok organda olduğu gibi plasentada da histopatolojik değişikliklere neden olduğunu ortaya koymuştur. Bunun yanında VEGF ekspresyonunun, preeklamptik vakalarda olduğu gibi, bu vakada da artmış olması, plasenta ve fetüs üzerinde patolojik durumların gelişebileceğini ve bu durumun da fetüs kaybı dahil bir çok soruna neden olabileceğini düşündürmektedir.

KAYNAKÇA

1. Wang C, Horby PW, Hayden FG, et al. A novel coronavirus outbreak of global health concern. Lancet. 2020; 395(10223): 470–473.

2. Nishiura J, Linton K, Yang H, et al. The extent of transmission of novel coronavirus in Wuhan, China, 2020. JCM. 2020; 9(2): 330.

3. Mahase E. China coronavirus: WHO declares international emergency as death toll exceeds 200. BMJ. 2020;368:m408

4. Chen N, Zhou M, Dong X, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet. 2020; 395(10223): 507–513.

5. Schwartz DA, Dhaliwal A. Infections in pregnancy with COVID-19 and other respiratory RNA virus diseases are rarely, if ever, transmitted to the fetus: Experiences with coronaviruses, parainfluenza, metapneumovirus respiratory syncytial virus, and influenza. Arch Pathol Lab Med. 2020; 144(8): 920– 928. doi: 10.5858/arpa.2020-0211-SA.

6. Schwartz DA. An analysis of 38 pregnant women with COVID-19, their newborn infants, and maternalfetal transmission of SARS-CoV-2: Maternal coronavirus infections and pregnancy outcomes. Arch Pathol Lab Med. 200; 144(7): 799–805.

7. World Health Organization. Tracking SARS-CoV-2 variants. December 6, 2021.

8. Zaigham M, Andersson O. Maternal and perinatal outcomes with COVID-19: A systematic review of 108 pregnancies. Acta Obstet Gynecol Scand. 2020; 99(7): 823-829. doi:10.1111/aogs.13867

9. Schwartz, D. A., Avvad-Portari, E., Babál, P., Baldewijns, M., Blomberg, M., Bouachba, A., & Zaigham, M. (2022). Placental tissue destruction and insufficiency from COVID-19 causes stillbirth and neonatal death from hypoxic-ischemic injury: a study of 68 cases with SARS-CoV-2 placentitis from 12 countries. Archives of pathology & laboratory medicine.

10. Castro, P., Palomo, M., Moreno-Castaño, A. B., Fernández, S., Torramadé-Moix, S., Pascual, G., & Diaz-Ricart, M. (2021). Is the endothelium the missing link in the pathophysiology and treatment of COVID-19 complications? Cardiovascular drugs and therapy, 1-14.
11. Neufeld, G., Cohen, T., Gengrinovitch, S., & Poltorak, Z. (1999). Vascular endothelial growth factor (VEGF) and its receptors. The FASEB journal, 13(1), 9-22.
12. Carmeliet, P., Ferreira, V., Breier, G., Pollefeyt, S., Kieckens, L., Gertsenstein, M., & Nagy, A. (1996). Abnormal blood vessel development and lethality in embryos lacking a single VEGF allele. Nature, 380(6573), 435-439.
13. Jackson, M. R., Carney, E. W., Lye, S. J., & Ritchie, J. K. (1994). Localization of two angiogenic growth factors (PDECGF and VEGF) in human placentae throughout gestation. Placenta, 15(4), 341-353.
14. Akercan, F., Cirpan, T., Terek, M. C., Ozcakir, H. T., Giray, G., Sagol, S., & Karadadas, N. (2008). The immunohistochemical evaluation of VEGF in placenta biopsies of pregnancies complicated by preeclampsia. Archives of gynecology and obstetrics, 277(2), 109-114.
15. Ashary N, Bhide A, Chakraborty P, et al. Single-cell RNA-seq identifies cell subsets in human placenta that highly expresses factors driving pathogenesis of SARS-CoV-2. Front Cell Dev Biol. 2020; 8: 783.
16. Seymen, C. M. (2021). Being pregnant in the COVID-19 pandemic: Effects on the placenta in all aspects. Journal of Medical Virology, 93(5), 2769-2773.
17. Vuorela, P., Hatva, E., Lymboussaki, A., Kaipainen, A., Joukov, V., Persico, M. G., & Halmesmäki, E. (1997). Expression of vascular endothelial growth factor and placenta growth factor in human placenta. Biology of reproduction, 56(2), 489-494.
18. Sgambati, E., Marini, M., Zappoli Thyrion, G. D., Parretti, E., Mello, G., Orlando, C., & Brizzi, E. (2004). VEGF expression in the placenta from pregnancies complicated by hypertensive disorders. BJOG: An International Journal of Obstetrics & Gynaecology, 111(6), 564-570.
19. Ferrara, N., Gerber, H. P., & LeCouter, J. (2003). The biology of VEGF and its receptors. Nature medicine, 9(6), 669-676.

UPREGULATION OF BRCA1 AND PPIP5K2 GENES AND PLATINUM DRUG RESISTANCE IN BOTH MILD AND SEVERE COVID-19 PATIENTS

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ABSTRACT

Introduction: Covid-19 infection can lead to severe symptoms and diseases such as common cold, bronchiolitis, life-threatening pneumonitis, and pneumonia. Beside its well-known life-threatening affects, it can also trigger carcinogenesis and worsen the anti-cancer treatment processes. The aim of the study is to investigate the common and most robust upregulated genes in both mild and severe Covid-19 patients and to identify related biological processes and pathways which may be affected upon Covid-19 infection.

Materials and Methods: Data of five mild- and five severe-Covid-19 patients and five healthy individuals were included. The data of these patients were obtained from the GEO database (GSE164805) from GPL26963 platform (Agilent-085982 Arraystar human lncRNA V5 microarray). T-tests were used for statistical analysis to examine the statistical differences between healthy and Covid-19 patient groups in the intensity of each 60.797 genes. $p<0.001$ is accepted as a significance level.

Results: Mean age of the patients is 56.4 ± 7.54 years. In addition to 5 healthy individuals (33%), totally 10 Covid-19 patients (67%) are included in this study. Out of Covid-19 patients, 5 of them have mild Covid-19 infection however 5 patients have severe Covid-19 infection. Totally there are 13 male (87%) Covid-19 patients and healthy individuals. Upon gene screening of 60.797 gene for each patient, 3152 common genes of both mild and severe Covid-19 patients are identified. However, according to Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway analysis, only tumour-suppressor gene BRCA1 and inositol pyrophosphate kinase gene (PPIP5K2) genes are upregulated in both mild- and severe- Covid-19 patients and these genes are related to biological processes such as platinum drug resistance pathway and phosphatidylinositol signalling pathway, respectively.

Conclusion: The history of the Covid-19 pandemic is more recent and long-term effects of Covid-19 infection has not yet been clarified especially on cancers. According to our results, platinum drug resistance is triggered via Covid-19 infection in both mild- and severe- Covid-19 patients which is associated with the upregulation of BRCA1 and PPIP5K2 gene. Overexpression of BRCA1 and PPIP5K2 genes are related to not only breast and ovarian cancers but also certain cancer types such as pancreas, stomach, colorectal and prostate cancers. However, these results should be validated with in vitro and in vivo studies.

Keywords: Covid-19, platinum-drug resistance, BRCA1, PPIP5K2, upregulation, cancer

INTRODUCTION

Mankind has faced various pandemics over the years throughout the world and severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) disease (named as Covid-19 disease) has been the fifth one since 1918 Spanish flu (H1N1 Influenza A Virus) pandemic. Similarly, Severe Acute Respiratory Syndrome (SARS-CoV) and Middle East Respiratory Syndrome (MERS-CoV) have been experienced before Covid-19 syndrome arise. Compared to other

pandemics, which was first observed in December 2019 at Wuhan province of China, Covid-19 is a global threat with high mortality rate, and it has been more severe effects on human health, and it has affected larger populations of people from every country in the world (Yen-Chin Liu et al., 2020). According to WHO data, totally 494,587,638 confirmed cases have been recoded until 9 April 2022. Among these cases, there have been reported 6,170,283 deaths (https://covid19.who.int/) (Accessed 9 April 2022).

Covid-19 is a highly infectious and contagious respiratory disease may lead to severe symptoms and diseases such as common cold, bronchiolitis, life-threatening pneumonitis and pneumonia, and its transmission occurs from human to human via direct contact through air droplets (Saira Baloch et al., 2020) (Nikhil Kirtipal et al. 2020).

As SARS-CoV-2 is a non-retroviral ssRNA virus, it can persist in the host for a long term which can cause effects on many diseases, including cancer (Miguel Alpalhao et al. 2020) (Randall Re et al. 2017).

For instance, it has been shown that coronavirus can suppress the tumour suppressor proteins such as p53 and pRb which are commonly shown as mutated in cancer cells such as breast and pancreas cancers (Bhardwaj K et al. 2012) (Ma-Lauer et al., 2016) (Liz J Hernández Borrero et al. 2021) (Shunsuke Kitajima et al. 2020). Furthermore, SARS–CoV–2 infection can delay the acquired immune system response via lowering the level of lymphocytes and inhibiting the DNA repair mechanisms. According to *in vitro* studies, Hui Jiang et al. have shown that e SARS–CoV–2 spike protein can prevent the DNA repair proteins such as tumour suppressor gene Breast Cancer Susceptibility Gene 1 (BRCA1) which binds to tumour suppressor protein p53 (Hui Jiang et al. 2021) (Quin C et al. 2020).

The number of publications showing the effect of Covid-19 infection on carcinogenesis and cancer progression is quite limited. Therefore, we aim to investigate the common and most robust upregulated genes in both mild and severe Covid-19 patients and to identify related biological processes and pathways which may be affected upon Covid-19 infection.

METHODS

Acquisition of Dataset

Gene expression profiles of microarray data for COVID-19 (GSE164805) were obtained from Gene Expression Omnibus (GEO) database (https://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSE164805). Samples from GSE164805 dataset (GPL26963 (Agilent-085982 Arraystar human lncRNA V5 microarray) platform) were composed of five healthy people, five mild Covid-19 patients, and five severe Covid-19 patients.

Identification of Common Genes in Both Severe and Mild Covid-19 Patients

Initially, patients are grouped into three classes; healthy individuals, patients had mild Covid-19 and patients had severe Covid-19. Then, t tests are applied for each 60,797 genes to test the statistical significance between healthy group and the patients that had experienced Covid-19 infection. In addition, 2 more t tests are applied which examines the same context between healthy group-mild Covid-19 cases and healthy group-severe Covid-19 cases. Totally 3152 genes appear as an outcome and significant in all three tests. Group means for significant genes are compared to understand whether the gene is upregulated or downregulated with respect to healthy individuals.

Bioinformatics and Evolutionary Genomics (http://bioinformatics.psb.ugent.be/webtools/Venn/) web tool was used to construct Venn

diagram for determining the common upregulated genes in both mild and severe Covid-19 patients.

Enrichment Analysis of Common Genes in Both Mild and Sever Covid-19 Patients

Gene set enrichment analysis process was performed to determine the main affected biological pathways as well as common upregulated genes in both mild and severe Covid-19 patients. For this reason, ShinyGO v0.741: Gene Ontology Enrichment Analysis was performed (http://bioinformatics.sdstate.edu/go74/). ShinyGO v0.741 is a web-based gene enrichment analysis platform and KEGG database was selected to define the molecular interaction and relation networks of common upregulated genes in both mild and severe Covid-19 patients.

Statistical Analysis

T-tests were used for statistical analysis to examine the statistical differences between healthy and Covid-19 patient groups in the intensity of each 60.797 genes. P<0.001 is accepted as a significance level.

The statistical details of the applied tests are as follows:

$Ho: GI_{healthy} = GI_{Covid-19}$

$Ha: GI_{healthy} \leq$ or $\geq GI_{Covid-19}$

The null hypothesis states that gene intensity (GI) is equal across health and Covid-19 group. Alternative hypothesis indicates the statistically significant difference in gene intensities between the two groups (healthy and Covid-19) In the additional two t tests, Covid-19 groups are defined as mild Covid-19 and severe Covid-19. Corresponding p values are reported along with means of gene intensities for different groups.

Ethics Committee Approval

Ethics committee approval was not necessary in this study because publicly open information from the Gene Expression Omnibus (GEO) database was used.

RESULTS

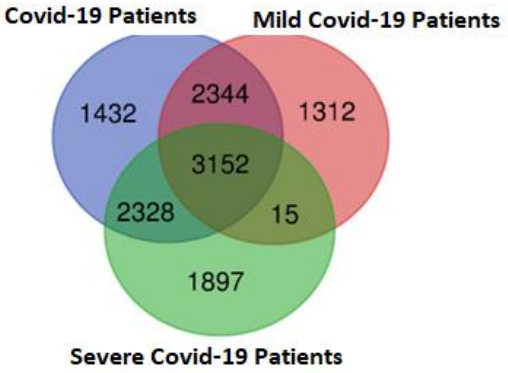
The characteristics of Covid-19 patients and healthy individuals are detailed in Table 1. In addition to 5 healthy individuals (33%), totally 10 Covid-19 patients (67%) are included in this study. Out of Covid-19 patients, 5 of them have mild Covid-19 infection however 5 patients have severe Covid-19 infection. The median age of the both Covid-19 patients and healthy individuals is 56.4 ± 7.54 and there are 13 male (87%).

Table-1: Demographic Data of Covid-19 Patients

	Number of patients/healthy individuals (% of patients)
Healthy Individuals	5 (33 %)
Patients with covid	10 (67%)
Patients with mild covid	5 (33 %)
Patients with severe covid	5 (33 %)
Male	13 (87 %)
Female	2 (13 %)
Age	Mean: 56.4 (SD: 7.54)

As a result of t-test analysis, totally 60.797 genes are screened, and we have shown that there are 3152 common genes of both mild and severe Covid-19 patients (Figure 1).

Figure-1: Common Genes in Both Mild and Severe Covid-19 Patients



By using 3152 common genes of both mild and severe Covid-19 patients, we have performed gene ontology enrichment analysis by using ShinyGO v0.741: Gene Ontology Enrichment Analysis platform. According to Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway analysis, only BRCA1 and PPIP5K2 genes are found to be related to biological processes. In case of BRCA1 gene, platinum drug resistance pathway is pointed out. On the other hand, Phosphatidylinositol signalling pathway was related to PPIP5K2 gene (Table-2, Table 3a and Table 3b) (Figure-2). In addition to these pathways, related biological processes such as homologous recombination, ubiquitin mediated proteolysis, breast cancer, microRNAs in cancer are also related to common genes of Covid-19 patients.

Figure-2: KEGG Pathway Analysis

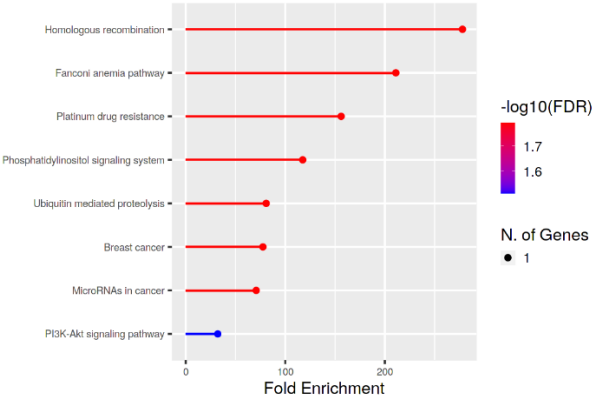


Table-2: BRCA1 and PPIP5K2 genes and related pathways due to Covid-19 infection

Enrichment FDR	nGenes	Pathway Genes	Fold Enrichment	Pathway	Genes
0.016086528	1	73	156.1369863	Platinum drug resistance	BRCA1
0.016086528	1	97	117.5051546	Phosphatidylinositol signalling system	PPIP5K2

Table-3a: BRCA1 gene may significantly related to Covid-19 infection in both severe and mild patients

Gene ID: BRCA1 (A_23_P207400)	Mean (Healthy Group)	Mean (Covid)	T-Test (P-value)-Inequal Variance Assumed	T-Test (P-value)-Equal Variance Assumed
All patients	6.09983542	7.59679018	1.72217E-05	2.7485E-06
Patients with mild covid	6.09983542	7.57494388	0.000467769	0.000314819

Patients with severe covid	6.09983542	7.61863648	3.80581E-05	2.96775E-05

Table-3b: PPIP5K2 gene may significantly related to Covid-19 infection in both severe and mild patients

Gene ID: PPIP5K2 (A_23_P213661)	Mean (Healthy Group)	Mean (Covid)	T-Test (P-value)-Inequal Variance Assumed	T-Test (P-value)-Equal Variance Assumed
All patients	9.4629745	10.7346445	3.56314E-06	1.01167E-05
Patients with mild covid	9.4629745	10.895597	0.00028186	0.000111798
Patients with severe covid	9.4629745	10.573692	0.000146882	0.000125185

DISCUSSION

Covid-19 infection is a global threat with high mortality rate and the history of the Covid-19 pandemic is more recent. Therefore, long-term effects of Covid-19 has not yet been clarified especially on cancers. In addition to life threatening diseases such as common cold, bronchiolitis, life-threatening pneumonitis, and pneumonia, Francescangeli et al. have hypothesized that Covid-19 dependent activation of several factors (innate immune cells activation and uncontrolled production of pro-inflammatory cytokines) may provide the favourable tumour microenvironment which can lead to tumorigenesis and metastatic relapse (Francescangeli et al. 2020). Even though possible contributions of coronavirus to carcinogenesis mechanisms and treatment processes have been shown, there have been limited number of studies explaining the exact and direct effects of the virus on specific cancer mechanisms. So far, there has not been any study which indicates the effects of Covid-19 infection on BRCA1 and PPIP5K2 expression patterns and related platinum-drug resistance mechanism. Therefore, we aim to determine the overexpressed genes in both mild and severe Covid-19 patients to identify the common and most robust gene patterns and related mechanisms particularly in cancers. To achieve this goal, we have screened 60.797 gene for each patient and healthy individual and 3152 common genes of both mild and severe Covid-19 patients have been identified (Figure 1). According to KEGG pathway analysis, only tumour-suppressor gene BRCA1 and inositol pyrophosphate kinase gene (PPIP5K2) genes are determined as upregulated in both mild- and severe- Covid-19 patients (Table 3) and these genes are related to biological processes such as platinum drug resistance pathway and phosphatidylinositol signalling pathway, respectively (Table 2, Figure 2).

BRCA1 gene involves in various processes such as DNA repair, transcription, and cell cycle checkpoint control (Venkitaraman 2002). As a well-known tumour-suppressor gene, it has been indicated that BRCA1 inherited germ-line mutations can lead to a predisposition of breast and ovarian cancers (Y Miki et al. 1994). Besides germ-line mutations of BRCA1 gene involvement in carcinogenesis, high expression of BRCA1 gene may trigger the early distant metastasis in estrogen-positive (ER+) breast cancer (Chang et al. 2022). In our study, only 3% of both mild- and severe- Covid-19 patients are female (Table 1) and the BRCA1 gene overexpression may be important in terms of breast and ovarian cancer predisposition upon Covid-19 infection.

While breast and ovarian cancers are the cancer types in which BRCA1 mutations are observed most, there are publications showing that BRCA1 mutations are associated with the

carcinogenesis process in prostate, stomach, colorectal, and pancreatic cancers (Cavanagh et al. 2015) (Sopik et al. 2015). Similarly, it has been shown that non-small cell lung cancer patients with high BRCA1 gene expressions have shorter overall survival rates compared to ones with less low BRCA1 gene expression (Sadraei et al. 2018). Most of our (87%) of Covid-19 patients is male (Table 1) and according to our results, it is possible that Covid-19 infection in these male patients may cause genetic changes (BRCA1 overexpression) that may play a role in susceptibility to many cancers.

BRCA1 mutations and overexpression does not only lead to differences in tumour development and metastatic processes, but it can affect the anti-cancer treatment processes. For instance, Quinn et al have been shown that both BRCA1 overexpression and secondary mutations of BRCA1 are associated with platinum drug resistance in ovarian cancer patients (Quinn et al. 2007) (Dhillon et al. 2011). In our study, we have further indicated that BRCA1 upregulation is linked to platinum-drug resistance according to KEGG pathway analysis results (Figure 2, Table 2, Table 3a).

Platinum-based anticancer drugs such as cisplatin, carboplatin, oxaliplatin, nedaplatin, and lobaplatin are the most used agents to cure various cancers. However, some patients develop drug resistance against these agents which can lead to dramatic outcomes and poor cancer prognosis. In addition to effects of BRCA mutations on anticancer drug resistance (Quinn et al. 2007) (Dhillon et al. 2011), it has also been shown that phosphatidylinositol 3-kinase (PI3K) cascades also induce the platinum-drug resistance (Ohmichi et al. 2005). In our study, we have indicated that PPIP5K2 gene upregulation is related to phosphatidylinositol signalling process according to KEGG pathway analysis (Figure 2, Table 2).

Like BRCA1 upregulation, the high expression of Diphosphoinositol Pentakisphosphate Kinase 2 (PPIP5K2), inositol pyrophosphate kinase, gene has been related to poor prognosis of cancers such as colorectal cancers (Chen-Hui Cao et al. 2021). In our study, PPIP5K2 gene has been detected as upregulated in only and both mild- and severe- Covid-19 patients (Table 2, Table 3b). The upregulation of PPIP5K2 gene may be an indicator and prognosis marker not only for colorectal cancers but also in other types of cancers. This important point should be further investigated.

There are some limitations of this study. Covid-19 and patient data at the genetic level have not reached high numbers since the disease has yet to find a new place in the literature. The number of patients in our study can be considered as a limitation. In addition, despite the small number of patients, high number of genes (60.797 genes) were examined for each patient. Therefore, we can claim that the results are robust statistically.

CONCLUSION

According to our results, platinum drug resistance is triggered via Covid-19 infection in both mild- and severe- Covid-19 patients which is associated with the upregulation of BRCA1 and PPIP5K2 gene. Overexpression of BRCA1 and PPIP5K2 genes are related to not only breast and ovarian cancers but also certain cancer types such as pancreas, stomach, colorectal and prostate cancers. However, these results should be validated with high number of patient data and *in vitro* and *in vivo* studies.

REFERENCES

Ashok R. Venkitaraman. Cancer Susceptibility Review and the Functions of BRCA1 and BRCA2. (2002) Cell, Vol. 108, 171–182. https://doi.org/10.1016/S0092-8674(02)00615-3

Bhardwaj K, Liu P, Leibowitz JL, Kao CC. (2012) The coronavirus endoribonuclease Nsp15 interacts with retinoblastoma tumor suppressor protein. J Virol 86:4294–304. https://doi.org/10.1128/jvi.07012-11.

Chen-Hui Cao, Han Ling, Kai Han, Xiao-Peng Lu, Mu-Yan Cai, Jing-Hua Cao, Jie Zhou, Zhi-Cheng Xiang, Jie-Wei Chen, Si Li, Jin-Long Lin, Jin-Ling Duan, Jie Luo, Yu-Jing Fang, Zhi-Zhong Pan, Li Liang, Feng Wang, Dan Xie, Feng-Wei Wang. (2021) PPIP5K2 promotes colorectal carcinoma pathogenesis through facilitating DNA homologous recombination repair. Oncogene 40(49):6680-6691. doi: 10.1038/s41388-021-02052-5

Federica Francescangeli, Maria Laura De Angelis, Marta Baiocchi, Rachele Rossi, Mauro Biffoni and Ann Zeuner. (2020) Covid-19 Induced Modifications in tumor Microenvironment: Do They Affect Cancer Reweakening and Metastatic Relapse? Front. Oncol. 10:592891.doi: 10.3389/fonc.2020.592891

Helen Cavanagh, Katherine M A Rogers. (2015) The role of BRCA1 and BRCA2 mutations in prostate, pancreatic and stomach cancers. Hered Cancer Clin Pract. Aug 1;13(1):16. doi: 10.1186/s13053-015-0038-x. eCollection 2015.

Hui Jiang and Ya-Fang Mei. (2021) SARS–CoV–2 Spike Impairs DNA Damage Repair and Inhibits V(D)J Recombination In Vitro. Viruses. 13, 2056. https://doi.org/10.3390/v13102056

Hui-Ju Chang, Ueng-Cheng Yang, Mei-Yu Lai, Chen-Hsin Chen & Yang-Cheng Fann. (2022) High BRCA1 gene expression increases the risk of early distant metastasis in -ER+ breast cancers. Scientific Reports 12:77. https://doi.org/10.1038/s41598-021-03471-w

Jennifer E. Quinn; Colin R. James; Gail E. Stewart; Jude M. Mulligan; Patricia White; Gary K.F. Chang; Paul B. Mullan; Patrick G. Johnston; Richard H. Wilson; D. Paul Harkin. (2007) BRCA1 mRNA Expression Levels Predict for Overall Survival in Ovarian Cancer after Chemotherapy Clin Cancer Res (2007) 13 (24): 7413–7420. https://doi.org/10.1158/1078-0432.CCR-07-1083

Kiranjit K. Dhillon, Elizabeth M. Swisher, and Toshiyasu Taniguchi. (2011) Secondary mutations of BRCA1/2 and drug resistance. Cancer Sci. 102(4): 663–669. doi:10.1111/j.1349-7006.2010.01840.x.

Liz J Hernández Borrero, Wafik S El-Deiry. (2021) Tumor suppressor p53: Biology, signaling pathways, and therapeutic targeting. Biochim Biophys Acta Rev Cancer. Aug;1876(1):188556. doi: 10.1016/j.bbcan.2021.188556. Epub 2021 Apr 29.

Ma-Lauer Y, Carbajo-Lozoya J, Hein MY, Müller MA, Deng W, Lei J, et al. (2016) P53 downregulates SARS coronavirus replication and is targeted by the SARS-unique domain and PLpro via E3 ubiquitin ligase RCHY1. Proc Natl Acad Sci 113:E5192–201. https://doi.org/10.1073/pnas.1603435113.

Masahide Ohmichi, Jun Hayakawa, Keiichi Tasaka, Hirohisa Kurachi, Yuji Murata. (2005) Mechanisms of platinum drug resistance. Trends Pharmacol Sci. 2005 Mar;26(3):113-6. doi: 10.1016/j.tips.2005.01.002.

Miguel Alpalhaoa, João Augusto Ferreira, Paulo Filipe. (2020) Persistent SARS-CoV-2 infection and the risk for cancer. Medical Hypothesis. 143 109882. https://doi.org/10.1016/j.mehy.2020.109882

Nikhil Kirtipala, Shiv Bharadwajb, Sang Gu Kangb. (2020) From SARS to SARS-CoV-2, insights on structure, pathogenicity and immunity aspects of pandemic human coronaviruses. Infection, Genetics and Evolution 85 104502 https://doi.org/10.1016/j.meegid.2020.104502

Nooshin Hashemi Sadraei, Yan Feng, Lingling Du, Pingfu Fu, Sulsal Haque, Afshin Dowlati, Jahnavi Gollamudi, Nathan A. Pennell, Tarek Mekhail, Stefanie Avril, Carol Farver, Stanton

L. Gerson, Neelesh Sharmab. (2018) High UDG and BRCA1 expression is associated with adverse outcome in patients with pemetrexed treated non-small cell lung cancer. Lung Cancer. 126:48-54. doi: 10.1016/j.lungcan.2018.08.011.
Qin, C.; Zhou, L.; Hu, Z.; Zhang, S.; Yang, S.; Tao, Y.; Xie, C.; Ma, K.; Shang, K.; Wang, W.; et al. (2020) Dysregulation of Immune Response in Patients With Coronavirus 2019 (COVID-19) in Wuhan, China. Clin. Infect. Dis. 71, 762–768.
Randall RE, Griffin DE. (2017) Within host RNA virus persistence: mechanisms and consequences. Curr Opin Virol 23:35–42. https://doi.org/10.1016/j.coviro.2017. 03.001.
Saira Baloch, Mohsin Ali Baloch, Tianli Zheng and Xiaofang Pei. (2020) The Coronavirus Disease 2019 (COVID-19) Pandemic. Tohoku J. Exp. Med., April, 250 (4), 271-278. doi: 10.1620/tjem.250.271
Shunsuke Kitajima, Fengkai Li, Chiaki Takahashi. (2020) Tumor Milieu Controlled by RB Tumor Suppressor. Int J Mol Sci Apr 1;21(7):2450. doi: 10.3390/ijms21072450.
V Sopik, C Phelan, C Cybulski, S A Narod. (2015) BRCA1 and BRCA2 mutations and the risk for colorectal cancer. Clin Genet. May;87(5):411-8. doi: 10.1111/cge.12497.
World Health Organisation (WHO) Timeline COVID-19 https://covid19.who.int/ (Accessed 9 April 2022).
Yen-Chin Liu, Rei-Lin Kuo, Shin-Ru Shih. (2020) COVID-19: The first documented coronavirus pandemic in history. Biomedical Journal 43 328-333. https://doi.org/10.1016/j.bj.2020.04.007
Y Miki, J Swensen, D Shattuck-Eidens, P A Futreal, K Harshman, S Tavtigian, Q Liu, C Cochran, L M Bennett, W Ding. (1994) A strong candidate for the breast and ovarian cancer susceptibility gene BRCA1. Science Oct 7;266(5182):66-71. doi: 10.1126/science.7545954.

ANTI-CANCER NATURAL COMPOUNDS AND THEIR MOLECULAR TARGETS ON TRANSCRIPTION FACTORS, EPIGENETIC MODIFICATIONS AND CANCER STEM CELLS

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ABSTRACT

Cancer is the second leading cause of mortality all around the world. Despite fast advancements in diagnostic technologies and cancer treatment, the primary barriers to effective treatment are metastasis and medication resistance. At this point, the primary issue should be the research and application of effective therapeutic techniques to improve the possibility of positive treatment response and overall life expectancy of patients. The aim of this study is to examine the current evidence in the literature regarding the molecular targets of natural compounds with anti-cancer properties. A structured and comprehensive literature search was conducted in published articles using the keywords curcumin, lycopene, natural anti-cancer agents, molecular target, quercetin, resveratrol, and cancer and natural compounds in PubMed/Medline, EMBASE and Scopus databases. Deregulation of multiple pathways is observed in many types of cancer. Disturbances in cellular metabolism, cell cycle, apoptosis, angiogenesis, or epigenetic alterations are all examples of this process. Furthermore, signals from the microenvironment can play an important role in tumor development. Interestingly, a number of chemical agents derived from natural sources seem to be very attractive alternatives to synthetic compounds. They can have anti-cancer properties similar to chemotherapy, but with less side effects. Natural substances found in fruits and vegetables, such as polyphenols, flavonoids, stilbenes, carotenoids, and acetogenins, have been shown to be beneficial against cancer cells in in vitro and in vivo research. According to recent research, the effect of natural substances on protein expression is linked to their impact on transcription factors. They may also be involved in changes in cellular response, cell signaling, and epigenetic modifications. Natural components like these can be incorporated in the diet to prevent against cancer. The actions of natural chemicals, particularly their anti-cancer potential, are described in this paper. Furthermore, natural agents' effects on cancer cell metabolism, proliferation, signal transduction, and epigenetic alterations are also highlighted.

Keywords: Curcumin, lycopene, natural anti-cancer agents, quercetin, resveratrol.

CYTOTOXICITY ANALYSIS OF DIFFERENT TREATED PORCINE DERMAL MATRIX: AN IN VITRO STUDY

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ABSTRACT

Aim: The aim of the present study was to compare the direct and indirect cytotoxicity of a porcine dried acellular dermal matrix (PDADM) versus a porcine hydrated acellular dermal matrix (PHADM) in vitro. Both are used for periodontal and peri-implant soft tissue regeneration.

Materials and methods: Two standard direct cytotoxicity tests—namely, the Trypan exclusion method (TEM) and the reagent WST-1 test (4-3-[4-iodophenyl]-2-[4-nitrophenyl]-2H-[5-tetrazolio]-1,3- benzol-desulphonated)—were performed using human primary mesenchymal stem cells (HPMSCs) seeded directly onto a PDADM and PHADM after seven days. Two standard indirect cytotoxicity tests—namely, lactate dehydrogenase (LTT) and MTT (3-[4,5-dimethyl-2-thiazolyl]-2,5-diphenyl- 2H-tetrazoliumbromide)—were performed using HPMSCs cultivated in eluates from the matrices incubated for 0.16 h (10 min), 1 h, and 24 h in a serum-free cell culture medium.

Results: The WST and the TEM tests revealed significantly lower direct cytotoxicity values of HPMSCs on the PHADM compared with the PDADM. The indirect cytotoxicity levels were low for both the PHADM and PDADM, peaking in short-term eluates and decreasing with longer incubation times. However, they were lower for the PHADM with a statistically significant difference ($p < 0.005$).

Conclusions: The results of the current study demonstrated a different biologic behaviour between the PHADM and the PDADM, with the hydrated form showing a lower direct and indirect cytotoxicity.

Keywords: cytotoxicity; cytocompatibility; acellular matrices; porcine dermal matrices; pre-hydrated matrix; dried form matrix.

CHARACTERISTICS OF CANCER STEM CELLS AS THERAPEUTİC TARGETS

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ABSTRACT
Cancer stem cells (CSC) are also known as tumor-initiating cells, side population or cancer-initiating cells. As with normal stem cells, CSCs can differentiate into all cell types, but their capacity for proliferation, self-renewal and differentiation can produce many adverse consequences such as therapeutic resistance, cancer recurrence and metastasis. Overall, multiple CSCs are known to be associated with enhanced tumor proliferation and poor clinical outcomes. Drug resistance has been identified as one of the greatest challenges for cancer therapy, and multi-drug resistance of CSCs is recognized as a major cause of treatment insufficiency. The causes of CSC therapeutic resistance are clinically important and clear identification of its underlying causes has become a research goal. Altered expression of transcription factors, receptors, and signaling pathways for effective treatments against non-stem cancer cells is thought to underlie their escape from CSC. For example, radiotherapy and conventional chemotherapeutics such as gemcitabine, doxorubicin, cisplatin, docetaxel, paclitaxel, and trastuzumab have been shown in many studies to be ineffective against CSCs. These treatments selectively enrich CSC populations, eliminate treatment-responsive non-stem cell cancer cells, and induce differentiation to produce more CSCs. Thus, therapeutic interventions to eradicate CSCs remain a serious target for successful treatment of cancer, especially for cancers that recur after successful treatment. *In vitro* and animal testing have shown positive effects for many of the new treatments currently under investigation, but more research is needed before large-scale clinical trials can be conducted and new treatments can be brought into clinics. Identification of novel molecules that play an important role in the maintenance of CSCs could serve as therapeutic targets. Future studies focusing on effective treatment for cancer, especially targeting biomolecules that can eliminate both differentiated cancer cells and potential populations of CSCs specific to different cancers, may hold promise for cancer therapy.

Keywords: Cancer stem cells, drug resistance, cancer therapy, therapeutic target

ÖZET
Kanser kök hücreleri (CSC), tümör başlatan hücreler, yan popülasyon veya kanser başlatan hücreler olarak da bilinir. Normal kök hücrelerde olduğu gibi, CSC'ler tüm hücre tiplerine farklılaşabilir, ancak çoğalma, kendini yenileme ve farklılaşma kapasiteleri, terapötik direnç, kanser nüksü ve metastaz gibi birçok olumsuz sonuç üretebilir. Genel olarak, çoklu CSC'lerin gelişmiş tümör proliferasyonu ve kötü klinik sonuçlarla ilişkili olduğu bilinmektedir. İlaç direnci, kanser tedavisi için en büyük zorluklardan biri olarak tanımlanmıştır ve CSC'lerin çoklu ilaç direnci, tedavi yetersizliğinin önemli bir nedeni olarak kabul edilmektedir. CSC terapötik direncinin nedenleri klinik olarak önemlidir ve altında yatan nedenlerin net bir şekilde belirlenmesi bir araştırma hedefi haline gelmiştir. Kök dışı kanser hücrelerine karşı etkili tedaviler için transkripsiyon faktörlerinin, reseptörlerin ve sinyal yollarının değiştirilmiş ekspresyonunun, CSC'den kaçışlarının altında yattığı düşünülmektedir. Örneğin, radyoterapi ve

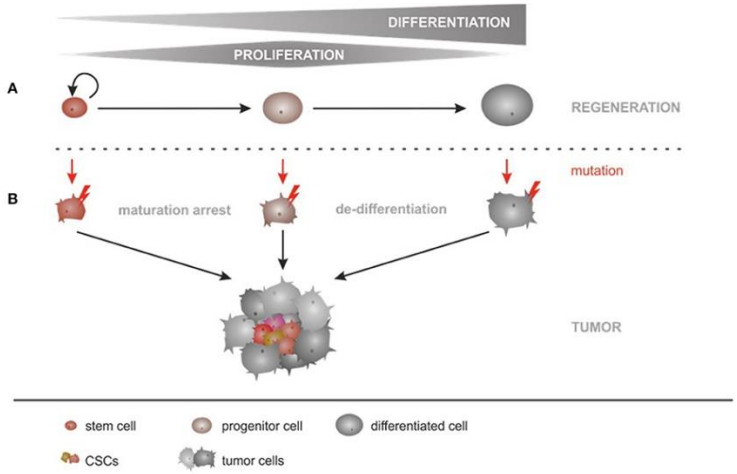
gemsitabin, doksorubisin, sisplatin, docetaxel, paklitaksel ve trastuzumab gibi geleneksel kemoterapötiklerin CSC'lere karşı etkisiz olduğu birçok çalışmada gösterilmiştir. Bu tedaviler, CSC popülasyonlarını seçici olarak zenginleştirir, tedaviye yanıt veren kök hücre olmayan kanser hücrelerini ortadan kaldırır ve daha fazla CSC üretmek için farklılaşmaya neden olur. Bu nedenle, CSC'leri yok etmeye yönelik terapötik müdahaleler, özellikle başarılı tedaviden sonra tekrarlayan kanserler için, kanserin başarılı tedavisi için ciddi bir hedef olmaya devam etmektedir. In vitro ve hayvan testleri, şu anda araştırılmakta olan birçok yeni tedavi için olumlu etkiler göstermiştir, ancak büyük ölçekli klinik deneyler yürütülmeden ve kliniklere yeni tedaviler getirilmeden önce daha fazla araştırmaya ihtiyaç vardır. CSC'lerin korunmasında önemli bir rol oynayan yeni moleküllerin tanımlanması, terapötik hedefler olarak hizmet edebilir. Kanser için etkili tedaviye odaklanan, özellikle hem farklılaşmış kanser hücrelerini hem de farklı kanserlere özgü potansiyel CSC popülasyonlarını ortadan kaldırabilen biyomolekülleri hedefleyen gelecekteki çalışmalar, kanser tedavisi için umut vaat edebilir.

Anahtar Kelimeler: Kanser kök hücreleri, ilaç direnci, kanser tedavisi, terapötik hedef

GİRİŞ

2020 yılında GLOBOCAN araştırmasına göre en yüksek mortaliteye sahip malign neoplazmalar akciğer (1 79 1444 ölüm), kolorektal (935173 ölüm), karaciğer (830180 ölüm), mide (768793 ölüm) ve meme kanserler (684996 ölüm) olarak sıralanmıştır, ayrıca lösemi (311594 ölüm) dahil kan kanserleri de ciddi mortaliteye sahiptir (Sung et al., 2021). Bu kanserlerin tümü, çeşitli kök hücre özelliklerine sahip hücreler içeren heterojen tümörlerdir. 1877'de Virchow'un öğrencisi olan Cohnheim bu hücre popülasyonunu fark etmiş ve bunların embriyonik bir karaktere sahip olduğuna dikkat çekmiştir (Capp, 2019). Bugün, bu hücreler kanser kök hücreleri (CSC'ler) veya tümör başlatan hücreler (TIC'ler) olarak adlandırılmaktadır ve tümör oluşumu ve büyümesinin itici güçleri olarak görülmekte olup genellikle agresif, heterojen ve tedaviye dirençli tümörlerle ilişkilendirilmektedir (Ayob & Ramasamy, 2018; Capp, 2019; Phi et al., 2018; Spillane & Henderson, 2007). Kemo veya radyoterapi gibi terapötik tedavilerin uygulanması üzerine, tümör hücresi alt popülasyonlarının bileşimi değişmektedir (Arnold et al., 2020; Ayob & Ramasamy, 2018). İlk başta, yüksek proliferatif kapasiteye sahip tümör hücreleri hedeflenir ve tükenir sonrasında CSC'ler hayatta kalırken tümör boyutunda bir azalmaya neden olmaktadır (Masahiro Shibata & Mohammad Obaidul Hoque, 2019). Ek olarak, bazı tümör hücreleri yaşlanacak [terapiye bağlı yaşlanma (TIS)] ve daha sonra yaşlanma ile ilişkili salgı fenotipi (SASP) nedeniyle tümör teşvik edici etkilerle tümör mikro-ortamında (TME) bir değişikliğe neden olabilmektedir (Ayob & Ramasamy, 2018; Fan & Schmitt, 2017; Zeng et al., 2018).

Tümör başlangıcı, dönüştürülmüş farklılaşmış hücreler veya dönüştürülmüş dokuda yerleşik kök hücreler tarafından yürütülebilir (Hanahan & Weinberg, 2011) (Şekil 1). Dönüşüm, doku rejenerasyonu sırasında gerçekleşebilir ve ayrıca enfeksiyonlara, toksinlere, radyasyona veya mutasyonlara neden olan metabolik etkilere bir yanıt olarak başlatılabilir ve/veya hızlandırılabilir (Basu, 2018; Blackadar, 2016). Dönüşüm işlemi sırasında, onkogenler aşırı eksprese edilir ve tümör baskılayıcılar, hücrelerin kontrolsüz büyümesini teşvik eden inaktive edilir. Sonuç olarak, hücreler farklılaşır ve kök hücre özellikleri kazanır (Basu, 2018).



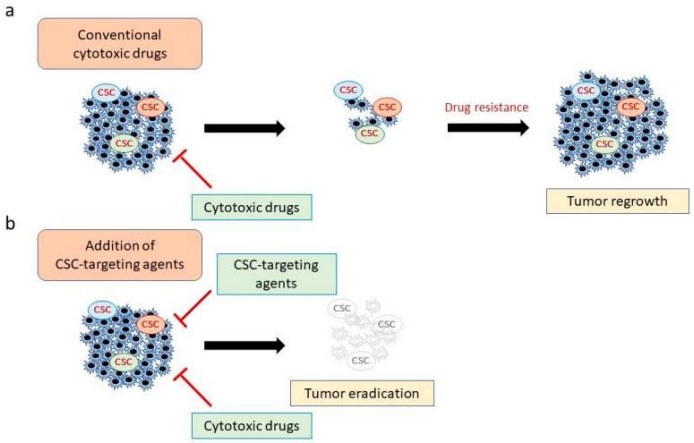
Şekil 1. Tümör başlangıcında CSC'lerin kökeni: CSC oluşumunun iki hipotezi. (A) Yetişkin doku yerleşik kök hücrelerinin çoğalması ve farklılaşması, doku homeostazını koruyan fizyolojik yenilenme programının bir parçasıdır. Yetişkin dokuda yerleşik kök hücreler asimetrik olarak bölünür ve yüksek çoğalma kapasitesine sahip geçici çoğaltıcı hücreler üretir. Bu hücreler terminal olarak farklılaşır; sonunda organ homeostazını desteklemek için çoğalma kapasitelerini kaybedecekleri bir süreç. (B) Tümörler, farklılaşmış hücreleri dönüştüren ve farklılaşmaya neden olan birkaç mutasyonun (kırmızı aydınlatma) adım adım birikmesiyle oluşturulabilir. Dokuda yerleşik kök hücreler ve onların soyları, kontrolsüz ve nişten bağımsız büyümeye yol açan mutasyonları biriktirebilir. Heterojen tümörler üretilir. CSC'ler fenotipik özellikleri paylaşır ve katı kanserlerde olduğu kadar sıvı kanserlerde de çeşitli belirteçler tanımlanmıştır (Walcher et al., 2020).

CSC'ler temelinde oluşturulan tümörlerin, yalnızca CSC popülasyonunun tümör büyümesini başlatabildiği tek yönlü bir hiyerarşi izlediğine inanılmaktadır (Afify & Seno, 2019). Tümörün başladığı zaman noktasında, kanser kök hücrelerinin CSC havuzunu korumak için asimetrik olarak bölündüğü öne sürülmektedir (Bu et al., 2013). Bu asimetrik bölünmeler, simetrik bölünmeler geçiren geçici çoğaltıcı hücreler üretir; dolayısıyla yüksek proliferatif kapasiteye sahiptir (Afify & Seno, 2019; Bu et al., 2013). Hematolojik kanserlerden (AML) elde edilen son verilere dayanarak, Bonnet ve Dick tarafından önerilen hiyerarşik model büyük olasılıkla basitleştirilmiş bir tanımdır (Goardon et al., 2011). Artık CSC'lerin organizasyonunun (hematolojik kanserlerin yanı sıra katı kanserlerde) daha karmaşık olduğuna inanılmaktadır (Bu et al., 2013; Chopra & Bohlander, 2019; Goardon et al., 2011; Quek et al., 2016). Sadece küçük bir hücre alt popülasyonunun tümör başlangıcını ve büyümesini destekleyebildiği CSC modelinin aksine, klonal evrim modeli, genetik olarak kararsız hücrelerin zaman içinde genomik ve genetik değişiklikleri biriktirerek tümör agresifliği, direnci ve heterojenitesinde bir artışa neden olduğunu belirtmektedir (Reya et al., 2001; Rich, 2016). Her iki model de birbirini dışlayan değildir; bu, farklı hücresel durumların birbirine dönüşebileceğini düşündüren hücresel plastisite (plastisite modeli) ile açıklanabilmektedir (Reya et al., 2001; Rich, 2016).

CSC-Hedefleme Tedavileri

Son zamanlarda, geleneksel ilaçları CSC hedefleyici ajanlarla birleştirmeyi amaçlayan birkaç girişimde bulunulmuştur (Şekil 2) (Desai et al., 2019; Wang et al., 2015). Bununla birlikte, sadece CSC'lerin değil, aynı zamanda birçok CSC olmayan tümör hücrelerinin heterojenliği ve yüksek plastisitesi, çeşitli kanserler için uygun hedefleme moleküllerini belirleme zorluğunu arttırmaktadır (Yang et al., 2017). Bu tür bir plastisite, CSC olmayanların, spesifik CSC hedefleme tedavilerine dirençli olabilen CSC'lere farklılaşmasını sağlar (Zhu & Fan, 2018). Ek

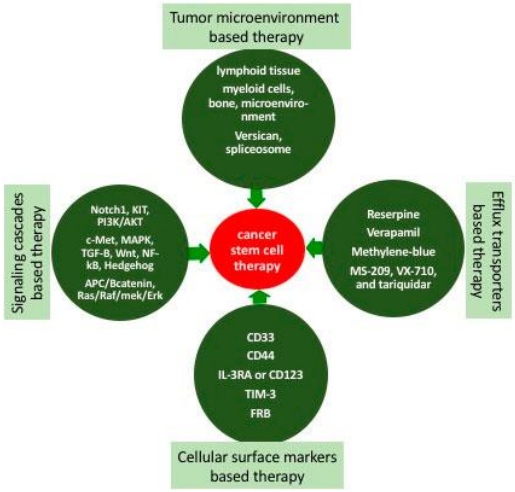
olarak, doku hemostazında ve yenilenmesinde önemli roller oynayabilecekleri normal kök hücre popülasyonlarında birçok yüzey belirteci de eksprese edilmektedir (Zhu & Fan, 2018). Bu nedenle, normal kök hücrelerde esasen bulunmayan (veya düşük seviyelerde eksprese edilen) spesifik kanser türleri için yeni CSC'ye özgü molekülleri ve/veya yolakları tanımlamaya acil bir ihtiyaç vardır.



Şekil 2. Geleneksel sitotoksik ilaçların kanser kök hücre (CSC) hedefleme ajanlarıyla birleştirilmesi. (a) Kemoterapötik ve moleküler hedefli ilaçlar çoğu kanser hücresine saldırabilse de, CSC'ler bu ajanlardan kaçarak tümörün yeniden büyümesine yol açabilir. (b) Hem CSC'leri hem de CSC olmayan tümör hücrelerini ortadan kaldırdığı için CSC hedefleme ajanları ve geleneksel ilaçlarla kombinasyon tedavisinin daha etkili olduğu tahmin edilmektedir (M. Shibata & M. O. Hoque, 2019).

Çok sayıda çalışma, meme, kolorektal, akciğer, yumurtalık, mesane ve baş ve boyun kanserleri dahil olmak üzere çeşitli kanserlerde CSC popülasyonlarının varlığını tanımlamıştır. Malign kök belirteçleri ve faktörleri kanser türleri arasında, aynı kanser arasında farklı hastalarda ve aynı tümör içindeki farklı bölgeler arasında farklılık göstermektedir; yine de, tüm CSC'ler tümörijenez, metastaz, ilaç direnci ve immünosupresif mikro-ortamı yönlendirme yeteneğini paylaşmaktadır (Desai et al., 2019). Bu özellikler, CSC'leri kanser için daha etkili tedavilerin geliştirilmesi için çekici hedefler haline getirmektedir (Desai et al., 2019). Bugüne kadar, STAT3 ve NANOG (Desai et al., 2019) gibi köklülük belirteçlerinin yanı sıra kötü huylu köklülük yolları düzenleyen, özellikle de çeşitli kanserlerde köklülük özelliklerini teşvik eden Wnt/β-katenin, Notch, hedgehog ve JAK-STAT yolaklarını hedef almak için girişimlerde bulunulmuştur (Ajani et al., 2015).

Kök özellikleri olan kanser hücreleri, terapötik ilaçlara, tümör kütlesindeki hücrelerin geri kalanından daha dirençli özelliğe sahiptir (Sotiropoulou et al., 2014). Bu nedenle, tümör kütlesi içindeki bu küçük hücre popülasyonuna karşı terapötik hedefler ve bu hücrelerin içine veya yakınına ilaç göndermek için tedavi stratejileri araştırmaya ciddi bir ihtiyaç vardır. Günümüzde, bu alan çok dikkat çekmektedir ve farklı şirketler ve akademik laboratuvarlar, tümörlerin tekrar oluşmasını durdurmak için bu küçük hücre popülasyonunu ortadan kaldırma üzerine yoğunlaşmaktadır. Hücre yüzey belirteçleri, sinyal yolları ve tümör mikroçevresi bu konuda en çok tercih edilen hedeflerden bazılarıdır (Şekil 3). Dirençli kanser kök hücrelerini duyarlı hale getirmenin yollarından biri, kanseri tedavi etmek için farklı kimyasal bileşiklerin kullanıldığı kimyasal yaklaşımdır (Sotiropoulou et al., 2014).



Şekil 3. Kanser kök hücrelerini hedeflemek için farklı terapötik yaklaşımlar ve adaylar (Ahmad & Amiji, 2017).

Kanseri başlatan kök hücreler, farklı uyaranlara yanıt olarak farklı sinyal yollarını aktive eder ve kanser gelişimine yol açar. Bu nedenle, belirli bir sinyal yolunu bloke ederek kanser tedavi edilebilir. Örneğin, Xanthohumol'ün Notch sinyal yolunu inhibe ettiği bildirilmiştir (Kunnimalaiyaan et al., 2015). Notch'e benzer şekilde, TGF-B (Zoni et al., 2015), Wnt (Gurney et al., 2012), NF-kB (Noort et al., 2014), Hedgehog (Takebe et al., 2015), MAPK (Brinkhof et al., 2015), c-Met (Tivantinib) (Ho-Yen et al., 2015), APC/B gibi birçok başka yol katenin (Borah et al., 2015), ILK [integrin bağlantılı kinaz] (QLT0267) (Borah et al., 2015), mTOR (rapamisin) (Martelli et al., 2011) ve Ras/Raf/Mek/Erk (Ciccarelli et al., 2016), tümör başlatan hücrelere karşı ilaç keşfi için iyi adaylardır. CSC'lerin akışı ve reaktif oksijen türü mekanizmaları da bu bağlamda ilginin hedefi haline gelmiştir.

Tümör mikro-ortamının, yavaş büyümelerini destekleyen, sessizliği indükleyen ve onları ilaca bağlı apoptozdan koruyan temel besinler ve sinyaller nedeniyle tümör kütlesi içindeki CSC'lerin ilerlemesinde ve hayatta kalmasında önemli bir katkıda bulunduğu bildirilmiştir. Örneğin, üçüncül lenfoid dokunun, tümör mikroçevresinde T hücresini topladığı ve bağışıklık hücrelerini aktive ettiği gösterilmiştir. Benzer şekilde, mezenkimal kök hücreler ve CSC'lerin stromal modülatörünün karsinojenezi kolaylaştırdığı bildirilmiştir (Bonnet & Dick, 1997). Mezenkimal kök hücrelerin ayrıca CSC'leri hareketsiz duruma zorladığı ve onları terapötik ilaçlara daha az duyarlı hale getirdiği bildirilmiştir. CD10+ hücreleri ayrıca CD133+ hücrelerinin tümörijenik kapasitesini ve invazivliğini artırma potansiyeline sahiptir (Zhu et al., 2010). Benzer şekilde, anjiyojenik, immün ve kanserle ilişkili fibroblast, stromanın ana bileşenleridir (Li & Neaves, 2006). Kanseri tedavi etmek için stratejilerden biri, CSC'ler ve çevresindeki tümör mikro-ortamı arasındaki bağlantıyı kesmek olmalıdır. Bu stratejilerin bazıları zaten yetersiz kalmıştır. Örneğin, bu tür bir yaklaşım, kemik iliği stromal hücresi tarafından salgılanan, stromal hücre kaynaklı faktör-1 (SDF-1//CXCL12) ve reseptörü CXCR4 arasındaki etkileşimin bozulmasıdır (Hernandez-Gea et al., 2013).

SONUÇ

Kanser kök hücreleri, tümörün korunmasından sorumludur. Bu nedenle, bu hücrelerin yok edilmesi sadece kanseri tedavi etmek için değil, aynı zamanda ilaç direncini ve dolayısıyla tedaviden sonra tümörün nüksetmesini önlemek için de önemlidir. Teknolojinin gelişmesiyle birlikte, bu hücreleri tümör kütlesinden ortadan kaldırmak için hedeflenebilecek farklı hücreye özgü belirteçler tanımlanmıştır. Ancak şimdiye kadar sadece bu belirteçleri hedef alan ilaçlar başarılı olamamıştır. Bu nedenle, CSC'lerin, kanser hücrelerinin ve ilişkili ortamının toplu

olarak hedeflenmesi, yalnızca kanseri başlatan hücreleri yok etmek için değil, aynı zamanda kanseri hep birlikte tedavi etmek için yeni bir strateji sağlayabilir. Bu senaryoda nanoteknolojinin çok faydalı olduğu kanıtlanmıştır. Bu teknoloji sayesinde ilaç farklı engelleri aşabilmekte, belirlenen alana ulaştırılmakta ve ilacın tümör yatağında birikmesini arttırmaktadır.

KAYANAKÇA

Afify, S. M., & Seno, M. (2019). Conversion of stem cells to cancer stem cells: undercurrent of cancer initiation. *Cancers*, *11*(3), 345.

Ahmad, G., & Amiji, M. M. (2017). Cancer stem cell-targeted therapeutics and delivery strategies. *Expert Opin Drug Deliv*, *14*(8), 997-1008. https://doi.org/10.1080/17425247.2017.1263615

Ajani, J. A., Song, S., Hochster, H. S., & Steinberg, I. B. (2015). Cancer stem cells: the promise and the potential. Seminars in oncology,

Arnold, C. R., Mangesius, J., Skvortsova, I.-I., & Ganswindt, U. (2020). The role of cancer stem cells in radiation resistance. *Frontiers in oncology*, *10*, 164.

Ayob, A. Z., & Ramasamy, T. S. (2018). Cancer stem cells as key drivers of tumour progression. *Journal of biomedical science*, *25*(1), 1-18.

Basu, A. K. (2018). DNA damage, mutagenesis and cancer. *International journal of molecular sciences*, *19*(4), 970.

Blackadar, C. B. (2016). Historical review of the causes of cancer. *World journal of clinical oncology*, *7*(1), 54.

Bonnet, D., & Dick, J. E. (1997). Human acute myeloid leukemia is organized as a hierarchy that originates from a primitive hematopoietic cell. *Nat Med*, *3*(7), 730-737. https://doi.org/10.1038/nm0797-730

Borah, A., Raveendran, S., Rochani, A., Maekawa, T., & Kumar, D. S. (2015). Targeting self-renewal pathways in cancer stem cells: clinical implications for cancer therapy. *Oncogenesis*, *4*(11), e177. https://doi.org/10.1038/oncsis.2015.35

Brinkhof, B., van Tol, H. T., Groot Koerkamp, M. J., Riemers, F. M., SG, I. J., Mashayekhi, K., Haagsman, H. P., & Roelen, B. A. (2015). A mRNA landscape of bovine embryos after standard and MAPK-inhibited culture conditions: a comparative analysis. *BMC Genomics*, *16*(1), 277. https://doi.org/10.1186/s12864-015-1448-x

Bu, P., Chen, K.-Y., Lipkin, S. M., & Shen, X. (2013). Asymmetric division: a marker for cancer stem cells? *Oncotarget*, *4*(7), 950.

Capp, J.-P. (2019). Cancer stem cells: From historical roots to a new perspective. *Journal of oncology*, *2019*.

Chopra, M., & Bohlander, S. K. (2019). The cell of origin and the leukemia stem cell in acute myeloid leukemia. *Genes, Chromosomes and Cancer*, *58*(12), 850-858.

Ciccarelli, C., Vulcano, F., Milazzo, L., Gravina, G. L., Marampon, F., Macioce, G., Giampaolo, A., Tombolini, V., Di Paolo, V., Hassan, H. J., & Zani, B. M. (2016). Key role of MEK/ERK pathway in sustaining tumorigenicity and in vitro radioresistance of embryonal rhabdomyosarcoma stem-like cell population. *Mol Cancer*, *15*, 16. https://doi.org/10.1186/s12943-016-0501-y

Desai, A., Yan, Y., & Gerson, S. L. (2019). Concise reviews: cancer stem cell targeted therapies: toward clinical success. *Stem Cells Translational Medicine*, *8*(1), 75-81.

Fan, D. N., & Schmitt, C. A. (2017). Detecting markers of therapy-induced senescence in cancer cells. In *Oncogene-Induced Senescence* (pp. 41-52). Springer.
Goardon, N., Marchi, E., Atzberger, A., Quek, L., Schuh, A., Soneji, S., Woll, P., Mead, A., Alford, K. A., & Rout, R. (2011). Coexistence of LMPP-like and GMP-like leukemia stem cells in acute myeloid leukemia. *Cancer cell*, *19*(1), 138-152.
Gurney, A., Axelrod, F., Bond, C. J., Cain, J., Chartier, C., Donigan, L., Fischer, M., Chaudhari, A., Ji, M., Kapoun, A. M., Lam, A., Lazetic, S., Ma, S., Mitra, S., Park, I. K., Pickell, K., Sato, A., Satyal, S., Stroud, M., . . . Hoey, T. (2012). Wnt pathway inhibition via the targeting of Frizzled receptors results in decreased growth and tumorigenicity of human tumors. *Proc Natl Acad Sci U S A*, *109*(29), 11717-11722. https://doi.org/10.1073/pnas.1120068109
Hanahan, D., & Weinberg, R. A. (2011). Hallmarks of cancer: the next generation. *cell*, *144*(5), 646-674.
Hernandez-Gea, V., Toffanin, S., Friedman, S. L., & Llovet, J. M. (2013). Role of the microenvironment in the pathogenesis and treatment of hepatocellular carcinoma. *Gastroenterology*, *144*(3), 512-527. https://doi.org/10.1053/j.gastro.2013.01.002
Ho-Yen, C. M., Jones, J. L., & Kermorgant, S. (2015). The clinical and functional significance of c-Met in breast cancer: a review. *Breast Cancer Res*, *17*(1), 52. https://doi.org/10.1186/s13058-015-0547-6
Kunnimalaiyaan, S., Trevino, J., Tsai, S., Gamblin, T. C., & Kunnimalaiyaan, M. (2015). Xanthohumol-Mediated Suppression of Notch1 Signaling Is Associated with Antitumor Activity in Human Pancreatic Cancer Cells. *Mol Cancer Ther*, *14*(6), 1395-1403. https://doi.org/10.1158/1535-7163.Mct-14-0915
Li, L., & Neaves, W. B. (2006). Normal stem cells and cancer stem cells: the niche matters. *Cancer Res*, *66*(9), 4553-4557. https://doi.org/10.1158/0008-5472.Can-05-3986
Martelli, A. M., Evangelisti, C., Follo, M. Y., Ramazzotti, G., Fini, M., Giardino, R., Manzoli, L., McCubrey, J. A., & Cocco, L. (2011). Targeting the phosphatidylinositol 3-kinase/Akt/mammalian target of rapamycin signaling network in cancer stem cells. *Curr Med Chem*, *18*(18), 2715-2726. https://doi.org/10.2174/092986711796011201
Noort, A. R., van Zoest, K. P., Weijers, E. M., Koolwijk, P., Maracle, C. X., Novack, D. V., Siemerink, M. J., Schlingemann, R. O., Tak, P. P., & Tas, S. W. (2014). NF-κB-inducing kinase is a key regulator of inflammation-induced and tumour-associated angiogenesis. *J Pathol*, *234*(3), 375-385. https://doi.org/10.1002/path.4403
Phi, L. T. H., Sari, I. N., Yang, Y.-G., Lee, S.-H., Jun, N., Kim, K. S., Lee, Y. K., & Kwon, H. Y. (2018). Cancer stem cells (CSCs) in drug resistance and their therapeutic implications in cancer treatment. *Stem cells international*, *2018*.
Quek, L., Otto, G. W., Garnett, C., Lhermitte, L., Karamitros, D., Stoilova, B., Lau, I.-J., Doondeea, J., Usukhbayar, B., & Kennedy, A. (2016). Genetically distinct leukemic stem cells in human CD34− acute myeloid leukemia are arrested at a hemopoietic precursor-like stage. *Journal of Experimental Medicine*, *213*(8), 1513-1535.
Reya, T., Morrison, S. J., Clarke, M. F., & Weissman, I. L. (2001). Stem cells, cancer, and cancer stem cells. *nature*, *414*(6859), 105-111.
Rich, J. N. (2016). Cancer stem cells: understanding tumor hierarchy and heterogeneity. *Medicine*, *95*(Suppl 1).
Shibata, M., & Hoque, M. O. (2019). Targeting Cancer Stem Cells: A Strategy for Effective Eradication of Cancer. *Cancers (Basel)*, *11*(5). https://doi.org/10.3390/cancers11050732

Shibata, M., & Hoque, M. O. (2019). Targeting cancer stem cells: a strategy for effective eradication of cancer. *Cancers*, *11*(5), 732.
Sotiropoulou, P. A., Christodoulou, M. S., Silvani, A., Herold-Mende, C., & Passarella, D. (2014). Chemical approaches to targeting drug resistance in cancer stem cells. *Drug Discov Today*, *19*(10), 1547-1562. https://doi.org/10.1016/j.drudis.2014.05.002
Spillane, J. B., & Henderson, M. A. (2007). Cancer stem cells: a review. *ANZ journal of surgery*, *77*(6), 464-468.
Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021). Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA Cancer J Clin*, *71*(3), 209-249. https://doi.org/10.3322/caac.21660
Takebe, N., Miele, L., Harris, P. J., Jeong, W., Bando, H., Kahn, M., Yang, S. X., & Ivy, S. P. (2015). Targeting Notch, Hedgehog, and Wnt pathways in cancer stem cells: clinical update. *Nat Rev Clin Oncol*, *12*(8), 445-464. https://doi.org/10.1038/nrclinonc.2015.61
Walcher, L., Kistenmacher, A. K., Suo, H., Kitte, R., Dluczek, S., Strauß, A., Blaudszun, A. R., Yevsa, T., Fricke, S., & Kossatz-Boehlert, U. (2020). Cancer Stem Cells-Origins and Biomarkers: Perspectives for Targeted Personalized Therapies. *Front Immunol*, *11*, 1280. https://doi.org/10.3389/fimmu.2020.01280
Wang, T., Shigdar, S., Gantier, M. P., Hou, Y., Wang, L., Li, Y., Al Shamaileh, H., Yin, W., Zhou, S.-F., & Zhao, X. (2015). Cancer stem cell targeted therapy: progress amid controversies. *Oncotarget*, *6*(42), 44191.
Yang, Z., Li, C., Fan, Z., Liu, H., Zhang, X., Cai, Z., Xu, L., Luo, J., Huang, Y., & He, L. (2017). Single-cell sequencing reveals variants in ARID1A, GPRC5A and MLL2 driving self-renewal of human bladder cancer stem cells. *European urology*, *71*(1), 8-12.
Zeng, S., Shen, W. H., & Liu, L. (2018). Senescence and cancer. *Cancer translational medicine*, *4*(3), 70.
Zhu, P., & Fan, Z. (2018). Cancer stem cells and tumorigenesis. *Biophysics reports*, *4*(4), 178-188.
Zhu, Z., Hao, X., Yan, M., Yao, M., Ge, C., Gu, J., & Li, J. (2010). Cancer stem/progenitor cells are highly enriched in CD133+CD44+ population in hepatocellular carcinoma. *Int J Cancer*, *126*(9), 2067-2078. https://doi.org/10.1002/ijc.24868
Zoni, E., van der Pluijm, G., Gray, P. C., & Kruithof-de Julio, M. (2015). Epithelial Plasticity in Cancer: Unmasking a MicroRNA Network for TGF-β-, Notch-, and Wnt-Mediated EMT. *J Oncol*, *2015*, 198967. https://doi.org/10.1155/2015/198967

DRY EYE IN ROUTINE OPHTHALMOLOGY CLINIC

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ABSTRACT

Purpose

The aim of this study is to investigate the frequency, causes and symptom frequency of dry eye in patients admitted to the routine eye outpatient clinic.

Method

Between February 2022 and April 2022, 1005 patients who applied to Adana City Hospital within 1 month were evaluated for dry eye. Cornea, conjunctiva, lid problems, allergic conjunctivitis, exposure keratopathy were evaluated with biomicroscope, and the patients' tear break-up time was measured and Schirmer I test was applied to the patients..

Results

Dry eye was diagnosed in 588 (58.8%) of 1005 patients who applied to the ophthalmology outpatient clinic in a month. The mean BUT time of those diagnosed with dry eye was 7.68±3.48 (4-10) seconds, the mean Schirmer I test value was 8.23±6.19 (2-15) mm, and both values were significantly lower than those without dry eye ($p<0.001$ for both). The three most common detectable causes of dry eye were screen exposure (46.93%, n=276), blepharitis (17.17%, n=101) and a history of refractive surgery (9.35%, n=55). The 3 most common findings were itching (25.51%, n=150), foreign body sensation (20.4%, n=120), burning-stinging (17.85%, n=105). Artificial tears were used in 97.95% (n=576) of the patients, 27.55% (n=162) topical steroid, 27.55% (n=150) lubricant ointment, 10% (n=59) topical cyclosporine-He was using A.

Conclusion

Dry eye patients constituted 58.8% of the patients who applied to the eye outpatient clinic. The most common detected cause of dry eye is screen exposure and the most common symptom is itching. Dry eye is a disease that can threaten vision and is very common in society..

Keywords: Dry eye, dry eye causes, dry eye symptoms, dry eye treatment

INTRODUCTION

Dry eye arises from tear film irregularity due to insufficiency or excessive evaporation of tears, which can cause damage to the surface of the eye (1,2). Increased use of contact lenses, prolonged life expectancy, refractive surgery, screen exposure, systemic drug use increase the frequency of dry eye.

In the literature, the prevalence of dry eye has been reported to be between 5 and 34% (3,4). In our clinical practice, we observe that this rate increases especially during and after the pandemic period. The aim of this study is to determine the frequency, most common symptoms and causes of dry eye in a routine eye clinic.

METHOD

In this study, 1005 patients who applied to Adana City Hospital between February 2022 and April 2022 were evaluated in terms of dry eye. Cornea, conjunctiva, lid problems, allergic conjunctivitis, exposure keratopathy were evaluated with biomicroscope and the patients' tear break-up time was measured and Schirmer I test was performed on the patients. All symptoms and findings of the patients, factors that may play a role in the etiology of dry eye, and drugs used in the treatment were recorded. Dry eye was diagnosed in patients with a tear break-up time of less than 10 mm and a Schirmer I test of less than 15 mm.

In the tear break-up time (BUT) test, following the instillation of flourescein into the eye, the patient blinks several times, and then the cornea is examined under cobalt blue under the slit-lamp and the patient does not blink during this time. The time between the last blink and the time we see the first spot on the surface painted with flourescein is considered the tear break out time.

The Schirmer I test is used to measure tear secretion. The measurement is made with a special filter paper placed on the outer 1/3 of the eye between the lower lid and the eye. The wetted value of the filter paper is measured after 5 minutes.

RESULTS

2010 eyes of 1005 patients who applied to the ophthalmology clinic for 1 month were evaluated. Dry eye was detected in 588 (58.50%) of these patients. The mean age of the patients participating in the study was 46.32 ± 14.49 (18-72) years. 64% (n=643) of the patients were female. 85 patients had comorbidities (Table-1).

While the mean BUT was 17.92±7.25 (11-30) seconds in those without dry eyes, it was 7.68± 3.48 (4-10) seconds in those with dry eyes. Schirmer I test was 20.94±6.88(11-33) mm in patients without dry eye and 8.23± 6.19(2-15) mm in patients with dry eye. Both values were statistically significantly lower in patients with dry eye ($p<0.001$) (Table-2).

When the detected causes of dry eye of the patients were analyzed: blepharitis in 101 patients (17.17%), contact lens use in 38 patients (6.46%), rheumatologic disease in 30 patients (5.1%), screen exposure over 4 hours in 276 patients (46.93%), systemic disease in 42 patients, drug use (antidepressant in 32 patients, antihistminic in 10 patients) (7.14%), history of refractive surgery in 55 patients (9.35%), other causes in 26 patients (14 patients senility, 5 patients lymphoma, 2 patients sarcoidosis, 5 patients unknown) (4.65%) identified (Table-3).

The symptoms of the patients were as follows: burning-stinging in 105 (17.85%) patients, foreign body sensation in 120 (20.4%) patients, redness in 51 (8.67%) patients, itching in 150 (25.51%) patients, fatigue in 10 (1.7%) patients. 103 patients had blurred vision (17.51%), 30 patients had discharge and burrs (5.1%), 19 patients had light sensitivity (53.2), 20 patients had

reflex watering (3.4%) (Table-4).
576 patients (97.95%) were using artificial tears, 150 patients (25.51%) were using lubricant ointment, 162 patients (27.55%) were using topical steroids, 59 patients (10.03%) were using topical cyclosporine-A (Table-5).

Table-1: Characteristics of Patients

	n=1005
Age (years)	46.32 ± 14.49 [18-72]
Gender (F/M)	643 (64%)/362 (36%)
Comorbidity (yes/no)	85 (14.5%)/503 (85.5%)
Dry eye disease (yes/no)	588(58.50%)/417(41.50%)
Schirmer I test (mm)	9.25(2-14)
Break-up Time Test (sec)	10.7(3-14)

Table-2: Table-2: Dry Eye Diagnostic Test ResultsResults

Dry Eye Diagnostic Tests	**n1=417**	**n2=588**	*p* values
mean BUT (sec)	17.92±7.25(11-30)	7.68± 3.48 (4-10)	<**0.001**
mean Schirmer I test (mm)	20.94±6.88(11-33)	8.23± 6.19(2-15)	<**0.001**

BUT: Break-up Time Test , p<0.05 significant

Table-3: Causes of Dry Eye

	n=588
Blepharitis	101(17.17%)
Contact lens	38(6.46%)
Presence of rheumatological disease	30(5.1%)
Screen exposure (>4 hours)	276(46.93%)
Systemic drug use (antidepressant, antihistamine…)	42(7.14%)
Refractive surgery history	55(9.35%)
Other (senility, sarcoidosis)	26(4.65%)

Table-4: Dry eye symptoms and signs

Burning-sting	105 (17.85%)
Foreign body sensation	120 (20.4%)
Hyperemia	51 (8.67%)
Itching	150 (25.51%)
Tiredness	10(1.70%)
Blurred vision	103(17.51%)
Runoff-burr	30 (5.1%)
Light sensitivity	19(3.2%)
Reflex watering	20 (3.4%)

Table-5: Drugs used in treatment

Artificial tear drops	576(97.95%)
Lubricant pomade	150(25.51%)
Topical steroid	162(27.55%)
Topical cyclosporine-A	59(10.03%)

DISCUSSION

Dry eye syndrome is a multifactorial ocular surface disease in which tear film stability is impaired. Two reasons are blamed in the etiopathogenesis of the disease. One of these is decreased tear secretion from the main lacrimal gland and accessory glands, and the other is increased tear osmolarity and increased evaporation due to inflammation. The increase in online work during the pandemic period, the prolongation of life expectancy, and the widespread use of refractive surgery have increased the incidence of dry eye, as patients have easy access to contact lenses. In the literature, this frequency has been reported to be between 5 and 34% (3,4). However, in our study, this rate was 58.5%.

In this study, the most common cause of dry eye was determined to be screen exposure. With the modern lifestyle, daily use of tablets, computers and smartphones, people become more and more dependent on screens (5). Intensive use of computers in the workplace has led to increased visual health problems and poor visual function, resulting in significant physical and occupational burden; An estimated 50% to 90% of all computer users experience 'Computer Vision Syndrome' symptoms (6). In a study conducted in Japan, long-term computer use was defined as a risk factor for dry eye, with the disease frequency varying between 22% and 27% in men and between 36% and 48% in women (7). Ocular surface damage in screen exposure has been explained by many mechanisms, including decreased blink rate, meibomian gland dysfunction, and corneal phototoxicity (8).

In this study, other common causes of dry eye were blepharitis and refractive surgery. Both causes cause evaporative dry eye. The meibomian glands are located in the upper and lower eyelids, where they secrete lipid (meibum) onto the ocular surface and form the outermost layer of the tear film. These lipids diffuse easily, increase tear film stability and provide protection

against evaporation. Posterior blepharitis can cause tear film alteration, symptoms of eye irritation, clinically significant inflammation, and ocular surface disease (9).

LASIK has become a very popular form of refractive surgery in recent years. This is due to the rapid and painless rehabilitation of vision, the absence of subepithelial corneal clouding. Postoperative dry eye affects approximately 50% of patients at 1 week, 40% at 1 month, and 20% to 40% at 6 months (10). Although dry eye after LASIK is usually temporary, some patients may also have persistent dry eye accompanied by severe symptoms..

CONCLUSION

Dry eye patients constitute a high rate of 58.8% of the patients who applied to the eye outpatient clinic. The most common detected cause of dry eye is screen exposure and the most common symptom is itching. Dry eye is a public health problem that can threaten vision and is very common in society.

REFERENCES

1.The definition and classification of dry eye disease: report of the Definition and Classification Subcommittee of the International Dry Eye WorkShop (2007). Ocul Surf. 2007;5(2):75-92.

2. Perry HD. Dry eye disease: pathophysiology, classification, and diagnosis. Am J Manag Care. 2008;14(3 Suppl):S79-87

3. Chia EM, Mitchell P, Rochtchina E, Lee AJ, Maroun R, Wang JJ. Prevalence and associations of dry eye syndrome in an older population: the Blue Mountains Eye Study. Clin Exp Ophthalmol. 2003;31(3):229-32.

4. Schaumberg DA, Sullivan DA, Buring JE, Dana MR. Prevalen-ce of dry eye syndrome among US women. Am J Ophthalmol. 2003;136(2):318-26

5. Kim DJ, Lim CY, Gu N, Park CY. Visual fatigue induced by viewing a tablet computer with a high-resolution display. *Korean J Ophthalmol* 2017; 31:388–393.

6. Rosenfield M. Computer vision syndrome: a review of ocular causes and potential treatments. *Ophthalmic Physiol Opt* 2011; 31:502–515.

7. Uchino M, Schaumberg DA, Dogru M, et al. Prevalence of dry eye disease among Japanese visual display terminal users. *Ophthalmology* 2008; 115:1982–1988.

8. Lee JB, Kim SH, Lee SC, et al. Blue light-induced oxidative stress in human corneal epithelial cells: protective effects of ethanol extracts of various medicinal plant mixtures. *Invest Ophthalmol Vis Sci* 2014; 55:4119–4127.

9. Nichols KK, Foulks GN, Bron AJ, et al. The International Workshop on Meibomian Gland Dysfunction: executive summary. Invest Ophthalmol Vis Sci 2011;52:1922-9.

10. Shoja MR, Besharati MR. Dry eye after LASIK for myopia: incidence and risk factors. *Eur J Ophthalmol*. 2007; 17: 1–6.

IDENTIFICATION GENETIC VARIANTS OF LZTFL1 GENE RS11385942 ASSOCIATED WITH SEVER COVID-19 INFECTION IN IRAQI PATIENTS

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Recently Genomic association studies have been identified several loci related with increased predisposition and severity for COVID-19. There is considerable variation in disease behavior among patients infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), however, the genetic association evidence has been unclear. The current study demonstrated that age, CRP, diabetes and other chronic disease can be dramatically as important risk factors in responsible severe infection in COVID-19 patients. Beside, genetic predisposition investigation to detect locus 3p21.31 to detect its SNPs of rs11385942 alleles associations with COVID-19 infection and evaluated risk score susceptibility on disease severity. Statistical and DNA sequences analysis were conducted by using Sanger method. The results showed male incidences is higher than female number (60 cases- 60% male) corresponding (40 cases 40% female). COVID-19 impact significantly on C-reactive protein and the age group 55-65 appeared high level of CRP (130.5 ± 58.93). While, DNA sequence alignments analysis among PCR amplifying fragment products of LZTFL1 from sever COVID-19 patients sever patients who have diabetes type 1 or 2 and received oxygen supplementation were preformed to compare with sequence of the control and *Homo sapiens* of LZTFL1 from international NCBI data base. Our findings represented the association signal nucleotide variation sequence of at locus 3p21.31 genes heterozygous allele AA/AAA exist for the rs11385942. more than homozygous alleles in sever infected patients.
To conclude, male and aged people paralleled the severity of COVID-19. The allele gene AA/AAA heterozygous gene SNP is more frequent in position 3p21.31 LZTFL1 rs 11385942 as a genetic predisposition locus in patients with developing COVID-19 with respiratory tract frailer.

Keywords: COVID-19, SARS-CoV, SARS-CoV-2, SNP, LZTFL1 Gene rs11385942.

ASSESSMENT OF HEALTH SYSTEM PERFORMANCES IN EUROPEAN UNION COUNTRIES DURING COVID-19

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ABSTRACT
The aim of this study is to assess the performance of the health systems of the European Union (EU) member countries during the Covid-19 pandemic. Data Envelopment Analysis (DEA) method is used to assess health systems' performance. The efficiency scores of EU countries were calculated and compared based on the input-oriented CCR model. The number of physicians, the number of nurses, the number of beds, and the number of Covid-19 cases were used as input variables; the number of deaths from Covid-19, and Covid-19 vaccine rates were used as output variables. In addition, the super-efficiency analysis was used to rank among efficient countries. Analyzes were performed using the EMS package program. It was determined that 8 of the 27 EU member countries were efficient, while 19 countries was inefficient. The efficiency score average of EU countries was calculated as 0.8161. According to the super efficiency analysis, Cyprus showed the best performance among the efficient countries, followed by Finland and Greece. As a result of the analysis, the worst performing countries were found as Bulgaria (0.4592), Slovakia (0.5425), and Czechia (0.5830). It is crucial to assess and compare the performances of countries' health systems during the Covid-19 period. The results obtained can be used to plan the improvements to be made in the health systems in the Post-Covid period and determine the policies to be carried out in future pandemics.

Keywords: Covid-19, Efficiency, Performance

INTRODUCTION
Covid-19 is an infectious disease, which initially appeared in Wuhan, in December 2019. This disease is a cause of novel coronavirus, which influences the respiratory system. It caused the outbreak of a Worldwide pandemic due to its fast spread and the unavailability of vaccines or specific treatment (Mourad et al., 2021). More than 550 million confirmed affected cases, and 6 million deaths by Covid-19 worldwide, at the end of June 2022 (Worldometer, 2022). These

numbers are severely affected by the healthcare systems' circumstances of each country. Over time, Europe has faced various crises, which have varied in intensity, the Covid-19 pandemic has perhaps one of the most pronounced dynamism related to the rapid transmission of the virus and the loss of human lives. Looking back to 2020, it can be said in unison that both governments and the world's population have been subjected to severe trials in the face of the health crisis and its consequences (Lupu and Tiganasu, 2022). As a result of the developments, the European Union's (EU) member states gradually implemented border controls and tried to come up with ways for limiting movement to contain the pandemic. In order to prevent the health system from coming to a complete standstill, some nations have established curfews that severely restrict social activity.

Evaluation of pandemic management processes, combating Covid-19, which is more likely to result in death especially in the elderly and those with systemic diseases, is of vital importance in EU member countries where the elderly population is densely populated, in order to guide the future management of the epidemic and possible future outbreaks (Varol and Tokuç, 2020). Each nation has evolved unique methods during the epidemic in a variety of areas, including diagnosis, treatment, necessary actions, and health investments. In the event of an epidemic in a country, the number of infected and death cases and the rate of their increase largely depend on the preparedness and health system of that country (Selamzade and Özdemir, 2020). As a consequence, one of the most important steps in the fight against the Covid-19 epidemic is comparing the performance of the countries' health systems and determining the effective processes. In this context, the aim of this study is to assess the performance of the health systems of the European Union (EU) member countries during the Covid-19 pandemic.

RESEARCH AND FINDINGS

In the present study, health systems efficiency scores of EU countries were calculated with Data Envelopment Analysis (DEA). DEA is one of the most widely used methods in assessing the efficiency of a set of Decision Making Units (DMUs). It is a non-parametric method which identifies an efficiency frontier on which only the efficient DMUs are placed, by using linear programming techniques (Asandului et al., 2014).

The study was carried out on 27 EU member countries. The efficiency scores of EU countries were calculated and compared based on the input-oriented CCR model. The purpose of the CCR model is to maximize multiple outputs with a given set of multiple inputs. Here, the highest possible score of the decision-making units is "1". The input and output variables used in the analysis were determined based on the literature (Ergülen et al., 2020; Sel, 2021; Selamzade and Özdemir, 2020; Breitenbach et al., 2021; Mourad et al., 2021; Lupu and Tiganasu, 2022). In the study, four input and two output variables were used. The number of physicians, the number of nurses, the number of beds, and the number of Covid-19 cases were used as input variables; the number of deaths from Covid-19, and Covid-19 vaccine rates (at least one dose) were used as output variables. The Covid-19 data used in the study belong to March 11, 2022 in order to evaluate the first two years of the pandemic. For other variables, the year 2017 was used for which all data can be accessed (Table 1). In addition, the super-efficiency analysis was used to rank among efficient countries. Analyzes were performed using the EMS package program.

Table 1. Variables and Data Sources

Data		Sources	Year
INPUTS	Physicians (Per 1000 people)	OECD	2017
	Nurses (Per 1000 people)	OECD	2017
	Hospital beds (Per 1000 people)	OECD	2017
	Covid-19 cases (Per 1 million population)	Worldometers	11 March 2022
OUTPUTS	Covid-19 deaths	Worldometers	11 March 2022
	Covid-19 vaccine rates	OurWorldinData	11 March 2022

Among the EU countries, the country with the highest number of physicians is Greece (n=6), and the country with the lowest number of physicians is Cyprus (n=2). The country with the highest number of nurses is Finland (n=14,26), while Hungary (n=6,91) has the highest number of hospital beds. The country with the highest number of Covid-19 cases (Per one million population) is Denmark (n=505195) and the highest vaccination rate (at least one dose) was Portugal (n=95,04).

As a result of DEA analysis, it was determined that 8 of the 27 EU member countries were efficient, while 19 countries was inefficient. Cyprus, Finland, Greece, Malta, Sweden, Denmark, Spain and Ireland are efficient countries. The efficiency score average of EU countries was calculated as 0.816 (Table 2).

Table 2. Health Systems Efficiency Score of EU Countries

Country	Efficiency Score	Country	Efficiency Score
Germany	0,652	Sweden	1,000
Austria	0,623	Italy	0,965
Belgium	0,759	Latvia	0,883
Bulgaria	0,459	Lithuania	0,657
Czechsia	0,583	Luxembourg	0,813
Denmark	1,000	Hungary	0,814
Estonia	0,716	Malta	1,000
Finland	1,000	Poland	0,970
France	0,721	Portugal	0,907
Cyprus	1,000	Romania	0,735
Croatia	0,690	Slovakia	0,542
Netherlands	0,940	Slovenia	0,601
Ireland	1,000	Greece	1,000
Spain	1,000	**Mean**	0,816

As a result of the DEA analysis, it was determined that the efficiency scores of most of the inefficient countries were below 0,700 (n=8). The efficiency score of the four countries is in the range of 0.900-1.000. According to the super efficiency analysis, Cyprus showed the best performance among the efficient countries, followed by Finland and Greece. As a result of the analysis, the worst performing countries were found as Bulgaria, Slovakia and Czechia (Table 3).

Table 3. Best and Worst Health Systems Performance

Country	Score	Country	Score
Cyprus	1,948	Bulgaria	0,459
Finland	1,416	Slovakia	0,542
Greece	1,337	Czechsia	0,583
Malta	1,327	Slovenia	0,601
Sweden	1,250	Austria	0,623

CONCLUSION

It was determined that 8 of the 27 EU member countries were efficient, while 19 were inefficient. The efficiency score average of EU countries was calculated as 0.8161. According to the super efficiency analysis, Cyprus showed the best performance among the efficient countries; the worst performing country was found as Bulgaria. The results showed that health systems in some European countries need to be strengthened, both at the management level and at the level of medical infrastructure and find more efficient ways to allocate health resources. Because of the uncertainties in its structure, it is thought that the Covid-19 pandemic, which should be handled in economic, social, technological, and cultural terms, should be handled with maximum responsibility by all actors in the economy, especially the health sector. The results highlight the importance of achieving best practices on efficiency through the link between the resources of health systems and Covid-19 outcomes. Inefficient countries in the sample analyzed could learn some pandemic health management practices from the efficient ones. In addition to having sufficient resources, it is thought that the effective use of existing resources is also important in terms of ensuring efficiency.

The results showed that in some European countries, health systems need to go through a deep restructuring, which will lead to their strengthening, but also to a thorough assessment, both at the level of management and at the level of medical infrastructure. The results could serve as starting points for health policymakers to perform comparative analyzes in terms of good practices in the health system and to develop national plans to better deal with health crises. It is crucial to assess and compare the performances of countries' health systems during the Covid-19 period. The results can be used to plan the improvements to be made in the health systems in the Post-Covid period and determine the policies to be carried out in future pandemics. Future research may use different methods. In addition, it can change input and output variables or make analyzes in different time periods.

REFERENCES

Asandului, L., Roman, M., & Fatulescu, P. (2014). The efficiency of healthcare systems in Europe: A data envelopment analysis approach. Procedia Economics and Finance, 10, 261-268.

Breitenbach, M. C., Ngobeni, V., & Aye, G. C. (2021). Global healthcare resource efficiency in the management of COVID-19 death and infection prevalence rates. Frontiers in Public Health, 9: 638481.

Ergülen, A., Bolayır, B., Ünal L, Z., & Harmankaya, İ. (2020). Covid-19 sürecinde Türkiye'nin etkinliğinin veri zarflama analizi ile değerlendirilmesi. Gümüşhane Üniversitesi Sosyal Bilimler Enstitüsü Elektronik Dergisi, 11(Ek), 275-286.

Lupu, D., & Tiganasu, R. (2022). COVID-19 and the efficiency of health systems in Europe. Health Economics Review, 12(1), 1-15.

Mourad, N., Habib, A., & Tharwat, A. (2021). Appraising healthcare systems' efficiency in

facing COVID-19 through data envelopment analysis. Decision Science Letters, 10(3), 301-310.
Sel, A (2021). Covid 19 Pandemisinde Sağlık Sistemi Gelişmelerinin Etkinliğinin Ölçülmesi: G-20 Üzerine Bir İnceleme. Kırklareli Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 10(2), 181-202.
Selamzade, F., & Özdemir, Y. (2020). COVID-19a Karşı OECD Ülkelerinin Etkinliğinin VZA ile Değerlendirilmesi. Electronic Turkish Studies, 15(4):977-991.
Worldometer (2022). Covid-19 Coronavirus Pandemic. Access link: https://www.worldometers.info/coronavirus/
Varol, G., & Tokuç, B. (2020). Halk sağlığı boyutuyla Türkiye'de Covid-19 pandemisinin değerlendirmesi. Namık Kemal Tıp Dergisi, 8 (3), 579-594.

ASSESSMENT OF BED UTILIZATION PERFORMANCE OF OECD COUNTRIES WITH THE PABON LASSO MODEL

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ABSTRACT
The purpose of this study is to assess OECD countries' bed utilization performance. In this context, bed turnover ratio (BTR), bed occupancy rate (BOR), and average length of stay (ALS) data for OECD countries for 2019 or the earliest year were evaluated using the Pabon Lasso model. M.S. Excel Program was used to analyze the research data and generate the Pabon Lasso Diagram. 38 OECD countries within the scope of the research, the BTR average is 75.51, the BOR average is 37.29, and the ALS average is 7.42 days. Countries are classified into four zones based on their productivity, according to the Pabon Lasso Diagram. There are twelve nations in the first zone, which is called the inefficient region and they are inefficient on all indicators: Austria, Colombia, Czech Republic, Estonia, Greece, Hungary, Korea, Latvia, Lithuania, Netherlands, Poland, and the Slovak Republic. Australia, Iceland, Mexico, Slovenia, Türkiye, and the United States constitute the second zone with low BTR, high BOR, and short ALS. These countries are efficient in terms of BOR and ALS, but in terms of BTR, they are inefficient. The productive zone, which encompasses ten nations with high BTR and BOR and short ALS, includes Chile, Costa Rica, Denmark, Finland, Ireland, Israel, New Zealand, Norway, Sweden, and the United Kingdom. Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, Portugal, Spain, and Switzerland are among the countries in the fourth zone with high BTR, low BOR, and long ALS. This region's countries are efficient in terms of BTR, even though inefficient in terms of BOR and ALS. In this study, the performance of the countries' bed utilization performance has been evaluated under 3 indicators. In terms of indicators, it is critical to investigate the causes of low productivity and to measures to reduce the causes of inefficiency. In this context, it is recommended that future studies conduct research on the possible causes of performance evaluation results.

Keywords: Bed Turnover Ratio, Bed Occupancy Rate, Bed Utilization Performance, Average Length of Stay, Pabon Lasso Model

INTRODUCTION

Improving performance and efficiency are among the top concerns of policy makers and health managers. Performance measurement is a crucial element for health services where efficiency is a vital indicator in itself (Mehrtak et al., 2014). Given the scarcity of resources and increasing costs, the importance of health system managers, planners, and decision-makers to identify the current situation and improve performance based on this has increased (Khalilabad et al., 2020). It is thought that the inefficient use of hospital beds will be a pressure factor on health systems as bed use performance has a significant impact on health system performance (Pecoraro et al., 2021).

The Pabon Lasso Model developed by Hipolito Pabon Lasso in 1986 has a wide usage area in the evaluation of bed use performance (Lasso, 1986: 341). It is a useful tool for evaluating bed utilization performance and its use is increasing (Aeenparast et al., 2015). The Pabon Lasso model is a remarkable method with its together use of three frequently used indicators such as the average length of stay, bed turnover rate, and bed occupancy rate (Figure 1). In addition to giving useful results, the method finds widespread use because it consists of easily accessible and calculated indicators in different countries (Çalışkan, 2016; Yıldız, 2017; Yiğit and Kumru, 2016; Hatice and Yiğit, 2021; Konca et al., 2022; Goshtasebi et al., 2009; Moradiet et al., 2007; Khalilabad et al., 2020). The fact that they require a lot of financial and human resources due to their nature has aroused great interest in the issue of health system performance. It is useful to determine the bed utilization performance, which has a very important place in the health system of countries. The purpose of this study is to assess OECD countries' bed utilization performance.

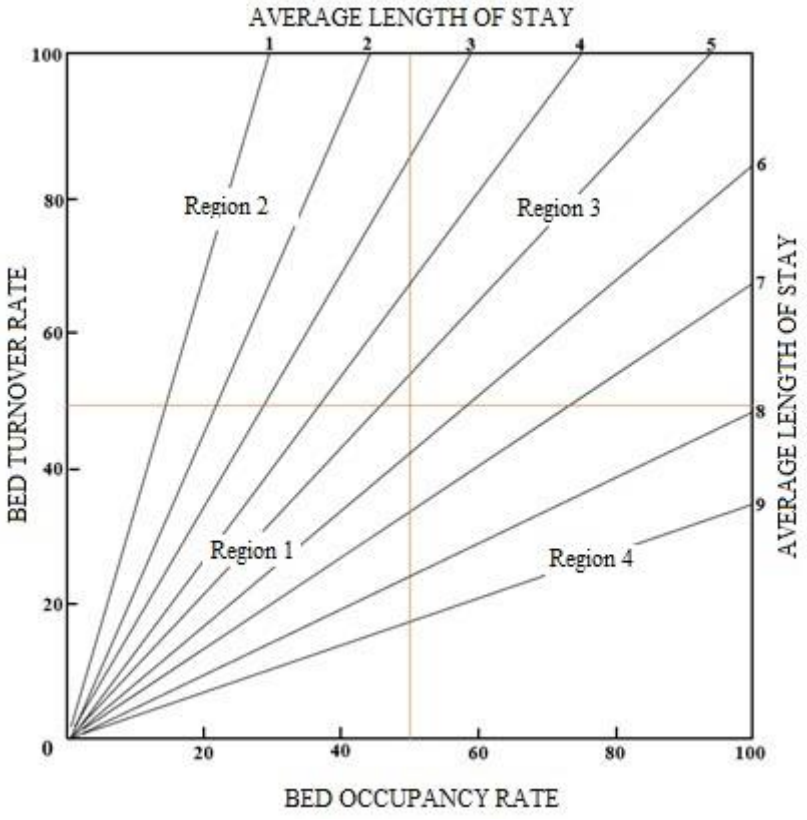

Figure 1. Pabon Lasso Chart (Lasso, 1986:342)

RESEARCH AND FINDINGS

In this study, the pabon lasso model was used to measure bed utilization performance. In this context, operational indicators of OECD countries for 2019 or the nearest year were obtained from the OECD database (OECD, 2022). BOR, BTR, ALS data of 38 OECD countries were evaluated with the Pabon Lasso Model. Countries evaluated in this context are Australia, Austria, Belgium, Canada, Chile, Colombia, Costa Rica, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak republic, Slovenia, Spain, Sweden, Switzerland, Türkiye, United Kingdom, United States. M. S. Excel program was used to analyze the data and create the pabon lasso diagram.

The average BOR of the countries covered by the study is 75.51%. Countries with below-average B0R from lowest to highest are Colombia, Poland, Iceland, Greece, Netherlands, Hungary, United States, Korea, Türkiye, Slovak Republic, Czech Republic, Slovenia, Australia, Lithuania, Austria, Latvia, Estonia, and Mexico. Countries with above-average Bed Occupancy Rate from highest to lowest are Finland, Sweden, New Zealand, Canada, Israel, Ireland, Costa Rica, United Kingdom, Denmark, Portugal, Switzerland, Belgium, Chile, Norway, Germany, France, Luxembourg, Italy, Japan and Spain. The average BTR of OECD countries is 37.29. Countries with lower than average Bed Turnover Rates are Japan, Korea, Colombia, Portugal, Poland, Hungary, Netherlands, Czech Republic, Latvia, Belgium, Luxembourg, France, Germany, Canada, Slovak Republic, Greece, Austria, Estonia, Lithuania, Spain, Italy and Switzerland. Countries with higher than average BTR are respectively Sweden, Türkiye, New Zealand, Denmark, United Kingdom, Israel, Australia, Finland, Norway, Ireland, Costa Rica, Chile, United States, Mexico, Slovenia and Iceland. The ALS in OECD countries is 7.42 days. Countries with longer than ALS are Korea, Japan, Hungary, Czech Republic, Germany, Luxembourg, France, Austria, Latvia, Canada, Switzerland, Spain, Italy, Portugal, Finland, Estonia and Lithuania, respectively. Countries with shorter than ALS are Türkiye, Mexico, Netherlands, Australia, Norway, Denmark, United States, Sweden, Costa Rica, Iceland, Ireland, Belgium, Chile, Colombia, Israel, New Zealand, United Kingdom, Slovenia, Greece. , Poland and the Slovak Republic.

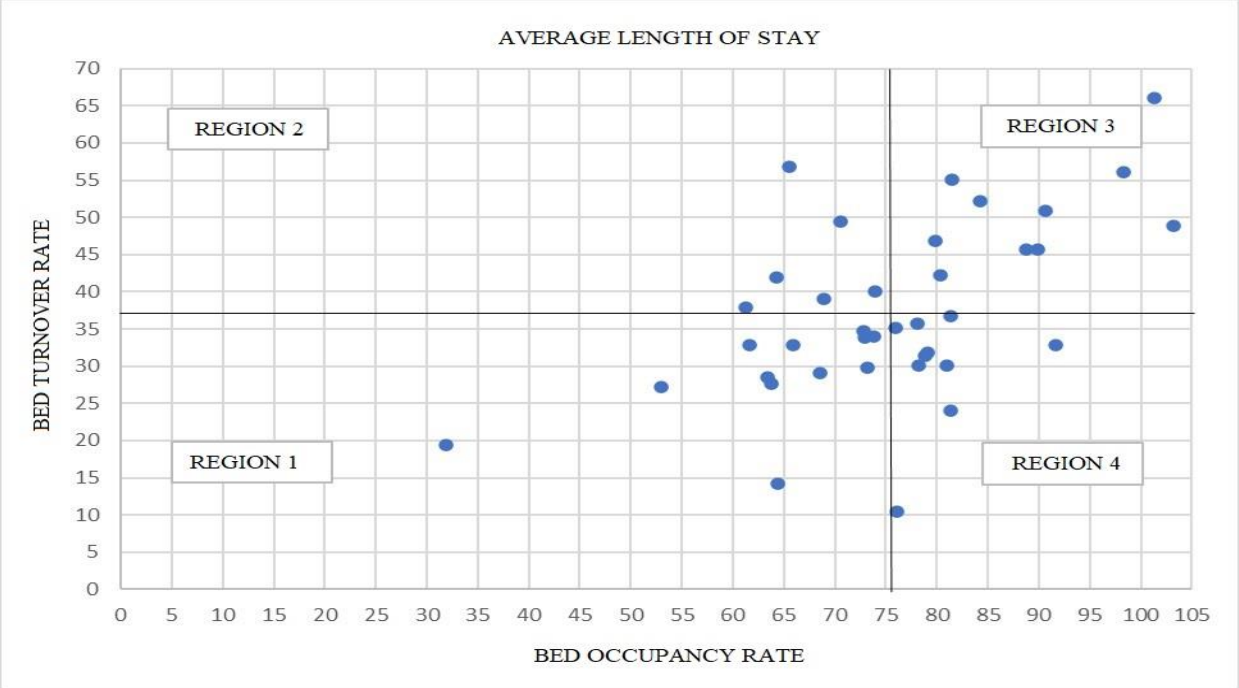

Figure 2. Bed Utilization Performance of OECD Countries According to the Pabon Lasso Model

As seen in Figure 2, in the Pabon Lasso Diagram, countries are located in 4 different regions according to their productivity status. In zone 1, called the unproductive zone, there are 12 countries with low BOR and BTR and long ALS: Austria, Colombia, Czech Republic, Estonia, Greece, Hungary, Korea, Latvia, Lithuania, Netherlands, Poland and the Slovak Republic. Region 2 with low BOR, high BTR and short ALS includes Australia, Iceland, Mexico, Slovenia, Türkiye and the United States. Region 3, the so-called productive region, with high BOR and BTR, and short ALS includes 10 countries: Chile, Costa Rica, Denmark, Finland, Ireland, Israel, New Zealand, Norway, Sweden and the United Kingdom. . Countries in Region 4 with high BOR, low BTR and long ALS are Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, Portugal, Spain and Switzerland.

CONCLUSION

In this study, the relative bed utilization performance of OECD countries was evaluated with the Pabon Lasso Model. In this context, countries are divided into four regions according to their productivity status. According to the research findings, Austria, Colombia, Czech Republic, Estonia, Greece, Hungary, Korea, Latvia, Lithuania, Netherlands, Poland and Slovak Republic countries are unproductive, Chile, Costa Rica, Denmark, Finland, Ireland, Israel, New Zeland, Norway, Sweden and United Kingdom were found to be productive. Due to the basis of the model, the bed utilization performance was examined within the framework of BTR, BOR and ALS. Especially during the pandemic period, the use of hospital bed capacities of countries has become more remarkable. On the other hand, efficient management of bed capacities is also important for the sustainability of health services, and studies should be conducted on productivity evaluations. Increasing research on this subject would be beneficial. It is recommended to carry out studies to determine the causes of unproductivity in future studies.

REFERENCES

Aeenparast, A., Farzadi, F., Maftoon, F., Zandian, H., & Rezaeı, Y. M. (2015). Quality of Hospital Bed Performance Studies Based on Pabon Lasso Model (Mini Review).

Çalışkan, Z. (2016). Kamu Hastane Birlikleri Performansının Pabón Lasso Modeli İle Analizi. Sosyal Güvence, (10), 1-24.

Goshtasebi, A., Vahdaninia, M., Gorgipour, R., Samanpour, A., Maftoon, F., Farzadi, F., & Ahmadi, F. (2009). Assessing hospital performance by the Pabon Lasso Model. Iranian Journal of Public Health, 38(2), 119-124.

Hatice, E., & Yiğit, V. (2021). Yoğun Bakım Yatak Kullanım Verimliliğinin Pabon Lasso Modeli İle Değerlendirilmesi. MANAS Sosyal Araştırmalar Dergisi, 10(2), 1138-1150.

Khalilabad, T. H., Asl, A. N., Raeissi, P., Shali, M., & Niknam, N. (2020). Assessment of clinical and paraclinical departments of military hospitals based on the Pabon Lasso Model. Journal of Education and Health Promotion, 9.

Konca, M., İlgün, G., & Yetim, B. (2022). İkinci Basamak Kamu Hastanelerinin Kaynak Kullanım Verimliliğinin Pabon Lasso Modeli İle Değerlendirilmesi. Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 24(1), 421-433.

Lasso, H. P. (1986). Evaluating hospital performance through simultaneous application of several ındicators. Bulletin Of The Pan American Health Organization, 20(4), 341-357.

Mehrtak, M., Yusefzadeh, H., & Jaafaripooyan, E. (2014). Pabon Lasso and Data Envelopment Analysis: a complementary approach to hospital performance measurement. Global journal of health science, 6(4), 107.
Moradi, G., Piroozi, B., Safari, H., Nasab, N. E., Bolbanabad, A. M., & Arezoo, Y. A. R. I. (2017). Assessment of the efficiency of hospitals before and after the implementation of health sector evolution plan in Iran based on Pabon Lasso model. Iranian journal of public health, 46(3), 389.
OECD (2022). OECD Stat. Access Link: https://stats.oecd.org/.
Pecoraro, F., Luzi, D., & Clemente, F. (2021). The efficiency in the ordinary hospital bed management: A comparative analysis in four European countries before the COVID-19 outbreak. Plos one, 16(3), e0248867.
Yıldız, M. S. (2017). Türkiye'de 2002-2015 yılları arasında hastane yatak kullanımının değerlendirilmesi: Pabon Lasso metodu uygulaması. Hacettepe Sağlık İdaresi Dergisi, 20(3), 347-356.
Yiğit, P & Kumru, S. (2016). Türkiye'de Hastane Verimliliğinin Pabon Lasso Modeli İle İncelenmesi. 10. Sağlık ve Hastane İdaresi Kongresi. 1-3 Aralık 2016. Ankara

BREAD CRISIS IN İSTANBUL (OCTOBER 17-19, 1935): INCIDENTS AND PROFITEERING IN BAKERIES

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ABSTRACT
Bread trade is a highly visible economic activity that every individual without exception is involved in or witnesses in urban life. This study analyzes the relationship between bread problem and urban life in İstanbul and discusses the behaviors shown. The main source of the study is newspapers which present participant observations in addition to institutional ideas. Therefore, the primary method was determined as problem-chronology and discourse analysis. Due to rising flour prices in many districts of İstanbul (such as Aksaray, Edirnekapı, Ortaköy, Fatih, Eyüp, Beşiktaş, Topkapı, Samatya), bakers reduced the bread supply on October 17, 1935. The fact that the supply did not meet the demand resulted in serious crowds in front of bakeries and eventually bread could find buyers for 5-10 cents more than its value in the black market. In a short time, the incidents went from being a space-supply problem to being a city-public security problem. The windows of bakeries were broken in Galata and Cağaloğlu, pickpocketing and theft cases were seen in Hocapaşa and Gedikpaşa, a child was injured by a sharp object, a woman who was in danger of getting crushed in Sirkeci was saved only with the help of police. Emin, who shouted "*What a disgrace*" as he could not find bread in Cağaloğlu, is the only case –detected- for being detained by police on grounds of opposition. It can be seen that the decision makers associated this whole process with the census (October 20, 1935) and the exploitation of bakers and could not focus on developing medium or long term plans on bread. In fact, the governor and mayor of İstanbul Muhittin Üstündağ called the current crisis as the trouble making of some rushers and invited the newspapers to fight against the "trouble makers". However, even the increasing human mobility in the city indicated serious infrastructure and organization problems.

Keywords: İstanbul, bread crisis, urban life.

INTRODUCTION
The questions

I. To what extent did the shrinkage of bread supply affect consumer behavior in İstanbul?

II. What is the position of bakery performances in the relationship between urban life and individual-state?

are the focus of the present study.

Almost every discussion about bread and its price starts with a reference to wheat in the Republic of Türkiye. The fluctuations in the wheat market could not be reflected in the weight of bread in Turkish market, no matter what. The price of wheat determined the prices of the related products (depending on whether it decreased or increased). This economic practice called "*Narh*" (officially fixed price), which was inherited from the Ottoman Empire, foresees

the price control of the state in consumer products.[1] Although all bread products share a common set of central themes (wheat flour, water, yeast and other functional compounds),[2] the price of bread that is not always the same quality or not made from the same quality of wheat does not guide its value, and the bread of the same price does not always have the same composite.[3]

Table 1. Wheat prices in İstanbul in 1935 (Kuruş)

Months	Wheat	Price
January	extra white (Polatlı)[4]	5.25
February	Sivas[5]	4.50
March	Yahşiyan[6]	4.75
	extra white[7]	4.34
April	extra white[8]	4.32
May	extra white (Anatolia)[9]	4.25
June	soft[10]	6.39
July	extra white[11]	6.35-6.5
August	soft[12]	5.32-7
September	extra white[13]	6.30-7
October	extra white (Anatolia)[14]	8-8.15

Although the theoretical framework is determined by the municipality, the practical equivalent of regulation is not seen in all of the nearly 200 bakers in İstanbul.[15] Although the

[1] Şevket Pamuk, "Prices in the Ottoman Empire, 1469-1914", *International Journal of Middle East Studies*, vol. 36, is. 3, August 2004, pp. 451-468.

[2] Eliot G. Mears, "Wheat, Wheat Flour, and Bread Composite Prices", *The Economic Journal*, vol. 33, no. 129, March 1923, p. 40.

[3] J. Kirkland, "The Relative Prices of Wheat and Bread", *The Economic Journal*, vol. 6, no. 23, September 1896, p. 476.

[4] "Wheat-on stock exchange (Buğday-Borsada)", *Son Posta* (Türkiye), no. 1610, (January 26, 1935), p. 8.

[5] "Wheat-on stock exchange (Buğday-Borsada)", *Son Posta*, no. 1638, (February 23, 1935), p. 11.

[6] "Wheat-on stock exchange (Buğday-Borsada)", *Son Posta*, no. 1645, (March 2, 1935), p. 11.

[7] "Wheat-on stock exchange (Buğday-Borsada)", *Son Posta*, no. 1652, (March 9, 1935), p. 7.

[8] "Wheat-on stock exchange (Buğday-Borsada)", *Son Posta*, no. 1691, (April 20, 1935), p. 9.

[9] "Wheat-on stock exchange (Buğday-Borsada)", *Son Posta*, no. 1712, (May 11, 1935), p. 9.

[10] "Wheat-on stock exchange (Buğday-Borsada)", *Son Posta*, no. 1754, (June 22, 1935), p. 9.

[11] "Wheat-on stock exchange (Buğday-Borsada)", *Son Posta*, no. 1770, (July 8, 1935), p. 4.

[12] "But bread prices will not increase (Fakat Ekmek Fiyatları Artmayacak)", *Son Posta*, no. 1807, (August 14, 1935), p. 3.

[13] "Wheat-on stock exchange (Buğday-Borsada)", *Son Posta*, no. 1847, (September 23, 1935), p. 15.

[14] "Wheat-on stock exchange (Buğday-Borsada)", *Son Posta*, no. 1868, (October 14, 1935), p. 14.

[15] "Bread may get cheaper (Ekmek Ucuzlayabilir)", *Tan* (Türkiye), no. 15-3318, (May 7, 1935), p. 6.

municipality determined the bread price as 11 kuruş; in July 1935, bread was sold for 9.10 kuruş in Laleli, for 9.30 kuruş in Balat Samratomruk, for 9.5 kuruş in Galata.[16] It is also known that Halk İktisat Fırını, Sakızlı Fırın, Mehmet Nafız Fırını in Aksaray and Merkez Fırını in Fatih sold bread under the officially fixed price.[17] On the other hand, one bakery in Gedikpaşa sold bread for 11.20 kuruş claiming it was both roasted and heavy, while two bakeries in Bayezid priced bread as 11.5 kuruş.[18]

Table 2. Bread prices in İstanbul in 1935 (Kuruş)

Months	Bread	French bread
June[19]	10	14
July[20]	11	15
August[21]	10.5	14
October[22]	12	16

Bread prices' being below the fixed upper limit in İstanbul brought along questions about product quality. Samples were taken from districts by the municipality three times a week and sent for analysis. 5 days of closure and 20 liras of fine were imposed on the bakeries that produced bread outside the established rules for the first time, and the number of bakeries fined reached 60 until August 17, 1935.[23] In addition, two bakeries, one in Hasköy and one in Küçük Pazar, were closed for two weeks on September 2, 1935.[24]

1. Bread crisis and incidents in İstanbul

"*...we saw such bakeries that only a tiny window was left on the edge of their closed shutters and hundreds of people were gathered in front of this window ...*"[25]

On October 17, 1935, some bakers in districts such as Fatih, Ortaköy and Beşiktaş applied to the municipality with the claim that millers did not give them flour and therefore they could not make bread.[26] When the municipality examined the situation, it was found that the claim was not true and that bakeries did not buy flour not to lose money in the face of flour

[16] "Many bakeries are selling bread for 9 kuruş (Birçok Fırınlar Ekmeği 9 Kuruşa Satıyor)", *Haber* (Türkiye), no. 1252, (July 3, 1935), p. 4.

[17] "A conversation with bakers selling cheap bread (Ucuz Ekmek Satan Fırıncılarla Bir Konuşma)", *Zaman* (Türkiye), no. 384, (July 14, 1935), p. 1.

[18] "Inconsistent bread prices (Birbirini Tutmayan Ekmek Fiatları)", *Son Posta*, no. 1780, (July 18, 1935), p. 3.

[19] "Officially fixed price of the municipality (Belediyenin Narhı)", *Haber*, no. 1235, (June 17, 1935), p. 2.

[20] "Officially fixed price remains the same (Narh Gene Eskisi Gibi Kaldı)", *Haber*, no. 1258, (July 9, 1935), p. 3.

[21] "The price of bread has finally dropped (Nihayet Ekmek Düştü)", *Son Posta*, no. 1799, (August 6, 1935), p. 2.

[22] "Crisis increased the price of bread (Buhran Ekmeği Yükseltti)", *Son Posta*, no. 1876, (October 22, 1935), p. 2. ; "Permanent council has reduced 30 money increase to 20 money (Daimi Encümen 30 Para Zammı 20 Paraya İndirdi)", *Son Posta*, no. 1883, (October 29, 1935), p. 2.

[23] "Those who make spoiled bread (Bozuk Ekmek Çıkaranlar)", *Son Posta*, no. 1810, (August 17, 1935), p. 3.

[24] "Two more bakeries were shut down yesterday (Dün İki Fırın Daha Kapatıldı)", *Son Posta*, no. 1827, (September 3, 1935), p. 3.

[25] "Ministry of Internal Affairs is asking about the causes of bread crisis (İç Bakanlık Ekmek Buhranının Sebeplerini Soruyor)", *Son Posta*, no. 1874, (October 20, 1935), p. 2.

[26] "Bread prices (Ekmek Fiyatları)", *Kurun*, no. 324, (October 18, 1935), p. 3.

price that increased by 80 kuruş per sack in the last four days.[27] Some readers who came to the printing house of newspaper Cumhuriyet said that they could not find bread in bakeries around Çarşıkapı, Beyazid, Divanyolu Gedikpaşa and Çemberlitaş, people waited in front of bakeries until midnight to buy a kilo of bread and a cook even reported that he had to buy bread for 15 for his restaurant.[28] Bakers with capital and large stocks of flour wanted the officially fixed price to increase to make more profit, while bakers with little capital and no flour stock wanted it to increase since the existing officially fixed price did not cover the price of flour. When the officially fixed price did not rise, the bakers in the first group forced the situation to increase their profit, and the second group made less bread at least to lose less money.[29] On October 18, 1935, those waiting in front of bakeries reported the bakeries to municipal police on grounds that the bakeries did not make bread. With this, police department started to control bakeries and the bakeries were told to make bread immediately. A police was assigned for each bakery to control the work. The controls also showed that there were many sacks of flour in many bakeries.[30] On the same day, officially fixed price for bread was fixed again in proportion to flour prices and as of October 19 (Saturday), bread increased to 11.5 kuruş, while French bread increased to 15 kuruş.[31] However, the price regulation was not sufficient for the supply of bread to meet the demand. Bakeries wanted officially fixed price for bread to increase to 14 kuruş, some bakers even conveyed their demands to the municipality quickly. After bakers' offer, Kadri, the President of the Bakers Association, and Mehmed, a member of the board of directors, were invited to the municipality and they met the Mayor and the Governor Muhiddin Üstündağ. In the meantime, meeting the need for bread by half greatly increased the worries of the public and many incidents occurred in the bakeries.[32] For example, a 12-year-old boy who was going from Sultanahmet to Aksaray to buy bread fell from the tram on the way home and got injured. In Cağaloğlu, blacksmith Emin who shouted "*What a scandal!*" when he could not find bread was taken into custody by the police.[33]

On the morning of September 19, there were lots of people in front of bakeries in Balıkpazarı, Balat, Unkapanı, Karagümrük, Eyüp, Aksaray, Edirnekapı, Fatih, Topkapı, Bayazid, Samatya, Ahırkapı, Sultanahmet and Çemberlitaş, and partially Beyoğlu and Eminönü.[34] Towards the evening, a shortage of bread started in the districts of Beyoğlu, Harbiye, Boğaziçi and Kadıköy and although some bakeries making bagels also made flat

[27] "Bread crisis started in the city (Şehirde Ekmek Buhranı Başladı)", *Cumhuriyet* (Türkiye), no. 4105, (October 18, 1935), p. 2.

[28] "Is there a bread crisis? (Ekmek Buhranı Mı Var?)", *Cumhuriyet*, no. 4105, (October 18, 1935), p. 2.

[29] "Bread crisis is not over yet (Ekmek Buhranı Henüz Zail Olmuş Değil)", *Cumhuriyet*, no. 4108, (October 21, 1935), p. 4.

[30] "There will be plenty of bread today (Ekmek Bugün Bol Olacak)", *Kurun* (Türkiye), no. 325, (October 19, 1935), p. 3.

[31] "The price of bread has increased to 11 and a half kuruş (Ekmek Fiyatı 11 Buçuk Kuruşa Çıkarıldı)", *Akşam* (Türkiye), no. 6108, (October 19, 1935), p. 2. ; "From İstanbul Municipality (İstanbul Belediyesinden)", *Akşam*, no. 6108, (October 19, 1935), p. 4.

[32] "Bakers want the fixed price to be increased to 14 kuruş (Fırıncılar Narhın 14 Kuruşa Çıkarılmasını İstiyorlar)", *Akşam*, no. 6109, (October 20, 1935), p. 7.

[33] "A Picture we haven't seen since the Great War (Büyük Harbdenberi Görmediğimiz Manzara)", *Cumhuriyet*, no. 4106, (October 19, 1935), p. 6.

[34] "Bread crisis continued fiercely yesterday, too (Ekmek Buhranı Dünde Şiddetle Devam Etti)", *Cumhuriyet*, no. 4107, (October 20, 1935), p. 1.

bread, they could not meet the demand.[35] The sudden problem in the chain of consumption affected many businesses. It can be seen in the records that Mustafa, a grocer on Nöbethane Street in Sirkeci complained that he could barely buy some bread for his customers towards morning.[36] In addition to these, bread was not given to those who ate at restaurants and sandwiches and cakes were not found in patisseries.[37] The reporter of Cumhuriyet newspaper who wandered around bakeries from Yedikule to Eminönü wrote: "the public is in a very bad condition because bread racks are empty and some canny citizens sold the bread they bought on the black market for 15-20 kuruş" and did not hide his astonishment at the fact that people snatched hastily baked bread.[38]

Table 3. Bread crisis in newspaper statements

Newspaper	Statement
Tan	"A whole city running over each other in front of bakeries to find bread..."[39]
Cumhuriyet	"Lack of bread, which the people had not seen for eighteen years and had completely forgotten, made itself felt once again in the last two days and brought war years back to life in memory."[40]
	"…these incidents are examples of mismanagement."[41]
	"Neighborhoods of the city such as Fatih, Karagümrük, Kasımpaşa, Ortaköy, Samatya, Kumkapı and Galata and Şişhane districts overshadowed the years of war."[42]
Son Posta[43]	"The government of the Republic of Türkiye will not starve the Turkish nation. Speculating on the hunger of people is opposed to the principles of the current regime."
	"The days we swallowed ash with document became history."
Haber	"What is happening? Who is giving bakeries the right to play with the stomach of people?"[44]

[35] "Bread crisis is not over yet (Ekmek Buhranı Henüz Zail Olmuş Değil)", *Cumhuriyet*, no. 4108, (October 21, 1935), p. 4.

[36] "Bread crisis (Ekmek Sıkıntısı)", *Kurun*, no. 326, (October 20, 1935), p. 4.

[37] "Bread crisis is not over yet (Ekmek Buhranı Henüz Zail Olmuş Değil)", *Cumhuriyet*, no. 4108, (October 21, 1935), p. 4.

[38] "Bread crisis continued fiercely yesterday, too (Ekmek Buhranı Dünde Şiddetle Devam Etti)", *Cumhuriyet*, no. 4107, (October 20, 1935), p. 4.

[39] "A Picture we haven't seen since the Great War (Büyük Harbdenberi Görmediğimiz Manzara)", *Cumhuriyet*, no. 4106, (October 19, 1935), p. 1.

[40] Orhan Selim, "Water-bread (Su-Ekmek)", *Tan*, no. 181-3484, (October 20, 1935), p. 2.

[41] "We are asking (Soruyoruz)", *Cumhuriyet*, no. 4107, (October 20, 1935), p. 1.

[42] "A Picture we haven't seen since the Great War (Büyük Harbdenberi Görmediğimiz Manzara)", *Cumhuriyet*, no. 4106, (October 19, 1935), p. 1.

[43] "There is no bread crisis! (Ekmek Kıtlığı Yoktur!)", *Son Posta*, no. 1874, (October 20, 1935), p. 3.

[44] "In the face of people's hunger (Halkın Aç Kalması Karşısında)", *Haber*, no. 1361, (October 20, 1935), p. 3.

Ulus	"The impact of the event is quite heavy on the public."[45]

As a result of the increasing bread demand, the shutters of the big bakery on the tramroad in Sirkeci were shut due to the crowd and trams and cars could hardly pass through the Street. An old Greek woman who was trapped in the middle of the crowd was rescued unconscious and injured only with the help of the police.[46] Since the people overflowed on the tramroad especially between Aksaray and Yedikule, tram drivers took great care to avoid accidents. Uncontrolled gathering of the citizens to demand bread did not only cause a unidirectional intervention to the ordinary flow of daily life, it also brought security problems with it. In the evening, the windows of a closed bakery were broken in Cağaloğlu. Three people caught by the police were taken to the police station. At night, a boy named Kemal was injured with bandoleer by unknown people in front of Çemberlitaş bakery.[47] There were also many cases of pickpocketing and theft in the crowds caused by the crisis. The watch of Lütfullah who waited until the evening at Hocapaşa bakery, the cigarette case of Hocapaşa public bath regular Halil and 400 lira of an old man among hundreds of people gathered in front of Gedikpaşa bakery were stolen.[48]

2. Administrators' approaches to bread crisis

It would be appropriate to examine the statements made about incidents under two different headings as administration and press. The first statement to be discussed in terms of administration is the letter of İstanbul Governor and Mayor Muhittin Üstündağ, dated October 20. The following is stated in Üstündağ's letter: "While some of the newspapers published today wrote about the gathering and crowding of some of the public in front of bakeries yesterday to buy bread, they also wrote about the lack and crisis of wheat, flour, bread and municipality measures. There is neither wheat, nor flour nor bread crisis in the country, nor a lack of measures. The current crisis is nothing but the defeatism of some hasty people. As a matter of fact, no one was left without bread and the most obvious evidence of this is that many people bought more bread than they needed. The way to prevent such unwanted incidents is newspapers' attacking the real corrupters by addressing them. Looking for other causes by neglecting them and talking about a crisis will do nothing but increase the daring of the offenders."[49]

On the other hand, the statements of deputy mayor Ekrem and Economy Director of the Municipality Asım Süreyya have an important place in the assessment of the situation in press. The statements are as follows: (deputy mayor Ekrem): "I can say that the current situation is caused by both the bakers and the bad acts of the people. Such unusual things always occur as

[45] "Bread crisis in İstanbul (İstanbul'da Ekmek Darlığı)", *Ulus* (Türkiye), no. 5113, (October 20, 1935), p. 5.

[46] "The people suffered a lot to buy bread yesterday (Dün Ekmek Almak İçin Halkın Çekmediği Kalmadı)", *Tan*, no. 181-3484, (October 20, 1935), p. 3.

[47] "The crisis continued fiercely yesterday, too (Buhran Dünde Şiddetle Devam Etti)", *Cumhuriyet*, no. 4107, (October 20, 1935), p. 9.

[48] "Bread crisis (Ekmek Sıkıntısı)", *Kurun*, no. 326, (October 20, 1935), p. 4. ; "The people suffered a lot to buy bread yesterday (Dün Ekmek Almak İçin Halkın Çekmediği Kalmadı)", *Tan*, no. 181-3484, (October 20, 1935), p. 3.; "People suffered so much to buy bread (Ekmek İçin İstanbullular Türlü Eziyet Çektiler)", *Haber*, no. 1361, (October 20, 1935), p. 4.

[49] "A letter of the mayor and governor (Vali ve Belediye Reisinin Bir Mektubu)", *Cumhuriyet*, no. 4108, (October 21, 1935), p. 4.

the officially fixed price changes or on the days preceding this change. If we add the general holiday tomorrow which coincides with the consensus, the situation will become more understandable. At such times, people want to buy more bread than they need. It is also possible that bakers wanted to make less bread. However, our investigation showed that bakers made the usual amount of bread. I am sure that this situation will turn to normal by this evening (October 19)." [50] (Economy Director of the Municipality Asım Süreyya) "There is nothing to worry about in the situation. Bakeries are making bread, bread price is rising. The fact that there is crowd in front of bakeries is due to people's desire to buy more bread because of the consensus."[51]

Interestingly, *Cumhuriyet* criticized the letter of Governor and Mayor Üstündağ by saying "We have no idea about how our esteemed administrator is supplying bread. However, no offense, we want to say that his idea about how people supply bread by walking for hours for a kilo of bread for the last four-five days is wrong…."[52] *Kurun* newspaper on the other hand, sufficed with exemplifying the existence of the problem: "What we saw was things telling how some İstanbulers were left without bread. Some of the consensus officers and watchmen were busy supplying bread to those who were left without bread. However, two citizens living at number 52 in Karaköy, were able to supply bread with the help of our writer. They were saying that they could not find bread at night (October 19) and they were hungry as a result."[53] As a matter of fact, the papers are right that the bread problem was not specific for October. The interviews of those who could not find bread in Ortaköy in June support this view.

Table 4. Various statements regarding the lack of bread in Ortaköy in June [54]

Interviewee	Statement
Cevad	"I have four children. We were hungry because I could not find bread. This had not happened even when the weather was worst in winter…Bread came from Beşiktaş for a moment, but it ran out quickly."
Niko	"With the money I earn, we can only live by eating bread. I have six siblings. I came to buy bread this evening. I could not find even a bite."
Şua	"I could not find bread. I went to Beşiktaş and came back. I gave 7.5 kuruş to tram for nothing. Thus, I bought bread for 17.5 kuruş."
Hüseyin	"I came for bread. But they said there was no bread in the bakery. Thus, I bought bread for 15 kuruş from a man who had bought a few bread."

[50] "According to deputy mayor (Şarbay Muavinine Göre)", *Cumhuriyet*, no. 4107, (October 20, 1935), p. 9.

[51] "According to economy director (Ekonomi Direktörüne Göre)", *Cumhuriyet*, no. 4107, (October 20, 1935), p. 9.

[52] "A letter of the mayor and governor (Vali ve Belediye Reisinin Mektubu)", *Cumhuriyet*, no. 4108, (October 21,1935), p. 4.

[53] "Bread problem (Ekmek Meselesi)", *Kurun*, no. 327, (October 21, 1935), p. 4.

[54] "Last night Ortaköy suffered from having no bread (Dün Gece Ortaköy Ekmeksizlikten Eziyet Çekti)", *Haber*, no. 1244, (June 26, 1935), p. 4.

Yako	"There are five of us at home. We do not have bread. I don't know how I will go home."
Muzaffer	"I went to the bakery to buy hundred dirham of bread and to fill in my stomach. There was no way to get in. I went to another bakery, I begged, but they did not give me bread."

Conclusion

1- Bread, the cultural/traditional aspect of which is emphasized today, was the basic consumption for many and the only consumption item for many people in the reality of the period.

2- October 17-19, 1935 İstanbul bread crisis is only an addition to the countless bread crises in Türkiye and the world.

3- The persistence and worries of individuals to buy bread and their waits in front of bakeries point to a trauma with historical foundations and reveals the negative connotation of bread shortage in social memory.

4- Despite negative statements about bakers, they did not become the object of mass hatred. However, this does not mean that the commercial attitude of bakers was accepted by the society.

5- Fixing the price of bread is a policy of the state to control the market. In Türkiye, bread production and distribution was not nationalized, as in the Soviet example; entrepreneurs' leaving the business and the resulting trade contraction was not desired.

6- Fixed price limited the competition between bakers and turned the issue into a price struggle between bakers and the municipality. With the official fixed price, the municipality regulated the trade between businesses who made or wanted to make bread and the individuals who wanted to consume bread-on the basis of the profit of parties.

7- Administrators' approach to bread problem and their accusing statements about certain groups seem to be biased. I am not sure that this is an attitude taken in the articles in the newspapers against the municipality because administrators approached the incidents in the form of protests. Although there were reproachful statements in front of bakeries, the aim of the crowd was to buy bread, not to protest not being able to find bread. Yes, the people did not shout "*respectful opposing*" slogans as "*Long live the king, let the price of bread fall*",[55] however, the groups were not politicized. I believe that this problem is caused by the fact that the Governorship and Mayorship of İstanbul are carried out together so that bureaucratic decisions are taken from a single source.[56] This can raise the question "*Although governorship and mayorship have different responsibilities, they are appointed by the same authority in the single party period. What does a distinction in positions change?*" However, the policies regulating the bread market belong to the same authority. In addition, the statements of administrators urged many people to share their experiences and this diversified the examples in the study.

Reference

Newspapers (Türkiye): Akşam, Cumhuriyet, Haber, Kurun, Resmi Gazete, Son Posta, Tan,

[55] Steven Laurence Kaplan, *The Bakers of Paris and the Bread Question 1700-1775*, Durham and London: Duke University Press, 1996, p. 12.

[56] *Turkish Municipality Law*, no. 1580. For details, see. *Resmi Gazete* (Official Gazette of the Republic of Türkiye), no. 1471, (April 14, 1930), pp. 8821-8840.

Ulus, Zaman.
Kaplan, Steven Laurence; *The Bakers of Paris and the Bread Qyestion 1700-1775*, Durham and London: Duke University Press, 1996.
Mears, Eliot G.; "Wheat, Wheat Flour, and Bread Composite Prices", *The Economic Journal*, vol. 33, no. 129, March 1923, pp. 39-50.
Pamuk, Şevket; "Prices in the Ottoman Empire, 1469-1914", *International Journal of Middle East Studies*, vol. 36, is. 3, August 2004, pp. 451-468.

DOĞU BATI EKSENİNDE KUZEYLİ SEYYAH HANS CHRİSTİAN ANDERSEN'İN GÖZÜNDEN PORTEKİZ – TÜRKİYE DEĞERLENDİRMESİ

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ÖZET
Masalları bütün dünyada bilinen Hans Christian Andersen'in gezi notları, masalları kadar ünlenmese de sosyal bilimlerin bütün dallarına katkı sağlaması bakımından gezi notları da oldukça önemli bir kaynaktır. Hans Christian Andersen'in 1840-1841'de Türkiye'ye (İstanbul ve İzmir), 1867'de Portekiz'e yaptığı gezi, dönemin doğu ve batı dünyasını görmemiz için, Kuzeyli (Danimarkalı) bir gezginin gözlemlerini kayda geçirmesi bakımından son derece önemlidir. Zira, tarafsız olmasıyla birlikte uzak bir coğrafyadan gelen seyyahın daha önce tecrübe etmediği deneyimleri, herhangi bir kültürün etkisinde kalmayarak kaleme alması eseri özgün kılmak noktasında dikkate şayandır.
Bu eserde, yazar (Hans Christian Andersen) geldiği coğrafyanın etkisi ile, sosyal, tarihi, kültürel, gözlemlerini bir kuzeyli (İskandinav) olarak değerlendirmektedir. Bu husus da Hans Christian Andersen'in doğuyu ve batıyı "öteki" olarak görmesine sebep olmuş ve yazıldığı dönemde Osmanlı İmparatorluğu'nu, "Doğu'yu" ve aynı zamanda da "Batı'yı" yani, Atlantik, Akdeniz ve İber yarımadası üçgenindeki Portekiz'i, "öteki" olarak analiz etmesini sağlamıştır. Seyahatnamelerin bir başka özelliği de yazıldığı döneme ve topluma ayna tutmalarıdır. Bu bildiride, yabancı ve kuzeyli olan seyyah Hans Christian Andersen'in gezi notları, karşılaştırmalı olarak değerlendirilecek ve ayrıca dönemin Doğu-Batı dünyası içindeki benzerlikleri ile farklılıkları bir yabancının gözünden aktarılacaktır. Diğer bir ifadeyle; XIX. Asır için zihniyet, medeniyet, coğrafya, inanç, tarihi ve kültürel miras, doğu batı ekseninde analiz edildiği yüzyıl da göz önüne alınarak çeşitli saptamalar yapılacaktır.

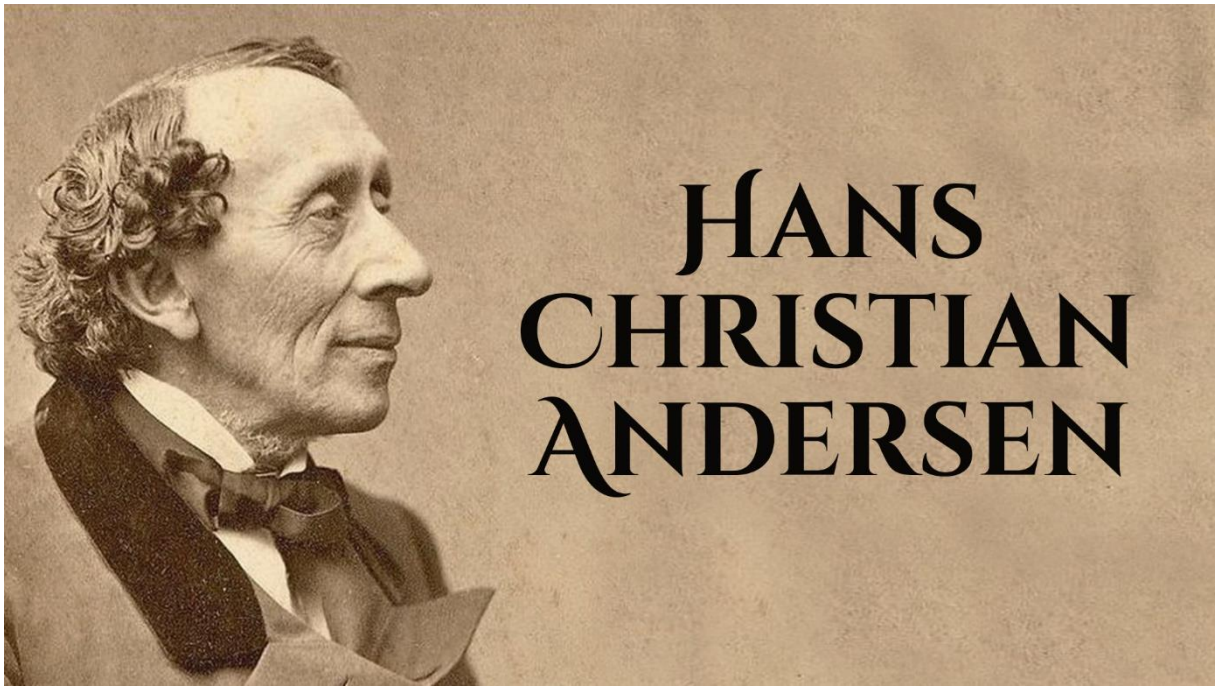
Anahtar Kelimeler: Hans Christian Andersen, Doğu, Batı, Seyahatname, Gezi Notları

AN EVALUATION OF PORTUGAL – TÜRKIYE THROUGH THE EYES OF HANS CHRISTIAN ANDERSEN, A NORTHERN TRAVELER ON THE EAST-WEST AXIS

ABSTRACT
In terms of contributing to all branches of social sciences, Hans Christian Andersen's travel-logs are very important sources worldwide even though they are not as well-known as his famous tales. Hans Christian Andersen's trip to Türkiye (Istanbul and Izmir) in 1840-1841 and to Portugal in 1867 is extremely important in terms of keeping a record of his observations concerning the eastern-western worlds of the period from the perspective of a Northern (Danish) traveler. Due to this reason, along with his impartiality, as a traveler who comes from a distant geography, who writes about experiences that he has not experienced before, without being influenced by any culture makes this work significant.
In this work, the author (Hans Christian Andersen) evaluates his social, historical, and cultural observations from a Northerners (Scandinavian) viewpoint. This issue caused Hans Christian Andersen to see both the east and the west as "the other" and during that century, in his analysis, he considered the Ottoman Empire as "the east", and Portugal in the triangle of the Atlantic, Mediterranean and Iberian Peninsula as "the west".

Another feature of travelogues is that they mirror the period and society in which they were written. In this paper, the travel-logs of the foreign and northern traveler Hans Christian Andersen will be evaluated comparatively, and the similarities and differences in the East-West world of that period will be expressed through the eyes of a foreigner. In other words; within the XIX. century, various determinations will be made by considering the mentality, civilization, geography, belief, historical and cultural heritage will be analyzed in the east-west axis.

Keywords: Hans Christian Andersen, East, West, Travel book, Travel-log



GIRIŞ

Seyahatnameler anı veya hatırat olarak -edebiyatta- önemli bir tür sayılmasına rağmen aslında bu yazı türü, sui-generis yani nevi şahsına münhasır bir özellik taşımaktadır. Öyle ki seyahatnameler, her şeyden önce yazarın gözlemlerini içermektedir. Yani seyahatnameler yer-mekân-insan ekseninde dönemin portresini, yazarın bakış açısı ile çizmektedir. Bu nedenle sosyo-kültürel, sosyo-psikolojik ve ekonomik olarak döneme ışık tutan bilgi kaynakları arasındadır. Bu da bize göstermektedir ki, seyahatnameler, edebiyata katkı sağlayan yazı türleri olduğu gibi sosyal bilimler için de önemli kaynak olmak özelliği taşımaktadır. Çünkü seyahatnamelerde esas olan, yazarın günlük yaşamında başından geçenlerden daha çok, farklı bir gözden uzak coğrafyaları anlatan yazılar olmasıdır. Yazarın (seyyahın) kendisi açısından son derece farklı coğrafyayı; folklarından, inancına, yeme-içme kültüründen kadının sosyal hayattaki yerine, sanat eserlerinden klimatolojik özellerine kadar ayrıntılı olarak ele alması eseri kıymetli yapmaktadır. Bunun için sosyolojiden sanat tarihine, tarihten coğrafyaya kadar uzanan geniş bir yelpaze içinde seyahatnameler son derece önemli kaynaklar olarak karşımıza çıkmaktadır.

Burada belirtmemiz gereken bir başka husus ise yazar kendisine uzak bir coğrafyayı tasvir ederken, ona göre ilginç olan ya da daha önce deneyimleme şansı olmayan yönlerini eserine aktarmaktadır.

Bu çalışmada yazarın/seyyahın bir kuzeyli olması hem Türkiye hem de Portekiz için yazarın

gözlemlerini çok daha değerli kılmaktadır. Çünkü her iki coğrafyaya da yabancı olan Danimarkalı Hans Christian Andersen'in

[1] gözlemleri kendi içinde her ne kadar öznel olsa da her iki coğrafyaya uzak olması nedeniyle daha nesnel değerlendirilmesini sağlamaktadır. Bu da çalışmayı daha özgün yapmaktadır.

Bu bildiride, Kuzeyli Hans Christian Andersen, kıta Avrupası'nın en batısındaki Portekiz ile Asya'nın en batısı, Avrupa'nın en doğusundaki, Türkiye (İzmir ve İstanbul özelinde) notları çoğu zaman kıyaslanarak, çoğu zaman da benzeyen yönleri vurgulanarak değerlendirilecektir. Eserin Türkiye kısmı, 1840-1841 yıllarında Hans Christian Andersen'in yaptığı Türkiye'yi de içeren gezisinin ardından 1842'de yayımlanan ilk gezi kitabı olan *En Digters Bazar* (*Bir Şairin Çarşısı*) adlı kitabın Banu Gür Saler Syvertsen'ın "İstanbul'da İki İskandinav Seyyah" isimli çevirisi üzerinden değerlendirilirken, Portekiz kısmı ise Boston: Houghton, Mıfflin and Company The Riverside Press, Cambridge, 1881 baskılı "In Spain and a Visit to Portugual" isimli İngilizce kitaptan derlenerek değerlendirilecektir. Diğer bir önemli husus ise yazarın Türkiye'yi 1840-1841 yıllarında, Portekiz'i 1867 yılında ziyaret etmesidir. Seyahatler aynı yüzyıl içinde olmasına rağmen, dönemin karakteristik bir özelliği olan hızlı değişim ve dönüşüm, gezi notları üzerinden yeri geldikçe vurgulanacaktır.

Türkiye[2]

Hans Christian Andersen'in İzlediği Rota

Hans Christian Andersen, Marsilya'dan Fransız buharlı savaş gemisi "Ramses" ile Arpişel'i (Ege Denizi'ni) geçerek önce Symrna'ya (İzmir) gelir. İzmir'den sonra yolculuğuna Yeni Foça, Midilli, Bozcaada'yı aşarak devam etmiştir. Bu güzergâhta devam ederek İstanbul'a gelmiş ve "Pontus Euxinus[3] Fernanda I." adında gemi ile Karadeniz ve Tuna yoluyla İstanbul'dan ayrılmıştır (Andersen, 1995, s. 75-128).

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[1][1]Bütün dünyada masalları ile tanınan Hans Christian Andersen (1805 Odense-1875 Kopenhag) aynı zamanda masalcı, şair, romancı ve oyun yazarıdır. Önceleri Kopenhag Kraliyet Tiyatrosu'nda aktör olmak isterken, aktörlükte başarılı olamayan Andersen, tiyatro müdürünün katkıları ile eğitimini Kopenhag Üniversitesi'nde sürdürmüştür. Üniversite eğitiminin ilk yıllarında *"1828-29 yıllarında Holmen Kanalı'ndan Amager Adası'nın doğu ucuna yaya olarak yapılan bir gezinti"* adlı eserini yazmıştır. Bundan sonraki süreçte 1833-34 yıllarında Fransa, İsviçre, İtalya'yı dolaştıktan sonra "İmprovisatoren" "Doğaçlama" kitabını yazar ve Andersen için gezmek bir tutku haline gelmiştir. Bu tutku ile Kopenhag Kraliyet Tiyatro müdürü ve sahibi olan Johans Collin'den Yunanistan ve Sicilya'ya gitmek için izin istese de, 1837'de sadece İsveç'e yolculuk yapabilmiştir. Aynı yıl, Danimarkalı yayıncı C. Steen'in ünlü yazarlara ait gezi yazılarının çevirilerini içeren "Seyahatnameler Dergisi'ni" çıkarması, Hermann Pückler-Moskau'nun "Semilasso'nun Afrika Gezisi" ve bir yıl sonra Lamartine'nin "Doğu Gezisi" kitabının çıkması Andersen'i derinden etkilemiştir. Çünkü "Tuna yolculuğuna çıkmak Constantinapel'i ziyaret etmek Andersen'in en büyük amacıydı. Kendisine verilen şair aylığı ile durumu biraz düzelmeye başlasa da, başarısızlıkla sonuçlanan iki oyun tecrübesinden sonra 1840 yılında "Mullaten-Melez" oyunundan elde edeceği kâr ile Karadeniz üzerinden Contantinapel'e gitmeye karar verir. Ancak Kral Frederik VI'nın ölümü, oyunun sahnelenmesini geciktirirken, gezinin de ertelenmesine neden olmuştu. "Mulatten-Melez" oyunu büyük başarı getirirken "Maurerpigen-Mağripli Kız" da sahnelenmeye başlar. Bu sırada 4 Kasım 1840 tarihli "Dagen" dergisi şöyle yazar: *"Şair H.C. Andersen şu sıralarda İtalya yolculuğuna çıkmış bulunmaktadır. Oradan da Doğu şiirinin kaynağını incelemek üzere Constantinopel ve Doğu'nun diğer başkentlerine gidecektir."* 31 Ekim'de Kopenhag limanından Kiel'e giden gemiyle yolculuğu başlayan Andersen, ilk ayını Almanya'da geçirdikten sonra Aralık ayı başlarında kuzey İtalya'ya, 19 Aralık'ta da Roma'ya varır. Andersen, Jonas Collin aracılığıyla Kral'a bir mektup yazarak Kral'dan seyahat bursu isteğinde bulunur. Hans Christian Andesen 1 Mart 1841'de postadan çıkan kredi mektubuyla gezisinin Roma kısmını bitirir. 15 Mart'ta "Leonidas" adlı buharlı gemiyle Napoli'den yola çıkan Andersen sırasıyla Malta, Sira, Pire'den geçerek 24 Mart'ta Atina'ya varmış ve 21 Mart'ta Pire'den kalkan buharlı gemiyle Ege denizini geçerek İzmir'e ulaşmıştır. 1842 yılında Bir Şairin Çarşısı adlı kitabı yayımlanmıştır.

[2]Bizans kaynaklarında Türklerin yaşadıkları bölgeleri ifade etmek üzere Türkistan ve Kafkasların kuzeyindeki sahalar için kullanılan Türkiye tabiri kullanılırdı. Ancak XII. yüzyıldan sonra Latince kaynaklarda Türkiye tabiri Anadolu için kullanılmaya başlanmıştı. İlk önce Denizli'den Karaman'a kadar uzanan bölge için kullanılan bu kelime, daha sonra bugünkü kullanıldığı şeklini almıştı. Ancak burada belirtilmesi gereken durum, Anadolu'yu ifade etmek için Türkiye tabirinin kullanılmasında Anadolu'daki demografik ve kültürel değişimin önemi son derece büyüktür. Anadolu'yu ifade etmek için "Türkiye" adı ilk kez II. Haçlı seferi döneminde ortaya çıkmış olsa bile sınırları ve kullanımını ilerleyen yüzyıllarda genişleyerek devam etmişti. Batı Kaynaklarında Türkiye tabirinin ortaya çıkması ve sınırlarının genişlemesi Türklerin siyasi ve nüfus olarak etkinliklerini artırması önemli bir etkendi. İngiliz seyyahlar XVI. yüzyılda İstanbul'un doğusundaki toprakları Türkiye olarak anlatırken hatta bu seyyahların çoğu Suriye ve Arabistan'ın bir kısmını dahi "Türkiye" içine dâhil ediliyordu (Özcan, 2012, s. 63-82.).

[3] Misafiri hoş karşılayan deniz: Karadeniz Çevirmen Banu Gürsaler Svyertsen notu.

Hans Christian Andersen bu gemi seyahati boyunca Türkiye'nin yani Anadolu'nun tarihine de dokunarak bunu üçüncü bir şahıs dilini ve kuş metaforunu kullanarak anlatmıştır; *"Yemyeşil tepelerin eteklerinde Yeni Foça uzanıyor. Fransa'dan Foça'nın evlatlarının kurmuş olduğu Marsilya kentinden gelen gemimizi selamlıyor yeşil dallar; sizler, siz yeşil dallar o kadar eskileri bilmeyecek kadar körpe de olsanız, yine de aşinasınız, küçük bir kuş şakımıştı bu öyküyü!"* (s.84)*"Kaptan karanlıkta bir noktayı, ovadaki bir yükseltiyi işaret ediyor ve "Akhileus" diyor. Yoksul kulübeleri ve çalıların bürüdüğü mezarıyla sen ey yalnız ve çorak arazi, kendi ününü bilir misin? Hayır çok yaşlısın! Yüce anılarını unuttun: Hektor, Akhileus, Odysseus ve Agamemnon ! Troya'nın kurulduğu İda dağı, sen kendini bile tanımıyorsun artık; bir yabancı sana anılarını sorunca, sen "Yıldızlar bilir" diye cevap veriyorsun. "Yıldızlar bilir, kenti kuran İlyon'un durduğu, Athena'nın kahramanı koruduğu yeri! Ben hatırlamıyorum! Ama duymuştum, küçük bir kuş şakımıştı bu öyküyü!"* (Andersen, 1995, s. 84-85)

Seyahatinin Amacı

Danimarkalı yazar Hans Christian Andersen'in, İzmir ve İstanbul ile ilgili seyahatinde özel bir nedene rastlanmazken, kendisi "*geziye çıkmak yaşamaktır*", "*İşte o zaman yaşam canlanır, zenginleşir; insan bir pelikan gibi kendi kanıyla değil, doğayla beslenir*" (Andersen, 1995, s. 75) düşüncesinden anladığımız kadarıyla gezmeye olan tutkusu ve gezmenin kendisini sürekli yenilediğine olan inancı ve ayrıca "*Tuna yolculuğuna çıkmak Constantinopel'i ziyaret etmek*" gibi amacının olması Hans Christian Andersen'i 21 Mart 1841'de Pire'de kalkan gemi ile Doğu'ya sürüklemesindeki yegâne amacı idi. Yine Banu Gürsaler, Syvertsen' Hans Christian Andersen'in seyahat çevirisinde ise 4 Kasım 1840 tarihli "Dagen" dergisinde: "Şair H.C. Andersen şu sıralarda İtalya yolculuğuna çıkmış bulunmaktadır. Oradan da Doğu şiirinin kaynağını incelemek üzere Constantinopel ve Doğu'nun diğer başkentlerine gidecektir" şeklinde yazmaktadır. (Andersen, 1995, s. 75-76)

Symrna

Hans Christian Andersen, Symrna'yı anlatmaya başlarken kendisinin ilk defa Asya'ya gelmesi, kafasında yarattığı "doğu" imgesi ve gördüklerini *"Şimdiye kadar hiç rastlamadığım bir bereket fışkırıyordu. Güneş ateş gibi yakıcıydı. Görmesi Mısırlı Musa'ya da nasip olan, İsa'nın doğduğu, irfan kazandığı ve cefa çektiği kıtayı, Homer'in şarkılarının dünyaya yayıldığı kıyıları gördüm. Burada, Doğu'ya, masalların anavatanına ayak basmış olacaktım"* (Andersen, 1995, s. 79) şeklinde anlatması, "Doğu" seyahatinin kendisi için nasıl değerli olduğunu göstermesi bakımından önemlidir. Ayrıca "Dünyanın en büyük ozanı burada yatıyor" diyerek İlyada'nın yazarı Homer'e atıfta bulunarak şiirsel bir dil ile buradaki gül için *"kokum onun mezarına yayılsın, fırtınada dökülen yaprakların mezarını örtsün, İlyada'nın ozanı burada toprak olmuş, ben bu toprakta boy verdim. Ben Homer'in mezarında bir gül, yapraklarını yoksul bir gül için açmayacak kadar kutsalım"* (Andersen, 1995, s. 82) ifadelerini kullanır.

Andersen'in Asya'yı görür görmez Sicilya'ya benzetmesi; zeytinlikleri, meyve bahçeleri ile İzmir, Asya ile ilgili ilk izlenimleriydi. Geminin İzmir Kalesi'ni geçtikten sonra limana demir atarken yine aynı heyecanı duyması *"Sanki daha beşikteyken ninnilerde bana Asya Kıyılarına ayak basacağım söylenmişti; hayalimde anılar canlandı"* (Andersen, 1995, s. 80) demesi aslında çocukluğundan itibaren "Doğu" dünyasının kendisini heyecanlandıracak biçimde anlatılması, Doğu'yu daha görmeden büyülü bir dünya olarak algılamasının ilk izlenimlerini veriyordu. İzmir ile ilgili ilk gözlemlerinde çeşitli ülkelerin konsolosluklarının bayraklarının bulunduğu servi ağaçlarını, kahverengi boyalı kırmızı sivri çatılı evleri "Kuzeye" benzetirken,

İzmir Kalesi ve beyaz minareler ile kısa bir İzmir'i tasviri yapar. Kırmızı hilalli bayrağı ve dar sokakları ile yüksek olmayan kagir ve ahşap evlerin ilk katlarında dükkanların olması bu şehir ile ilgili verdiği bir başka detaydır. Ayrıca veba hastalığının olduğu bir dönemde dar sokaklarda yürümenin herhangi bir temkin olmayacağını da belirtirken şehir halkı ile ilgili tasviri *"müslin*[4] *yaşmaklara bürünmüş, yalnızca kara gözleri ve burunlarının ucu görünen kadınlara rastladım; dimdik tuttukları başlarında Danimarka'da Jydepotte adı verilen seramik çanakların tersten oturtulmuş haline benzeyen iri siyah şapkaları, upuzun mavili siyahlı "talar"ları*[5] *ile Ermeniler; süslü Rumlar; kirli Yahudiler; önlerinde tütün çubuklarını taşıttıkları adamları ile ciddi ve ağırbaşlı Türkler geçti yanımdan*" (Andersen, 1995, s. 80) şeklindeydi.

Kadına bakış açısı bir kuzeyli olmasına rağmen tamamen "Batı"nın "Doğu"da gördüğü ya da görmek istediği kadın bakış açısının aynısına sahipti. *"Kırmızı kurdeleler, çiçekler ve madeni takılarla süslenmiş iki beyaz öküzün çektiği arabaya tıka basa kadınlar doluşmuştu, arabayı yaşlı ve şişman bir Türk arabacı sürüyordu. Sanırım hepsi de çok güzeldi bu kadınların, kentteki her kafes penceresinin ardında da küçük bir huriler topluluğu oturmuyor muydu zaten! Bu kadınlar, bir Türk ozanının dediği gibi "mücevher kutusundaki yakutlar, şişedeki gülyağı, kafesteki papağan kadar saklıydılar. "Gecenin rengi vücuduna yayılmış" "kara başının üzerindeki kapkara saçlarıyla zenci kadın bile kendini saklıyordu"* (Andersen, 1995, s. 81) sözleri Andersen'in Doğu'daki mistik, gizemli kadın anlayışını özetler niteliktedir. Dikkatini çeken bir başka husus da dünyanın her yerinden değişik giysilerin bulunmasının yanı sıra Arapça, Türkçe, Rumca, İtalyanca gibi birçok yabancı lisanın İzmir'de kullanılmasıydı. Ayrıca bu şehrin meyveler bakımından bereketli olmasını Romalıların bağ ve bahçeler tanrıçası Pomona'nın bereketine benzetirken Romalılara benzettiği bir diğer özellik de yaşmaklı Türk kadınlarını beyaz, mumyalanmış Romalıların cenaze törenlerindeki kişilere benzetmesiydi. Fransız Tiyatro Salonunda, "La reine de seize ans" ve "Les premiers amours"u Rumlar ve Türkler ile izlemesi, İsveç kraliçesi Christine'nin anlatıldığı bir oyunu izlenmesi kendisine yine farklı gelmişti. Aynı zamanda, "Danimarka Konsolosu, Bay Jongh" ile İzmir'de karşılaşmış ve Pera'da buluşmak üzere sözleşmişlerdi. (Andersen, 1995, s. 79-81)

Dardanel ve Mermer Denizi

Hans Christian Andersen, Marmara Denizi'ni (Mermer Denizi'ni) güneyin en soğuk denizi olarak görür. Çanakkale'de boğazdan gemi ile geçerken Avrupa yakasından kurulan şehirden bahsetmiş burada bir minarenin ve beş yel değirmenin var olduğunu söylemiştir. Asya tarafının ise daha mevsimsel olarak yaz havasında olduğunu buranın tarlaları ve ağaçları ile daha cana yakın olduğundan söz eder. Gelibolu'yu minareler dışında hem dik çatılı kırmızı boyalı evleri hem de geniş ovaları ile coğrafi olarak Danimarka'ya benzetirken, gemide dikkatini çeken bir diğer husus da hanımlardı. Burada hanımlara bakmanın geleneklere aykırı olduğunu *"Türk kadınlarının oturduğu tarafa küpeşteye gittim amacım kıyıları seyretmekti ama hanımlara bakmadan da edemedim; yemek yerken yaşmaklarını indirmişlerdi. Onlar da beni süzdüler! Aralarında en genç ve en güzel olanı ciddi bir edayla oturup, hafifçe baş sallayan yaşlı kadına benden söz ettiğini sanıyor bu karşılıklı bakışma anında genç bir Türk yanıma yaklaşıp, Fransızca olarak benimle konuşmaya başladı; bu konuşma sırasında yarı şaka yarı ciddi peçesiz kadınların yüzlerine bakmanın ülkenin geleneklerine aykırı olduğunu bildirdi; hanımların eşinin nasıl ciddi bir tavırla beni süzdüğünü anlayıp, anlamamış olduğumu sordu!"*

[4]Müslin kumaş:(Alm. Musselin, Fr. mousseline, İng. mousseline; muslin fabric), bezayağı örgü yapısında, pamuk, ipek ya da çok ince yün ipliklerden, yumuşak tutumlu, ince ve seyrek dokunmuş kumaşa denir (Tekstil sayfası, 07.07.2022).

[5] Talar: uzun elbise anlamına gelmektedir.

(Andersen, 1995, s. 88-89) bu cümle ile belirtmişti. Andersen'in burada Türk erkekleri ile dikkatini çeken özellik ise Türklerin saçını kökünden kazıtması ve kıyamet günü Cebrail'in onları mezarlarından çekip çıkarabilmesi için tepede bir tutam saç bırakmasıdır[6] (Andersen, 1995, s. 86-91).

Constantinopel ve Çarşılar

Hans Christian Andersen, İstanbul'u gecenin karanlığında Venedik'e benzetirken, Altınboynuz, Yedikule, Pera ve Galata ve sayısız minaresi ile İstanbul'dan bir şiir gibi bahseder. Geniş körfezinin karmaşasını ve hengamesini Napoli'ye benzetirken, Napoli, İstanbul'un yanında cenaze sessizliği şeklinde kalır diye yorumlar. Ayrıca İstanbul'un sokaklarında en dikkatini çeken hususlardan biri de Türklerin dürüstlüğü olur, kayıkçının kendisinden daha düşük değerli para istemesini belirtirken *"Türkler böylesine dürüst insanlardır, burada kaldığım süre içinde her gün, Türklerin en fazla hüsniyet sahibi, en dürüst halk olduğuna dair kanılar buldum"* (Andersen, 1995, s. 94) diyerek Türklerin dürüstlüğünden seyahatnamede övgüyle söz eder.

Hans Christian Andersen, İstanbul'un ziyaret edilmesi gereken en önemli yerinin "Çarşı'ları olduğunu belirtir. Dev bir kenti andıran bu çarşılar Andersen'e göre Acem, Ermeni, Mısırlı, Rum gibi vatandaşların olduğu bir arı kovanına benzer. Doğu ve Batı'nın burada büyük bir Pazar kurduğu sınırsız mal çeşidi ile burası Andersen'e göre dünyanın en büyük pazarıdır. Büyük Çarşı, Mısır Çarşısı Andersen'in son derece dikkatini çeken çarşılardır. Andersen bu çarşılarda gözlemlediği milletleri şu şekilde anlatır: *"Türk, ağzındaki uzun tütün çubuğuyla ciddi ve ağırbaşlı oturuyor, Yahudi ve Rum el kol işaretleri yaparak bağırıp çağırıyor; bu birbirini kesen sokaklardan karmakarışık bir insan seli akıp gitmekte, tüylü sivri külahlarıyla Acemler, başa tersten oturtulmuş seramik çanağa benzer siyah şapkalarıyla Ermeniler, kuzu postu içindeki Bulgarlar, siyah türbanlarının üzerine eskipüskü bir şal sarmış Yahudiler, süslü Rumlar ve yaşmaklı kadınlar; nasıl da kalabalık! Ve bütün bu hengâmenin içinde seçkin bir Türk, başını sağa sola çevirmeksizin tüm ağırbaşlılığıyla oturmakta."* Yine İstanbul çarşılarını *"İstanbul'un görkemli çarşıları yanında Palais Royal'in görkemli dükkanları saçları gül yağı ve mürrüsafi kokan, pahalı kumaşlardan giysiler içindeki Doğulu bir kız karşısında Parisli süslü bir yosmacık gibi kalır"* (Andersen, 1995, s. 97-98) cümlesi betimlemektedir.

Hans Christian Andersen'in Dinî Gözlemleri

Scutari[7] Kabristanı: (Üsküdar Mezarlığı) Bizans imparatorlarının, prenslerinin ve prenseslerinin sürgün yeri olan Marmara Denizi'ndeki adaların karşısında bulunan Üsküdar semtinin kabristanı İstanbul'un en büyük mezarlığıdır. Hans Christian Andersen, Türkler kendilerini Avrupa'da yabancı hissettikleri için ebedi istirahatlerinde mezarlığı evleri olarak kabul ettiklerini ve bu yüzden ölünün üzerine başka bir ölünün gömülmediğini aktarmıştır. Türkler ile ilgili belirttiği bir diğer önemli husus da Türkler dünyaya gelen her çocuk için bir çınar, her ölü için ise bir servi diker ve bu yüzden Üsküdar Kabristan'ı orman gibidir demiştir. Mezar taşındaki oyuktan bir köpeğin su içmesi Türkler için, merhumun huzura kavuşmasına yorulurken mezar taşları ile ilgili belirttiği bir nokta da mezar taşında yaldızlı bir nilüfer çiçeği mevcut ise bunun kadın mezarı olduğunu ve bunun haricinde başka bir bilginin olmamasını

[6]Türk erkeklerinin genelinde böyle bir gelenek yoktur. Andersen muhtemel olarak Kalenderiler'den bahsetmektedir. Kalenderiler ile ilgili bkz. (Bağcı, 2020; Ocak, 1999).

[7] Scutari- Yunanca Üsküdar demektir. (etymologeek, 07.07.2022).

kadınların öldüklerinde dahi yabancılara mahrem olduğunu belirtmesidir (Andersen, 1995, s. 113-115).

Peygamberin Doğum Günü: Hans Christian Andersen'in İstanbul'da deneyimlediği dinî ritüellerinden birisi de 4 Mayıs'ta Peygamberin doğum günü kutlamalarına katılmasıydı. Bu kutlamaların görkemi ve o gecenin İstanbul siluetini son derece şiirsel anlatması, bu kutlamalara Türkler' in ne derece önem verdiğini vurgulaması bakımından çarpıcıdır (Andersen, 1995, s. 116-123). Kendisini etkileyen bir başka dinî ritüel ise dervişlerin ayinlerine katılmasıdır. Bu ayinlerden birisi tekkeleri Üsküdar'da bulunan "Çığlık atanlar" anlamına gelen "Ruhaniler"[8] olurken diğeri de Pera'daki "Dönenler" yani "Mevlevi'lerdir (Andersen, 1995, s. 104).

Bosporus

Hans Christian Andersen, Boğaziçi'nin güzelliğini ve kendinde bıraktığı etkiyi şiirsel bir dille anlatmasının yanı sıra Boğaziçi'yi "Doğu"nun ve "Batı"nın kendini eşsiz bir şekilde bütünleştirdiği, siyahtan beyaza geçiş yapan gri bir nokta gibi tasvir etmiştir. Oluşan bu ahenk ve uyumu, *"Boğaziçi, suları deniz kadar saydam ve tuzlu bir nehirdir, iki denizi birbirine bağlayan, her köşesi bir tablo, her yani tarih olan iki kıta arasında bir nehir; Doğu, Avrupa'ya burada kur yapar ve hükümdar olma düşleri kurar. Kaba kuvvet ile yumuşaklığı buradaki gibi uyum içinde bir araya getiren bir başka yer görmedim"* (Andersen, 1995, s. 129) şeklinde anlatmıştır.

Hans Christian Andersen, İstanbul'dan ayrılırken İstanbul Boğazı'nın kendisinde bıraktığı hissiyatı bir resim galerisini gezmekle eşdeğer tutuyordu. Boğazın bütün manzarasını büyük ustaların yaptığı bir tablodan geçide benzetirken, Galata, Tophane, Fındıklı, Üsküdar, Kandilli, Kuruçeşme, Bebek, Rumelihisarı, Anadoluhisarı, Göksu deresi[9] (Semavi su), Kanlıca, İncir Köyü, Sultaniye, Tarabya, Büyüdere bu galerinin tablolarını oluşturan sanat eseriydiler.

Andersen'in kafasında daha çocukken "Doğu"nun mistik dünyasının şekillendiğinin tezahürünü bu sarayda *"Küçük bir çocukken "Binbir Gece"yi hiç aklımdan çıkarmaz, asma bahçeleri ve fıskiyeli havuzlarıyla mermer saraylar düşlerdim. İste şimdi bu düş gerçekleşmiş, bütün ayrıntılarıyla canlanarak karşıma çıkmıştı"* (Andersen, 1995, s. 131) diye ifade edişinden anlamaktayız. Yine "Doğu" ve kafasındaki Türk kadını imajını kendi şiirselliği ile *"Saray bahçesi sırtlardan denize, sahildeki tuhaf ahşap evleriyle dikkat çeken Kuruçeşme köyüne doğru uzanıyor. Bu binaların meyilli kalaslarla alttan desteklenen ikinci katları birincisinin dışına taşmış, evlerle kıyı arasında kalan alanın üzeri dışarı çıkıntı yapan ikinci katlarla örtülmüş durumda. İçeride yaşlı hanım sultanlar yaşadığından pencerelerde kafesler var, ancak eskinin bu güzel ve güçlü kadınlarının denizi ve yabancı gemileri gözetleyebilmeleri için yeterince budak deliği de bulunmakta. Ah, bir güzellik şiiriydi her biri bir zamanlar, unutuldular şimdi ve artık şu mısra bile teselli etmiyor onları:"vergessne Gedichte sind neue!*[10] *' Bağırlara saplanan bir deste oktu upuzun ipek kirpikleri, eğilmişler şimdi salkım söğüt gibi gözünün gölüne ve orda hâlâ aksini seyretmekte bir güzellik yıldızı, bürünürler yaşmaklarına sımsıkı, görülsün ve görebilsinler diye açıkta bırakarak gözlerini"* (Andersen, 1995, s. 131)

[8]Çevirmen Banu Gürsaler Svyertsen bunun Rufailik olabileceğini söylemiş. 18. yüzyılın ikinci yarısından itibaren batılı seyyahların yoğun ilgi gösterdiği iki tekke vardı. Bunlardan ilki Pera'da bulunan Galata Mevlevihanesi, diğeri de Üsküdar Menzilhâne Yokuşu'ndaki Rıfaî Asitanedir. Rifâî dervişlerinin şöhreti de en az Mevlevîlerinki kadar yaygın olup Mevlevîlere "whirling"(dönen) denirken, Rufaîlere ise "howling"(höyküren) nitelemesi yapılmıştır. 12. yüzyılda Ahmed el-Rifâî (ö. 1182) tarafından temeli atılan Rifâîyye tarikatının' en önemli özelliklerinden kendine has ayinleridir. Bu tarikatın gelmesi 16. yüzyılın sonları olup Üsküdar İnadiye'de merkez tekkenin kurulması ile 18. yüzyılın ilkyarısından itibaren diğer semtlere yayılır (Varol, 2015).

[9] Hans Christian Andersen Göksu'yu Danca göksel (semavi) su olarak çevirmiş, Çevirmen Banu Gürsaler Svyertsen notu.

[10] Almanca "yepyenidir unutulmuş şiirler".

şeklinde anlatmıştır.

İstanbul'dan ayrılırken *"*Yüksek Kapı" adı verilen binada yaşayan Ali Efendi ve saray tercümanlarından Saffet'i ziyaret ederek Ali Efendi ile Lamartin'in Doğu gezisi[11] üzerine sohbet etmiştir. Ali Efendi'nin İstanbul'un kendisi üzerinde bıraktığı izlenimleri sorması üzerine *"İstanbul'un konumunu dünyada eşi bulunmaz bir güzellikte bulduğumu, manzaranın Napoli'den daha harika olduğunu, ancak bizim Kuzeydeki kentlerimizden birinin buraya biraz benzediğini söyledim. Stockholm'de, Mosebakken'den bakıldığında görülen manzaranın, kırmızı ahşap evleri, kubbeli kiliseleri ve çam ağaçlarıyla Södermalm adlı semtin, minarelerini saymazsak Pera kulesinden Tatlısu'ya bakarken görünen manzarayı andırdığını"* (Andersen, 1995, s. 124-125) söylemiştir. (Andersen, 1995, s. 124-136)

Hans Christian Andersen'in Türk Tasviri

Hans Christian Andersen'in Türkler ile ilgili tasviri: *"Evler ahşaptan ve iki katlıdır; birinci katta kapısız penceresiz, ters çevrilmiş sandığa benzer bir dükkân bulunur ve burada yerden yüksekçe bir seki üzerinde elinde uzun tütün çubuğuyla bir Türk oturmuştur, malları çevrede asılıdır. Rengârenk giysiler içinde çoğunlukla da güzel yüzlü, sakallı ihtiyarlar burada otururlar! Burada hiç kimse gevezelik etmez! Her evin alt katındaki ahşap kulübe, sahiplerinin balmumundan bebekler gibi önünde durduğu, bir oyuncak bebekler dolabına benziyor."* şeklinde olurken şehrin genel yapısı ve toplumun genel duruşu bilhassa da yaş almış insanlarla ilgili değerlendirmeleri oldukça ilgi çekicidir. Yine *"Kadınların yabancıların bakışlarından koruyan kafesli pencereleriyle evlerin ikinci katlarını hatırlıyorum! Şiir burada Türk'ün ta kendisi, sar afyon çiğneyeni, kırmızı şalvarı, sarı kaftanı ve yeşil türbanıyla yaşayan bir şiirdir; bağdaş kurmuş oturuyor, gözleri yarı kapalı, dudakları kıpır kıpır; titreyen bu yaprakları, ağır ağır nefesini teslim etmekte olan bu yazıyı gözlerimle okuyorum"* cümlelerinde son derece şiirsel bir dille Türklerle ilgili vardığı kanıyı ifade etmiştir. (Andersen, 1995, s. 111-112)

PORTEKİZ

Danimarka'dan Portekiz'e İzlediği Rota

Hans Christian Andersen, Almanya, Hollanda ve Belçika üzerinden Paris'e geldikten sonra yolculuğunu gemi ile planlamış olmasına rağmen Bordeaux'ya vardıktan sonra kara yoluyla Madrid üzerinden Lizbon'a gitmeye karar verir. Portekiz'in birçok şehrinde gezilerini tamamladıktan sonra, bu defa Lizbon üzerinden deniz yoluyla Bordeaux'ya döner (Andersen, 1881, s. 228-289)

Hans Christian Andersen'in Portekiz'e Seyahatinin Amacı

Hans Christian Andersen'in Kopenhag'da bulunduğu sıralarda Lizbon'daki O'Neill ticaret evinin başkanı, oğulları José ve George O'Neill'i hem Danimarka dilini ve geleneklerini öğrenmeleri hem de o dönemde Portekiz'deki siyasi huzursuzlukların baş göstermesinden dolayı Danimarka'ya göndermişti. İspanyol-Portekiz Bakanı dal Borgo tarafından Amiral Wulff'a emanet edilen O'Neill'ler daha sonra Profesör Neilson'ın okuluna yerleştirilmişlerdi. Dört yıl kadar Danimarka'da kalan O'Neill'ler daha sonra İsveç'in dilini ve geleneklerini öğrenmek için İsveç'e gitmişlerdi ki bu ayrılıştan sonra O'Neill'ler ile uzun süre görüşmediğini söyleyen Hans Christian Andersen, kendisine gelen bir hemşerisinin Portekiz'de hiç tanıdığın

var mı sorusuyla gençliğinin arkadaşı, babasının ölümünden sonra Danimarka Konsolosu olan Bay George O'Neill'den daha iyi tanıdığı biri olmadığını anımsar. Kendisine mektup yazan Hans Christian Andersen, aynı zaman da Portekiz'i ziyaret etmesi için de O'Neill'lerden sıcak ve içten bir davet mektubu alır.

Hans Christian Andersen'in Portekiz'e yaptığı ziyaret, O'Neill'lerin Portekiz'e dönmesi ve Hans Christian Andersen'i Portekiz'e davet etmesiyle başlasa da Andersen'in bu geziye çıkmasındaki en önemli etken ruhunu beslemek istemesi ve uzun geziye olan özlemidir. İşte bu özlem, Andersen'in 6 Mayıs'tan 14 Ağustos 1866 yılına kadar Portekiz'de kalmasına neden olur. (Andersen, 1881, s. 228)

Bordeaux'dan Lizbon'a Varış

Hans Christian Andersen Bordeaux'dan Portekiz yolculuğuna başlarken önce imparatorluğun en donanımlı gemilerinden biriyle seyahat etmeyi planlamıştı. Hem deniz yolunun fırtınalı olması hem de daha önce Londra'da gösterisini izlediği Ristori'nin Bordeaux'da Medea karakteri olarak çıkacak olması Hans Christian Andersen'i deniz yolculuğundan vazgeçirerek Bordeuax'da birkaç gün daha kalmasını sağlamıştı. Ristori'yi izledikten sonra Cervantes ve Murillo'nun diyarı dediği İspanya'ya, Bordeaux'dan trenle giderken son derece şiirsel diye yorumladığı Biscay Körfezi'ni ve Biarritz'i de aşar (Korovin, 2018). Bu yolculuk esnasında otuz üç yıl önce ilk kez Roma'dayken, Aziz Petrus Kilisesi'nde yüksek kadife sandalyelere oturmuş iki kraliyet kaçağı olan Portekizli Don Miguel ve İspanya Kraliçesi Christina'nın da trene bindiğini görür. 23 Nisan'da Burgos'tan Valladolid ve Escurial'ı geçerek sabah erkenden Madrid'e gelen Andersen'in Madrid ile ilgili tespiti çok daha etkileyici sayılmaz. Öyle ki bu defa Murillo'nun ve Velasquez'nin eşsiz tablolarını dahi bu gelişinde çok ilgi çekici bulmaz. İspanya ile ilgili *"Resim galerisi dışında, İspanya'nın başkenti yabancılara orijinal hiçbir şey sunmuyor hatta gerçek bir İspanyol şehrinin görünümü bile değil"* (Andersen, 1881, s. 231-232) yorumunda bulunur.

Madrid'de kaldığı süre boyunca, Birinci Napolyon'un altında isyancı olarak vurulan İspanyolların anısına büyük bir ulusal ziyafet verildiğini ancak kendisinin Portekiz'e vardıktan kısa bir süre sonra Madrid'te isyan çıktığından bahseder. Ancak Andersen'in belirttiğine göre, kendisi Madrid'den ayrılmadan önce zaten sokaklarda kargaşanın başlamıştır. Bu kaos durumda olmasına rağmen Madrid'te kendisine sevinç yaşatan olay ise Upsala'daki öğrencilik yıllarında ve daha sonra Stockholm'deki Kraliyet Tiyatrosu'nda yönetici olarak tanıdığı çok saygıdeğer Baron Stedigk ile buluşması olur. Hans Christian Andersen, Madrid'e İsveç Bakanı olarak gelen Baron Stedigk ile kendini evinde Danimarka'da gibi hisseder. Yolculuğuna Cid ve Don Quixote'ın topraklarından devam eden Andersen, bu topraklarda son derece romantik bir hava vardı der. Daha sonra Tejo nehrini geçtikten sonra, Talavera de la Reina köyüne varır. Buradaki insanları *"Uzun, yırtık pırtık pelerinler içinde, onları haydut gibi gösteren başlarına geniş kenarlı şapkalar takmış, köylüler şimdiden etrafımızı sarmıştı"* (Andersen, 1881, s. 233) diye anlatır ve Pizarro'nun doğum yeri Truxillo'ya gelir. Ardından Merida'ya vardıktan sonra burayı Roma'ya ve bilhassa Civita Vecchia şehrine benzetir sonra Guadiana Nehri üzerinden İspanyol sınır kasabasına Badojas'a gider. İspanyol topraklarından sonra Portekiz sınırına geçen Andersen pasaportlar talep edilmeden sadece isimleri istenilerek geçtiğini söyler. Portekiz'e geçtikten sonra *"Dostların ve misafirperverliğin beni beklediği ülkeye vardığımda kendimi evimde gibi hissettim"*der. (Andersen, 1881, s. 236)

Lizbon'a geldikten sonra Hans Christian Andersen'in en dikkat çekici tespitlerinden biri de İspanya ve Portekiz ile ilgili kıyaslamasıdır: *"İspanya'dan Portekiz'e gelmek ne büyük bir geçiş. Orta Çağ'dan modern zamanlara uçmak gibiydi. Her yerde bembeyaz, dost canlısı evler,*

çitlerle çevrili korular, ekili alanlar ve büyük istasyonlarda ikramlar olduğunu gördüm. Modern İngiltere'den bir esinti gibi, yaşayan dünyanın geri kalanından bir nefes alındı. Yeşilin ortasındaki beyaz evleri ile pitoresk güzellikte, ilk Portekizli şehir Elvas önümüzde yüksekte göründü." Yine *"Karanlık çöktü ve gece yarısına doğru Abrantes'in yanından geçtik ve kısa süre sonra İspanya sınırından gelen demiryolunun Lizbon ve Coimbra arasındaki ana yola bağlanan küçük Entroncumento kasabasına vardık. Burada harika bir modern tren yolu oteli bulduk en azından bana öyle geldi ki, Madrid yolculuğu sırasında bu tür konforlara alışkın değildim. Portekiz Kralı, İspanya'dan son yolculuğunda geceyi burada geçirmişti. Burada büyük, güzel bir salon, iyi bir restoran ve içecekler, hatta çay ve porto şarabı bile içilebilirdi: medeniyetin merkezinde değil miydik?"* (Andersen, 1881, s. 236-237) değerlendirmesinde bulunur.

Hans Christian Andersen, uzun bir yolculuktan sonra Lizbon ve Tejo nehrini geçip Alcantra Vadisi'nden Cintra yoluyla Lizbon'a yakın bir yer olan Pinieros'a geçerken buradaki köylüleri ve dilencileri de anlatmayı ihmal etmez ve Pinieros'a gelir. (Andersen, 1881, s. 228-237)

Pinieros

Hans Christian Andersen, Pinieros'a geldikten sonra Madam O'Neill' tarafından memnuniyetle karşılandığını ve çok geçmeden arkadaşı George'un da son derece güzel karşıladığından bahseder. Burada birkaç gün kaldıktan sonra, evi, aileyi ve tüm çevreyi yıllardır tanıyormuş gibi hissettiğini söyler ve şöyle devam eder: *"Pinieros, bulunduğumuz yüksekliğin ve kır yerinin adıdır; Lizbon'daki çok daha eski evlerde olduğu eski, biraz harap, iki katlı, gül renkli duvarları, yeşil boyalı kapıları ve pencere kanatları olan bir kır evidir."* (Andersen, 1881, s. 238-239) Pinieros'un bir sayfiye yeri olduğundan bahsederken dönemin kır evleri hakkında da bilgi verir.

Pinieros'u eşsiz güzellikte ve berekette olan bir yer olarak anlatan Andersen, birçok yerde ülke/yer anlamına gelen "Quintas" adı göze çarpıyor, der. Andersen'e göre zeytin ağaçları, Cintras Dağı, Alcantara Vadisi ve "Arcos dos aquas livres" su kemeri ise Pinieros'un güzelliğini tamamlar. Palmella, şehrin ve nehrin arkasındaki ufukta, St.Luis ve Monte Arrabida dağlarıyla birlikte yükseldiğini de söyler. *"Geldiğimde bahçe henüz en iyi bitki örtüsüne sahipti; burada çok sayıda gül ve alev rengi sardunyalar vardı; tırmanan bitkiler, bizim ormandaki küçüklüğümüzden farklı olarak, duvarların ve çalıların üzerine ağır perdelik olarak tutku çiçeğiyle asılırdı. Narın kırmızı çiçeğine karşı mürverin beyaz çiçekleri, birlik içinde Danimarka renklerini sundu. Etrafta yüksek kaktüsler, asma yaprakları ve kara selviler vardı. Ama aynı zamanda o kadar çok çiçek ve bitki bütün düşünceleri Danimarka'ya taşıdı. Görünürde kırmızı gelincik ve mavi hindiba çiçeği vardı; deniz yonca çiçeği yeşil çimenlerden çok ev gibi görünüyordu ve zeytin ağacı bize söğüdümüzü hatırlattı."*(Andersen, 1881, s. 240-241) diyen Andersen, Pinieros ile ilgili hem duygularını hem de gördüğü manzarayı yine şiirsel bir dille anlatır.

Hans Christian Andersen, Pinieros'a çok yakın bulunan bir bankerin lüks villasından bahseder ki bu villanın tiyatrosunun olması, zevkle süslenmesi sahibinin aristokrat misafirler için operetler sunması ve Kraliçe Maria da Gloria'nın da orada olması çok etkiler Andersen'i. Daha sonra bu tiyatronun yakılmasını ve inşaatının uzun sürmesini "*parkın kendisi, seraları ve devasa şemsiyelere benzeyen Çin pagodaları, terk edilmiş koridorlar gibi ve hüzünlü bir izlenimi bırakıyor. Walter Scott'ın, Leicester Kontu'nun Amy Robsart'ı ziyaret ettiği Kenilworth'deki şato bahçesiyle ilgili açıklamasını düşünmeden edemedim*" (Andersen, 1881, s. 241) diye anlatır.

Burada, birbiri üzerine yapılmış İtalyan tarzındaki bu villaların Fronteria Marquis'a ait olduğunu belirtir. Ve bu villayı *"Bahçeden yüksek bir teras, ana bina ile küçük bir şapel arasındaki bağlantıyı kurar ve bir portakal koruluğuna çıkar. Terasın tamamı Portekiz krallarının mermer büstleri ile dekore edilmiştir; burada kişi bu yöndeki tarihi bilgisini tazeleyebilir veya ne kadar önemsiz olduklarını yansıtabilir. Galerinin duvarları, tümü kadın tasvirlerini temsil eden, mozaikte garip bir şekilde büyük ve çarpıcı figürlerle süslenmiştir. Geometri, Astronomi, Şiir vb. Terasın altında, sallanan söğütlerin ve biber ağaçlarının altında kürek çekebileceğiniz, garip bir şekilde ya da her türden deniz kabuğuyla isimlendirilmiş küçük mağaraların yanından geçebileceğiniz teknelerle dolu büyük bir gölet var. Yemek salonunda aile atalarının gerçek boyutlu portreleri görülüyor. Bir tanesi Hindistan'da Kral Yardımcısı unvanını almış olan Don Pedro de Mascarenhas'ı gösterir. Savaştaki başarıları, duvarları kaplayan beyaz ve mavi porselen karelerde temsil ediliyor"* (Andersen, 1881, s. 242) diye anlatır.

Fronteira Marquis büyük bir içtenlikle karşılayarak evinin her zaman Andersen'e açık olduğunu söyler. Hans Christian Andersen, Pinieros'ta misafir olarak gittiği evde, Madam O'Neill ve oğullarından da bahsetmeyi ihmal etmez. Büyük oğlunun piyano çalması ve oğullarının Alman asıllı öğretmenin hayat hikâyesine de değinir.

Tejo nehrine bakan St.Johannes mezarlığı ve merkezde azizlerin mermere oyulduğu ve birçok niş figürünün bulunduğu şapelden de bahseder. Daha önce hiç böyle büyük kilise avlusu görmediğini söyleyen Andersen buranın adının Franszıca "plaisir" Portekizce "Prazeres" yani Türkçe "zevk" anlamına geldiğini de söyler. Bununla ilgili olarak Kraliçe'nin sarayındaki kilise avlusunun isminin de "Necessidades", "nececessity" yani "gereklilik" gibi son derece orijinal isminin olduğuna da değinir. (Andersen, 1881, s. 238-245)

Lizbon

Hans Christian Andersen, Lizbon ile ilgili duyduğu "*Okuduğum pis sokaklar, atılan leşler, yaban köpekleri, Afrika yerleşimlerinden gelen, ak sakalları siyah tenli, iğrenç hastalıklarla dolu burada dolaşması gereken zavallı figürler"* nerede diye sorduğunda aldığı cevap: "onlar otuz yıl önce idi" olmuştur. Çünkü gördüğü Lizbon aksine tertemiz, *"dost canlısı evler, mavi beyaz desenli porselen parlak karelerle süslenmiş duvarlar, yeşile boyanmış kapılar ve balkonlar ile renkler her yerde"* (Andersen, 1881, s. 246) diye yazar. Ayrıca caddelerin hayatı ve kargaşası ve vanilyalı dondurmaları Lizbon'da Andersen'in dikkatini çeken bir diğer hususdu. Hans Christian Andersen Lizbon'da kaldığı süre içerisinde opera binası kapalı olduğu için operaya gidemediğini belirtirken küçük şarkıların ve operetlerin verildiği Price's Circus ile Maria Secundo tiyatrosunun çok sık ziyaret edildiğini belirtir. Lizbon'un merkezinde kuyumcuların olduğu Gold Street-Rua do Ouro caddesi ve "La Praca do Comercio" meydanı burada Lizbon'un en dikkat çekici yerlerinden olurken teraslar halinde uzanan bu şehir, Andersen'e Cenova ve Edinburgh'u anımsatacaktı.

Hans Christian Andersen, Lizbon ile ilgili değindiği bir diğer husus da edebiyat ve edebiyatçılardı. Portekizlilerin daha önce değer vermediği bir şair olan Camoen'un, şehrin en yüksek ve en sık ziyaret edilen kısmına anıtının dikilmesinden bahseder. "*Camoen'in kölesi de orada olacak mı diye sordum. Camoen'in hayatı boyunca sokaklarda oturup neredeyse açlıktan ölmek üzere olan zavallı, terkedilmiş efendisi için yalvardığı gibi, üssünde oturduğunu ve elini uzattığını hayal ettim. Böyle bir temsil, yaşarken büyük şairini düşünmemiş olan ulusa karşı kalıcı bir sitem olurdu. Anıtın ne olacağını bilmiyorum; kendi eseri her zaman onun en iyi anıtı olacak. Portekiz'in adı, kanlı savaşlar ve yeni toprakların keşfinden çok, tüm topraklardan*

insanlar arasında onun aracılığıyla hafızada kalacaktır", (Andersen, 1881, s. 247) diye Camoen'ı anlatır.

Andersen, Portekiz edebiyatının da diğer tüm edebiyatlar gibi, halkın şiiriyle başladığını, bunun ardından sanat şiiri şeklinde devam ettiğinden bahseder. "Inez de Castro" trajedisini yazan "Gomez"; "Şarkıları halka nüfuz eden Bocage", Carvalho ve Garret'ten söz eder. Bahsettiği bir diğer edebiyatçı da XIX. yüzyılın başında Lizbon'da doğan Helsingor'dan Andersen'in taşralısı olan Bayan Vidul ile evli olan Antonio Feliciano de Castilho'dur. Castilho, ciddi edebiyat sevgisine sahip bir aileye mensuptur. Çiçek hastalığına yakalanmış ve bu hastalıkta görme yetisini tamamen kaybetmiş olan Castilho tarih, felsefe ve Yunanca'ya hâkim bir şairdi. Ayrıca Coimbra'da pastoral şiir "Echo e Narcisso"yu yazdı ve birkaç yıl içinde birkaç baskısı geçti. "Ovid"i tercüme etti. Castilho'nun kısa sürede evlenip eşinin ölmesi ile onun anısına yazdığı şiir, hemşerileri tarafından edebiyatın en iyilerinin arasında yer alır.

Daha sonra babası Helsingor'da Konsolos olan Charlotte Vidul ile evlendi ki Castilho babasının yeni eşinin yardımı ile Portekizce'ye, Baggesen'in "Çok Küçükken Bir Zaman Vardı", Oehlenschliiger'in "Harika Akşam Havası", Boye'nin "Farum'da Kilise Çanı" ve birkaç Danimarkalı yazarın lirik ve öyküsel şiirlerini çevirdi. Ayrıca bunlardan Portekizliler arasında en popüler olanı Boye'nin şiiridir. Bayan Castilho ile çok iyi anlaşan O'Neill, Bayan Castilho'yu ziyaret eder ve daha sonra da Madam Castilho Pinieros'a iade-i ziyaret yapar. Andersen'in değerli emanetleri arasında Castilho'dan mektuplar da bulunur.

Andersen ayrıca Kral Fernando ile buluşmasını *"Kont de Foss, iyi monte edilmiş silahları ve zırhları, hatta at sırtında bütün bir şövalye figürünü gösteren tablolarla asılı büyük bir dairede beni karşıladı"* diye bahseder. Ayrıca *"Uzun boylu, çok yakışıklı bir adam olan Kral Fernando, benimle tanışmak için yaklaştı, yazılarımdan, Portekiz'deki ziyaretimden bahsetti ve sıcak ifadelerle O'Neill ailesinden bahsetti"* diye anlatır Andersen. Ayrıca *"Ben ayrılırken Kral elini bana uzattı ve ekledi: "Veda etmeyeceğiz, tekrar buluşacağız." Konuşmasında çok içten, açık sözlü ve bir o kadar da asil bir şey vardı ki bu ziyaret hafızama kazındı"* (Andersen, 1881, s. 251) der ve Portekiz ve Brezilya'nın tarihsel sürecinden bahseder.

Setúbal

Hans Christian Andersen, Lizbon'nun güneyindeki Setubal'a gemi ile varır. Tejo nehrinden geçerken Belem Şatosu'ndan övgüyle bahseder. Gemi ile yaptığı bu seyahatinde *"Gemi yolcular ve bagajlarla doluydu; yolculuk başladı, gemide harika bir dinginlik ve ciddiyet vardı; beyler oturup gazete okudu, hanımlar şemsiyelerinin altına sığındılar; güneyin canlılığına dair tüm izlenime kapılmadılar, ama hepsi yabancıya karşı hoşgörülü ve kibar davrandılar"* (Andersen, 1881, s. 255) tespitinde bulunur.

Hans Christian Andersen, "Palmella'nın dağ sırtlarının altında Setubal'ın daha pitoresk bir hale geldiğini, İngilizlerin St. Ybes'i, Palmella, St.Luis ve Monte Arrabida'nın buradaki vadi manzarasını bir bütün haline getirdiğinden de bahseder.

"Önümde yüksekte Palmella kalesini gördüm; daha yakın, gölgelerle dolu güçlü ağaçların arasında, şimdi terkedilmiş Manastır Brancanas; ve buna yakın yeni evim, Carlos O'Neill'in kır evi," Dos Bonegos" oyuncak bebek evi ki, evin ve terasların süslendiği birçok heykel, büst ve vazolar bu ismi çağrıştırmıştır" diye gördüğü manzarayı dile getirir. Sonrasında; *"Bahçe birkaç terasa ayrıldı; geniş taş basamaklar en yüksekten büyük bir çiçek bahçesine iniyordu. Ne muhteşem renkler! Ne çeşit çiçekler! 'Duvardaki çatlaklardan bile, bizim kuzeyde evimizde seralarda yetiştirdiğimiz pembeler ve kaktüsler fışkırıyordu. Biber ağacı, altın balıkların yüzdüğü ve beyaz nilüferlerin büyüdüğü büyük su rezervuarlarının üzerine bir salkım söğüt gibi*

eğildi. Yine taş merdivenlerden iniyoruz ve meyve bahçesinde duruyoruz: limon ve portakal ağaçları meyve yüklü. Mütevazi bir şekilde kokulu beyaz çiçeklerini sunar. İşte tazelik, bereket, gölge ve dalgalanan sular. Büyük kaplumbağaların yüzdüğü en yüksek rezervuarlardan Mağribi usulü borular aracılığıyla bahçenin girişine doğru taşınır, taze, berrak su, suların her birinin ayrı meyve ağaçlarının bulunduğu birkaç terasa iner. Dolu, zengin yaprakları ve ağır, sulu üzümleriyle bağ biraz daha derindedir. Dolgun, zengin yaprakları ve ağır, sulu üzümleriyle bağ biraz daha derindedir" (Andersen, 1881, s. 257) tespitinde bulunur.

Hans Christian Andersen, Setubal'i klimatolojik olarak değerlendirdiğinde okyanus, tüm körfez ve Adolph Nehri ile bir bütün oluşturur diye anlatır. Burası kış gibi soğuktur der kalın kış pelerinimi giymekten memnun olduğunu da söylemekten çekinmez.

Andersen, ayrıca Brancanas Manastırı'nın selvi ve mantar ağaçlarıyla çevrili manastır bahçesini de söylemeyi ihmal etmez. Bütün bu ihtişamın resmedilemez ve kelimelerle anlatılamaz olduğunu da vurgulayan Andersen, Brancanas'ın, etrafındaki dağların yaz mevsimi boyunca harika yeşil kalan çalılığını, birçok yel değirmenini, portakal ve limon ağaçlarını da anlatır.

Aziz Antonio bayramının ise çok çarpıcı ve bir şenlik havasında geçtiğini belirten Andersen bir şenlik ateşinin yakıldığını tüm şehrin sokakta bu bayramda yer aldığını söyler. Şehir ile ilgili verdiği bir diğer bilgi de Setubal'de, Portekiz'in gurur duyduğu şair Bocage'nın adının Setubal meydanına verilmiş ve bir de anıtının dikilmiş olduğudur. Edebiyat dünyası ile ilgili olarak Portekiz'in genç ve gelecek vaat eden şairlerinden biri olan Portella'nın şiir kitabının yayımlanmış olması ise Andersen'in gözünden kaçmaz. Ayrıca bu şehir ile verdiği bir başka detay ise St.Antonio şöleninde ve St.Peter Günü'nde şehir ile tren istasyonu arasında yükseltilmiş bir amfi tiyatroda düzenlenen büyük bir boğa güreşi de buranın önemli geleneklerinden biri olmasıdır. Burada dikkat çektiği bir durum da Almanya, İspanya gibi ülkelerin o dönemde ne kadar karışık olduğundan bahsederken Portekiz'in huzuru ve barış içinde yaşamasıdır.

Küçük kiliseler içinde en güzellerinden biri olarak tarif ettiği "İsa" Kilisesi'"ni ince ve zarif sütunlar ve oymalı altın yaldızla süslenmiş duvarlarını ve porselen ile kaplamasını anlatmaya değer görür. Kilisenin resim koleksiyonu arasında Bu kilisede Portekiz'in en büyük ve en ünlü sanatçısı "Gran Vasco"nun iki eserinin bulunmasının kendisine Holbein'in çizimlerini hatırlattığını söyler. Setubal'ın Pompeii'si kısmen kazılmış balıkçı köyü "Troja" ve harap Trappist manastırı da Andersen dikkatini çeker. (Andersen, 1881, s. 255-270)

Aveiro

O'Neill'in bazı ticari işlerinden dolayı kardeşi Jose ve Hans Christian Andersen ile Aveiro'ya gider. Andersen bu yoluculukta Oporta'ya giden demiryollarını kullandıklarını söylerken *"büyüleyici bir havayla, Lizbon'da Salvaterra ve Benavente'ye uzanan, ancak daha sonra deniz ulaşımını zorlaştıran büyük kum setleriyle giderek daralan Tejo Nehri boyunca yola çıkıyoruz"* (Andersen, 1881, s. 271)der. Andersen Estrella dağlarının İspanya sınırına dönmesinden sonra mantar ağaçlarından ve pirinç tarlalarından geçtiklerini, burayı kendi memleketindeki tahıl tarlalarına benzettiğini söyler. Coimbra'nın biraz kuzeyinde ormanların kesilmesi ile bataklık ve kazılmış kanalların olduğu bir düzlükte insanın kendini bir an Portekiz Hollanda'sındaymış hissettiğini söyler. Ancak böyle hissetmesine rağmen burada Hollanda'nın lüksünün ve tazeliğinin olmamasını da belirtir. Hans Christian Andersen'in belirttiği bir başka nokta ise buranın eskiden olduğu gibi verimli olmaması idi. Çünkü kumların Vouga nehrinin ağzını doldurması nedeniyle tüm arazilerin kısa sürede bataklığa dönüşmesi burayı verimsiz yapmıştı ancak yapımına 1801 yılında başlanan kanalın 1808'de tamamlanması ile bölgenin yeniden

sağlıklı günlerine kavuştuğunu söyler. Ayrıca Aveiro şehrine Portekiz'in Venedik'i denilmesine rağmen Andersen, gondol şeklindeki römorkör dışında her şeyin Adriatic şehrini hatırlattığına da değinir.

Çok önemli bir husus da Portekiz'de gördüğü ilk güzel yüzlerin Aveiro'da olmasıydı. Aveiro'da gördüğü kadınlarla ilgili *"Tanıştığımız ve yanından geçtiğimiz birçok kadın sıkıca sarılmıştı ve büyük pelerinlerinin içinde yarı donuk görünüyordu; yine de söylemesi garip ama burada Portekiz'de gördüğüm ilk güzel yüzleri gördüm arka plandaki karanlık kostümün dışarı attığı kadın güzelliği. Genç kızlar bile yaşlı kadınlarla aynı kalın paltoyu giyerdi; çıplak, kirli ayaklarına kadar sarkıyordu. Şapka çok geniş kenarlı siyah keçedendi; yolcunun bavulunu ve valizini koydukları büyük sepeti bu başlığın üzerine yerleştirdiler ve böylece otele taşıdılar. Ağır yük taşımalarına rağmen neşeliydiler ve hem ağızlarıyla hem gözleriyle gevezelik ettiler"* (Andersen, 1881, s. 272) gözlemini anlatır. Bununla birlikte Aveiro ile ilgili şu tarihsel olaya da değinir. Aveiro şehri ve çevresi bir zamanlar, Joseph Emanuel'in yönetiminde, hoşnutsuz, lider Cizvitlerden oluşan bir grubun başı olarak görülen ve aynı zamanda Marquis Tavora ile krala karşı canice bir girişimden hüküm giyen Dük Don Joseph Mascarenhas'a aitti. Aveiro Dükü, bu olay sonunda boynunda iple infaz edildi ki Hans Christian Andersen bu karanlık olayın Aveiro'yu hatırlan en önemli olay olduğunu söyler.

Coimbra

Bir üniversite şehri olan Coimbra'ya vardığında Andersen, buranın hem ikliminin hem de insanlarının güney sıcaklığı ile kendisini karşıladığından bahseder. Coimra'daki hareketliliği ve telaşı Napoli'ye benzetir. Mondego nehri boyunca uzanan Coimbra'da dar sokaklar çarpık ve sürekli yükseliyor, taş basamaklar bir şeritten diğerine ve oradan da diğer binalara çıkıyor diyen Andersen şehrin mimarisi ile ilgili bilgi verir.

Coimbra'da her yerin dükkân ve kitapçı olduğunu belirten Andersen, buradaki öğrencileri anlatırken ise *"Elbiseleri pitoresk, bize Faust ve Theophrastus'u hatırlatıyor. Elbise, uzun siyah bir "Talcer" ve aynı renkte kısa bir mantodan oluşuyor. Çoğu zaman başları açık, sokaklardan ve nehir kıyısından geçiyorlardı. Taktıkları şapka büyük ve ağırdı. Bir tür sarkık Polonya şapkası"* diye anlatır. Öğrencilerin çoğunun kıyafetini Ortaç Çağ kıyafetlerine benzeten Andersen hem öğrencilerin tavırlarını hem de genel atmosferi *"bir önce yüzyıldan kalma gibiydi"* (Andersen, 1881, s. 274) şeklinde değerlendirir.

Coimbra'yı portakal ağaçları, büyük selviler ve mantar ağaçları büyük bir botanik bahçesine benzeten Andersen, şehrin aşağı kısmındaki Santa Clara manastırının görülmeye değer olduğunu söyler. Yine "La Quinta dos Lagrimas"dan da bahsetmeyi ihmal etmez. Bu bina "La Quinta dos Lagrimas" Inez de Castro'nun masum çocuklarıyla birlikte öldürüldüğü yerdir. Andersen bu hikâyeyi *"Portekizli "Bebek" Don Pedro'nun, kendisi gibi kraliyet kanından güzel Inez ile evlendiği yaygın olarak bilinir. Ancak bu evlilik bir sırdı; Don Pedro, acımasız babasından korktuğu için bunu kabul etmeye cesaret edemedi ve babasına olanlardan haberdar olduğunda, onu başka biriyle evlenmeye zorladı ve bu arada Inez ve çocuklarının bahçedeki bu binada öldürüldü. Kısa bir süre sonra baba öldü ve bu, o zamanlar kral olan Don Pedro'nun, sevgilisinin cesedini tabuttan alıp kraliyet ihtişamını giydirip tahta oturtmasına izin verdi. Tüm sarayın diz çöküp ölünün elini öpmeye zorlandığı yer"* (Andersen, 1881, s. 275) diye anlatır.

Andersen, Coimbra'da Slesvigian olan edebiyat profesörünü de ziyaret eder. Portekiz halkına hitap edebilecek bir şeyler içerdiğinden emin olduğu için, bu profesörün yalnızca kendisinin değil, Ingemann'ın tarihi romanlarını da çevirmeyi düşündüğünü belirtir. Üniversitede şölene davet edilen Hans Christian Andersen ayrıca "*Muhteşem şapeli, taht salonunu ve "rokoko*

tarzında" inşa edilmiş, kalın kemerler, yaldızlar ve freskli tavanlarla süslenmiş kütüphaneyi gördüm" diye anlatır. *"Kütüphaneci, "Lusiad"ın iyi gravürlerle resmedilmiş birkaç farklı basımını çıkardı. Bazı sayfalarda dikkatle çizilmiş ve anlamsız karakterlerden başka bir şey gibi görünmeyen, ancak mikroskoptan bakıldığında her sayfası küçük bir başyapıt olan iki yazılı İncil gördüm*" (Andersen, 1881, s. 276) şeklinde bilgi verirken buradaki kütüphanede çok değerli bilim kaynakları olduğunu söyler. *"Coimbra, insanın sadece birkaç gün değil, birkaç hafta kalması, öğrencilerle birlikte yaşaması, özgür, büyüleyici doğada dışarı çıkması, kendini yalnızlığa terk etmesi ve hatıralara gelenek ve şarkılardan gelen görüntülerle çağrıda bulunmasına izin vermesi gereken bir yerdir"* (Andersen, 1881, s. 277) diye söyler ki buranın yapısının anlaşılması için bu cümle oldukça önemlidir.

Cintra

Cintra'yı *"Yeni Cennet"* diye adlandıran Byron'dan sonra Portekizli şair Garret, buraya *"Bahar burada tahtına kavuştu"* derken Andersen ise "*Portekiz'in en büyüleyici ve en ünlü yeri şüphesiz Cintra'dır*" (Andersen, 1881, s. 278) diye anlatır. Şehrin içindeki görkemli kalede Kral Don Louis, yazın bir kısmını geçirirken babası Don Fernando ise gökyüzüne uzanan dağ kalesi "Penha"da yaşar der. Andersen, Kral Fernando'nun yaşadığı Penha'yı yarı Mağribi ve yarı İtalyan stili olarak değerlendirirken, burasının sentez bir mimari olduğuna vurgu yapar. Andersen'in Cintra ile ilgili en çarpıcı tespitlerinden birisi de *"Her ulusun Cintra'da anavatanının bir kısmını bulduğu söylenir: Danimarka'yı burada buldum; diğer güzel ülkelerden pek çok değerli nokta keşfettiğimi hayal ettim"* (Andersen, 1881, s. 279) diyerek Cintra'nın eşsiz güzelliğine ve bu cümlesinden de anlaşılacağı gibi herkesin az çok kendini bu coğrafyaya ait hissetmesine vurgu yapmasıdır. Buranın bitki örtüsünde ise ağaç kavunu ve incir ağacı gibi ağaçlar dikkatini çekse de mürver ve konvolvulus bitkisi ile kendini Danimarka'da hisseder. Ayrıca Cintra'nın o günkü kültürel koşullarına *"Bitki örtüsü kuru ve solmuştu, ama yalnız bir kaktüs hala hayat belirtisi gösteriyordu. İlk taşra kasabasında genç karısıyla birlikte gezgin bir müzisyenle karşılaştık. Doğaçlama şarkısına kemanla eşlik etti; genç bir çocuk tef çaldı. Akan bir mısrada, meyhanenin signorasına bunun kırmızı eteği ve sarı atkısı hakkında şarkı söyledi. Şarkı bir çeşme gibi akıyordu, kelimeler kesintisiz bir dizi halinde akıyordu; kesinlikle eski bir şarkıydı"* (Andersen, 1881, s. 278) şeklinde vurgu yapması yönünden bu gözlemleri son derece kıymetlidir (Andersen, 1881, s.271-283).

Hans Christian Andersen'in Lizbon'dan Ayrılışı

Hans Christian Andersen, Almanya ve Fransa'nın savaşa girme riskinden dolayı Lizbon gibi sıcak bir şehirde beş gün Rio'dan gelecek gemiyi bekledikten sonra Rio'dan gelen "Navarre" adlı gemiyle Lizbon'un güzel yerlerini, dalgalı ve korkutucu İspanyol Denizi'ni ve Biscay Körfezini geçerek Gironde Nehri'ne gelir. Garonne ve Dordogne'nin nehirlerinin birleştiği yerden üzüm bağlarını, şehirleri, villaları, kavak gruplarını geçerek Bordeaux'ya varır. (Andersen, 1881, s. 283-289)

SONUÇ

Hans Christian Andersen için seyahat her ne kadar bir tutku ve ruhunu devamlı besleyen ruhsal bir yolculuk olsa da Doğu seyahati için baktığımızda "Doğu" mistisizmi ve hayalinde yarattığı egzotik "Doğulu" olana yakın olma, yakından tanıma bilhassa Asya kıtasına ayak basma hissini *"Şimdiye kadar hiç rastlamadığım bir bereket fışkırıyordu. Güneş ateş gibi yakıcıydı. Görmesi Mısırlı Musa'ya da nasip olan, İsa'nın doğduğu, irfan kazandığı ve cefa çektiği kıtayı, Homer'in şarkılarının dünyaya yayıldığı kıyıları gördüm. Burada, Doğu'ya, masalların*

anavatanına ayak basmış olacaktım" bu cümlelerle anlatması son derece önemlidir. Portekiz gezisi ise her ne kadar ruhunu doyuran ve Andersen'e yeni ufuklar açan bir gezi olsa da aslında Portekiz yolculuğuna kendisine gelen tavsiye mektubu ile karar verir. Doğu gibi sürekli hayalini kurduğu bir seyahat değildir. Aksine Portekiz seyahati, uzun zamandır özlem duyduğu bir yolculuk için bir fırsatın kendisine gelmesidir.

Hans Christian Andersen'in Doğu yolculuğu deniz yolculuğu iken Batı'ya yolculuğu kara yolculuğudur.

Yine başkent olarak bir değerlendirmeye gidecek olursak Hans Christian Andersen İstanbul'da Ali Efendi ve saray tercümanlarından Saffet'i ziyaret ederek Ali Efendi ile Lamartin'in Doğu gezisi[12] üzerine sohbet etmiştir. Ali Efendi'nin İstanbul'un kendisi üzerinde bıraktığı izlenimleri sorması üzerine: *"İstanbul'un konumunu dünyada eşi bulunmaz bir güzellikte bulduğumu, manzaranın Napoli'den daha harika olduğunu"* söylemiştir. Lizbon ile ilgili değerlendirmesinde Lizbon aksine tertemiz, *"dost canlısı evler, duvarları mavi beyaz desenli porselen parlak karelerle süslenmiş, kapılar ve balkonlar yeşile boyanmış, renkler her yerde"* diye yazar.

Kadınlar ile ilgili değerlendirmesinde, mezar taşında yaldızlı bir nilüfer çiçeği mevcut ise bunun kadın mezarı olduğunu ve bunun haricinde başka bir bilginin olmamasını da kadınların öldüklerinde dahi yabancılara mahrem olduğunu belirtmesidir. Yine *"Kadınların yabancıların bakışlarından koruyan kafesli pencereleriyle evlerin ikinci katlarını hatırlıyorum" der.* Portekiz ile ilgili en dikkat çekici husus ise Fronteira Marquis'a ait olduğunu belirttiği villanın tasviridir ki *"Galerinin duvarları, tümü kadın tasvirlerini temsil eden, mozaikte garip bir şekilde büyük ve çarpıcı figürlerle süslenmiştir"* der. Buranın kadın tasvirleri ile süslenmiş olması, "Doğu"nun ve "Batı"nın kadın algısı üzerine çarpıcı bir örnektir ki bu da gizlenen ve alenen sergilenen kadın olmak üzere Doğu'nun ve Batı'nın kültürel yapısına güzel bir örnektir. Dönemin konjonktürel yapısını; zaman, coğrafya ve toplum olgusunu kapsayarak üçlü bir değerlendirme yapması açısından seyahatnameler son derece önemlidir. Bu değerlendirmeye baktığımızda iki farklı coğrafya, iki farklı toplum ve hemen hemen aynı zaman dilimine denk gelen bir değerlendirme gerçekleştirilmiştir. Hans Christian Andersen'in gözlemleri ve analizleri zaman algısı aynı kalarak hiç tanımadığı coğrafya ve toplumları değerlendirmesi açısından son derece objektiftir.

Andersen'in seyahatnamesi çok katmanlı olup daha çok şiirsel bir dil kullanması seyahatnamesine kattığı kendine has bir özellik olurken aynı zamanda anlattığı durumları ve olayları zaman zaman tarihsel olarak sunduğu bilgilerle zenginleştirmesi bakımından da önemlidir.

Andersen'in iki farklı ülke topraklarına seyahati incelendiğinde farklı coğrafya, farklı kültür ve farklı toplum yapısından birinin seyahatlerinde ilgi duyduğu, ilginç bulduğu noktalara temas

[12]Fransız İhtilali'nin hemen akabinde aristokrat bir ailenin çocuğu olarak dünyaya gelen Alphonse de Lamartine (21 Ekim 1790) Napolyon'un Mısır seferinden sonra Chataubriand, Theophilé Gautier, Gustave Flaubert, Gérard de Nerval, Lord Byron gibi Avrupalı şair ve yazarlarda başlayan Doğu seyahatleri yapan yazarlar arasına Lamartine de katılır. 16 aylık "Doğu" serüvenin sonunda ilk kitabı "Voyages en Orient" 1834 yılında yayımlanır. Ardından 1848 İhtilali'nden sonra geçici hükumette Dışişleri Bakanlığı da yapan şair, 1850 yılında ikinci Doğu seyahatine çıkar. Bu seyahatini tamamladıktan sonra da hatıralarını "Nouveau Voyages en Orient" adlı eserde toplar. Selattin Çitçi, Alphonse de Lamartine'in "Voyage en Orient" ve "Nouveau Voyage en Orient" Adlı Eserlerinde Oryantal Bakışlar.
https://www.academia.edu/16260743/Alphonse_de_Lamartine_in_Voyage_en_Orient_ve_Nouveau_Voyage_en_Orient_Adl%C4%B1_Eserlerinde_Oryantalist_Bak%C4%B1%C5%9Flar

ettiği görülmektedir. Bu nedenle XIX. yüzyılda Portekiz ve Anadolu Osmanlı topraklarında yaşayan insanların kılık kıyafetinden, toplumsal yapısına, seyahat edilen mekânların sokaklarından mimari yapısına kadar devrin bir panoramasını bir seyyahın gözüyle görmek dönemin tarih çalışmalarına katkı sunacaktır. Bu alandaki bilgi ve veri imkânlarını zenginleştirecektir.

KAYNAKÇA

Andersen, H. C. (1881). *In Spain and a Visit to Portugal, Boston: Houghton, Mifflin and Company*.The Ribersiue Press. Cambridge.

Andersen, H. C. (1995). *İstanbul'da İki Seyyah* Çev.: Banu Gürsaler Syvertsen. Yapı Kredi Yay. 2. Baskı.

Bağcı, B. (2020). Osmanlı Devleti'nin Kuruluş Döneminde Kalenderî Gruplar. *Orta Çağ Araştırmaları Dergisi*, III/II, s. 240-252.

Çiftçi, S. (2015). Alphonse De Lamartine 'İn "Voyage En Orı- Ent"Ve "Nouveau Voyage En Orıent" Adlı Eserlerinde Oryantalist Bakışlar. KIBATEK Edebiyat Sempozyumu. s. 287-306.

Etymologeek. (07.07.2022). https://etymologeek.com/eng/Scutari/12262037

Korovin, A. (2018). H. C. Andersen's Travel Books – A Fairy-Tale Vision Of Europe. *TijdSchrift voor Skandinavistiek*. vol. 36, nr. 2, s. 189-195.

Ocak, A. Y. (1999). *Osmanlı İmparatorluğu'nda Marjinal Sûfîlik: Kalenderîler (XIV-XVII. Yüzyıllar)*. Türk Tarih Kurumu Yayınları. Ankara.

Özcan, A. T. (2012). XVI. Yüzyıla Kadar Türkiye ve Türkmenya Adının Batı Dünyasında Kullanımı ve Sınırları. *Türkiyat Mecmuası*, C. 22/Güz, s. 63-82.

Tekstil Sayfası. (07.07.2022). https://tekstilsayfasi.blogspot.com/2020/10/muslin-kumas-nedir-kumas-ozellikleri.html

Varol, M. (2015). Oryantalist İmgelemin İnşasında İstanbullu Bir Tekke: Rifâî Âsitânesi. (Ed.) Emecen vd. *Osmanlı İstanbul'u* C. III. s. 707-748.

FROM REGIONAL TO TRANSNATIONAL: THE JOURNEY OF VAISHNAV RELIGION AND BENGALI HINDU CULTURE

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ABSTRACT

Gaudiya Vaishnavism started its journey in 16th century Bengal with the motto of reforming Hindu religion and making this religion acceptable to others also through the proper religious way. Vaishnavism existed in different parts of India with slight differences. Sri Chaitanya-led vaishnavism gave a different dimension to Vaishnavism and Hinduism (though Vaishnavism is a version of Hinduism). All the forms of Vaishnavism are Krishna centric but Gaudiya Vaishnavism gives importance to Radha also while Krishna remains at the centre. It became quite successful in the mission. Vaishnavism became popular in Bengal. İt started reconfiguring the mainstream hindu culture and that process is continuing till now. Since the establishment of ISKCON and the opening of various branches/centers in different parts of the USA the Hare Krishna Movement has taken a new turn. In different regions of the USA due to the Hare Krishna movement, the number of practitioners has also been increased. Side by side in the UK and other European states the number of Vaishnav communities is increasing and ISKCON is establishing branches one by one. When the people are taking 'Deeksha' of this religion they are also accepting the faith, belief system as well as Bengali rituals and culture. Though it is slow yet it is making its place in nooks and corners of the world. Through this religion, Bengali Hindu culture has become a transnational phenomenon, and people are accepting the food and dress code also. Once it was a regional culture but it is now a transnational phenomenon. ISKCON and the Hare Krishna movement are very much responsible for promoting Bengali Hindu Culture all over the world. Vaishnav Religion is now a transnational phenomenon. This religion is promoting a semi-monastic lifestyle among practitioners and a popular culture across the world. The focal point of this paper is to track the expansion of this religion and its changing dimension from regional to transnational phenomenon. This paper tries to analyse the role of ISKCON in the spreading of Bengali Hindu Culture and Vaishnav religion.

Keywords: Bengali Hindu Culture, Transnational culture, Vaishnavism, ISKCON, Hare Krishna movement, semimonastic lifestyle.

FEMALE UTOPIA IN "THE SOUND AND THE FURY": THE MYTH OF PERSEPHONE

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ABSTRACT

The aim of this paper is to present elements of a female utopia through the myth of Persephone in the novel written by William Faulkner "The Sound and the Fury".

The myth of Persephone revolves around the myth of the woman, her fertility as well as infertility, which is physical and emotional, generating many layers of symbolic meaning. The focus of the story is on the female world, represented by the virgin daughter, Persephone, the mother, embodied by Demeter. Components of this complex feminine world are also found in Faulkner's novel. Through the compositional feature of parallelism, symbolism is exposed to the reader. Moreover, the emotional level is increased to highlight new interpretations to the novel. Ideas of utopia placed within the female context, by the myth, take on different connotations. Usually at the center of these notions is the use of gender. This approach is based on the belief of creating equality between the sexes, in an American society of the south under the influence of many transformations: social, economic, and political. Caddy Compson, the daughter of the Compson family, is different from her mother, Caroline Compson. All at once, her feminine utopia differs from that of her mother. Her negative stimulus makes Caddy project a utopian behavior entirely in antagonism with that of her mother. Caddy frees herself from the stereotypical women of South America by projecting her utopia on the myth of Persephone.

Through an empirical analysis of Caddy Compson, it is possible to arrive to the point to present her utopia and the influence of Persephone's myth.

Keywords: modernism, literary techniques, Joyce, Faulkner, form, content

1. Introduction: Utopia in Faulkner and "The Sound and the Fury"

In his Nobel Price Speech, in 1955, Faulkner says "I decline to accept the end of man."(Stein, 1960, p.67-82).The decline of this apocalyptic moment is an indication where we can find a utopia of human beings, a utopia of living, filtered through the action of the characters and experimenting narrative styles. Faulkner is at the point where the literature and history are terminated. Being a typically modernist work, it passes through "an aesthetic ordering," (p.481) which according to David Lodge (1991) uses "allusion to or imitation of literary models, or mythical archetypes; or repetition-with-variation of motifs, images, symbols" (p.481). Such narrative method was named "the method of myth" by Elliot (1923), inspired by Joyce's *Ulysses* (1922), even though he used this technique in his *Waste Land* (1922). What surprised Elliot (1923) was "the usage of Odyssey myth… as a manner to put order, give form, meaning to the endless panorama of futility and anarchy in contemporary anarchy." (p.483). We can conclude that the elements of utopia, in this novel, are precisely expressed through the usage of myth.

2. Female utopia

Ideas of utopia placed within the female context, by the myth, take on different connotations. Usually at the center of these notions is the use of gender. This approach is based on the belief of creating equality between the genders, in an American society of the south under the influence of many transformations: social, economic, and political. Caddy Compson, the daughter of the Compson family, is different from her mother, Caroline Compson. All at once, her feminine utopia differs from that of her mother. Her negative stimulus makes Caddy project a utopian behavior entirely in antagonism with that of her mother. Denying every norm of decency, Caddy frees herself from every emotion called "forbidden" from Carolina's viewpoint and the stereotypical women of South America.

3. Caddy Compson

From the first moments of her description in the novel, Faulkner is careful to construct the figure of a woman quite different from the stereo-typical image projected on every South American woman. Building her figure on the technique of the character as a counteractive subject, Faulkner unfolds the clashes between limiting reality and personal desires as he produces an internal conflict. Out of a reality projected on chastity, she finds herself caught up in the values imposed by generations of a career military family. This unusual identification for a female in society causes a reversal of gender roles within the family. Caddy takes actions that belong to the opposite gender role. This gender shift appears throughout the novel. She exposes a physical dominance and control over her brothers.

There is a technique of narration where the narrator reveals the characters. As a result, he tries to go deep into the construction of characters and events. Quentin says that she "was never in the gender role of queen or a fairy, on the contrary, she always played the part of a king, giant, or general." (Faulkner, 1990, p.215) This change of active roles also appears in the fleshly aspect, where Caddy reveals all her libido freely, without restrictions or shyness. A Victorian woman would never do it. On the contrary, her sexual imposition on men appears in the episode, when telling Quentin about her first kiss, she says "I do not let him kiss me, but I made the gesture." (Faulkner, 1990, p.171)

4. The Myth of Persephone

Zeus and Demeter have a daughter called Persephone according to Greek religion and mythology. One day, the god of the underworld abducted her, and she became the queen of the underworld. While on his chariot he saw Persephone in a field nearby taking some flowers. The girl started crying for help but there was no help. In the meantime, Demeter searched for her daughter in vain. She received news that with the approval of her father, Zeus, Hades decided to make her his queen in the underworld. The range of Demeter was so big that she decided to prevent the plants on earth from growing. Her wrath produced famine on earth. For this reason, Zeus had to ask Hades to free Persephone. She was forbidden to return to her normal living with the mother. While staying in the underworld with Hades, she ate pomegranate seeds. This action forced her to stay in the world of Hades. In order to settle the situation with Demeter and Hades in the above and underworld, Zeus decided that Persephone would spend half of the year with the mother and half with Hades, her husband.

5. Interpretations

Gantz (1996) says that since Persephone had consumed pomegranate seeds in the Underworld, she was forced to spend four months, or in other versions six months for six seeds, with Hades (p.87) Demeter's despair or happiness to have her daughter with her would cause: Autumn and Winter seasons, signifying dryness, Spring and Summer seasons, signifying blossom. Nilsson

(1950) admits that not only does Persephone and Demeter's annual reunion symbolize the changing seasons and the beginning of a new cycle of growth for the crops. It also symbolizes death and the regeneration of life (p.164). Burkert (1985) supports that the abduction of Persephone by Hades, in the form of Ploutus (πλούτος, wealth), represents the wealth of the grain contained and stored in underground silos or ceramic jars (*pithoi*) during the Summer seasons (as that was drought season in Greece) (p.178) The woman of the grain, fertility, lives underground with Hades. Moreover, death and life coexist. Fertility of land dies when the drought of autumn and winter comes. Fertility is reborn with spring and summer.

6. Caddy and Fertility

In various analysis of the Caddy's character, many critics have compared the strength of her female libido to the god of fertility. South America is a fertile land and productive barn not only for this geographical part but the whole territory, this goddess is representative of the land, unfolding economic abundance. In Caddy, all this forceful display of libido has also taken on the opposite connotation, producing emotional bareness. Faulkner presents the inner soul of our character. Life and death coexist within her. While confessing to Caddy her troubled emotional state, she says that now "I can't cry, I can't shed tears even for a single minute." (Faulkner, 1990, p.124) The fact of not taking care of her daughter and the rest of the family drove the Compson into an emotional drought that was even deeper than it was when the children were young while the family was still afloat. This emotional drought is paralleled by the land drought of the South, turning it from a fertile land of cotton production to waste land due to the consequences of the Industrial Revolution and technological processing. Bleikasten (1974) says that "Faulkner seems to want say that at least within the society of the southern whites, the female soul is corrupted, condemning it to an irreversible barrenness." (p.140) The opposition between fertility and barrenness, as an opposition between utopian ideas and counter utopian carries female symbolism throughout the novel. At this point in the novel is intertwined the myth of Persephone.

7. Caddy and Persephone: Life and Death

The myth of Persephone revolves around the myth of the woman, her fertility, her barrenness. A fertility and barrenness that is not only physical, but also emotional, generating symbolic meaning. In this story the focus is on the feminine world, represented by Persephone, the mother represented by Demeter and the king of underworld. Elements of this complex world are also found in this novel. When parallelizing the female domain in Faulkner's novel with the female realm of the ancient myth, we can say that Caddy is like Persephone, Mrs. Compson is similar to Demeter, they both symbolize the role of the mother. The moment Mrs. Compson realizes Cady is expecting a child, she symbolically places a veil of sadness over her face similar to Demeter's veil, expressing all her anger and hopelessness of having a daughter who does not follow the rules of female purity, typically of the south, unfulfilling the ideal of the southern woman. Mr. and Mrs. Compson plan to move Caddy away from the eyes of their town to hide her delicate condition. This departure resembles the abduction of Persephone, an unwilling departure to the underworld.

Mr. Compson vows to take Caddy to the "French Lick" (224) in Indiana, a hot spring where the heat of the currents create a state of purgatory, known as "Pluto's Waters". Here Caddy, by chance, meets Herbert Head, a banker, but also gambler who is an economic potential not only to save her from the trouble of expecting a child, but also a possibility of support for the whole family. Herbert would provide Jason with a bright future in banking, but also help the family from financial bankruptcy. The initials of Head's name are like the initials of the

underworld god, Hades. Just as Hades kidnapped Persephone in a golden chariot to send her to the underworld, signifying economic progress, Herbert will send Caddy to his hometown, Indiana, a state that the Puritans, like the Compson Family, attach to underworld, using a luxury car, of the latest brand. The car was a gift for the future bride, a symbol of this same wealth. Elements of this myth are found in the book in Quentin's and Benjy's episode. Their minds are constantly dominated by the streams of thoughts dedicated to Caddy, while they predict her tragic death.

8. Conclusions

The days of the Holy Week in the Christian religion describe the crucifixion, death and resurrection of Christ, his love, and sacrifice to save humanity. In the novel *The Sound and the Fury*, each day of this week is symbolically portrayed by one of the Compson's brothers owing to the passions of their hearts. Benjy's contribution to this week is through his craziness; Quentin's due to his suicidal desire; Jason's thanks to his avarice. Out of a parallelism between the days in Compson's family and the days of the Holy Week is presented the family's huge panorama. The aim of the myth running in the novel is to put order, give meaning to life, and hope to the absurdity, craziness, along with the alienation to this South American family. A utopian reality is created different from the spiritual as well as emotional drought of the Compson family. Moreover, it even symbolizes the drought of many families experiencing several modern world socio-economic changes.

Faulkner treats the female utopia of her society, the female utopia of women in South America. The aim is not to make a presentation of female characters, but even to focus on the conditions that make such presentation. The discourse used to portray Caddy Compson shows an image projected on the ideals of the American society, under strong puritan influence. Her utopia is built upon imposed, unauthorized cultural codes of this society. Faulkner leaves open the construction of femininity and of the female utopia, as an influence of some idealized components, generated from the culture of different societies these women belong. The myth of Persephone is based on a contradiction between utopian and counter-utopian ideas, fertility, death, barrenness. Caddy's tragic end presupposes a personal counter-utopia, but also a female counter-utopia, because as Quentin says, many women will suffer her fate, who will fall into the cracks of hell, just like the animals of God.

9. References

Bleikasten, A. (1974). *The Most Splendid Failure: Faulkner's The Sound and the Fury*. Bloomington: Indiana University Press.

Burkert Walter (1985). *Greek Religion*. Harvard University Press. ISBN 0-674-36281-0

Elliot, T.S. (1923). Ulysses, Order, and Myth. *Dial*, 75.

Faulkner, W. (1990). *The Sound and the Fury*. New York, NY: Vintage International.

Gantz, T. (1996) *Early Greek Myth: A guide to literary and artistic sources*. Johns Hopkins University Press, in two volumes: ISBN 978-0-8018-5360-9 (Vol. 1), ISBN 978-0-8018-5362-3 (Vol. 2).

Lodge, D. (1994) *20th Century Literary Criticism. A Reader*, 17th Impression. Longman.

Nilsson, M. (1950) *Minoan-Mycenaean Religion, and its Survival in Greek Religion*, Revised 2nd ed. Lund: Gleerup.

Stein, J. (1960). William Faulkner: An Interview. In F.J. Hoffman and O.W. Vickery (Eds.), *William Faulkner: Three Decades of Criticism*. (pp.67-82). New York: Hartcourt, Brace &World, Inc.

THE CLASSICAL INDIAN DRAMA NARRATIVE AND RASA THEORY IN THE CONTEXT OF CINEMA: A CROSS-CULTURAL UNDERSTANDING WITH SOME KEY DIALECTS OF WESTERN SCHOLARSHIP

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ABSTRACT
Cinema as a cultural institution has been studied by academic researchers in the arts and humanities. At present, cultural media studies are home to the aesthetics and critical analysis of films, and other branches of film scholarship. Cinema has to be understood in the context of poetics, dramatics, and aesthetics which have different roots in Western and Indian films and other performing arts. Understanding Indian cinema, therefore, means understanding Indian aesthetic traditions and aesthetics.
In the Western counterpart, Aristotle said that the Narrative structure of the plot is the soul of the tragedy. Classical Indian aesthetics, on the other hand, as elaborated in the Natyashastra, one of the most authoritative treatises on the topic, states that *rasa*, a Sanskrit term signifying the essence of emotion as a sentiment or the final emotional state of relish/aesthetic experience achieved by a spectator while watching a performance, is the soul of a drama. Furthermore, Indian theater and cinema also recognized that a codified narrative structure that channels *rasa* to the audience is important. An analysis of Bollywood movies reflects the application of *rasa* in its plots bringing forth some unique features compared to other schools of cinema. The authors seek to find the deployment of the fundamentals of *rasa* theory as an alternative tool for analyzing theater productions as well as the spectator's experience. This paper aims to summarize what has been found with regards to Classical Indian Drama narrative and *rasa* theory in the context of cinema and a cross-cultural understanding of some key dialects of Western scholarship by pinpointing the certain gaps in knowledge in this domain and providing recommendations for research practice. It also seeks to identify promising directions for future research on Western and Indian dramatics in a broad manner.

Keywords: *rasa*, Narrative, cinema, Natyashastra, aesthetics

INTRODUCTION
Films and film-making became a huge business, they brought in a fusion between intellectual debate and art. The film is also known as a cinema and movie. A discussion about films in the light of ancient Indian aesthetic principles will show that drama is closest in nature to films.

Drama and films both are used to convey, within a stipulated time, some message to society. Drama too has the same characteristics, the world over at all times. In the Indian context, drama has been called the best form of poetics. It has been seen that through the age poetry has primarily remained a form that is heard while drama gives us the audio-visual pleasure of poetry, all these aspects are taking us away from our main point of debate and discussion. Let us try and hope to find a resemblance between drama and films as we undertake to study world films through the knowledge of the ancient Indian aesthetic doctrines.

A narrative is a story or description of a series of connected events (Cambridge dictionary, n.d). It is the way a story is told. A narrative can be a work of poetry, prose, theatre, or film and can be based on, as well as, convey different messages and themes. The structure of the narrative, which will be also referred to as narrative style or model, has its own roots and unique development in each civilization. Consequently, the narratives of Western and Indian civilizations have their own distinct models and aesthetics. According to Sen (2018), most Western Storytelling structures are derived from Classical Greek traditions. Cinema in the West, in particular, has incorporated the Aristotelian storytelling style which follows three stages of Narrative structure, such as Beginning, Middle, and End. Later on, this narrative structure was elaborated on and categorized by Freytag as, Exposition, Rising action, Climax, Falling action, and Resolution. Although recent trends of film narratives have been changing and modifications are still going on, it is seen that the basis of screenplay writing still follows the Aristotelian style of narrative presentations.

India, on the other hand, has its unique approach to the narrative structure based on an exhaustive treatise on dramaturgy called *Natyashastra* by Bharata, which also encompasses all forms of performing arts. Khudva (2019) states that, in the context of Indian performing arts, there remains no clear distinction between the various forms of art such as dance, painting, drama, gesture, and appearance since all are forms of creative expressions contributing to creating '*rasa*' or aesthetic experience. Thus, it can also be regarded as a treatise on poetry, dance, music, and drama, as well as on painting, sculpture, and architecture. Dramatists worked over a couple of centuries on the foundational principles given in the *Natyashastra* to evolve Indian dramaturgy into its present form. Much like Aristotle's *Poetics*, the *Natyashastra* discusses extensively the narrative structures of the play. Chaturvedi & Gupta (2017) also state the concepts of a well-built plot and narratology that existed in it which prescribes a more detailed graph with five successive stages in a plot starting with an overarching concept like *kārya* (deed or objectives) which is then further divided into five stages, viz., *ārambha* (beginning), *prayatna* (effort), *prāptsambhāva* (the prospect of success), *niyatāphalaprāpti* (removal of obstacles to attain success) and *phalaprāpti* (attainment of the desired goal) (Rangacharya, 2014), which has certain parallels with the Aristotelian concepts of narrative and Freytag's categorization of narrative structure (exposition, rising action, climax, falling action, and denouement). The *Natyashastra* includes another classification of the movement of the plot into five elements, viz*., bīj (*seed), *bindu* (drop), *patāka* (action), *prakari* (episode), *kārya* (deed or objectives) (Rangacharya, 2014) and other related concepts like *sandhi*, *arthapakhşepaka,* etc. to convey an organized model of drama narrative which will be further elaborated in the following sections.

While the Hollywood movie may look highly structured and coded in the same vein as the Western Symphony, the Indian screenplay is somewhat similar to the Indian Raga with its

original rituals but is inextricably linked to the lack of proper coding in the Western sense. Is there any specific 'Indian' way of telling stories or narrative models? Does it help a contemporary screenwriter to know of a distinctive aesthetic tradition from Natyashastra, etc, and the larger world of folk narratives and Indian literature (Chakraborty, 2006)? The Indian narrative tradition described in Natyashastra clearly states that art must be experienced, must be transcendental, and must be informed and educated, which has somewhat similar to the handful of Western theorists who have advocated for emphasis on artistic experience.

In this context, a question that arose in my mind was whether the elements of a plot, as given in the *Natyashastra*, are clearly visible in the Indian cinema like its Western counterpart reflects the Aristotelian schema? This led me to inquire about the key features of Classical Indian drama narratives and Aristotelian drama narratives - what are their similarities and differences? How does an audience perceive these two kinds of narratives? This, in turn, led me to investigate further the possible contributions of Classical Indian narrative structures in contemporary cinema.

Furthermore, the *Natyashastra* does not only deal with aesthetics but also discusses the psychological impact of the performance on the audience. One of the important contributions of Bharata's treatise is its *Rasa* theory. Though *rasa* has many literal meanings like the taste, extract, juice, essence and so on, in the *Natyashastra* it is used to signify the essence of emotion as a sentiment or the final emotional state of relish/satisfaction/reaction/aesthetic experience achieved by a spectator while watching and experiencing a performing art (Rangacharya, 2014). The depiction of rasa and channeling it to the audience is one of the important aspects of Indian theatre and cinema. I found many articles and thesis papers on the *rasa* theory and its relevance to Indian film. The *rasa* theory in fact could be used as an effective tool for theatre analysis (Roy, 2017).

To achieve these, I used a mixed methodology which will include a literature review and qualitative methods. I focus on the Literature Review Method (LRM) to identify the Western and Classical Indian narrative structures from different categories of literature. The findings and discussion are portrayed through the Qualitative method.

Defining Narrative

A narrative study is a crucial approach of any literary work, basically in a novel, a short story, a drama, and cinema as well. The narrative has a coherent relationship between the sequence of events and the characters. In a story, a character is part of events or plots which create a story that is interesting to read. A story without structures cannot make it alive. Fludermik (2009) said that "narratology is a description of the constants, variables, and combinations typical of narrative and explaining how the characteristic of narrative texts connects within the structure of the theoretical model". In short, a narrative is a structured form of communication, especially in literary work. A structure in a story means a text which contains the collection of events chronologically until a story unity is formed.

In the Cambridge Introduction to Narrative, H. Porter Abbott (2008) provides his own definition of narrative.

"Narrative is the representation of an event or a series of events.

Another definition of narrative from Kristin Thompson and David Bordwell (2001) who wrote in their book *Film Art*:

"We can consider a narrative to be a chain of events in a cause-effect relationship occurring in time and space. Typically, a narrative begins with one situation; a series of changes occur

according to a pattern of cause and effect; finally, a new situation arises that brings about the end of the narrative."

Introduction to the Western and Classical Indian narrative structures

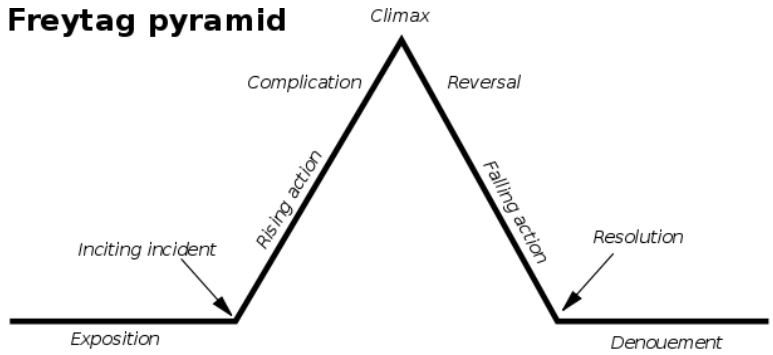
Narrative Units in Western Theater

In this section, I will present a brief tour of the narrative units that comprise works in the history of Western theater. What are the units of narrative in this ancient form?

In the West, traditional narrative Structure has a long history of development. What is currently considered a classical or traditional narrative structure is often called "*Aristotle's Arc*". Aristotle was one of the first to write about drama and describe its three segments: beginning, middle, and end, wherein we find an introduction, climax, and denouement. The narrative increases the intensity in the climax and then gradually reaches an end. This has been a dominant structure, not from classical times, till the mid-nineteenth century also (Padmavat, 2015).

Three-act structure has seen a resurgence in recent years and movie blockbusters and hit TV shows also adopted this. Over time, dramas evolved, the Roman poet, Horace advocated for five acts and many centuries later, a German playwright, Gustav Freytag developed the five-act structure commonly used today to analyze classical and Shakespearean dramas. He theorized that effective stories could be broken into five parts which create a pyramid or triangle shape containing five dramatic elements: exposition, rising action, climax, falling action, and denouement or catastrophe. We can assume this five-act structure as an expansion of the classical divisions. The combination of Aristotle's and Freytag's theories in a structural model is useful in discussions and criticisms of all narrative genres and has increasingly become the convention not only for drama but for comedies, short stories, and novels as well (Putri & Nurhadi, 2019). Figure 1 offers a visualization of Freytag's pyramid model.

Figure-1



Another very influential narrative structure in the Western narrative tradition is called the 'Hero's Journey'. The 'Hero's Journey, also known as the Monomyth, was first conceptualized by Joseph Campbell in his book *The Hero with a Thousand Faces* (Campbell,2003). The Hero's Journey traces its protagonist's story roughly through the following stages:

The Departure Act: The Hero leaves the Ordinary World

The Initiation Act: The Hero enters into unknown territory (the " Special World ") and goes through various challenges

The Return Act: Hero ultimately triumphs before returning home, transformed.

Save the Cat is one of the most popular books on screenplay writing. In the book, author Blake Snyder, a successful screenwriter who became an influential screenplay guru, provides a variant on the basic three-act structure that has dominated blockbuster filmmaking since the late 1970s.

Instead of a broad overview of how a screen story fits together and theoretical analysis, his book broke down the three-act structure into a detailed 15 key story beats of the screenplay. Moreover, he facilitates some possible events that have to happen and then gives each of those beats' names with the page number. Given that each page of a screenplay is expected to equal a minute of film, this makes Snyder's guide essentially a minute-to-minute movie formula (Lukinbeal & Sharp, 2019).

Narrative Units in Film

There is some discussion of act structure and also a few ideas concerning smaller units, such as scenes and beats, as well as ways in which a completed film may be analyzed and subdivided structurally (Funk,2018).

Field (1979)

Syd Field is well known for his successful formula for screenplays containing three acts. His formula is precise, even indicating the number of pages that should comprise each section of the story arc. Field suggests that the dramatic structure should have a definite beginning, middle, and end, though not necessarily in that order. He notes that "….a delivered screenplay must have a definite three-act structure and no longer than 2 hours and 8 minutes, or 128 pages, in length" (Field, 1979).

Thompson (1999)

Kristin Thompson has extensively studied the forms of plot advocated in screenwriting manuals and exemplified in films. Based on her observations and analysis of films, she argues that a structure of five major sections makes more sense: Setup, Complication, Development, and Climax, followed by Denouement.

Bordwell and Thompson (2001)

In *Film Art*, Bordwell and Thompson examine the plot and story of the film. They note, "In analyzing a film, it is often helpful to begin by segmenting it into sequences. Sequences are often demarcated by cinematic devices (fades, dissolves, cuts, black screen, and so on) and form meaningful units. In a narrative film, the sequences constitute the parts of the plot" (Bordwell & Thompson, 2001).

To know the narrative model of both western and Indian, we can go through a comparative discussion between various matrices that are embedded in Natyashastra and Aristotle and also the Freytag model of narrative structure, because these three traditional structures are being prominently used in contemporary cinema and the other performing art as well.

Aristotelian and Classical Indian Narrative styles: A comparison

In literature, drama as a genre occupies an important place both in Western and Eastern literature. Aristotle's *Poetics* and Bharata's *Natyashastra* are two prominent works that focus on the essentials of drama from different perspectives. *Poetics* Originally written in Greek explores mainly the aspects of tragic drama and its effect on the audience. The *Poetics* of Aristotle (384-322 B.C.) is one of the greatest pieces of literary criticism in the Western world. Similarly, *Natyashastra,* which is written in Sanskrit, discusses the Indian tradition of drama and its technicalities and how it influences the audience. Both the *Poetics* and *Natyashastra* bear striking resemblances in theme and treatment and are believed to be the earliest in the field (Dhar, 2017). Much like Aristotle's *Poetics*, the *Natyashastra* breaks down the required structure for a unified play as well as outlines different styles of storytelling. While reading about Aristotle I came across another influential critic, Bharata Muni, whose theory functions

as a contemporary contradiction to Aristotle's theory. Both of their theories together help to outline the structure and format behind many of the stories, plays, and films that we see in the present day.

Before I go into the comparison between Aristotelian and Classical Indian narrative structures. Let me first briefly introduce the key attributes of the Aristotelian narrative format briefly.

Key attributes of Aristotelian narrative structure

Aristotle notes that the epic and tragedy are the outcome of the imitations of noble actions and tragedy is superior to all types of literature. Aristotle defines Tragedy as "The imitation of an action, serious, complete and of a certain magnitude, in a language beautified in all different parts with different kinds of embellishments through action and not narration, and through the scene of pity and fear bringing about the 'Catharsis' of these emotions" (Butcher, 1951).

This definition has roughly two parts, the first part is concerned with tragedy as one of the imitative arts and points out its medium, objectives, and manner of presentation. The second part is concerned with the emotional effect of Tragedy. Serious action means a tale of suffering, exciting pity, and fear. The action should be complete, whole, and well-knit. It means there should be an organic unity or a natural sequence of events that cannot be disturbed. In Tragedy, the outcome depends on a tightly constructed cause-and-effect chain of actions. In short, there should be a good beginning, a middle, and an end. He also suggests that every tragedy therefore must have six parts, which determine its quality—namely, Plot, Characters, Diction, Thought, Spectacle, and Melody (Butcher, 1951). I will restrict my discussion to the plot construction only.

What is the ideal plot according to Aristotle?

The plot is the first principle and most important feature of tragedy. Aristotle defines a plot as the arrangement of the incidents. Plots will have the following qualities:

The plot should be a whole, with a beginning, middle, and end. The beginning is the incentive moment and must start the cause-and-effect chain but not be dependent on anything outside of the play. The middle or climax must be caused by earlier incidents. The end, or resolution must be caused by the preceding events but not lead to other incidents outside of the play; the end should therefore solve or resolve the problem created during the incentive moment.

The *Natyashastra* in the light of *Poetics*

According to Ghosh (2009), there are references to text absorbed into the current body of *Natyashastra* that date back to 500 B.C. This makes portions of *Natyashastra* possible predecessors or contemporaries of Aristotle's *Poetics.* The fact that how ancient scriptures could have been created around the same time about a similar subject matter and be separated by such a vast geological distance.

The text is important for many reasons, although here I will majorly focus on the sophistication and detailed theory behind ancient Indian storytelling. In a broad sense, the Natyashastra breaks down the dramatic structure in a similar manner as *Poetics*. There are distinct guidelines and goals set out to help playwrights successfully craft their performances. Both texts are similar in their goals to clearly establish a set standard of narrative structure. Furthermore, Ghosh (2009) hypothesized that the quality of a play, as prescribed by Aristotle, depends on the level of realism and ability of the play to relate to the audience. Other hands, the quality of a play, as determined by the *Natyashastra*, depends on the level and quality of spectacle as well as the adherence to one of the predefined structures.

Plot

In Western poetics, Aristotle has considered the plot as the most important element of tragedy, Sage Bharata has also given importance to the plot. He has considered the plot as the body of the drama and *rasa* as the soul of drama (Ghosh, 2009). The *Natyashastra* describes two kinds of plot, Principal (*ādhikārika)* and Subsidiary(*prāsangika*) (Rangacharya,2014). The principal is the storyline that directly pushes the story forward through the various and necessary junctures, concerned with the main hero. The subsidiary plot is any incidents mentioned that push any narrative forward that are not critical to the principal plot.

Unity

Another similarity between Aristotelian and classical Indian storytelling regarding the concept of unity. According to Aristotle, the plot must be "complete," having "unity of action with time and place as well. The requirement for strong storytelling to stay focused is important. If a story does not stay on subject or thematic arc, would become confusing. For this purpose, the *Natyashastra* have the following devices:

The Germ (bija) of the play as well as its Prominent/focal Point (bindu) helps to maintain the consistency of the play. bīja (lit. 'Germ or seed') is 'that which is explored in small measure and expands itself and ends in fruition', the prominent point (bindu) is that which sustains the continuity till the end of the play. An Act should not present too many incidents and such subsidiary events as might affect the unity of impression (Ghosh, 2009).

Content of the Plot

For Greeks, tragedy was the highest form of drama, and tragedy in the Greek sense did not exist in Indian drama. The fact that both the Greek and Sanskrit tradition of drama is serious not only in their subject matter but also in the manner and mode of their presentation. Both authors agree that the function of drama is to give the reader or audience a focus. Therefore, the final cause must be in-built in the play and must have an effect on the audience and the audience becomes a willing participant which Bharata calls *sahrdaya* or co-creator. Bharata also suggests that drama must provide pleasure - *ananda* - above the emotions of joy and sorrow – a state of mind above and beyond anything (Pandey, 1995). Massey (1992) also notes that Bharata defines nātya as a mimicry of the exploits of gods, *asura*-s (demons), kings, as well as of householders of this world. This is similar to Aristotle's description of tragedy as an imitation of some action that is important, entire, and of proper magnitude.

Mimesis and *Anukaraṇa*

Both Bharata and Aristotle are primarily concerned with drama and the theory of imitation that they emphasized in the works *Natyashastra* and *Poetics* respectively and concerned with the nature of imitation expected in a successful drama. Ray (2005) suggests that "in brief, we may say that while Bharata's idea of imitation is governed by the principles of the theory of Rasa, Aristotle's idea is mainly governed by what he believes to be the universal principle of nature. While it cannot be gainsaid that Bharata's idea of imitation, so far as drama is concerned is radically different from Aristotle's, there is a basic affinity between Bharata and Aristotle when we consider imitation in poetic terms because the ingredients, excitants, and ensuant that for Bharata would create the right kind of Rasa leading to aesthetic rapture, would for Aristotle lead to the right kind of pleasure".

Greek Chorus and classical Indian *purbaranga:*

While Greek drama began with an entrance by the chorus, Indian drama begins with

Purvaranga (preliminaries). These are not considered a part of the drama. The *Purvaranga* is followed by the opening (*Mukha sandhi),* the progression (*pratimukha sandhi*), the development (*garbha sandhi*), the pause (*vimarśa sandhi*), and the conclusion (*nirvahana sandhi).* These are considered vital stages in the progression of the main plotline (Ghosh, 2009). We can understand as these five junctures are the *Natyashastra* version of the three-act structure from *Poetics.* The principal plot includes all these five junctures. Each phase is outlined in the *Natyashastra* as follows:

The Opening

That part of a play, in which the creation of the Germ as the source of many objectives and Sentiments takes place (Ghosh, 2009). This is where the story is set up. The characters, purpose, concept, and object (i.e., the germ) are all established.

The Progression

After the introduction (The Opening), the germ or the focal goal/idea is initiated and set into motion (Ghosh, 2009).

The Development

In this phase, the journey or work of the protagonist is put forth to attain or accomplish the goal.

The Pause

One's pause (lit. deliberation) over the Germ that has sprouted in the development on account of some temptation, anger, or distress, is called the Pause (Ghosh, 2009). Here we find a sudden turn in the progression leading to suspense about the

The Conclusion

Bringing together the objects [of the Junctures] such as the Opening etc. along with the Germ, when they have attained fruition, is called the Conclusion (Ghosh, 2009). In short, this is the closure of the play. This juncture is preceded by the conclusion and wraps up the story.

However, there are other dramatic devices mentioned by the *Natyashastra* that help in the progression of the sub-plot or fulfill many of the same functions as the Greek chorus.

Five stages in the development of the plot:

In Aristotle, the entelechy of the plot accomplished that the causal network of probability and necessity articulates the action toward one particular and ultimately tragic outcome. *Natyashastra* equally describes the elements of action and focuses on the exertions of a hero. With this emphasis on action, the paradigmatic scenario of the Sanskrit drama assumes the shape of a quest narrative composed of five successive stages and culminating in attainment (Dimitrova, 2015). Five stages in the development of the plot are as follows: *ārambha* (beginning), *prayatna* (effort), *prāptsambhāva* (the prospect of success), *niyatāphalaprāpti* (removal of obstacles to attain success), and *phalaprāpti* (attainment of the desired goal) (Rangacharya, 2014). I will briefly convey these five stages in the following section.

***ārambha* (beginning)**

That part of the play merely records eagerness about the final attainment of the result with reference to the Germ (focal point) (Rangacharya, 2014). This is the setup that outlines the goal for the hero/protagonist to attain through their story.

***prayatna* (effort)**

The protagonist strives toward the attainment of the Result and shows further eagerness (Rangacharya, 2014). The hero takes initiative towards their goal in the form of training or pursuing logical steps.

***prāptsambhāva* (the prospect of success/Possibility of Attainment):**

When the attainment of the object is slightly suggested by an idea and an opportunity presents

itself that helps the hero to attain his goal (Rangacharya, 2014).

***niyatāphalaprāpti* (removal of obstacles to attain success /Certainty of Attainment):**

When the protagonist visualizes an idea for sure attainment of the result (Rangacharya, 2014).

***phalaprāpti* (Attainment of the desired goal):**

When the intended result appears in full at the end of events of a play (Rangacharya, 2014).

Freytag's pyramid structure:

Aristotle was one of the first who wrote about drama and described its three parts: beginning, middle, and end. This "Beginning, Middle, End" structure of the building plot was expanded by German literary critic Gustav Freytag in his *Technique of the Drama*, published in 1863. It has since been widely applied to all narrative forms and found to characterize most successful fiction as a tool to shape the narrative structures of their works (MacEwan, 1968). Freytag's model commonly referred to as Freytag's Pyramid was designed for the use of five-act plays. Five stages are exposition, inciting moment, rising action, climax, falling actions, resolution, and denouement. The concepts of Freytag's dramatic elements as the facility to find out the transformation in the novel and film adaptation by comparing the plot. This approach is very helpful for literary researchers in understanding changes in story plots so that they can show transformation in narrative structure (Madej, 2008).

Freytag and classical Indian narrative units: A comparison

Freytag's narrative structure can be discussed in the light of Classical Indian narrative structure as well. Here we find the notion of *kārya* (Deed/objectives/actions) which is divided into five stages these five processes indicate the mental stages of the hero and the concept of *sandhi* (junctures) that are further divided into five stages as I have discussed. In the following section I will try to figure out the similarities between Freytag structure and Classical Indian narrative structure:

Freytag's narrative structure	**Classical Indian narrative structures**		**Signifies**
	Division of Karya's (deed/objectives/actions of the protagonist)	**Division of Sandhi's(junctures)**	
Exposition- Describes the setting, the protagonist, and the primary conflict and objectives. Ends with the inciting moment, which drives the story forward.	*Ārambha* (beginning)- Commencement of an enterprise, depicting an ardent desire of the hero to attain a fruit or success.	*Mukha Sandhi* in which the germ (desire) is created in the mind of the protagonist	Story's overall setup: Characters, conflicts, goals

Rising action- Develops the primary conflict, and confounds it with secondary conflicts. Minor obstacles are overcome by the protagonist.	*prayatna* (effort)- A quick action for the attainment of the fruit when it is not found. The protagonist strives toward the adversities.	In *Pratimukha sandhi* expression of desire takes place which is sometimes perceptible, sometimes lost.	The protagonist encounters obstacles in these stages
Climax- The turning point of the story. The exact nature of the primary conflict is revealed, the antagonist/ adversities are revealed and the path ahead is made clear.	*prāptsambhāva* (the prospect of success)- Even though the possibility of attaining a desired object is doubtful due to some strong pre-meditated obstacles but the effort is continued with the hope of success.	*Garbha Sandhi* - the sprouting of the germ (the prospect of desire).	Characters take the necessary steps to resolve it
Falling action- Resolves the primary conflict. This leads to a moment of final suspense, in which the outcome is in doubt.	*niyatāphalaprāpti* (removal of obstacles to attain success)- When success is certain in the absence of obstacles.	*Vimarsha* sandhi- sudden turn in the progression leading to suspense about the achievement.	Protagonist witnesses the consequences of the decisions he or she made previously.
Conclusion/denouement- Returns the story to a state of normality. Wrapping up the story with success.	*phalaprāpti* (attainment of the desired goal)- The ultimate and total success achieved at the end of the show by the protagonist.	*Nirvahana* Sandhi - successful achievement of the desire.	The aftermath of the story; intended result achieved by the protagonist

Fragmented narrative structure

Another important dialect of Indian cinema is that of Western writers such as Nelmes (1996) had discussed the fragmented narrative structure. It can be found in Ramayana and Mahabharata. Fragmented and circular descriptions where one story leads to another. These kinds of narratives can be found in Bhagavatam, Kalidas's early Sanskrit poetry by Kalidas and Gunadhyaya. Even the story of Panchatantra and other ancient Indian folklore adopts this narrative composition which is different from the Western conceptual style concept. Using moving image analysis (Murthy et al. (2012), Murthy and Oinam illustrate an Indian approach to film communication that is different and distinct from Western film studies on social issues. A film theory derived from a philosophical basis, similar to some of the Western cultural theories which give a wider scope for brief interpretations of Indian content, narrative, and genre.

Classical Indian aesthetic notion of RASA theory

One of the most important parts of the Natyashastra in its description of an aesthetic tradition that may be termed the "Rasa" theory (Rangacharya, 2014). This forms the core of the Sanskrit Natya (performance) theory. "Rasa" which also means "essence" refers to the effect of the performing art on audiences (Rangacharya, 2014). Thus, under the Indian aesthetic tradition, every dramatic presentation is aimed at evoking a particular kind of aesthetic experience in the audience. "Rasa" is a combination of both affective and cognitive effects on the audience.

The Natyashastra, congruently elucidates the relationship between the structure of drama, and the plot, Bhāva, and Rasa, using the same tree-and-seed motif. Like a tree grows from a seed and flowers and fruits. So, the Sentiments (Rasa) are the source (root) of all the states (bhāva), and likewise, the states exist (as the source of all the Sentiments" (Ghosh, 1967). Bharata appears to suggest theatre is a living organism, more than human, as a tribute and an understanding of the divine.

Natyashastra states that Natya (or performance) is the imitation of life, wherein the various human emotions have to be dramatically emphasized in such a way that the spectator is able to flavor the portrayed pleasure and pain (Gupt, 2006). In the Natyashastra, this is captured in the phrase, "vibhāva anubhāva vyabhichari sanyogat Rasanishpattih" (Rangacharya, 2014). This phrase essentially states that Rasa, or aesthetic relish, is produced as a result of the combination of determinants (vibhāva), consequents (anubhāva), and transitory emotions (vyabhicharibhāva) (Rangacharya, 2014). Thus, Rasa, like the taste of food, comes from a combination of a variety of ingredients. Like as a connoisseur enjoys good food, so also does a person of refinement revel in the well-defined dominant mood (sthayibhāva) created by the other Bhāvas and abhinaya (Rangacharya, 2014). Vibhāvas are the cause (Karana) of action, with one vibhāva being termed the main cause (alambana vibhāva), while the other lesser external vibhāva are termed uddipana vibhāva (Rangacharya, 2014). The emotional reaction caused by the vibhāvas is known as the anubhāva (Rangacharya, 2014). And finally, the thirty-three vyabhicāribhāvas, are transient emotions that all contribute to creating sthāyibhāvas, and ultimately Rasa (Rangacharya, 2014). Sāttvika bhāvas is the physical manifestation of intense emotion and may be used as anubhāvas or vibhāvas. According to Natyashastra there are eight individual rasas or emotions and each rasa has a particular dominant mode (sthāyibhāva), These are 'love (rati), mirth (hasa), sorrow (shoka), anger (kroadha), energy (utsaha), fear (Bhaya), disgust (jugupsa) and astonishment (vismaya)'. Their corresponding rasas are 'erotic/romantic

(sringara), comic (hasya), pathetic (karuna), furious (raudra), heroic (Vira), fearful (bhayanaka), odious (bibhatsa) and marvelous (adbhuta)' (Rangacharya, 2014).
Rasa is evoked when emotion is awakened in the audience's minds in a purposeful manner and is experienced while the individual is in a detached, but contemplative mood (Chaudhury, 1965). However, it is assumed that the audience always understands that the situations, actions, and characters on stage are but mere representations of reality, and thus can be actively enjoyed by the audience, a notion comparable to "the willing suspension of disbelief" in Western theatre (Chaudhury, 1965). The Natyashastra is quick to note that Rasa emerges from art, and not from reality, thereby demarcating reality from mimetic reality (Gupt, 2006). Thus, the audience could experience the emotions portrayed by the actor on stage, but both actor and spectator remain aware that these emotions are caused by Natya. Some theorists have pointed to this as an example of a kind of catharsis, similar to Aristotle's notion of catharsis for the release of emotions in a safe environment (Gupt, 2006).

Significance of the *RASA* theory in the context of Cinema

Rasa, according to Indian aesthetics, is the essence of performative art. It is not only felt by the actors/ performers but is also conveyed by them to the sensitive spectators, who after enjoying the various emotions expressed by the actors through their words, expressions and gestures feel the pleasure. India cinema, since its conception, has relied on Natyashastra for its skeletal structure in terms of both its theme and structure. Its domestic themes circle around love and overpowering grief, the stereotypical roles of the chivalric hero and pristine heroines, the larger-than-life backgrounds, exquisite make-up and costumes, and innumerable musical and dance sequences that follow the aesthetic principles of this ancient text. Unlike Euro-American cinema, based on Konstantin Stanislavsky's acting methods, which emphasizes 'becoming' the character, Indian cinema is completely based on conveying the emotion to the spectator and experiencing the 'spectacle'. Bharata's Natyashastra strongly argues that the ultimate sensation depends upon the emotion felt by the audience (as guided by the actor's performance). Bharata believes that the relevant representation of the durable psychological states acts as a stimulus in evoking in the spectator a verisimilitude of other psychological states that is then known as a Sentiment. In Indian cinema, the actors portray their emotions even more than the actual characters they are playing thus conveying well the emotion to the audience, which is the main aim of performative art according to the Natyashastra. The role of the eight rasas is quite central to Indian cinema and its structure. It not only works to drive the plot and accentuate the behavior of the characters; its function is deeply engraved in the basic storyline. The rasas have an important role to play in creating the characters in a film. Shringara rasa signifies beauty, love, and faithfulness or devotion and is always a strong trait of the lead female character, the pure and innocent heroine. Veer rasa, which highlights vigor, strength, courage as well as pride defines the proud, chivalric hero. Taking up the example of Bollywood, one can argue that performance in Indian cinema is very Natyashastra-oriented, unlike the modern Euro-American cinema based on the methods of Konstantin Stanislavsky. This difference lies in every aspect of Indian cinema.

Russian Stanislavsky created the methodology which later got developed into the basic code for modern theatre. This methodology differs from Indian cinema in its belief that the actor should completely inhabit the spirit of the character to be played. Stanislavsky argues in favor of this idea of 'becoming' the character. An actor could perform only when he becomes the

character completely. He argued against the process of enactment as theorized by Bharata in Natyashastra. Natyashastra believes that the conveyance of emotion is important and hence gives value to the Spectacle. According to Natyashastra, the enactment process has four steps. Firstly, the experience of the poet, then the creation of the text. The actor then tries to enact the effect of the experience on the poet, in the last stage, the audience recreates the experience that the actor portrays. Other hands, Stanislavsky believes that the actor must not transpose his understanding and interpretation of the character to his performance because there is always a possibility that the depiction of emotion might change from its original form and conception. He also suggests that an actor should aim at becoming a living breathing embodiment of the character than just trying to convey an emotion. This is precisely what differentiates between Euro-American cinema and Indian cinema. Indian cinema relies mainly on the Rasa and the idea of the Spectacle. Indian cinema, especially Bollywood, quite evidently makes use of all these techniques to convey, melodramatically, the emotion to the audience which is quite contrary to the Euro American cinema where the main objective to be achieved becoming the character, as per Stanislavsky method. However, in the eyes of Western scholars, Bollywood (or popular Indian movies) cinema denies classification. One reason for this may be that any attempt to classify and interpret Bollywood films requires an understanding of the phenomenon of Bollywood. Because Bollywood is not just about movies, it is part of Indian cultural identity that has a different aesthetic and dramatic rule. Bollywood pictures are not melodramas in the Western sense of the word. But in the light of a collection of different cultural aesthetics, different aesthetic traditions, and individual artistic methods, they allow listeners to experience their own sensations dramatically, much like Western melodrama (Schneider, 2009). Hogan (2003) wrote, "The most common primary rasas in Indian cinema are the romantic and the sorrowful/ pathetic''. He believes that the most elemental and essential human emotions are love and sorrow and hence the most displayed rasa are the Karuna rasa and the Shringara rasa, which makes Indian cinema circle around Melodrama and romance.

Screenwriting in Indian cinema too is completely on the codes given by the Natyashastra. Natyashastra often gives the analogy of a satisfying meal that has a myriad of spices and ingredients perfectly and expertly mixed. In films too, this very essence of life can be captured and presented to the spectator. Indian cinema does try to create this very 'organic mix' by melting rasa theory with every form of the screenplay. As described by Lynch (1990) the Western devaluation of emotion in the face of logic, India cultivates emotion as food, necessary for a reasonable life, and as a taste, to fully understand the meaning and purpose of life.

Conclusions and Further work

The rasa theory possesses the possibility of being applied in modern contexts. This theory can explain some of the features of popular cinema. Various research has already been done on this and is going on. In addition, the evolving Indian storytelling practices, performance cultures, and continuance of ancient aesthetics somehow being an emerging fields of academic scholarship. Philip Lutgendorf (2007) suggests the possibility of exploring an Indian style of filmmaking, setting new directions in the field of film criticism, and cultural studies. Furthermore, Copper's (2000) rasa-based analysis focuses on the choice of narrative, plot construction, acting, motivation, cinematography, and mise-en-scene placement to achieve an influential rasa of adbhuta (surprise) by looking at the character's choice. Patrick Hogan claims that the Rasa theory was silenced by post-structural critics whose methods are post-

structural and Eurocentric (Hogan, 2003). He also asserted that it was a theory that captures something in the experience of aesthetic emotion thus this is applicable cross-culturally (Ibid., P. 40). Rasa theory could serve as a better guide for judging Western melodramas as opposed to the Aristotelian codes and several European art-house filmmakers have tried to review the auteur Ship using the concept of Rasa theory. This theory could be a possible alternative to Western aesthetics and a broad interest in the application of Rasa Theory to analyze literary forms, drama texts, and other performing arts. However, Western ideas can increase the understanding in an organized way so that India strengthens the actor. This could also suggest the ability of the Natyashastra to add subtlety of analysis to more subjective Western training.

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REFERENCES

Abbott, H. P. (2008). *The Cambridge introduction to narrative* (2nd ed). Cambridge University Press.

Alisha, I. (2015). The Natyashastra and Indian Cinema: A Study of the Rasa Theory as a Cornerstone for Indian Aesthetics. I*nternational Journal of English Language & Translation Studies, 3*(1), 80-87. Retrieved from http://www.eltsjournal.org

Babcock, K. J. (1987). *Modern dramatic tragedy and Aristotle's Poetics: a comparison* [Ph.D. thesis, College of William & Mary]https://doi.org/10.21220/s2-wdc6-xk68.

Baxter, J. (2007). The soul of tragedy: some basic principles in Aristotle's *Poetics*. *phoenix, 1*(2), 1. https://doi.org/10.22329/p.v1i2.221

Bordwell, D., & Thompson, K. (2001). *Film art: an introduction* (6th edition). McGraw-Hill Humanities.

Butcher, S.H. (ed.) (1951). *Aristotle's theory of poetry and fine art* (Trans.). Dover Pub.

Campbell, J. (2003). *The hero's journey: Joseph Campbell on his life and work*. New World Library.

Chakravarty, I. (2006). *Teaching the craft of screenwriting in India.* Proceedings of the 1st Conference of *Film* & TV Institute of India, Pune.

Chaturvedi, R. & Gupta, T. (ed.) (2017). *Contemporary Indian Theatre: theatricality and artistic crossovers*. Rawat Publications.

Chaudhury, P, J. (1965). Indian Poetics. *The Journal of Aesthetics and Art Criticism, 24* (1)197-204.

Cooper, D. (2000). *The Cinema of Satyajit Ray*. Cambridge University Press.

Dhar, P. (2017). The poetics and Natyashastra- a study in comparison, *Innovation the research concept*, Vol (2).

Dimitrova, Z. (2015). Aesthetic codification of the unsavory from Natyashastra and the Poetics to the post-dramatic theatre. *New Theatre Quarterly, 31 (4).*

Field, S. (1979). *Screenplay: the basics of film writing*. Random House Publishing Group.
Fludernik, M. (2009). *An Introduction to narratology*. Routledge.
Froehlich, H. (2020). Dramatic structure and social status in Shakespeare's plays. *Journal of cultural analytics*. https://doi.org/10.22148/001c.
Funk, N. G. (2018). *The role of narrative units in the design of coherent plot structures for single-player action video games* [Ph.D. Dissertation, Simon Fraser University].
Ghosh, M. (1967). *The Natyashastra*. Chowkhamba Sanskrit Series Office.
Ghosh, M. (2009). *Natyashastra: a treatise on ancient Indian dramaturgy and histrionics, ascribed to Bharata-Muni.* Chowkhamba Sanskrit Series.
Gupt, B. (1994). *Dramatic concepts: Greek and Indian*. D.K Print world.
Hogan, P. (2003). Rasa Theory and Dharma Theory: From the Home and the World to Bandit Queen', *Quarterly Review of Film and Video*, *20*(1), pp. 37–52. Doi: 10.1080/10509208.2003.10555039
Hogan, P. (2008). *Understanding Indian Movies: Culture, Cognition, and Cinematic Imagination*. University of Texas Press.
Jennings, P. (1996). *Narrative structures for new media*. Leonardo.
Joshi, N. (2001). *Some aspects of Sanskrit literature and literary criticism*. Eastern Book Linkers.
Kane, V. P. (1971). *History of Sanskrit poetics*. Motilal Banarasidas.
Koenitz, H. et. Al. (2018). The myth of 'universal' narrative models: expanding the design space of narrative structures for interactive digital narratives. *Lecture Notes in Computer Science.* https://doi.org/10.1007/978-3-030-04028-4_8.
Kudva, S. S. (2019). *It's not all about song and dance: how the Natyashastra informs contemporary Bollywood* [Ph.D. Dissertation, Kent State University].
Lal, Vinay and Ashis Nandy (ed.). (2008). *Fingerprinting Popular Culture: The Mythic and the Iconic in Indian Cinema.* Oxford University Press.
Livingston, P., & Plantinga, C. (2011). *The Routledge companion to philosophy and film*. Routledge.
Lukinbeal, C., & Sharp, L. (2019). Narrative formula through the geography of Transformers: Age of extinction. *Handbook of the Changing World Language Map*. https://doi.org/10.1007/978-3-030-02438-3_141.
Lutgendorf, P. (2007). Is There an Indian Way of Filmmaking? *International Journal of Hindu Studies*, Vol. 10, 227-56.
Lynch, O. M. (1990). *Divine passions.* University of California Press.
MacEwan, J. E. (1863) *Freytag's technique of the drama* (trans.). Benjamin Bloom.
Madej, K. S. (2008). "Traditional narrative structure" – not traditional so why the norm? *5th International conference on narrative and Interactive learning environments*.
Massey, R. (1992). From Bharata to the cinema: a study in unity and continuity. *Ariel: A Review of International English Literature*, *23*(1), 59-72.
Mukherji, R. (1966). *Literary criticism in ancient India.* Sanskrit Pustak Bhandar.
Murthy, C.S.H.N & Oinam, B.M (2013). *The Nuances in the intertextuality of Film Remakes of Devdas: Situating Romanticism in Devdas from the perspective s of Indian aesthetics*. Forthcoming.
Murthy, C.S.H.N. (2012). Indian Cinema as a Model for De-Westernizing Media Studies: A Comparative Study of Indian Philosophical and Western cultural Theories, *Asia Pacific Media Educator*, SAGE, *2*(2) 197-215, DO: 10.1 177/1326365X13498167

Murthy, C.S.HN., Amrita, B., & Oinam, B.M. (2011). *Breaking Western Film-making Models: An unexplored Indian frame of film communication.* Forthcoming.
Nelmas, J. (1996). An introduction to film studies. Routledge
Padmavat, S.N. (2020). Aristotle's six elements of tragedy, *An international journal in English,* vol (1),3.
Palombini, A. (2017). Storytelling and telling history: towards a grammar of narratives for cultural heritage dissemination in the digital era. *Journal of Cultural Heritage, 24*, 134–139. https://doi.org/10.1016/j.culher.2016.10.017.
Pandey, C. K. (1995). *Comparative aesthetics* (Vol. I). Chowkhamba Sanskrit Series Office.
Putria, A., & Nurhadi, M. (2020). Dramatic elements in Dashner'S Maze Runner novel and film adaptation. *Anaphora: Journal of Language, Literary and Cultural Studies*, *2*(2), 80–88. https://doi.org/10.30996/anaphora.v2i2.3368.
Rangacharya, A.(ed.) (2014). *The Natyashastra (Trans.).* Munshiram Manoharlal Publishers.
Ray, M. (2005). *A Comparative Study of the Indian poetics and Western poetics*, UGC major research project.
Roy, P. (2006). *The aesthetics of emotional acting: an argument for a rasa-based criticism of Indian cinema and television* [Ph.D. Dissertation, The University of Edinburgh].
Schneider, A. (2009). 'Hum aapke hain koun...!' An example of the coding of emotions in contemporary Hindi mainstream film. *Projections, 3*(2), 56-70. https://doi.org/10.3167/proj.2009.030205
Schwartz, S. L. (2004). *Rasa: Performing the divine in India*. Columbia University Press
Sen, Somnath, (2018). *Narrative Roots of Bollywood (A paper that contrasts Western Story TELLING with Indian Story TELLING),* [M. A thesis, University of Southern Califoria]
Sharma, M. (2014). Mahesh Dattani's Thirty Days in September in the Light of Rasa Theory', *International Journal of Research, 1*(7).
Snyder, B. (2005). *Save the cat! The last book on screenwriting you'll ever need.* Michael Wiese Productions.
Sundararajan, Louise and Raina Maharaj, K. (2016). *Mind and creativity: Insights from rasa theory with special focus on sahridaya (the appreciative critic)*. Sage.
Thompson, K. (1999). Storytelling in the new Hollywood: understanding classical narrative technique. Cambridge, MA: Harvard University Press.

GAGAUZ EDEBİYATINDA İSTİFHAM SANATININ SEMANTİK DÜZLEMDEKİ ANALİZİ

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ÖZET

Bürünsel bir bildirişim ögesi olan dil, sezgi ve düşlemin estetik bağlamdaki uzamsal izdüşümünü yansıtmaktadır. Bu nedenle anlam sınırı kesin hatlarla çizilemeyen özgün ve hissel yaratının sanatsal sesletimi, dilin görüngü odağını semantik forma taşımaktadır. Düşünce ediminin imgesel tarzını dışa vuran dilsel tasarımlar ise estetik dizgeye dönüşerek hayal gücü periyodunu belirgin kılmaktadır. Dolayısıyla gerçeklik boyutundaki örtük izlenimleri gramatikal yörüngede kodlayıp biçem tablosuna aktaran sanatçı, betimsel translasyon vasıtasıyla söz sanatları düzlemini açığa çıkarmaktadır.

Çalışmada söz bilimsel kategoride önem arz eden istifham (soru sorma) sanatının işlevsel açınımı ele alınmıştır. Gagauz literatürüne ait taranan metinler veri kaynağı olarak işaretlenmiş, doküman analizi metodu işe koşulmuştur. Araştırmanın teorik desenine özgü veriler tespit edilmiş, söz konusu veriler yorumlanarak semantik katmanda çözümlenmiştir.

İfadeye güç katan, onu akıcı, çarpıcı ve etkili kılan yazınsal unsurlar retorik üslubu ifade etmektedir. Gagauz edebiyatında dikkat çekici bir sanatsal görünge olan istifham sanatı, anlamı güçlendirmek adına, duygu ve düşünce dağarcığını soru sorma tarzına büründürmeyi, coşkuyu ve heyecanı gün yüzüne çıkarmayı amaç edinmektedir. Üzüntü, şaşkınlık, öfke ve nefret gibi değişik duygusal oluşumların etkisiyle beliren bu estetik bakış açısı, söylemin cevap beklemeksizin, semantik alan çizgilerini derin yapıdan yüzey yapıya taşıyarak soru soruyormuş gibi kullanımını ifade etmektedir. Sözde soru tümceleriyle eşdeğer bir konumda yer alan bu estetik değer, alıcının dikkat yetisine süreklilik kazandırmaktadır. İstifham sanatında alıcıya yöneltilen sorunun yanıtı hakkında herhangi bir belirti sezilmemektedir. Estetik ve özgün bir üslubun yansıması olan bu imgesel eylem, Gagauz edebiyatının zengin ve sanatsal bir perspektife egemen olduğunu bildirmektedir.

Anahtar Kelimeler: Gagauz edebiyatı, istifham sanatı, semantik, analiz

ANALYSIS OF THE ART OF INTERROGATION IN GAGAUZ LITERATURE ON THE SEMANTIC PLANE

ABSTRACT

Language, which is a prosodic communication element, reflects the spatial projection of intuition and phantasy in the aesthetic context. For this reason, the artistic pronunciation of the original and sensual creation, whose meaning boundary cannot be drawn with precise lines, carries the phenomenon focus of the language to the semantic form. Linguistic designs that express the imaginative style of the act of thought, on the other hand, turn into an aesthetic system and make the imagination period clear. Therefore, the artist, who encodes the implicit impressions in the dimension of reality in a grammatical orbit and transfers them to the style

table, reveals the plane of rhetoric through descriptive translation.
In the study, the functional aspect of the art of interrogation (question), which is important in the rhetorical category, is discussed. The scanned texts of the Gagauz literature were marked as data sources, and the document analysis method was employed. Data specific to the theoretical pattern of the research were determined, and the data were interpreted and analyzed in the semantic layer.
The literary elements that add strength to the expression and make it fluent, striking and effective express the rhetorical style. The art of interrogation, which is a remarkable artistic perspective in Gagauz literature, aims to transform the repertoire of emotions and thoughts into a questioning style and to reveal enthusiasm and excitement in order to strengthen the meaning. This aesthetic point of view, which emerges under the influence of different emotional formations such as sadness, surprise, anger and hatred, expresses the use of discourse as if asking a question, without waiting for an answer, by carrying the semantic field lines from the deep structure to the surface structure. This aesthetic value, which is in a position equivalent to so-called interrogative sentences, gives continuity to the attention ability of the receiver. In the art of interrogation, no indication is detected about the answer to the question directed to the receiver. This imaginative act, which is the reflection of an aesthetic and original style, states that Gagauz literature dominates a rich and artistic perspective.

Keywords: Gagauz literature, the art of interrogation, semantics, analysis

GİRİŞ

Bir sanat formu olarak beliren yazın; olay, olgu ve duyumsamaları dil ekseninde betimleyen, estetik tarzda görünüm arz eden yaratma eylemlerinin özgün yansımasıdır. Sanatçı, tinsel ya da özdeksel evren karşısındaki sanatsal izlenimini, his yörüngesinde saklı olan coşkuyu, heyecanı ve gerçekliği imgelem çatısı altında söz eyleme dönüştürerek anlamlandırır. Güzel ve orijinal yaratışın fonetik bağlamdaki yansıması, edebi esere hayat veren dil olgusunu işaretler. Böylece iletinin dilin olanaklarından faydalanarak etkili ve estetik bir anlatıma kavuşması yazın sanatı aracılığıyla gerçekleşir.

İnsanın kendisine karşı yarattığı ikinci bir doğa olan sanat, her şeyden önce insanın var olana bir karşı çıkışı, varlığa bir meydan okumasıdır (Bozkurt, 2000: 9). Sanatın asıl özelliği, belirli bir nesne üretmeyi amaçlayan, bir tasarım veya kurmaca sonucunda oluşan bir etkinlik olması, insanın yaratıcı gücüne bağlı bulunmasıdır (Bozkurt, 2000: 15). Sanat istemi, yetkin olmayan bir yaratmadan ve bir tasarım bütünlüğü elde etmek adına salt bir optik süreç nasıl oluşuyorsa o şekilde algı unsurlarının birbirini zamansal olarak kovalamasından ve onların birleşmesinden ibarettir (Worringer, 2017: 46). Her sanat eseri bir anlamı içerir. Sanatçı, ürettiği eseriyle okurlara bir şeyler bildirmek ister. Sanat eseri bu bildirinin taşıyıcısıdır. Okur ancak eserin ne anlattığını anladıktan sonra onun derinliğine nüfuz edebilir. Çünkü edebiyat eseri için anlaşılır olmak bir zorunluluğu getirir (Kolcu, 2019: 216). Bu nedenle sanatsal bir perspektifin iletimi olan istifham (soru sorma), edebi oluşumun birer sanatsal işlevi olarak görünüm arz eder. Okuyucunun dikkatini aktifleştirmek, duygu ve his boyutunu daha etkili kılmak adına duyguların ve düşüncelerin soru şeklindeki aktarımı olan istifham sanatı, estetik temelli yapının birer sanatsal figürüdür. İstifhamda sanatçı, soru sorar, ancak bu sorusuna ilişkin herhangi bir cevap beklemez. Çünkü sorunun cevabını kendisi bilir. Soru ile amacı, his ve heyecan unsurunu açığa çıkararak sözün etki gücünü arttırmak, etkileyici ve çarpıcı bir ifadenin inşası için sanatsal etkileşimde bulunmaktır.

İstifham sanatı, ilk bakışta "tecahül-ü ârif sanatına benzer. Ondan ayrıldığı nokta, tecahül-ü ârifte bilmezlikten gelinen şey biraz sezdirilirken istifhamda böyle bir durum yoktur (Köklügiller, 2009: 158). Hayret, sevgi, nefret gibi duyguların tesirinde, dikkat çekmek ya da hisleri güçlendirmek amacıyla sözün nidâ, temenni ve soru biçiminde söylenmesi sanatı (Elgün, 2000: 107) olan istifham, yanıtı beklenmeyen, dikkati çekmeyi gaye edinen soru sormadır (Karadağ, 2000: 227).

BULGULAR

Gagauz yazınına ait incelenen metinlerde istifham (soru sorma) sanatının görüntü düzlemi şu şekilde yansımıştır:

1.

Bölä yok nasıl yaşamaa –
Yärä hep uzaktan bakmaa.
Ondansa yok hiç bir bakış…
O aalemä mi adanmış?
(Zanet, 1998: 41)

Şair, sevgilinin kendisine karşı sergilemiş olduğu ilgisiz tavrın ve acımasız tutumun nedenini soru sorarak anlatmak istemiştir. Şairin söz konusu durum karşısındaki üzüntüsü ve kuşkulu bakış açısı onu, sorgulayıcı bir söyleme sürüklemiştir. "O aalemä mi adanmış?" cümlesindeki şüpheli yaklaşım ile okuyucunun dikkatini canlı tutmak isteyen şair, ruh hâlini, duygu ve düşüncelerini istifham yolu ile dile getirmiştir. Dizede soru ibaresi olmasına rağmen soruya bir cevap beklentisi yoktur.

2.

On gün artık ne bir haber,
Ne ses, ne çan, ne da mektub.
Bu – cezadan da taa beter.
Kayıp oldu bitki umut.

Kimnärlän, näända hep gezersin,
Brakıp beni yalnızlıkta?
Bakışını kimä adêêrsın,
Beni dä brakmadaan raada?
(Zanet, 1998: 47)

Şair, düşüncelerini etkili kılmak ve bir duygu atmosferi oluşturmak adına istifham (soru sorma) sanatına başvurmuştur. Şiirde "kimnärlän", "näända", "kimä" soru sözcükleri çerçevesinde istifham sanatı ortaya çıkmıştır. Şair, sevgiliden uzun süre haber alamadığı için umutsuzluğa düşmüş ve bu durumu kendisine verilmiş bir ceza olarak nitelemiştir. Sevgilinin, kimlerle ve nerede olduğunu merak etmiş, kendisini neden yalnızlığa terk ettiğini istifham aracılığıyla ifade etmiştir. Şair, düşüncelerini diri ve coşkun kılmak için bu tarz bir söyleme başvurmuştur. Şairin, sorduğu sorulara bir cevap beklememesi ise şiirde istifham sanatına yöneldiğini gösteren ipuçları olmuştur.

3.

Oldu kaç saat hep cıngırdêêr
Bu çan telefonda.
Kimä lääzımım? Kim aarêêr
Beni bu küü kenarında?

Dostum mu, osa duşmanım mı
Bendän bir cuvabı bekleer?
Osa yannış bir insanın mı
Telefonda sesi öter?

Benimsa yok iyiliim, kefim.
Bu ses beni pek kazgallêêr…
Elim seslämeer. Afedin
Kim cuvabı bendän bekleer.
(Zanet, 1998: 94)

Şiirde, uzun süre çalmakta olan telefona cevap vermek istemeyen şairin ruh hâli istifham sanatı vasıtasıyla konu edilmektedir. Şair; kimin, neden kendisini aradığını merak etmekte ve bu durumu sorgulamaktadır. Şiirde merak, sitem, kızgınlık, üzüntü gibi duygular dikkati çekmekte, bu hislerin okuyucuya daha net aktarılabilmesi için istifham sanatı bünyesinde yer alan yineleme sanatına başvurulduğu görülmektedir. "mı, mu" soru ekleri ile "kim", "kimä" gibi soru sözcükleri ile yinelenen ibareler istifham sanatını işaretlemektedir. Şair, okuyucunun dikkat potansiyelini aktifleştirmek, coşkuyu yoğunlaştırmak amacıyla soru sorma sanatına yönelmekte, sorduğu sorulara bir cevap beklememektedir.

4.
Garip hem zavalı halkım,
Kimin umurunda acın, sancın,
Kimin umurunda zorluun, kahırların,
Kimin umurunda, halkım? Kimin?
(Zanet, 2021: 34)

Dörtlükte, içinde bulunduğu duygu ve düşünce iklimini soru sorma tarzında dile getiren şair, yaşadığı his selini yoğunlaştırmak gayesiyle yineleme (tekrir) sanatına başvurmuştur. "kimin" soru sözcüğü ile istifham sanatını varsıl bir katmana taşıyarak ifadeyi canlı ve etkili bir söyleme kavuşturmuştur. Şair, halkının çektiği acıların, üzüntülerin ve zorlukların kimsenin umurunda olmadığını istifham sanatı ile dikkatlere sunmuştur. Düşüncelerini soru yoluyla işlemiş, ancak soruya bir yanıt beklentisi içinde olmamıştır.

5.
Boş erlär bir zaman dolacek.
Orada nelär olacek?
Pak hem duruk sular mı?
Eşil otlar, fidannar mı?
Bombadan parçalar mı, seslär mi?
Tütünnän küllär mi?
Güllär mi?
(Zanet, 2021: 123)

Bu dizelerde şair, boşalan yerlerin bir gün dolacağına dair çıkarımda bulunmaktadır. Fakat orada neler olacağını kestirememekte ve bunu merak etmektedir. Tahmin yürüterek olası durumları sıralamakta, merak duygusunu istifham sanatı aracılığıyla dışa vurmaktadır. Şair, okuyucunun dikkat algısını soru sorma eylemine odaklamak istemektedir. Dizelerde "mı, mi" soru ekleriyle yansıtılmış ifadeler olmasına karşın şairin soru şeklinde işlediği düşüncesine bir

yanıt beklemesi söz konusu olmamaktadır.

6.

Uzun kamış, uzar kamış,
Şu baaların çotucaanda
Gülgülü üzüm var.
Al almayı ata – ata
Kollarım büzüldü
Sana da, Saşka, baka – baka
Gözlerim süzüldü.
Ver al çevreciini, mari Saşa,
Gözümü sileyim.
Gözümü sildikçä, Saşa,
Seni mi anayım?
Şu su yolunda, mari Saşu,
Köprü mü olayım?
Gelän – geçän dostlara, Saşa,
Seni mi sorayım?
Seni da bana vermäsalar,
Deli mi olayım?

(Gaydarcı, 2018: 37)

Şair, sevgiliye olan aşkını dile getirmek adına soru sorma tekniğini kullanmış, istifham yapmıştır. Şairin, duygularını bu teknikle işlemesinin nedeni, anlatımdaki etkililiği ön plana çıkarma isteğinden kaynaklanmıştır. Sevgiliye kavuşma arzusu üzerinde duran şair, soru sorma yönteminin yanı sıra, abartma (mübalağa) sanatına da yönelmiştir. Şöyle ki, "Köprü mü olayım?", "Deli mi olayım?" dizelerinde bir abartı söz konusu olup bu hissel oluşum istifham aracılığıyla yansıtılmıştır.

7.

Göklär dolu yıldız
Yıldız, yıldız, yıldız…
Neçin salt bän yalnız,
Ama neçin yalnız?

Neçin sanki göklär
Bakêr bana gamsız,
Neçin beklemeklär
Uçsuz hem kenarsız?

(Baboglu, 2003: 103 - 104)

İstifham sanatında bazı soru kökleri yaygın olarak kullanılmaktadır. Bu şiirde de "neçin" soru zarfı kapsamında istifham sanatı belirmiştir. Şair, duygu potansiyelini akıcı ve etkin kılmak için bu yolu seçmiştir. Yalnızlık duygusuna olan bakış açısını sorular sorarak ifade eden şair, yinelenen sözcükler (yıldız, yalnız) aracılığıyla tekrir (yineleme) sanatına da gönderimde bulunmuştur. Şair, okuyucunun dikkatini yalnızlık temasına çekerken istifham sanatını görünür kılmış, böylece estetik bir haz oluşturarak söyleme güç katmıştır.

8.

Yalnız ihtärlär küüdä
Taa çok olêr Bucakta,
Gençlär daaler dünnäädä,
İş aarêêr aşırıda.

Nerdä o ii vakıtlar,
Evlerindä insannar,
Çalışkan gagauzlar,
Bucakta zengin küülär?

(Karagançu, 2015: 19 – 20)

Şair, şiirde gençlerin iş bulma gerekçesiyle köyden kentlere göçtüğünü, köyde ise yalnızca yaşlı kesimin kaldığını ifade etmektedir. Bu durumu üzüntüyle karşılayan şair, eski günlere özlem duymaktadır. "nerdä" soru sözcüğü etrafında gelişen istifham sanatı, şairin düşüncesini odağa taşıyarak söyleme aktif ve akıcı bir yön çizmektedir.

9.

Otelin kedileri anılmış:
Biri kara, biri mor, birisi da teker –
Hepsinä var iş, hepsinä var er,
Birisinin yavrusu geler – nesa kapmış,
Ardından öbürü sürüner – o da geeri kalmış.
Yaşamak burada kaynêêr –
Hepsinä buka düşer.
Kedilär da besli – diil aaç
Bu oteldän kaç bin insan geçti! Kaç?

(Zanet, 2018: 105)

Şiirde, bir otelin kedileri gözlemlenmiş ve tasvir edilmiştir. Bu tasvir işlemini gerçekleştiren şair, bakış açısını geniş bir perspektife taşıyarak olayı zaman olgusuyla ilişkilendirmiştir. Söz konusu otelden ne kadar insanın gelip geçtiğini, dolayısıyla yaşamı sorgulamıştır. Sorgulama işlemi sürecinde "kaç" soru sözcesini işe koşan şair, merak duygusunu dile getirmek adına istifham yapmış, ancak herhangi bir cevap beklentisi içinde olmamıştır.

10.

Şu karşıkı baylerdä bir kuzu meylär,
Avlana, baara, kaldı sürüsündän.
Ah kara koyun kuzusu – mu – y – sun?
Üreciimin yaralarnın sızısı – mı – y – sın?
Sarı gülün kara çalı tikeni – mi – y – sin?
Diildi bir gün, diildi üç gün üç yıllık – mı – y- sın?

(Akt. Zanet, 2010: 256)

Şiirde, sürüsünü kaybeden bir kuzunun dramatik durumu konu edilmiş, şairin bu olay karşısındaki hüznü istifham sanatı aracılığıyla sunulmuştur. "-mI" soru edatı ile beliren soru sorma tekniği ifadeye yoğunluk hissi katarak etkileyici bir sunum yaratmıştır. Şair sorduğu sorularda herhangi bir cevap beklememiştir.

11.
Bir küçücük kuşçaaz olsam,
Uçup, evä bän gideyim.
Kızçaazımın kara saçlı
Kafacıını bän öpeyim.

Nelär idi büün yavrucuum,
Nelär giidi sırtçaazına?
Oldu mu bir, ani dedi
Tatlı bir laf kuşcaazıma?
(Akt. Karanfil, 2013: 18)

Şiirde kızını görebilme arzusu içinde olan şair, kızına olan özlemini soru sorma yöntemi ile anlatmıştır. "nelär" soru sözcüğünün tekrarı ve "mu" soru ekinin, ifadeyi pekiştirmesiyle istifham sanatı görünür kılmıştır.

12.
Ah, o süüt fidanı
Dereciin boyunda,
Dereciin boyunda,
Bir sapa erceezdä!

Ne daatmış saçlar'nı –
Taramaz mı deyni,
Osa can laflar'nı
Sölemää mi deyni?!
Sırada kız gibi
Gözellii düşünmää,
Zerä güz yakında,
Az kaldı evlenmää…

Ah, o süüt fidanı
Dereciin boyunda,
Dereciin boyunda,
Gençliimin aklında!..
(Köse, 2001: 34)

Şiirde gençliğine özlem duyan ve sevgiliye kavuşmayı arzulayan şair, bu duyguları yaşamın ve tazeliğin sembolü olan söğüt fidanıyla ilişkilendirmiştir. "Ne daatmış saçlar'nı" dizesinde şairin, söğüt fidanının yapı itibariyle dağınık ve aşağı yönlü sarkık olan dallarını insan saçına benzetmesi teşbih sanatını, bilinen bir şeyi bilmezlikten gelerek nükteli bir ifade kullanması tecahülü arif sanatını, şairin bunu soru yoluyla ve cevap beklemeksizin dile getirmesi ise istifham sanatına yöneldiğini göstermiştir. "ne", "deyni" soru zarfları ile "-mI" soru eki aracılığıyla soru sorma işlemi gerçekleşmiştir.

13.
Ne düşünersin sän Bucaam,
Bu güz günü, boz bulutlu?
Nasıl seni koruyacam,
Benim topraam, gülär üzlü?

Nerelerdä o gülüşün,
Gözelledän süretini?
Suuk havadan mı üşüdün,
Yorgunnatmış ne tenini?

Nelär zeetleer seni, annat,
Canın sızlêêr ne sebeptän?
Ver baaşlayım sana kanat,
Umut, ani dirilecän…

(Bujilova, 2020: 44)

Şiirde, yaşadığı yerin (Bucak) eski canlılığının ve neşesinin kaybolduğunu gören şair, bu duruma bir anlam verememektedir. Dolayısıyla memleketinin neden bu hâle geldiğini merak etmekte ve üzülmektedir. Teşhis (kişileştirme) sanatıyla yoğrulan ifade, istifham sanatı vasıtayla estetik bir görünüm arz etmektedir. "ne", "nasıl", "nerelerdä", "nelär" soru sözceleri ile "mı" soru eki istifham sanatını pekiştiren ipuçları konumundadır.

14.

Dap – duru geldim, göz attım
En geniş bir göka dünneydä.
Ah, Bucaam, ana tarafım,
Var mı sanki sendän gözäl?

(Kuroglu, 2011: 128)

Dörtlükte şair, memleketi olan Bucak'ın güzelliği karşısında duyduğu heyecanı ve hayranlığı soru sorarak ifade etmiş, okuyucunun ilgisini bu güzelliğe çekmek istemiştir. "mı" soru eki çerçevesinde istifham sanatı belirmiştir. Şair, "Var mı sanki sendän gözäl?" dizesinde yeryüzünde Bucak'tan daha güzel bir yer olmadığını belirterek abartma sanatına da göndermede bulunmuştur. "mı" soru eki kapsamında istifham sanatı gün yüzüne çıkmıştır.

15.

Sayıklêêrım, düşünerim,
Nääni bulutlar kayerlar,
Sayıklêêrım, düşünerim,
Neçin yaamurlar yaayêrlar?

Sınırı gökün da var mı,
Bu dünnä geniş mi, dar mı?
Kanatlı insan duuar mı?
İnandan ilaç olar mı?

Çiçeklär, senip, açêrlar,
Deredän sular kaçêrlar,
Nereyi onnar varêrlar?
Yukarı kalkıp, damnêêrlar.
Neçin şenniktä gülerim,
Ya da kendimi dürerim?
Nereyi cuvap aarêêrım,
Onnarı da sayıklêêrım.

(Tukan, 2010: 123)

Şair, kendini ve yaşamı düşünsel yönden irdeleyerek sorgulayıcı bakış açısıyla analiz etmektedir. Yaşamda sürerlik arz eden birtakım doğa olaylarını ve olağanüstü oluşumları ele alan şair, kendi ruhsal durumunu da sorgulamaktadır. "näänı", "neçin", "nereyi" soru sözcükleri ile "mI" soru eki aracılığıyla soru sorma eylemini gerçekleştirmekte, ancak soruların cevabına dair herhangi bir ipucu sezdirmemektedir.

16.

Bekledim, bekledim
Bän seni pek çok yıl, pek çok saat.
Nasıl sän, nasıl sän kendini,
Be duyarsın da raat?
Bän çaardım, bän çaardım,
Bilmeerim, ne laflar taa demää.
Sade taş, sade taş
Dayanar, bir cuvap vermemää.
Sölä ne sölä ne,
Bu erdä ne yapıyım bän sensiz?
Netürlü, netürlü
Yaşaycan ömür'nü sän bensiz?

(Kara Çoban, 2004: 19)

Şair; sevgiliyi görebilme, ona kavuşabilme ve ondan haber alabilme arzusunu sorular sorarak dile getirmiştir. Öfke, kızgınlık, sitem ve özlem temalarının iç içe geçtiği bu şiirde şair, sevgiliyi bekleyecek gücünün kalmadığını, onsuz yaşayamayacağını ifade etmiş, mübalağa sanatını işe koşmuştur. Yinelenen soru zarfları (nasıl, ne, ne türlü) vasıtasıyla istifham sanatının görünüm açısı belirmiş, söylem etkili ve canlı bir üslup ile zenginleşmiştir.

SONUÇ

Çalışmada söz sanatları bağlamında beliren estetik işlevin semantik düzlemdeki görüngüsü incelenmiştir. Estetik ulamda analiz edilen edebi ürünlerin anlam ve işlev odaklı özgün çizgide konuşlandığı, gizil imgelem motiflerin etkin ve yaratıcı oluşumla bütünleştiği tespit edilmiştir. Retorik unsurlar vasıtasıyla sanatsal bir betim kazanan biçemin, sistemli kullanımı sonucunda söz varlığına heyecan ve âhenk kattığı saptanmıştır.

Anlatımın çarpıcı bir izlenim sergilemesi adına, yanıt alma amacı güdülmeden soru sorma işleminin gerçekleştiği, anlamın geniş bir yelpazeye taşındığı istifham sanatının, edebi sanatlar örüntüsünün estetik halkalarından birini temsil ettiği görülmüştür. Hüzün, kin, nefret, şaşkınlık gibi değişik hislerin etkisi altında gelişen bu estetik halka, şairin, okuyucunun dikkat yetisini canlı tutmak amacıyla duygusal yansımaları soru tarzına dönüştürüp anlamsal yoğunluğa ulaştırdığını göstermiştir.

Gagauz yazınına dair taranan metinlerde sanatsal bir betimleyici olan istifham sanatının estetik iletimi irdelenmiştir. Gagauz edebiyatının semantik düzlemdeki estetik derinliği gün yüzüne çıkarılmaya çalışılmış, sanatsal söylemin düşsel verilerinin yorum gücünün etkisiyle realist düzeye ulaştırılma çabasına vurgu yapılmıştır. Bu bağlamda dilin anlamsal boyutunu analiz eden semantik aracılığıyla dili estetik ve özgünlük kriterleri açısından inceleyen edebi sanatların oluşumu işaretlenmiştir. Çalışmada Gagauz literatüründeki estetik hazzın birtakım sanatsal unsurlar ile betimsel objeler yardımıyla özgün ve kapsamlı bir görüntüye sahip olduğu yansıtılmıştır.

KAYNAKÇA

Baboglu, N. (2003). *Güz Çiçekleri*, Chişinău. Pontos Yayınları.

Bozkurt, N. (2000). *Sanat ve Estetik Kuramları*, Bursa. Asa Kitabevi.

Bujilova, V. (2020). *Sonsuza Uçan Kuşlar*, (Haz. Bülent Hünerli), Çanakkale. Paradigma Yayınları.

Elgün, A. Ç. (2000). *Edebi Söz Sanatları*, Kayseri. Laçin LTD. ŞTİ.

Gaydarcı, G. (2018). *Gagauzologiya XIX – XXI Asirlerdä Gagauzların Halk Yaratmaları*, Gagauziya M. V. Maruneviç adına Bilim – aaraştırma merkezi.

Kara Çoban, D. (2004). *Seçmä Yaratmalar*, Ankara. Türksoy Yayınları.

Karadağ, M. (2000). Edebiyat Bilgi ve Kuramları. İzmir. Ürün Yayınları.

Karagançu, V. D. (2015). *Yaprak Dökümü*, Chişinău. Tehnıka – Info. Gagauziya M. V. Maruneviç adına Bilim – aaraştırma merkezi.

Karanfil, G. (2013). *Akar Sel Gücü*, Ankara. Meras Cümnä Topluluu.

Kolcu. A.İ. (2015). *Edebiyat Kuramları*, Konya. Salkım Söğüt Yayınları.

Köklügiller, A. (2009). *Edebiyat Sözlüğü*, İstanbul. Uğur Eğitim Pazarlama ve Yayıncılık A.Ş.

Kösä, M. (2001). *Vakitin Soluması*. Ankara. Kültür Bakanlığı Yayınları.

Kuroglu, S. (2011). *Canımı Baaşlarım*. Kişinöv. Gagauziya Bakannık Komiteti.

Tukan, V. (2010). *Şiirlär*. Chişinău. İ. S. Firma Editorial – Poligrafică "Tipografia Centrală,

Worringer, W. (2017). *Soyutlama ve Özdeşleyim* (Çev. İsmail Tunalı), İstanbul. Hayalperest Yayınları.

Zanet, T. (1998). *Akar Yıldız*. Chişinău. Chişinev Concernul Presa.

Zanet, T. (2010). *Gagauzluk: Kultura, Ruh, Adetlär*. Chişinău. Pontos Yayınları.

Zanet, T. (2018). *Seçmä Yaratmalar "60 yaşına"*. Chişinău. Pontos Yayınları.

Zanet, T. (2021). *Ana Sözü "Seçme Şiirler"*. Ankara. Bengü Yayınları.

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ÖZET
İnsanlığın tarihi kadar eski olduğu düşünülen çalgıların zaman içerisinde hem yapısal hem de icra özellikleri açısından sürekli bir değişim/gelişim içerisinde olduğu ve bu değişim/gelişim sürecinin halen daha devam ettiği konuya yönelik yapılan çeşitli araştırmalarda vurgulanmaktadır. Herhangi bir çalgının yapımındaki hassas ayarlar ve ince hesaplamalar, ortaya çıkan ürünün ses kalitesi ve mukavemeti açısından çok önemli bir konudur. Dolayısıyla çalgı yapımcılığı açısından önem arz eden, yapım hazırlık aşaması ve yapım aşamasındaki işçilikteki hassas hesaplamalar aynı zamanda bu hesaplamaların kalıcı bir şekilde her çalgıya uyarlanabilmesi açısından gelişen teknolojiden faydalanmak kaçınılmaz bir hale gelmiştir. Bu tespitlerden hareketle yola çıkılan araştırmada, Türk halk müziğinin ulusal ölçekte en yaygın çalgılarından biri olan bağlamanın yapım/onarım aşaması örnekleminde, günümüzde teknolojik aletlerden ne oranda faydalanıldığının belirlenmesi amaçlanmıştır. Araştırma durum tespiti yapmaya yönelik olup betimsel bir nitelik sergilemektedir. Araştırma bu manada geçmişten gelen ve günümüzde var olan durumu ortaya koymayı hedeflemektedir. Araştırma sürecinde geçmişten günümüze bağlamanın yapım/onarım açısından gelişim süreci ve bu süreçte faydalanılan teknolojik olanaklar dikkate alınarak ele alınmaya çalışılmıştır. Konuya yönelik veriler; kaynak taraması, gözlem, kişisel görüşme vb. birçok araştırma tekniği kullanılarak tespit edilmeye çalışılmıştır. Araştırma sürecinde konuya yönelik elde edilen çok yönlü verilerden hareketle çeşitli sonuçlara ulaşılmak istenmiştir. Araştırmadan elde edilen bilgiler doğrultusunda; teknolojik aletlerin günümüzde bağlama yapım ve onarım süreçlerinde çok yaygın bir şekilde kullanıldığı, standart ve kaliteli bağlama yapımı için bu aletlerin yadsınamaz bir yeri olduğu, ağaç israfının önlenmesi ve mukavemetli bağlama yapımı için teknolojik aletlerin kullanılmasının birçok açıdan olumlu sonuçlar doğurduğu, teknolojik olanaklar paralelinde yaprak tekne yapımlarının standart bir hale geldiği, çeşitli kaplamalar, desenler, ağaç süslemelerinin çok daha kolay ve kalıcı bir şekilde uygulanabildiği, seri bağlama üretimleri açısından yapımcılara büyük kolaylıklar sağladığı sonuçlarına ulaşılmıştır.

Anahtar Kelimeler: Bağlama, Bağlama Yapımı/Onarımı, Teknoloji, Teknolojik Aletler.

THE ROLE OF TECHNOLOGICAL TOOLS IN TODAY'S BAĞLAMA MAKING/REPAIR PROCESS

ABSTRACT
Thought to be as old as the history of mankind, in the time of the instrument, both structural

and performance characteristics in terms of constant change/development and change/development is emphasized in various studies on the topic that process is still continuing. Precise settings and fine calculations in the construction of any instrument are a very important issue in terms of the tonal quality and strength of the resulting product. Therefore, it has become inevitable to take advantage of the developing technology in order to adapt these calculations permanently to each instrument at the same time, the precise calculations in the preparation stage of construction and the workmanship at the construction stage, which are important for instrument making, are also important. Based on these findings, the research aimed to determine the extent to which technological tools are used today in the sampling of the bağlama construction / repair stage, which is one of the most common instruments of Turkish folk music on a national scale. The research is aimed at conducting due diligence and exhibits a descriptive nature. In this sense, the research aims to reveal the situation that comes from the past and exists today. In the research process, the development process from the past to the present in terms of bağlama construction / repair and the technological possibilities used in this process have been taken into consideration. Data related to the subject; resource screening, observation, personal interview, etc. it has been tried to be detected using many research techniques. Based on the multifaceted data obtained on the subject in the research process, it was desired to reach various conclusions. In accordance with the information obtained from the research; nowadays widely used in bağlama building and repair processes of the technological tools, the standard for making high-quality bağlama and an undeniable place of these tools, wood for the construction of waste prevention and the strength of the bağlama that has positive consequences on many aspects of the use of technological tools in parallel with the technological amenities, the Leaf becomes a standard when the construction of the body, various textures, patterns, tree decorations a lot easier and can be applied in a permanent manner, it has been concluded that it provides great convenience to producers in terms of mass bağlama production.

Keywords: Bağlama, Bağlama Construction/Repair, Technology, Technological Tools.

1. GİRİŞ

Çalgı veya enstrüman en genel anlamıyla; müzikal ses elde etmek için veya müzik icra etmek için kullanılan aletlerin tümüne verilen isimdir. İnsanlığın tarihi kadar eski olduğu düşünülen çalgıların zaman içerisinde hem yapısal hem de icra özellikleri açısından sürekli bir değişim/gelişim içerisinde olduğu ve bu değişim/gelişim sürecinin halen daha devam ettiğini söylemek mümkündür. Herhangi bir çalgının yapımındaki hassas ayarlar ve ince hesaplamalar, ortaya çıkan ürünün kalitesi ayrıca mukavemeti açısından çok önemli bir konudur. Dolayısıyla çalgı yapımcılığı açısından önem arz eden, yapım hazırlık aşaması ve yapım aşamasındaki işçilikteki hassas hesaplamalar aynı zamanda bu hesaplamaların kalıcı bir şekilde her çalgıya uyarlanabilmesi açısından gelişen teknolojiden faydalanmak kaçınılmaz bir hale gelmiştir. Bu tespitlerden hareketle yola çıkılan araştırmada, Türk halk müziğinin ulusal ölçekte en yaygın çalgılarından biri olan bağlamanın yapım/onarım aşaması örnekleminde, günümüzde teknolojik aletlerden ne oranda faydalanıldığının belirlenmesi amaçlanmıştır.

Bağlama; günümüz fiziksel şekliyle yaklaşık olarak 70 ile 100 yıllık bir geçmişe sahip olmakla birlikte, tarihi kökleri açısından ele alındığında Orta Asya Türklerine kadar uzanan derin bir geçmişe sahip önemli bir halk çalgısıdır. Türklerin tarih sahnesinde ortaya çıktığı döneme kadar uzandığı düşünülen "kopuz" adlı çalgının bir türevi olan bağlama, günümüzde hem tezene ile

hem de el ile (şelpe) çalınan, telli/mızraplı (tezeneli) çalgılar grubunun bir üyesidir. Tarihi kökleri açısından ele alındığında, kadim bir kültür mozaiğine sahip olan Türklerin yaşamının her alanında bu çalgının izlerine rastlamak mümkündür. Dede Korkut'dan, Köroğlu'na, Dadaloğlu'ndan, Pir Sultan Abdal'a hemen hemen bütün halk ulularının hayatlarında bağlamanın önemli bir yere sahip olduğu ve bağlamayla adeta bütünleştikleri günümüze kadar süregelen birçok araştırmada sabittir. Dolayısıyla derin köklere sahip engin bir birikime sahip Türk kültürünün yadsınamaz bir unsuru olan bağlama, yalnızca bir çalgı tanımlamasından uzaklaşarak daha derin anlamlara bürünmüş adeta bir kültür simgesi haline gelmiştir.

Bağlamanın geçmiş ve günümüz açısından organolojisine genel olarak bakıldığında; geçmiş dönemlerde göçebe bir topluluk olan Türklerin yaşam şartları paralelinde, zanaat erbapları tarafından ince hesaplamalar olmaksızın ihtiyaca binaen özellikle at sırtında taşınabilir küçük boyutlarda yapılan sade bir çalgı olduğu görülmektedir. Ancak günümüz açısından ele alındığında; hem çalgı yapım işi hem de icra kulvarının artık bir zanaat sarmalından uzaklaşarak sanat kimliğine bürünmesi, toplumsal ihtiyaçlar doğrultusunda seri üretime geçilmesi, gelişen profesyonel icracıların çalgı yapımcılarından olan farklı tınısal, fiziksel görünüm, çeşitli sahne ihtiyaç aparatları beklentileri vb. gibi durumlardan dolayı, bu çalgının yapım aşamasında kapsamlı tekniklerden ve aynı doğrultuda ince hesaplamalardan bahsetmek mümkün hale gelmiştir.

Günümüz bağlama yapım sektörüne bakıldığında; yukarıda da bahsedilen çeşitli ihtiyaçlardan dolayı teknolojik aletlerden çok kapsamlı bir şekilde faydalanıldığı görülmektedir. Bağlama yapımında kullanılan teknolojik aletleri "Yapım Öncesi Ağaç Hazırlama Aşamasında Kullanılan Teknolojik Aletler" ve "Yapım Aşamasında Ağaç Şekillendirme/Süsleme İşlemlerinde Kullanılan Teknolojik Aletler" olmak üzere iki farklı başlık altında genelleştirmek mümkündür.

2. YÖNTEM

Araştırma durum tespiti yapmaya yönelik olup betimsel bir nitelik sergilemektedir. Araştırma sürecinde geçmişten günümüzde var olan mevcut durum çok yönlü ve karşılaştırmalı olarak ele alınmıştır. Araştırmada, günümüz bağlama yapım/onarım sürecinde teknolojik aletlerin rolüne yönelik değişim/gelişim süreci, teknolojik ilerlemeleri dikkate alan yaklaşımla incelenmeye çalışılmıştır. Konuya yönelik veriler kaynak taraması, görsel ve işitsel analiz, gözlem, kişisel görüşme vb. birçok araştırma tekniği kullanılarak kaynağında tespit edilmeye çalışılmıştır. Araştırma sürecinde konuya yönelik elde edilen çok yönlü verilerden hareketle çeşitli sonuçlara ulaşılmak istenmiştir. Araştırma, ülkemizde yaygın biçimde kullanılan ve ulaşılabilen bağlama yapım/onarım süreci ile sınırlı tutulmuştur.

3. BULGULAR VE YORUM

3.1. Bağlama Yapım Öncesi Ağaç Hazırlama Aşamasında Kullanılan Teknolojik Aletler

Bağlama veya herhangi bir çalgının yapımında kullanılan ağaçların istenilen kuruluğa ulaştırılarak işlenebilir hale getirilmesi büyük önem arz etmektedir. Konuyu terminolojik ifadelerle detaylandırmadan herkesin anlayacağı bir dille şu şekilde anlatmak mümkündür; bilindiği gibi ağaçlar, köklerinden ayrılmadığı sürece canlı olan bir bitki türüdür ve sadece çalgı yapımında değil hayatımızın birçok alanında farklı ihtiyaçlar için kullanılmaktadır. Ağaçlar ilk kesildiği anda içinde belirli miktarda su barındırır ve bu suyun ağaçtan arındırılma (kurutma süreci) aşaması kullanılacak yere göre bazen ilkel yöntemlerle bazen de ince hesaplamalarla

yapılmaktadır. Daha açık bir ifadeyle örneğin; yakmak için kesilen bir ağacın kurutulma süreci ile kapı veya mobilya yapımında kullanılacak bir ağacın kurutulma süreci aynı şekilde olmamaktadır. Yakmak için kullanılacak bir ağaçtaki kurutma süreci güneş altında ve herhangi bir gözlemleme süresine gerek duyulmaksızın olmakla birlikte, ağacın herhangi bir eşyaya dönüştürülmek amacıyla kullanılmasındaki kurutulma sürecinde süre/gözlem/kontrol süreci arasında önemli farklılıklar bulunmaktadır. Aynı doğrultuda bir zanaat erbabı tarafından mesela kapı yapımında kullanılan bir ağacın kurutulma serüveni ile bir sanat dalı olan çalgı yapımında kullanılacak ağacın kurutulma süreçleri arasında da ince hesaplamalar ve uygunluğa eriştirme açısından yine çeşitli farklılıklar bulunmaktadır.

Geçmiş dönemlerde genellikle herhangi bir teknolojik alet kullanılmadan yapılan ağaç kurutma işlemleri günümüzde yaygın olarak teknolojik aletler ile yapılmaktadır. Bu teknolojik aletler hem ağacın kurutulma süresinin kısaltılması hem de istenilen oranda nemden arındırılması için ağaç sektöründeki her alanda olduğu gibi çalgı yapımcılığında da önemli bir rol oynamaktadır. Adı geçen bu teknolojik aletler çok kapsamlı ve farklı isimlerle anılmakla birlikte, bu süreçte öne çıkanları; çeşitli ağaç kurutma fırınları ayrıca kuruma seviyesini ölçen teknolojik aletler olarak genelleştirmek mümkündür.



Resim 1 Vakumlu Ağaç (Kereste) Kurutma Fırını

[1]



Resim 2 Ağaç Nem Ölçer[2]

[1] Resim 1 http://www.atrialtd.com.tr/TR/ProductsDetails.asp?PGGroupID=553&PGImageID=6&LangID=1&CatID=20

[2] Resim 2 https://www.hepsiburada.com/weather-forecast-tahta-ve-ahsap-nem-olcer-tahta-nem-olcer-termometre-thr291-pm-HB00000II5FX

3.2. Bağlama Yapım Aşamasında Ağaç Şekillendirme/Süsleme İşlemlerinde Kullanılan Teknolojik Aletler

Ağaçların kesilmesinden, taşınmasına ayrıca uygun şartlarda kurutulmasını yönelik günümüzde kullanılan; çeşitli motorlu testereler, motorlu taşıtlar, kurutma fırınları, nemölçerler, presleme makinaları, kaplama makinaları gibi aletler yalnızca çalgının yapımcılığı için değil aynı zamanda ağaç sektöründeki birçok farklı alanda da ortak olarak kullanılmaktadır.

Yukarıda genel olarak bahsedilen bu aletler konu başlığımız olan bağlama yapımcılığı açısından ele alındığında, ağacın işlenebilecek uygun şekle getirilmesi sürecinde kullanılmakla birlikte günümüz çalgı yapımcılığı açısından büyük önem taşımaktadır. Özellikle bağlamanın tuşesinde/sapında zaman içerisinde yaşanan ve halk arasında "sap atma" denilen deformasyon probleminin ağaçtaki nem oranıyla ilişkili olduğu düşünüldüğünde, ağacın uygun şekilde ve istenilen oranda kurutulmasının önemi daha da iyi anlaşılmaktadır.

Bahsedilen bu hazırlık aşamasından sonra istenilen niteliğe ulaştırılan ağaç deyim yerindeyse tezgâha yatırılmakta ve ardından insan işçiliği ayrıca teknolojik aletler yardımıyla kapsamlı bir işleme sürecine girmektedir. Bu sürecin ilk aşaması olan bir nevi ana işçilik diyebileceğimiz ağacın şekillendirilme ve montelenmesinde kullanılan teknolojik aletlerin yanı sıra, genel yapım süreciyle eş zamanlı veya sonrasındaki çeşitli süsleme/kaplama vb. işçiliklerindeki teknolojik aletlerle konu daha kapsamlı bir hale bürünmektedir.

Bağlamanın en önemli parçası olan ve yapımında çeşitli zorluklar içeren "tekne" bölümü, bahsedilen işçilik sürecinin ilk aşamalarından biridir. Bu aşama zaman içerisinde çeşitli değişimlere uğramış ve farklılaşarak günümüze kadar süregelmiştir. Teknolojik aletlerin yaygın olmadığı dönemlerde "kama", "oyma kaşığı", "oyma bıçağı" vb. şekillerde adlandırılan basit aletlerle yapılan bu işçilik süreci, bağlama yapımcılığında zamanla o kadar önemli bir boyuta ulaşmıştır ki "tekne oymacılığı/yapımcılığı" adı altında yeni bir sektör haline gelmiştir.

Bağlamanın tekne bölümü genellikle iki farklı şekilde yapılmaktadır. Bu şekillerden ilki "oyma tekne" veya "yarma tekne" olarak adlandırılan yekpare ağaçtan oyularak oluşturulmakta, ikinci şekli ise "yaprak tekne" adı verilen aynı veya farklı cinsteki ağaç parçalarının bir araya getirilmesiyle oluşturulmaktadır.



Resim 3 Oyma Tekne Yapımı[3]

[3] Resim 3 https://www.youtube.com/watch?v=Esd5KzFIWX0



Resim 4 Yaprak Tekne Yapımı[4]

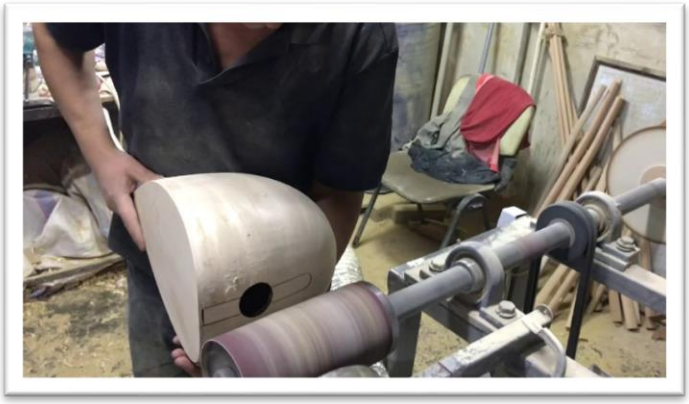
Oyma tekne ve yaprak teknenin en önemli farkının; yaprak teknenin herhangi bir ağacın içinin oyularak, yaprak teknenin ise ağaç parçalarının bir araya getirilmesi ile oluşturulması konusuna daha önce değinilmişti. Bu iki farklı yapıdaki tekne çeşidi bağlama yapımcılığında aktif olarak kullanılmakla birlikte, hem yapım kolaylığı hem de düşük maliyetli olması açısından yaprak teknenin günümüzde daha yaygın kullanıldığını söylemek mümkündür. Özellikle seri üretimlerde veya "sıra saz" olarak adlandırılan bağlama grubunda neredeyse tamamen yaprak tekne tercih edilmektedir. Mukavemet ve ses kalitesi açısından günümüz bağlama yapımcılığı ayrıca icracılığı alanında bu iki teknenin hangisinin uygun olduğuna yönelik ciddi tartışmalar bulunmakla birlikte özellikle ağaç israfının önlenmesi açısından yaprak teknelerin yaygınlaştırılmasını savunan tarafın çoğunlukta olduğu gözlemlenmektedir.

Yaprak tekne ve oyma tekne arasında işçilik açısından birçok farklılıklar bulunmaktadır. Oyma teknelerin şekillendirilmesi ve özellikle son şekil verildikten sonra yapılan teknenin iç/dış zımparalama işlemi önemli bir konu olarak ortaya çıkmaktadır. Oyma teknelerde yapılan bu zımparalama işlemi (bu işlem yaprak teknelerde de yapılmakla birlikte, yaprak teknelerin önceden ince şeritler halinde kesilerek yapıştırılmasından dolayı oyma teknelere oranla daha çok yüzeysel bir düzleme/temizleme şeklindedir), tekneden istenilen verimin alınması açısından itina ile yapılması gereken bir iştir. Bu süreçte teknenin istenilenden kalın veya ince zımparalanması durumunda ağaç çok kaliteli bile olsa istenilen ses açısından verim ciddi oranda düşebilmektedir. Geçmiş dönemlerde bu zımparalama işlemi tamamen el emeği ve göz kararı ile ortalama bir şekilde yapılırken günümüzde teknolojik aletlerin kullanılmasıyla birlikte standardize olma yolunda ivme kazanmıştır.



[4] Resim 4 https://www.youtube.com/watch?v=3ctxjf83ZuA

Resim 5 Tekne İçi Zımparalama İşlemi[5]



Resim 6 Tekne Dışı Zımparalama İşlemi[6]



Resim 7 Tekne Dışı Zımparalama İşlemi[7]

Bağlama yapımında önemli olan bir diğer konu da göğüs bölümüdür. Bu bölüm kaliteli bir bağlama yapımı için, hem doğru ağaç seçimi hem de seçilen ağacın uygun şekillendirmelerle tekneye monte edilmesi açısından bağlama yapımcılığında ustalığı belirleyen en önemli kriterlerden biridir. Göğüs bölümünün istenilenden çok kalın veya çok ince olması durumu hem ses kalitesi hem de mukavemet açısından kaliteyi düşürmekte ve dolayısıyla üzerinde titizlikle durulması gereken önemli bir durum olarak ortaya çıkmaktadır. Bu süreçte göğüs bölümünün istenilen seviyeye getirilmesinde teknolojik aletler yapımcılara büyük kolaylıklar sağlamaktadır.

[5] Resim 5 https://www.youtube.com/watch?v=suIqBVSs9qc
[6] Resim 6 https://www.youtube.com/watch?v=suIqBVSs9qc
[7] Resim 7 https://www.youtube.com/watch?v=p7HuP-zNp5g



Resim 8 Göğüs Bölümü Zımparalama İşlemi[8]

Bağlama yapımcılığında tuşe bölümünün yapımı da en az tekne bölümü kadar ustalık ve beceri gerektiren hassas bir işlemdir. Bu bölüm eğer uygun ağaç seçimi ve doğru şekillendirmelerle monte edilmezse, kısa zaman içerisinde deformasyonlara ve dolayısıyla ses kalitesinin ciddi bir oranda bozulmasına sebep olmaktadır.

Bağlamanın tuşe yapımında genellikle sert ve dayanıklı ağaçlar tercih edilmektedir. Dolayısıyla bu durum ağacın mukavemetli olmasından dolayı şekillendirilmesinde çeşitli zorluklar içermektedir. Özellikle seri üretimlerde karşılaşılan bu problemin çözümü için teknolojik aletlerden önemli bir ölçüde faydalanılmakta ve hem ölçme hem de ağacın şekillendirmesi sürecinde faydalanılan bu aletler yapımcılara büyük kolaylıklar sağlamakla birlikte standart bir tuşe yapımı konusunda da icracılara olumlu bir şekilde yansımaktadır.



Resim 9 Bağlama Tuşesi (sap, kol, klavye) Yapımı[9]

[8] Resim 8 https://www.erganihaber.net/haber/5473/24-yildir-baglama-yapiyor.html

[9] Resim 9 https://www.youtube.com/watch?v=nuqQ79BJROc



Resim 10 Bağlama Tuşesi Yapım/Onarım[10]

Yukarıda genel olarak bağlamanın ana iskeleti diyebileceğimiz ve en önemli olan ilk yapım aşamasında, günümüzde kullanılan teknolojik aletlerden kısaca bahsedildi. Bu yapım sürecinde kullanılan aletlerin dışında ana iskelet ortaya çıktıktan sonra da yapılan çeşitli delme, zımparalama, kaplama, süsleme vb. gibi aşamalarda yine teknolojik aletler önemli bir rol oynamakta ve bu aletler hem yapımcılara büyük kolaylıklar sağlamakta hem de standardizasyon açısından bu çalgının yapımına önemli katkılar sağlamaktadır. Bu süreçte özellikle burgu veya halk adında "kulak" adı verilen tel sabitleme ve akort yapmaya yarayan parçanın yanı sıra tellerin tekne bölümüyle olan sabitlenmesini sağlayan tel yuvalarının/deliklerinin açılmasında teknolojik aletler hemen hemen her yapımcı tarafından aktif olarak kullanılmaktadır.



Resim 11 Burgu Deliklerinin Yapılma İşlemi[11]

Bağlama yapımcılığında "ince işçilik" de denilen ve her müşterinin kişisel istekleri doğrultusunda şekillenen çeşitli kaplama, süsleme, desenleme işlemleri günümüzde her yapımcı tarafından farklı şekillerde uygulanmaktadır. Bu yapım sürecinde bağlamalardaki özellikle tuşe bölümleri abanoz, maun vb. gibi ağaçlarla kaplanmakta ve yanı sıra istekler doğrultusunda bu bölüme çeşitli ayrıntılı süslemeler de yapılmaktadır. Yapılan kaplamalar ve çeşitli süslemeler iki farklı şekilde ortaya çıkmaktadır. Bu sürecin birinci şeklini; tek tip bir kaplama veya süslemenin seri üretimlerde teknolojik aletler vasıtasıyla her çalgıya aynı şekilde uyarlanması, ikinci şeklini ise; müşterinin isteği doğrultusunda tek bir çalgıya uygulanması

[10] Resim 10 https://www.youtube.com/watch?v=WpUFBR93wF4

[11] Resim 11 https://www.haberturk.com/mugla-haberleri/66062167-28-yildir-el-emegi-baglama-yapiyor

olarak genelleştirmek mümkündür. Adı geçen bu iki işçilikte de teknolojik aletler günümüzde yaygın olarak kullanılmakta ve yapımcılara hassas ayarlar ayrıca her çalgıya uyarlanabilecek sistematik bir yöntem sunmak açısından büyük kolaylıklar sağlamaktadır.



Resim 12 Ahşap Oyma Makinesi[12]



Resim 13 Abanoz Kaplamalı ve Sedef Süslemeli Bağlama[13]

4. SONUÇ VE ÖNERİLER

Konuya yönelik yapılmış çeşitli araştırmalar ve kişisel birikimlerimizin harmanlanmasıyla oluşturulan bu araştırmada, bağlama yapımcılığında günümüzde kullanılan teknolojik aletler ve bu aletlerin sektördeki önemine yönelik genel bilgiler sunulmuştur. Araştırma doğrultusunda, bağlama yapımcılığı sektörünün her geçen gün daha da geliştiği ve bu gelişim serüveninde

[12] Resim 11 https://www.hepsiburada.com/depolife-14-parca-set-hss-matkap-ucu-6-ahsap-oyma-dremel-dramel-6-adet-daire-mini-teste-ince-kesim-testere-pm-HB00000JBKGA

[13] Resim 12 https://twitter.com/fikoo13/status/552910811824676865

teknolojik aletlerin çok önemli rolünün olduğu görülmüştür. Geçmiş dönemlerde müstakil olarak ve sınırlı sayıda yapılan bağlamaların, günümüzde artan nüfusla ilişkili olarak icracıların çoğalması, müzik eğitimi verilen kurum/kuruluşlarda bu çalgının aktif bir şekilde yer alması vb. gibi durumlardan dolayı talebin arttığı, bu talepten dolayı da yapımcıların seri üretime geçme gerekliliğinin doğduğu anlaşılmıştır. Seri bağlama üretimlerindeki çeşitli ihtiyaçlar bağlama yapımcılarını diğer ağaç sektörlerinde kullanılan teknolojik aletlere yönlendirmiş ve bu durumun sonucunda ise çok farklı amaçlar için yapılmış aletler çalgı yapımcılığında etkin bir şekilde kullanılmaya başlanmıştır. Teknolojik aletlerin bağlama yapımcılığında kullanılmasıyla birlikte; hem ses hem de dayanıklılık açısından çok daha kaliteli bağlamaların üretildiği, yaprak tekne yapımının yaygınlaşmasıyla birlikte ağaç israfının büyük bir oranda önlendiği, özellikle tekne yapımlarının büyük bir ölçüde standart hale getirilebildiği, çeşitli kaplamalar, desenler, ağaç süslemelerinin çok daha kolay ve kalıcı bir şekilde uygulanabildiği, özellikle seri bağlama üretimleri açısından yapımcılara büyük kolaylıklar sağladığı sonuçlarına ulaşılmıştır.

Geçmişten-günümüze bağlama yapımcılığına genel olarak bakıldığında hem form boyları hem de çeşitli fiziksel özellikler açısından bu çalgının tam anlamıyla sistematize edilemediği görülmektedir. Bu durumun en önemli nedenini; hem icracıların kişisel istekleri doğrultusunda imal edilen bağlamalar hem de ulusal ölçekte form boyu açısından tam anlamıyla ortak bir paydada buluşulamaması şeklinde açıklamak mümkündür. Adı geçen bu standart olamama durumu bağlama icracılarına ve yapımcılarına/onarımcılarına bazı problemler çıkarmakla birlikte konuya yönelik günümüzde önemli bir farkındalık oluştuğunu ve bu doğrultuda ciddi fikirlerin ortaya atıldığını söylemek mümkündür. Yukarıda da birkaç örneği sunulan teknolojik aletlerin bağlama yapımcılığında aktif olarak kullanılmasının yanı sıra, ihtiyaç dâhilinde yalnızca bağlama yapımı için özel teknolojik aletler geliştirmeye yönelik yapılacak çalışmaların özellikle bu çalgıdaki standardizasyon probleminin çözümünü hızlandıracağı ve kaliteyi ciddi bir oranda arttıracağı düşünülmektedir.

5. KAYNAKÇA

Resim 1 Vakumlu Ağaç (Kereste) Kurutma Fırını
http://www.atrialtd.com.tr/TR/ProductsDetails.asp?PGGroupID=553&PGImageID=6&LangID=1&CatID=20

Resim 2 Ağaç Nem Ölçer
https://www.hepsiburada.com/weather-forecast-tahta-ve-ahsap-nem-olcer-tahta-nem-olcer-termometre-thr291-pm-HB00000II5FX

Resim 3 Oyma Tekne Yapımı
https://www.youtube.com/watch?v=Esd5KzFIWX0

Resim 4 Yaprak Tekne Yapımı
https://www.youtube.com/watch?v=3ctxjf83ZuA

Resim 5 Tekne İçi Zımparalama İşlemi
https://www.youtube.com/watch?v=suIqBVSs9qc

Resim 6 Tekne Dışı Zımparalama İşlemi

https://www.youtube.com/watch?v=suIqBVSs9qc

Resim 7 Tekne Dışı Zımparalama İşlemi
https://www.youtube.com/watch?v=p7HuP-zNp5g

Resim 8 Göğüs Bölümü Zımparalama İşlemi
https://www.erganihaber.net/haber/5473/24-yildir-baglama-yapiyor.html

Resim 9 Bağlama Tuşesi (sap, kol, klavye) Yapımı
https://www.youtube.com/watch?v=nuqQ79BJROc

Resim 10 Bağlama Tuşesi Yapım/Onarım
https://www.youtube.com/watch?v=WpUFBR93wF4

Resim 11 Burgu Deliklerinin Yapılma İşlemi
https://www.haberturk.com/mugla-haberleri/66062167-28-yildir-el-emegi-baglama-yapiyor

Resim 12 Ahşap Oyma Makinesi
https://www.hepsiburada.com/depolife-14-parca-set-hss-matkap-ucu-6-ahsap-oyma-dremel-dramel-6-adet-daire-mini-teste-ince-kesim-testere-pm-HB00000JBKGA

Resim 13 Abanoz Kaplamalı ve Sedef Süslemeli Bağlama
https://twitter.com/fikoo13/status/552910811824676865

TEKNOLOJİK GELİŞMELERİN BAĞLAMA İCRACILIĞINA YANSIMALARI

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ÖZET

Bağlama; günümüzde genellikle yedi tele sahip olan, tezene veya tezenesiz (şelpe tekniği) icra edilen, 17'li ses/perde sistemini bünyesinde barındıran, farklı düzenler (akortlar) ve yöreden-yöreye farklılıklar gösteren icra özellikleriyle Türk halk müziğinin en önemli çalgılarından biridir. Evrensel ölçekte bakıldığında, kuramsal açıdan "telli-mızraplı halk çalgıları" kategorisinde değerlendirilen bağlamayı dünya üzerindeki halk çalgılarından ayıran en önemli özelliklerin başında, yöreden-yöreye hatta kişiden-kişiye çeşitli değişkenlikler göstererek belleklere yerleşmiş icra dinamikleri gelmektedir. Bağlama icracılığının tarihi serüvenine bakıldığında, genellikle tek kişilik çalma-söyleme (âşıklık, ozanlık vb.) geleneği paralelinde şekillendiği ve ana icra karakterini bu doğrultuda belirlediğini söylemek mümkündür. Bu doğrultuda, tek kişilik çalma-söyleme geleneği ve bu geleneğin günümüzdeki değişimleri göz önünde bulundurulduğunda bağlama icracılığında da önemli değişimlerin/gelişimlerin olduğu açıkça görülecektir. Adı geçen bu değişim/gelişim hem müzikal icra dinamikleri hem de icra ortamları, stüdyo emisyonları vb. gibi kulvarlarda çeşitli teknolojik imkânlardan faydalanma olarak iki ana başlık altında ele alınabilir. Bu araştırmada, teknolojik gelişmelerin bağlama icracılığına yansımaları, müzikal dinamiklerdeki değişimlerin/gelişimlerin dışında kalan; canlı performanslarda bağlamayı geniş topluluklara duyurma ihtiyaçları, stüdyo kayıt süreçlerindeki ihtiyaçlar, farklı tonlar/renkler duyurmak isteyen icracıların ihtiyaçları vb. gibi hususlar temelinde ele alınmıştır. Araştırma betimsel bir nitelik sergilemekte olup durum tespiti yapmaya yöneliktir. Araştırma sürecinde geçmişten günümüzde var olan mevcut durum ele alınmıştır. Araştırmada, bağlama icra performanslarına yönelik değişim/gelişim süreci teknolojik ilerlemeler odaklı incelenmeye çalışılmıştır. Konuya yönelik veriler kaynak taraması, görsel ve işitsel içerik analizi, gözlem, kişisel görüşme vb. birçok araştırma tekniği kullanılarak tespit edilmeye çalışılmıştır. Araştırma sürecinde konuya yönelik elde edilen çok yönlü verilerden hareketle çeşitli sonuçlara ulaşılmak istenmiştir. Araştırma doğrultusunda; bağlama icracılığının geçmişten günümüze hem müzikal hem de kişisel tercihler, beğeniler ve çeşitli ihtiyaçlar doğrultusunda sürekli bir değişim/gelişim içerisinde olduğu, bu değişim/gelişim sürecinde teknolojik olanaklardan her geçen gün daha da çok faydalanıldığı, müzikal değişimin/gelişimin dışında kalan unsurlarda teknolojik olanakların genellikle bağlamayı kalabalık topluluklara rahatça duyurma, stüdyo kayıtları, farklı tonlar/renkler duyurmak isteyen icracıların tercihlerinde aktif bir rol oynadığı ve bu değişim/gelişim sürecinin bağlama icracılığına birçok olumlu katkı sağladığı sonuçlarına ulaşılmıştır.

Anahtar Kelimeler: Bağlama, Bağlama İcrası, Teknoloji, Müzik Teknolojisi.

REFLECTIONS OF TECHNOLOGICAL DEVELOPMENTS ON BAĞLAMA PERFORMANCE

ABSTRACT

Bağlama, with seven strings is usually nowadays, pick or without pick (şelpe technique) were performed, and 17 audio/curtain control system, incorporating different layouts (chords), that differs from region to region and execution capabilities is one of the most important instruments of Turkish folk music. Viewed on a universal scale, the bağlama considered in the category of "stringed-plectrum folk instruments" from a theoretical point of view is one of the most important characteristics that distinguish it from folk instruments around the world, showing various variations from region to region or even from person to person, and the dynamics of performance that have settled in memory are at the beginning. Looking at the historical adventure of bağlama performance, it is usually a one-man play-don't-sing (minstrelsy, minstrelsy, etc.) it can be said that it was formed in parallel with the tradition and determined the main executive character in this direction. In this direction, considering the tradition of playing-singing for one person and the changes in this tradition today, it will be clear that there are also significant changes / developments in bağlama performance. This said change/development affects both the dynamics of musical performance and the performance environments, studio emissions, etc. it can be considered under two main headings as using various technological facilities in such courses. In this research, icracilig reflections on the context of technological developments, changes in musical dynamics/development outside of; to announce a live performance guitar in large communities needs, in the process of recording studio needs, different tones/colors to the needs of the performer who wants to expose, etc. it is considered on the basis of such considerations. The research has a descriptive nature and is aimed at conducting due diligence. In the course of the research, the current situation that exists from the past to the present has been discussed. In the research, the change/development process for bağlama performances has been tried to be examined with a focus on technological advances. Data on the topic are collected through resource scanning, audio and visual content analysis, observation, personal interview, etc. it has been tried to be detected using many research techniques. Based on the multifaceted data obtained on the subject in the research process, it was desired to reach various conclusions. In line with the research; bağlama icracilig of both past and present musical and personal preferences, likes, and various needs in line with a continuous change/development is in this change/development in the process of the technological possibilities stand out more and more every day where it is used for musical change/development is usually crowded communities guitar freely in the elements outside of the technological possibilities of advertising, studio recordings, it has been concluded that performers who want to announce different tones /colors play an active role in their preferences and that this change/development process has made many positive contributions to bağlama performance.

Keywords: Bağlama, Bağlama Performance, Technology, Music Technology.

1. GİRİŞ

Bağlama; günümüzde genellikle yedi tele sahip olan, tezene veya tezenesiz (şelpe tekniği) icra edilen, 17'li ses/perde sistemini bünyesinde barındıran, farklı düzenler (akortlar) ve yöreden-yöreye farklılıklar gösteren icra özellikleriyle Türk halk müziğinin en önemli çalgılarından

biridir. Bağlama; hem icrasal hem de yapısal olarak her biri diğerinden farklılıklar gösteren büyük bir aileye verilen genel bir adlandırmadır. Bağlama icracılığının tarihi serüvenine bakıldığında, genellikle tek kişilik çalma-söyleme (âşıklık, ozanlık vb.) geleneği paralelinde şekillendiği ve ana icra karakterini bu doğrultuda belirlediğini söylemek mümkündür. Bu doğrultuda, tek kişilik çalma-söyleme geleneği ve bu geleneğin günümüzdeki değişimleri göz önünde bulundurulduğunda bağlama icracılığında da önemli değişimlerin/gelişimlerin olduğu açıkça görülecektir. Bağlama icracılığındaki adı geçen bu değişim özellikle geçmiş dönemlerde büyük bir oranda; gezgin âşıklar, ozanlar tarafından söz unsuru temelli şekillenen türkülerin küçük topluluklara duyurulmasında bir yan unsur olarak görülürken, günümüzde solo bir çalgı olarak kullanılabilecek dinamiklere sahip olması şeklinde açıklanabilir. Daha açık bir ifadeyle; geçmiş dönemlerde âşıkların, ozanların temel misyonu olan söz ustalıklarının ve bu ustalık tezgâhında ortaya çıkan ürünlerin halka ulaştırılmasında bir yan unsur olarak görülen bağlamanın, zaman içerisinde müzikal açıdan gelişmesi ve bu doğrultuda söz unsuru dışında da -enstrümantal açıdan- kendi icra karakterini zenginleştirmesi bu halk çalgısının değişimindeki en belirgin unsur olarak değerlendirilebilir. Bağlama icracılığının tarihi serüvenine mekânsal açıdan bakıldığında genellikle köy kahveleri, köy meydanları, çeşitli eğlence ortamlarında (düğünler, asker geceleri, sıra geceleri, velime geceleri gibi yöresel müzikli oturaklar vb.) genellikle herhangi bir teknolojik alet olmaksızın tek başına yalın bir şekilde kullanıldığı görülmektedir. Ancak gelişen teknolojik olanaklar ayrıca çağın ihtiyaçları paralelinde müziksel sunum/kayıt mekânları ve bu mekânlardaki değişim/dönüşüm müzik pratiklerini de etkilemiş dolayısıyla her çalgıda olduğu gibi örneklem olarak ele aldığımız bağlamaya da ciddi bir şekilde yansımıştır. Geçmiş ve günümüz açısından ele alındığında yukarıda da belirtildiği üzere, özellikle mekânsal değişimler, canlı performanslar ve yanı sıra stüdyo kayıt ortamlarında teknolojik olanaklardan faydalanma durumu günümüz bağlama icracılığında çok önemli bir konu olarak ortaya çıkmaktadır. Bu düşüncelerden hareketle yola çıkılan araştırmada, günümüz bağlama icracılığında kullanılan teknolojik aletlerin genel bir bakış açısıyla değerlendirilmesine odaklanılmıştır. Araştırmada bağlamada kullanılan teknolojik aletlerin teknik özelliklerine değinilmeden yalnızca genel bir bakış açısıyla öne çıkan ve yaygın olarak kullanılan aletler ele alınarak bir durum değerlendirmesi yapmak amaçlanmıştır.

2. YÖNTEM

Araştırma durum tespiti yapmaya yönelik olup betimsel bir nitelik sergilemektedir. Araştırma sürecinde geçmişten günümüzde var olan mevcut durum çok yönlü ve karşılaştırmalı olarak ele alınmıştır. Araştırmada, bağlama icra performanslarına yönelik değişim/gelişim süreci teknolojik ilerlemeleri dikkate alan odakla incelenmeye çalışılmıştır. Konuya yönelik veriler kaynak taraması, görsel ve işitsel içerik analizi, gözlem, kişisel görüşme vb. birçok araştırma tekniği kullanılarak kaynağında tespit edilmeye çalışılmıştır. Araştırma sürecinde konuya yönelik elde edilen çok yönlü verilerden hareketle çeşitli sonuçlara ulaşılmak istenmiştir. Araştırma ülkemizde yaygın biçimde kullanılan ve ulaşılabilen bağlama icraları ile sınırlı tutulmuştur.

3. BULGULAR VE YORUM

3.1.Bağlama İcracılığında Kullanılan Teknolojik Aletler

Bağlama icracılığında kullanılan teknolojik aletler günümüzde özellikle canlı sahne performanslarında çok önemli bir yere sahiptir. Bağlamanın canlı sahne performanslarında

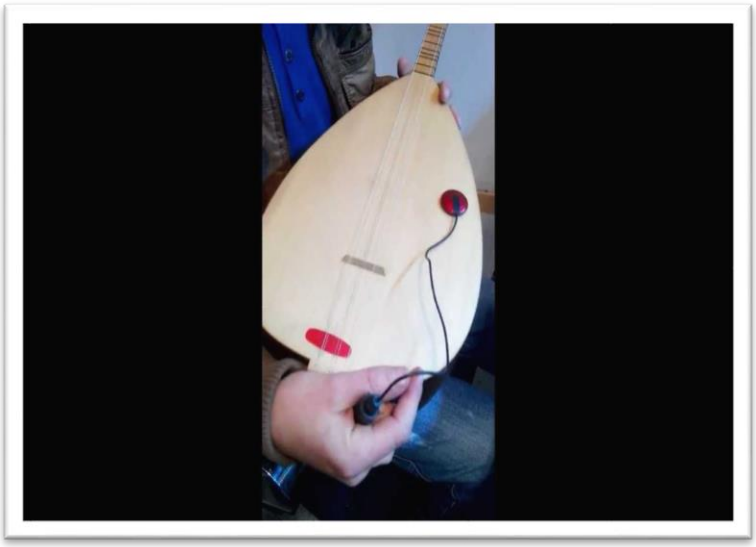
yararlanılan teknolojik aletleri; bu çalgıyı geniş topluluklara duyurma ihtiyacı ve kişisel tercihler/beğeniler doğrultusunda farklı tonlar/renkler arayan icracıların ihtiyaçları şeklinde iki ana başlık altında toplamak mümkündür. Bağlamadaki teknolojik aletlerin ilki olarak ele aldığımız 'kalabalık topluluklara duyurma ihtiyacı' tamamen bu çalgının volüm düşüklüğünden kaynaklanan mecburi bir durum olmakla birlikte ikinci başlık olarak değerlendirdiğimiz icracıların beğenileri doğrultusundaki 'farklı ton/renk arayışı' ise kişisel beğeniler sarmalında gerçekleşmektedir.

3.2.Bağlamayı Kalabalık Topluluklara Duyurmak İçin Kullanılan Teknolojik Aletler

Bağlama fiziksel yapısı ile çok düşük bir volüm karakterine sahiptir. Evrensel ve ulusal ölçekte bakıldığında ses volümü açısından en düşük çalgılardan biri olarak ele alınabilecek bağlama, bu özelliğiyle hem başka çalgılarla olan toplu icralarda hem de kalabalık topluluklar için yapılan icralarda önemli problemler yaşanmasını beraberinde getirmektedir. Örneğin bağlama evrensel çalgılardan olan gitar, keman, piyano veya halk çalgılarından olan kaval, zurna, sipsi vb. gibi çalgılarla birlikte icra edildiğinde eğer herhangi bir teknolojik aletten faydalanılmazsa kendi sesini yeterince duyuramamaktadır. Aynı doğrultuda kalabalık bir insan topluluğuna yapılacak bir icrada da bu durum açıkça görülmektedir. Dolayısıyla bu problem geçmişten-günümüze bağlama icracılığının en önemli problemlerinden biri olarak ortaya çıkmaktadır. Bu problemin çözümüne yönelik olarak çok farklı teknolojik alet denenmişse de günümüzde halen daha tam anlamıyla ortak bir çözüme kavuşturulabildiğini söylemek mümkün değildir.

Yukarıda adı geçen problemlerin çözümüne yönelik birçok farklı teknolojik aletten faydalanılmıştır. Bu teknolojik aletlerin bir kısmı bağlamaya monte edilip sabit hale getirilirken, bir kısmı da farklı aparatların bu çalgıya takılması/yapıştırılması vb. gibi şekillerde uygulanmaktadır. Özellikle 1980/90 yılları arasında ivme kazanan ve günümüze kadar gelişerek süregelen bağlamanın volümünü yükseltmeye odaklı bu denemelerin, günümüzde çok farklı şekillerde kullanıldığı görülmektedir.

Hem bağlamaya kalıcı bir şekilde monte edilen hem de çeşitli aparatlar yardımıyla icra anında bu çalgıya takılan/yapıştırılan teknolojik aletlerde temel mantık; bir ses alıcı manyetiğin çalgıdan aldığı sesi cihaz ve hoparlöre iletmesi esasına dayanmaktadır. Konuya yönelik yapılan birçok denemede olumlu sonuçlar alınmışsa da, bu aletlerin büyük bir bölümünde bağlamanın akustik tınısının orijinal bir şekilde duyurulmasına yönelik halen daha çeşitli problemler mevcuttur. Bu problemlerden en önemlisi; özellikle halk arasında yapıştırma, vakumlu, öpücük, takma, akg manyetik vb. şekillerde adlandırılan cihazlarda bağlamanın akustik sesinin genellikle duyurulamamasıdır. Bu durum özellikle bağlamanın canlı sahne performanslarındaki hem solo hem de toplu seslendirmelerde icracıların en önemli problemlerinden birisi olarak ortaya çıkmaktadır.



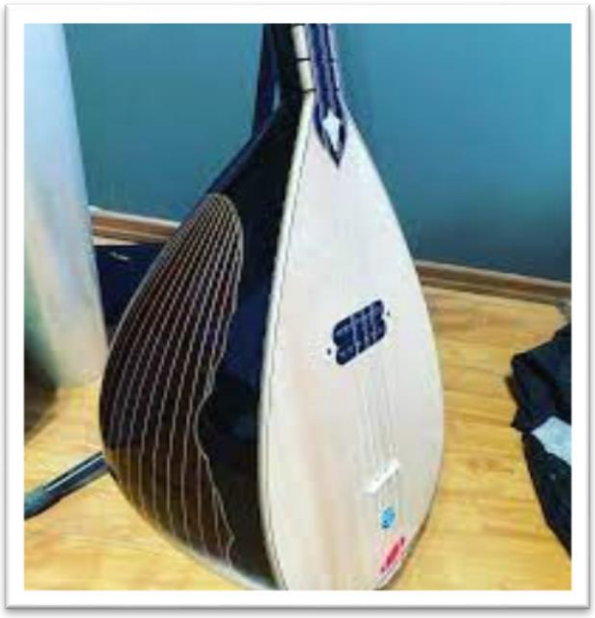
Resim 1 Yapıştırma Manyetik[14]

Resim 1'de yapıştırma manyetik olarak adlandırılan düzenek görülmektedir. Bağlamanın canlı sahne performanslarında en çok kullanılan ses alma düzeneği olan bu aletler birçok farklı isimle veya farklı seçenekle icracıların kullanımına sunulmuştur. Yapıştırma manyetikler bağlamanın özellikle canlı performanslarında kalabalık topluluklara sesinin duyurulmasında etkin bir rol oynamakla birlikte yukarıda da bahsedildiği gibi bu çalgının akustik sesinin duyurulmasında genellikle yetersiz kalmaktadır.

Yukarıda da görüldüğü gibi yapıştırma manyetikler bağlamanın göğüs bölümü olarak adlandırılan bölümüne bir plastik vakum veya sakız benzeri sabitleyicilerle konumlandırılmaktadır. Bu geçici ve sabit olmayan konumlandırma durumu da ayrıca bir problem olarak ortaya çıkmaktadır. Bu problem; yapıştırma manyetiklerin göğüs bölümündeki hangi alana konumlandırılmasının standardize edilememesinden kaynaklanan ses rengindeki/volümündeki değişiklikler şeklinde ortaya çıkmaktadır. Bu durumu özellikle çeşitli korolardaki toplu bağlama seslendirmelerinde ortaya çıkan ses farklılıkları sorunları şeklinde açıklamak mümkündür. Daha açık bir ifadeyle örneğin iki bağlama üzerinde aynı özellikte olan yapıştırma manyetikler farklı yerlere konumlandırıldığı zaman belirgin bir şekilde ses volümü ve ses renginde ilk duyum anında bile farklılıklar algılanmakta dolayısıyla bu durum toplu icralarda duyum konusunda çeşitli aksaklıkların yaşanmasına sebep olmaktadır.

Yapıştırma manyetiklerden farklı olarak bağlamada kullanılan diğer bir seçenek ise göğüsten manyetikli veya eşik altı manyetik adı verilen ve çalgıya sabitlenen ses yükseltici aletlerdir. Bu teknolojik aletler, bağlamanın genellikle göğüs bölümüne sabitlenen ses alıcıların, tekne bölümünde açılan ve "jak girişi" adı verilen bir giriş yuvasından oluşan düzeneklerdir. Bu düzenekler yapıştırma manyetiklerin aksine çalgıya sabitlendiği ve yanı sıra daha gür tonlar elde edildiği için icracılar tarafından günümüzde yaygın olarak tercih edilmektedirler.

[14] Resim 1 https://www.youtube.com/watch?v=vm0Nrq0tDkI



Resim 2 Göğüsten Manyetikli Bağlama[15]



Resim 3 Eşik Altı Manyetik [16]

3.3.Bağlamada Farklı Tonlar/Renkler Arayan İcracıların Kullandıkları Teknolojik Aletler

Bağlama icracılığında özellikle bu çalgının volüm düşüklüğü probleminden kaynaklanan problemin çözümü için kullanılan teknolojik aletlerin yanı sıra; farklı tonlar, renkler, efektler arayan icracıların tercihleri doğrultusunda da yeni aletlerin kullanımından söz etmek mümkündür. İcracıların tercihleri doğrultusunda şekillenen farklı renk, ton, efekt arayışları, bir halk çalgısı olan bağlamanın kapsamlı teknolojik aletlerle buluşması zeminini hazırlayan en önemli faktördür. Adı geçen bu arayışlar sonucu ortaya çıkmış ve bugün belki de sahnelerde

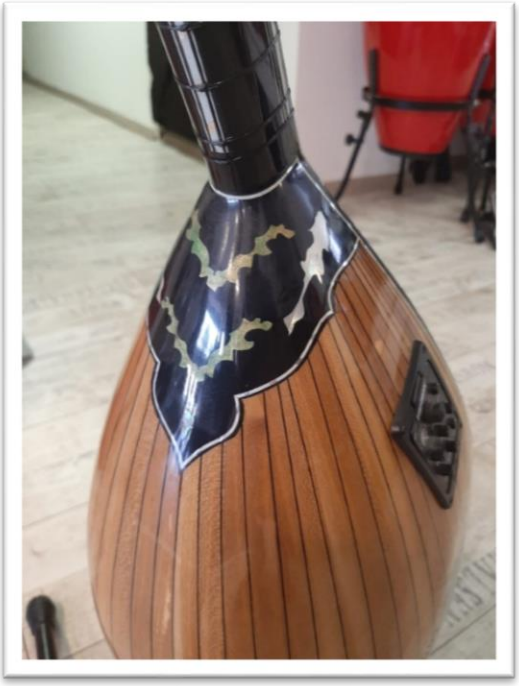
[15] Resim 2 https://pt-br.facebook.com/Diyar.Saz.Evi.Mevlut.Savci

[16] Resim 3 https://sesmuzikaletleri.com/baglama-yaprak-gurgen-esik-altili

kullanılan hemen her sazda görülen equalizer (ekolayzer) sistemi bu konuda en önemli örnekler arasındadır. Bu teknolojik aletler temel mantık olarak yukarıda bahsedilen eşik altı manyetik sistemiyle benzer şekillerde bağlamaya monte edilirken (sabitlenirken), ton açısından eşik altı sistemlerine göre icracılara çok daha farklı seçenekler sunmaktadırlar. Aşağıdaki Resim 4'de de görüldüğü gibi bu aletlerde; "VOLUME", "TREBLE", "MID", "BASS" gibi farklı seçenekler icracının kendi tercihiyle istediği derecede ayarlayacağı şekildedir. Bu seçeneklere ek olarak equalizer sistemleri "TUNER" seçeneğiyle icracıların canlı performans esnasındaki kalabalık ortamlarda, çalgıyı duymasına gerek kalmadan ışık yönlendirmeleriyle yalnızca görerek kolayca akort yapabilmelerine imkân sağlayan kapsamlı teknolojik aletlerdir.



Resim 4 Equalizer (Ekolayzer) Sistemi[17]



Resim 5 Equalizer Sistemli Bağlama[18]

[17] Resim 4 https://www.mydukkan.com/shadow-sh-l4000-akort-aletli-saz-ekolayzer-u-55992
[18] Resim 5 https://onlinemuzikkursu.com/urun/uzun-sap-equalizer-sistemli-baglama

Bağlama icracılarının farklı ton/renk/efekt arayışlarının bir diğer sonucu olarak günümüzde yaygın olarak kullanılan "elektro bağlama" veya diğer bir deyişle "elektrik bağlama" olarak adlandırılan yeni bir çalgı ortaya çıkmış ve bu çalgı üzerinde kullanılan denemeler teknolojik açıdan en doruk noktaya ulaşmıştır. Günümüzde yaygın olarak kullanılan elektro bağlama ve yanı sıra "efekt pedalı" icracılara sınırsız bir ton/renk/efekt olanağı sunmaktadır. Bu doğrultuda her icracı istediği rengi, tonu, efekti bir tuşla kolayca ayarlayabilmekte ve icra esnasında bile ayağıyla basarak hemen farklı bir ton/renk/efekt tercihine geçebilmektedir.



Resim 6 Elektro Bağlama ve Efekt Pedalı[19]

Günümüz bağlama icracılığında teknolojik aletler özellikle canlı sahne performanslarında çok yaygın bir şekilde kullanılmaktadır. Bazı örnekleri sunulan (örnekleri çoğaltmak mümkündür) teknolojik aletler icracılara birçok anlamda kolaylıklar sağlamakla birlikte, bu örneklerin geleneksel bağlama icracılığındaki öz dokunun bozulmasına olan yansımaları ayrı bir tartışma konusu olarak ortaya çıkmaktadır. Adı geçen tartışmayı, teknolojik aletlerin yaygınlaşmasının özellikle yöresel çalım teknikleri (üslûp, tavır) açısından bir bozulmaya sebebiyet verdiği temelinde ele almak mümkündür. Ancak bu konu bildiri başlığının sınırlılığını aştığı için üzerinde durulmayacaktır. Günümüz bağlama icracılığının özellikle canlı sahne performansları düşünüldüğü zaman bu kulvarda kullanılan teknolojik aletlerin artık bu çalgı ile bütünleştiği ve işlevsel açıdan değerlendirildiğinde ise vazgeçilemez bir unsur olarak daha da gelişerek devam edeceği düşüncesine ulaşılmaktadır.

4. SONUÇLAR

Teknolojik gelişmelerin bağlama icracılığına yansımaları başlıklı araştırmadan elde edilen bilgiler doğrultusunda,

- Bağlamanın, günümüzde genellikle yedi tele sahip olan, tezene veya tezenesiz (şelpe tekniği) icra edilen, 17'li ses/perde sistemini bünyesinde barındıran, farklı düzenler (akortlar) ve yöreden-yöreye farklılıklar gösteren icra özellikleriyle Türk halk müziğinin en önemli çalgılarından biri olduğu,

[19] Resim 6 https://forum.donanimhaber.com/elektro-baglama-efekt-prosesor-sok-fiyat--140880677

- Bağlama icracılığının tarihi serüvenine bakıldığında, genellikle tek kişilik çalma-söyleme (âşıklık, ozanlık vb.) geleneği paralelinde şekillendiği,
- Bağlamanın geçmiş dönemlerde genellikle; gezgin âşıklar, ozanlar tarafından söz unsuru temelli şekillenen türkülerin küçük topluluklara duyurulmasında bir yan unsur olarak görülürken, günümüzde solo bir çalgı olarak kullanılabilecek dinamiklere sahip bir çalgı olduğu,
- Geçmiş dönemlerde herhangi bir cihaz yardımı olmaksızın köy kahveleri, köy evleri, köy meydanları vb. gibi küçük mekânlarda seslendirilen bağlamanın, zaman içerisinde kalabalık insan topluluklarına duyurulma ihtiyacı paralelinde ilk kez teknolojik aletlerle tanıştığı,
- Bağlama icracılığında kullanılan teknolojik aletlerin genel olarak; 'Bağlamayı Kalabalık Topluluklara Duyurmak İçin Kullanılan Teknolojik Aletler' ve 'Bağlamada Farklı Tonlar/Renkler Arayan İcracıların Kullandıkları Teknolojik Aletler' olmak üzere iki ana başlık altında ele alınabileceği,
- 'Bağlamayı kalabalık topluluklara duyurmak için kullanılan teknolojik aletler' başlığı altındaki genel durumun; bu çalgının volüm düşüklüğünden kaynaklandığı ve bu problemin çözümü için "yapıştırma/öpücük/vakumlu" manyetik adı verilen düzeneklerin veya çalgıya sabitlenen "eşik altı manyetik" düzenekleri ile çözülmeye çalışıldığı,
- 'Bağlamada farklı tonlar/renkler arayan icracıların kullandıkları teknolojik aletler' başlığı altındaki genel durumun ise, bağlama icracılarının farklı ton/renk/efekt arayışları sonucu ortaya çıktığı,
- Bağlama icracılığındaki çeşitli arayışlar sonucu bu çalgı ailesine "elektro bağlama" adı verilen yeni bir üyenin katıldığı ve "elektro bağlama" ile birlikte kullanılan "efekt pedalı" gibi kapsamlı cihazlarla birlikte ise bağlama icracılığında teknolojik alet kullanımının ivme kazandığı sonuçlarına ulaşılmıştır.

5. KAYNAKLAR

Resim 1 Yapıştırma Manyetikli Bağlama Örneği:
https://www.youtube.com/watch?v=vm0Nrq0tDkI

Resim 2 Göğüsten Manyetikli Bağlama Örneği:
https://pt-br.facebook.com/Diyar.Saz.Evi.Mevlut.Savci

Resim 3 Eşik Altı Manyetikli Bağlama Örneği:
https://sesmuzikaletleri.com/baglama-yaprak-gurgen-esik-altili

Resim 4 Equalizer Sistemi
https://www.mydukkan.com/shadow-sh-l4000-akort-aletli-saz-ekolayzer-u-55992

Resim 5 Equalizer Sistemli Bağlama Örneği:
https://onlinemuzikkursu.com/urun/uzun-sap-equalizer-sistemli-baglama

Resim 6 Elektro Bağlama ve Efekt Pedalı:
https://onlinemuzikkursu.com/urun/uzun-sap-equalizer-sistemli-baglama

ENHANCEMENT PHOTOCATALYTIC DEGRADATION OF METHYLENE BLUE ON GRAPHENE OXIDE INTERCALATED ZNAL–NO_3 LAYERED DOUBLE HYDROXIDES

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ABSTRACT

Graphene oxide is a type of two-dimensional material that can be used in the field of photocatalysis, but its agglomeration characteristics limit its use. So we tried to combine GO with hydrotalcite to improve the morphology and enhance the performance of Layerd Double Hydroxide. The XRD, XPS, UVVis prove that the material obtained is GO intercalated zinc-aluminum hydrotalcite,. Then, in the experiment of degrading methylene blue, the effects of time, pollutant concentration, pH and catalyst dosage on degradation were investigated. After 30 minutes of adsorption and 100 minutes of illumination, the maximum degradation rate of methylene blue can reach 99% by ZnLDH/GO 200 at pH 10 and 100 mg of catalyst to degradation 5 ppm of the methylene blue. The enhanced activity of ZnLDH/GO composites may be due to the concerted catalysis effect between two constituents of as-prepared composites. Therefore, composite with hydrotalcite enhances photocatalytic performance of GO, so the composite of ZnLDH/GO has great potential in the field of photocatalytic degradation.

Keywords: Photocatalysis; Graphene Oxide; Methylene Blue.

INFLUENCE OF SYNTHESIS CONDITIONS ON PHYSICO-CHEMICAL AND PHOTOCATALYTIC PROPERTIES OF SILVER NANOMATERIALS

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ABSTRACT

Silver based nanomaterials were successfully synthesized by adopting different synthesis conditions to investigate their influence on physico-chemical and photocatalytic properties of the materials. Different analytical techniques such as X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FT-IR), Scanning electron microscopy (SEM), and the diffuse reflectance UV-vis spectra (DR UV-vis) were used to investigate the physico-chemical properties of synthesized Ag nanomaterials. The silver samples (Ag-1 and Ag-2) synthesized using silver nitrate ($AgNO_3$), sodium bicarbonate ($NaHCO_3$) and polyvinylpyrrolidone (PVP) template produced phase pure silver (Ag) metal nanorods and nanoparticles; the morphology of Ag metal phase is depended on the hydrothermal treatment. However, the sample (Ag-3) prepared without PVP template with simple calcined at 250 oC showed presence of pure silver oxide (Ag_2O) phase. The sample (Ag-4) prepared without PVP template and calcination step showed presence of pure silver carbonate (Ag_2CO_3) phase; interestingly subjecting the sample to hydrothermal treatment (Ag-5) has not resulted any change in crystal structure of the sample except increase of particle size of Ag_2CO_3. All synthesized Ag nanomaterials were used as photocatalysts for degradation of p-nitrophenol (p-NP) under visible light irradiation. The Ag-4 sample showed best photocatalytic activity (86% at pH 10, p-NP conc of 16 mgL-1, 120 min and catalyst mass of 100 mg) than the other synthesized silver nanomaterials; this is possibly due to the presence of pure Ag_2CO_3 crystal structure with nanorod morphology with low band gap energy of 1.96 eV.

Keywords: Silver nanomaterials; Synthesis conditions; Photodegradation; p-nitrophenol; Visible light

ULTRASES DESTEKLI EKSTRAKSIYON ILE HAZIRLANAN PORTAKAL KABUĞU EKSTRELERININ RADIKAL YAKALAMA AKTIVITELERININ İNCELENMESI VE OPTIMUM EKSTRAKSIYON KOŞULLARININ DENEYSEL TASARIM YÖNTEMI ILE BELIRLENMESI

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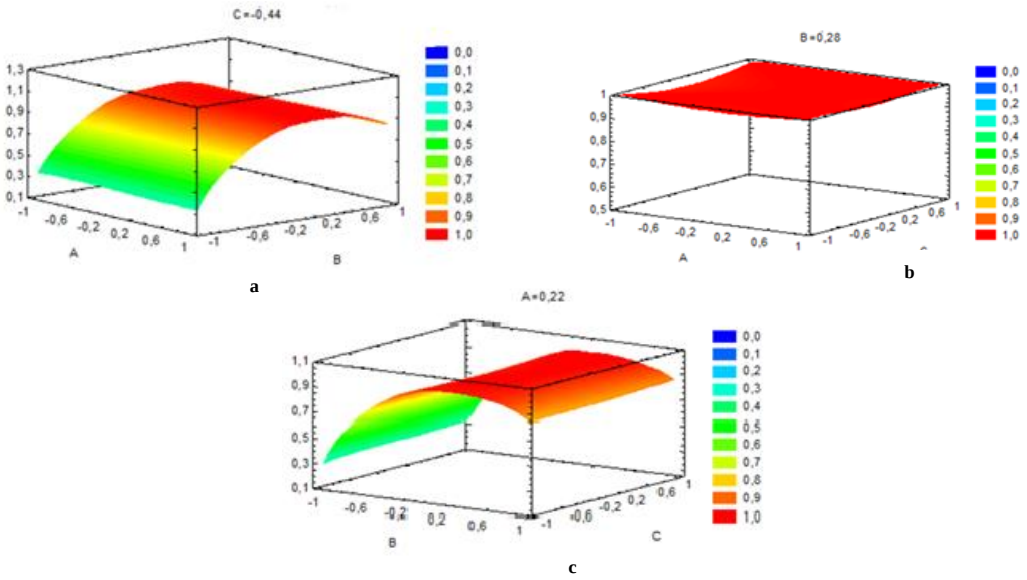
ÖZET

Turunçgiller, 'Rutaceae (Sedef otugiller)' ailesine ait dünyanın en önemli meyve gruplarındadır (Zou vd., 2016). Özellikle beslenmede yaygın olarak yer alan portakal, greyfurt, mandalina, limon, lime gibi çeşitlerinin yanında turunç, bergamot, kumkuat, şadok, pamelo, yuzu ve ağaç kavunu gibi türler de bu aileye aittir (Assefa vd., 2016; Singh vd., 2020; Wang vd., 2017). Oldukça lezzetli olan bu meyve grubu besin değeri açısından da önem taşımaktadır. Yapılan araştırmalar turunçgillerin antioksidan, antikanser, anti-enflamasyon, anti-diyabetik özellikler gibi çeşitli biyoaktif özellikler taşıdığını ortaya çıkartmıştır (Wang vd., 2017). Bu özellikleri, içeriklerinde bulunan büyüme ve gelişmeye katkı sağlayan mineral, vitamin ve lif kaynakları yanında biyoaktif özellikteki flavonoid ve karotenoid gibi önemli bileşiklerden gelmektedir (Sharma vd., 2017).

Bu çalışmada gıda atığı olarak ayrılan portakal kabuklarının, önemli antioksidan kapasite parametrelerinden olan DPPH$^{\cdot}$ radikal yakalama aktivitesi, $DMPD^{+}$ radikal yakalama aktivitesi ve $ABTS^{+}$ radikal yakalama aktivitesi incelenerek atık ürünlerden fayda sağlamak, raf ömrü uzatan gıda katkı maddelerine doğal ürün alternatifleri bulmak ve fonksiyonel gıda çalışmalarına katkı sağlamak hedeflendi. Ekstraktların hazırlanmasında klasik diğer yöntemlere göre birçok avantajı bulunan ultrases destekli ekstraksiyon yöntemi (UAE) kullanılarak kısa sürede, az miktarda çözücü ile optimal ekstraksiyon şartları belirlendi.

Ekstraksiyonu etkileyen parametrelerden süre (2, 6, 10 dk.), çözücü oranı (%100aseton, %50 aseton, %100 su) ve çözücü miktarı (10, 15, 20 ml) üç farklı seviyede incelendi ve UAE koşullarının optimum değerleri önemli bir optimizasyon yöntemi olan Box-Behnken Tasarımı (BBD) ile belirlendi. (Şekil 1).



Şekil 1 Portakal Kabuğunun Ultrases Destekli Ekstraksiyon Koşullarında Radikal Yakalama Aktiviteleri için yapılan optimizasyonda istenebilirlik fonksiyonu için çizilen Cevap Yüzey Tasarımı grafikleri

a) Süre ve Çözücü oranı; **b)** Çözücü oranı ve Çözücü miktarı; **c)** Süre ve Çözücü miktarı;

Anahtar kelimeler: Box-Behnken Tasarımı, Doğal antioksidan, Ultrases Destekli Ekstraksiyon, Portakal kabuğu

REFERANSLAR

Assefa A. D., Ko E. Y., Moon S. H., Keum Y-S., (2016). "Antioxidant and antiplatelet activities of flavonoid-rich fractions of three citrus fruits from Korea". Biotech.109, pp. 1-10.

Sharma K., Mahato N., Cho M. H., Lee Y. R., (2017). "Converting citrus wastes into value-added products: Economic and environmently friendly approaches". Nutrition. 34, pp. 29-46.

Singh B., Singh J. P., Kaur A., Singh N., (2020). "Phenolic composition, antioxidant potential and health benefits of citrus peel". Int. Food Res. J. 132, 109114.

Wang W., Ma X., Xu Y., Cao Y., Jiang Z., Ding T., Ye X., Liu D. (2015) "Ultrasoundassisted heating extraction of pectin from grapefruit peel: optimization and comparison with the conventional method". Food Chem. 178, pp. 106-114.

Zou Z., Xi W., Hu Y., Nie C., Zhou Z., (2016). "Antioxidant activity of Citrus fruits". Food Chem. 196, pp. 885-896.

MODIFICATION OF THE PULLULANASE WITH ENCAPSULATION AND INVESTIGATION OF STABILITY

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ABSTRACT

Pullulanase (E.C 3.2.1.41) provides the formation of maltose, glucose, and maltotriose by catalyzing the hydrolysis of glucosidic bonds pending the saccharification of starch. Maltose, glucose, and maltotriose are widely used in food and other related areas (Naik et al., 2022).

Enzyme immobilization means that the free enzyme is trapped in a solid material or physically restricted in a specific region so that the enzyme can perform its catalyzing task efficiently. The catalytic performance and stability of the enzyme increase after the immobilization. Moreover, enzyme immobilization allows the enzyme to be separated from the substrate, the medium, and the product, thus enabling its reuse (Feng et al., 2022).

Various enzyme immobilization procedures are examined in four different groups such as covalent binding, cross-linking, adsorption, and entrapment (Nguyen and Kim, 2017).

This study aimed to immobilize the pullulanase into polyvinyl alcohol gel by the entrapment method, and compare it with the free enzyme by determining some properties after the immobilization. Firstly, the immobilization of the pullulanase into polyvinyl alcohol gel was performed by the entrapment method. In the study, the optimum pH value of the immobilized enzyme with the highest activity was found to be 6, and the optimum pH value of the free enzyme was found to be 5 using the DNS (Dinitrosalicylic acid) method. The optimum temperature value was determined as 50, and 30 ◦C for the immobilized, and free enzymes, respectively. In order to examine the stability of the immobilized enzyme under changing pH and temperature conditions, thermal and pH stability studies were carried out under varying temperature and pH conditions. The storage stability was investigated for six weeks under optimum conditions where the free and immobilized enzymes have the highest activity. In addition, the effects of four substrate concentration (0.1% w/v, 1.0% w/v, 2.0% w/v, 5.0% w/v) on enzyme activities were investigated. The Km constants of the free enzyme and the immobilized enzyme were found to be 0.054 mg glu/mL and 0.065 mg glu/mL, and the Vmax constants were 1.01 U/mL and 0.93 U/mL, respectively, by using the Lineweaver-Burk curve. As a result, it has been determined that the immobilized pullulanase into polyvinyl alcohol gel is a more advantageous choice than the free enzyme in processes that require heat treatment and need to take place in a basic environment.

Keywords: Pullulanase, Enzyme Immobilization, Polyvinyl Alcohol Gel, DNS Method

REFERENCES

Naik, B., Goyal, S. K., Tripathi, A. D., Kumar, V. 2022. "Optimization of pullulanase production by Aspergillus flavus under solid-state fermentation". Bioresource Technology Reports, *17*, 100963.

Feng, Y., Xu, Y., Liu, S., Wu, D., Su, Z., Chen, G., Li, G. 2022. "Recent advances in enzyme immobilization based on novel porous framework materials and its applications in biosensing". Coordination Chemistry Reviews, *459*, 214414.

Nguyen, H. H., Kim, M. 2017. "An Overview of Techniques in Enzyme Immobilization". Applied Science and Convergence Technology, *26*(6), 157–163.

INVESTIGATION OF THE PROPERTIES OF HAZELNUT SHELL POWDER ADDED POLYPROPYLENE FOAMS BY CHEMICAL FOAMING METHOD

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ABSTRACT
The main purpose of this study is to design a polypropylene-based (PP) lightweight and low-cost foam material using chemical foaming agent and hazelnut shell (HS) powder. Hazelnut shell powder was used as the reinforcing material and polypropylene was preferred as the matrix material. A foaming agent containing calcium oxide (Hydrocerol ITP812) was used to provide the foam structure. Maleic anhydride grafted polypropylene (PP-g-MA) was added to the structure as a compatibilizer to improve the mechanical and morphological properties of hazelnut shell filled polypropylene foam composites. After grinding the hazelnut shell particles, in order to reduce their size to about 200 μm, five different composites were produced by adding different ratios of filler into the matrix (2.5 wt.%, 5 wt.%, 7.5 wt.% and 10 wt.%). The effect of hazelnut shell powder used in different ratios on the mechanical properties of the composite and the foam structure was investigated. The PP/HS mixtures were first extruded as filament and prepared as granules, in order to obtain homogeneous blends. Afterwards, the test samples were prepared by compression molding. The blowing agent having an activation temperature of 220°C, the maximum temperature used for the extruder was fixed at 210°C. During the pressure molding, a process temperature of 225°C was used, so that foaming was ensured to occur during the compression molding. Three point bending and tensile tests were carried out to determine the mechanical properties of the material. In addition, the morphological properties of polymer foam composites were also characterized. As a result, certain improvements such as increased tensile and flexural strengths were observed in the mechanical properties of the hazelnut shell added polypropylene foam composites. In addition, from the morphological study, it was understood that the hazelnut shell powder was homogeneously dispersed in the composite structure and a good compatibility between the filler and the matrix was observed.

Keywords: Polypropylene, Hazelnut Shell, Chemical Foaming, Extrusion, Compression Molding, Polymer Foam Composite.

1. INTRODUCTION
The importance of polymers and polymeric materials is recognized day by day. The use of polymers in different fields is increasing due to the advantages of polymeric materials such as

being lighter and less expensive than other material types, providing good mechanical and thermal properties. In order to provide the desired properties in the final part of polymer products, these properties are provided by using various additives during the production phase. Many studies have been done on this subject so far.

In recent years, areas such as automobiles and electric vehicles where low-weight parts are preferred has been increasing, and various polymer composites are being developed to be used in these areas. Many studies have been carried out with different additives where the main matrix is polypropylene. Especially, it can be found that many studies were conducted to evaluate waste materials such as mussel shells and walnut shells. However, to the best of our knowledge, no studies have been conducted on the production of PP foam composites with hazelnut shell. In the literature, the mechanical tests results of hazelnut shell added polypropylene samples prepared at various filler amounts (between 5 wt.% and 20 wt.%), showed that as the hazelnut shell ratio increases, the hardness value increases from 74 to 77.7 and thus the elasticity modulus increases from 869.05 MPa to 1925.48 MPa [1]. Considering the result, hazelnut shell is a good option for use as a filler in polymer composites.

Polymeric foams can be classified into different groups depending on the polymer matrix material, glass transition temperature, expansion rate, cell morphology and cell size. According to the cell morphology, polymeric foams are examined in two groups as closed cell or open cell. In this classification, the cell geometry, the size of the cells formed and the cell shape are important points. The formation of open-cell or closed-cell structure can be controlled by the type of material to be foamed and the appropriate foaming process [2]. In the production of polymer foam material, physical foaming agents (FB) or chemical foaming agents (CB) are used to form gas bubbles in the polymer-based matrix. Although both methods perform the same operation, the difference between them is the production source of the gas formed. Chemical foaming agents that produce gas during foaming are usually reaction products. On the other hand, physical foaming agents gasify a significant portion of the polymer matrix under foaming conditions. The amount and type of foaming agent affect the density and cell formation of the finished product [3]. The gas bubbles formed in the polymer matrix cause the density to drop to a great extent. Thus, the same volume of production can be made using less raw material and the cost of the product is significantly reduced. In addition, the density can be controlled by controlling the pore ratio in the polymer matrix. As a result, foaming agents also allow the production of polymer foams with different properties and which can be used in various applications [4]. For example, in a study on density, in a PP mixture with sodium bicarbonate additive, which is an endothermic chemical foaming agent of 2 wt.%, the density of the molded part decreased from approximately 0.9 g/cm^3 to approximately 0.6 g/cm^3, and thus the density of the part was decreased by 33% [5]. In another study, the effect of chemical and physical foaming agents in PA6 polymer was investigated and a density reduction of at least 30% was achieved with all materials [6].

In the literature, it can be seen that the polymer foam composites with additives can offer advantages to different industries. In this study, a new material alternative was presented by examining the properties of hazelnut shell powder added PP composites. In this work, hazelnut shell powder added polypropylene foams were produced by using chemical foaming agent, and the effect of hazelnut shell on the mechanical and morphological properties of polypropylene foams was investigated by using hazelnut shell powder at different rates.

The main purpose of this study is to develop a new material that can be used in low weight applications by producing polypropylene foams with hazelnut shell powder by chemical

foaming and extrusion production method. In addition, it is to evaluate the hazelnut shells, which are a kind of agricultural waste and are not recycled in a large area, as a low-cost and non-chemical filling in polypropylene foam composite. Thus, the production of more environmentally friendly composites can be achieved. Hazelnut shell also acts as a reinforcement to reduce the decrease in mechanical properties caused by the composite being in foam form. The use of hazelnut shells offers advantages both environmentally and economically because it is a low-cost filler compared to other chemical fillers and recycling an agricultural waste.

2. MATERIALS AND METHODS

2.1. Materials

Polypropylene, the matrix of the polymer composite provided by Lukoil (Buplen). The hazelnut shell used as filler was supplied in powder form from Giresun/Türkiye. Calcium oxide based Hydrocerol ITP812 (Avient) with an activation temperature of 220°C was used as a chemical foaming agent. Maleic anhydride grafted polypropylene (PP-g-MA) (Coace, Chemical B1A) was used to form a compatible composite.

2.2. Composite Foam Production

The production of hazelnut shell powder added polypropylene foams was realized by the grinding of hazelnut shells in 200 μm size, mixing of composites containing different ratios of HS and additives in planned proportions, obtaining filaments by extrusion and preparing them as granules and obtaining test samples by compression molding.

For a more effective grinding process, hazelnut shell powder was dried at 80°C for 20 hours in order to remove moisture. Then, the hazelnut shell powder was ground at 1000 rpm for 10 minutes using a Pulverisette 9 vibratory disc grinder.

The PP/HS foam composites containing 5 different ratios of HS were prepared and dried in an oven at 80°C for 24 hours before the extrusion process. The various ratios of the composites are shown in Table 1.

Table 1. Formulations of PP/HS foam composites.

Sample	Formulations (wt.%)
PP/CB	98.5 / 1.5
PP / CB / PP-g-MA / HS-2.5	93 / 1.5 / 3 / 2.5
PP / CB / PP-g-MA / HS-5	90.5 / 1.5 / 3 / 5
PP / CB / PP-g-MA / HS-7.5	88 / 1.5 / 3 / 7.5
PP / CB / PP-g-MA / HS-10	85.5 / 1.5 / 3 / 10

The prepared composites were produced as filaments using a laboratory scale twin screw extruder (Polmak Plastik Lab. Extruder 18 mm) with 9 heating zones. The twin screw extruder offers a great advantage in obtaining a homogeneous foam structure, as HS and other additives are well dispersed in the polymer matrix. In addition, pure PP was produced in order to compare the polypropylene samples with and without additives. The process temperatures of the extrusion line are given in Table 2.

Table 2. Extrusion parameters.

Sample	Rotational speed (rpm)	Temperatures of the zones (°C)
PP/HS	60	190, 195, 200, 205, 210, 210, 210, 210, 210, 200

Since the activation temperature of the used CB is 220°C, the extrusion process temperatures are set at a lower level. The produced filaments were granulated and reached the appropriate size for compression molding. In the last stage, test samples were obtained by compression molding method at a temperature of 225°C and a pressure of 5 bars during 3 min. in a 12-ton capacity Carver hot press device.

2.3. Characterization Methods

Various characterization studies have been carried out to determine the physical, microstructural and mechanical properties of foam composites. The morphological properties of the produced PP/HS based foam composites were determined a Carl Zeiss Gemini 300 scanning electron microscope at 5.00 kV. In addition, the density decrease, which is one of the aims of the study, was detected by measuring the density with a pycnometer. Furthermore, in order to determine the mechanical properties of the composites, both the tensile test and the three-point bending tests were carried out on a SHIMADZU-AGS-X mechanical test device under a10 kN load.

3. RESULTS AND DISCUSSIONS

3.1. Density Results

For each composite, the density measurements were repeated using 3 samples. The results were gathered in Table 3. When all foam composites were examined, it was observed that there was a decrease in density as the hazelnut shell ratio increased. A density reduction by 15% was achieved as intended. The highest density decrease was observed in the case of the foam composites containing 10 wt.% and 7.5 wt.% HS.

Table 3. Density measurements results.

Sample	HS content (wt.%)	Density (g/cm^3)
PP	0	0.75
PP/CB	0	0.81
PP / CB / PP-g-MA / HS-2.5	2.5	0.74
PP / CB / PP-g-MA / HS-5	5	0.72
PP / CB / PP-g-MA / HS-7.5	7.5	0.69
PP / CB / PP-g-MA / HS-10	10	0.68

3.2. Morphological Analysis Results

SEM images obtained at a magnification of ×50 for each PP/HS foam composites were given in Figure 1. From the results, it can be seen that as the ratio of hazelnut shell powder in the samples increased, an increase in pore amount and variations in cell sizes were observed. In addition, it can be also concluded that the use of MAH-g-PP as compatibilizing agent improved the compatibility between the filler and the polymer matrix in the structure.

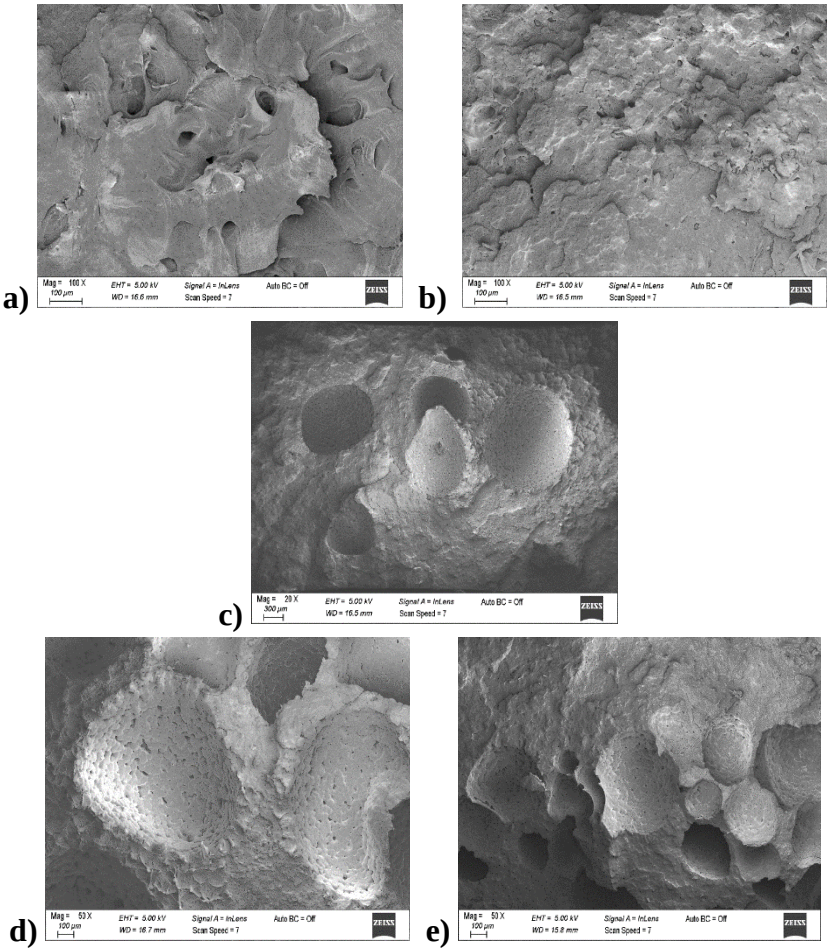

Figure 1. SEM images (magnification: ×50) of PP/HS foam composites: a) PP/CB, b) PP / CB/PP-g-MA/HS-2.5, c) CB/PP-g-MA/HS-5, d) CB/PP-g-MA/HS-7.5, e) CB/PP-g-MA/HS-10.

3.3. Tensile Test Results

Mechanical properties of hazelnut shell powder added polypropylene foam composites were examined by tensile test and compared with the pure PP sample. Test results were summarized in Table 4. When the results were examined, it was seen that the tensile strength increased slightly depending up to the HS content of 2.5 wt.%, but began to decrease as the HS ratio increased.

Mechanical properties of hazelnut shell powder added polypropylene foam composites were also examined by three point bending test and compared with the pure PP sample. The results were summarized in Table 5. When the results were examined, it was seen that composites containing hazelnut shells were able to withstand higher flexural strength than pure PP.

Table 4. Tensile test results.

Sample	Tensile strength (MPa)	Elongation at break (%)
PP	30.33	7.87
PP/CB	30.59	7.31
PP / CB / PP-g-MA / HS-2.5	30.66	6.32
PP / CB / PP-g-MA / HS-5	26.28	4.63
PP / CB / PP-g-MA / HS-7.5	25.25	5.13
PP / CB / PP-g-MA / HS-10	24.23	4.33

Table 5. Three point bending test results.

Sample	Flexural Modulus (MPa)	Flexural strength (MPa)
PP	1281	39.58
PP/CB	1372	41.96
PP / CB / PP-g-MA / HS-2.5	1405	41.96
PP / CB / PP-g-MA / HS-5	1566	40.45
PP / CB / PP-g-MA / HS-7.5	1532	43.04
PP / CB / PP-g-MA / HS-10	1638	40.22

4. CONCLUSION

PP/HS foam composites were examined and a decrease in density was observed as the hazelnut shell ratio increased. A density reduction by 15% was achieved as intended. The highest density decrease was observed for the foam composites containing 10 wt.% and 7.5 wt.% HS. From SEM images, it was seen that the hazelnut shell was homogeneously distributed in the polymer matrix. Furthermore, the mechanical test results revealed that the mechanical properties can be improved by using hazelnut shells at optimum ratios. As a result, hazelnut shell powder can be considered both as a low-cost filler in polymer matrices and as a compatible alternative to support mechanical properties using a compatibilizing agent.

REFERENCES

[1] Demirer, H., Kartal, İ., Yıldırım, A., & Büyükkaya, K. (2018). The utilisability of ground hazelnut shell as filler in polypropylene composites. Acta Phys. Pol. A, 134, 254-257.

[2] Chul, B.P., Lewis, K.C., (1997) A Study of Cell Nucleation in the Extrusion of Polypropylene Foams, Polymer Engineering and Science, 37, 1-10.

[3] Jiong, S.M.S., (2006) Application of nanoparticles in polymeric foams, (Doktora tezi), Graduate School of the Ohio State University.

[4] Yetgin, H., Unal, H., (2008) Polimer Esaslı Köpük Malzemeler, Dumlupınar Üniversitesi, Fen Bilimleri Enstitüsü Dergisi, 017, 128-117.

[5] Garbacz, T., Palutkiewicz, P. (2015) Effectiveness of Blowing Agents in the Cellular Injection Molding Process, Cellular Polymers, 34, 89-214.

[6] Rocha, A., Kehret, L., Huber, T., Henning, F., Elsner, P., (2015) Investigations on injection molded, glass-fiber reinforced polyamide 6 integral foams using breathing mold technology, AIP Conference Proceedings 1664, 110013; https://doi.org/10.1063/1.491848.

PRODUCTION OF FLY ASH AND GLASS FIBER REINFORCED RIGID POLYURETHANE COMPOSITE FOAMS AND INVESTIGATION OF THEIR PROPERTIES

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ABSTRACT
It has been observed that rigid polyurethane (PU) foams find a wide area of use in sectors such as aviation, space, construction and automotive where strength/weight ratios are crucial. These materials encounter some limitations in applications that require performance. Therefore, interest and research on improving their properties is increasing day by day. In this work, fly ash (FA) which is a recyclable, low cost and easy to supply filler, and glass fiber (GF), one of the most widely used reinforcements in composites, were used as filler. PU/FA/GF foam composites were prepared at various ratios using mechanical stirring and free casting method. Furthermore, in order to improve the properties of the filler/polymer interface, a titanate-based agent was used as compatibilizer. The effect of GF and FA on the final properties of PU/FA/GF foam composites was investigated. In particular, the thermal conductivity, mechanical properties and flammability properties of these materials were characterized. From the horizontal burning test performed according to the UL-94 standard, the flammability test results revealed that a linear burning rate decrease by 65% is obtained with increasing the FA/GF additive ratio. In addition, from the tensile test performed according to the ASTM D 638 standard, it was observed that the elastic modulus values increased by a maximum of 81% compared to the values of the unfilled PU foam. In addition, a 38% reduction in pore size was observed in the measurements performed using the SEM analysis results and the ImageJ program.

Keywords: Rigid Polyurethane Foams, Fly Ash, Glass Fiber, Titanate, Inflammability, Mechanical Properties.

1. INTRODUCTION
Today, with the increasing population, developing technology and job opportunities, tourism, commercial and military activities have increased, so the development of sectors such as space, aviation and automotive has gained momentum. With the increase in cost, comfort and desired performance characteristics in these sectors, parameters such as the selection of materials used in the production of vehicles, their cost, process, maintenance and sustainability are expected to be at an optimum level. Although different performance requirements are encountered in different application areas, lightness is one of the most important of these requirements. It brings many advantages such as lightness, fuel efficiency, payload, longer range and speed [1]. Composites, which contain many features such as strength/weight ratio, corrosion resistance,

and the use of fewer parts, are an ideal material group for many areas, and polymeric composites are widely used in this group, especially due to their low densities. In particular, carbon, glass and aramid fiber reinforced thermoset or thermoplastic matrix polymeric composites are extensively used in primary structural elements that need to exhibit high mechanical properties. Apart from primary structural elements, many polymer/polymeric composites are used according to various desired end-use performances in secondary structural elements and in cabin applications for the aerospace industry.

Polyurethane, which is obtained as a result of polymerization of polyester or polyethers with isocyanates, is one of these polymers. PU, which is used in many sectors and fields due to its high tensile strength, chemical resistance, machinability and mechanical properties, is available in composite and different forms. These are rigid and flexible foams, rigid and flexible interior foams, elastomers, adhesives, coatings and sealants [2]. Examples of applications in this field are the seats of passenger aircraft, aircraft cabins, heat and sound insulation of automobiles, ceiling and walls, luggage compartment, class segment separators, aircraft cockpit and fuel tank linings of space vehicles, PU foam usage. Despite its many superior features, polyurethane also has weaknesses that need to be developed. PU is in the flammable material class due to its chemical structure, high air permeability and inner surface area of the foam structure. In addition, carbon monoxide, hydrogen chloride and irritating gases released into the environment in case of combustion are very harmful for health [3]. Therefore, in order to use PU foam safely in indoor applications, this property should be improved with various filling/reinforcing elements. In addition to its non-flammability feature, it is foreseen that the improvement of moisture absorption and mechanical properties will expand the area of use and become a lower-cost alternative material to high-cost insulation materials. In this direction, various additives such as graphite, ionic liquid, silica, melamine, hydroxyl containing inorganic flame retardant (aluminum hydroxide, magnesium hydroxide, titanium oxide, calcium carbonate etc.) have been used to improve the non-flammability of PU foams. However, since the cost and supply of most of these additives and the process steps are not very easy, studies in the field of an alternative filler/reinforcement combination have increased [4].

Polyurethane is a polymer that has been studied extensively for reasons such as its superior properties and its ability to be used in different forms for the desired application area. Many studies on the application of PU foam in various fields and the development of different properties are available in the literature. In the studies carried out, studies have been carried out to improve the properties of PU foam according to the desired application area, both with different material combinations, reinforcement elements and optimizations made at the process stage.

In the study of Ciecierska et al., graphite and carbon nanotubes were used to improve the mechanical, thermal and fire resistance properties of rigid PU foams and their effects were investigated. It was observed that the addition of nanotubes as small as about 0.05 wt.% increased the mechanical strength of the foams by about 20%, and the thermal stability and flammability properties were greatly improved with the addition of graphite. However, weak interfacial adhesion was observed between graphite and PU matrix, which resulted in negative results in flexural strength. [5] Likewise, in another study to improve the thermal, mechanical and flame retardant properties of PU foams, mineral fillers (feldspar or kaolinite clay) were added to castor oil-based hard PU foam. Thermogravimetric analysis was used to diagnose the effect of fillers on mechanical strength, compressive strength and flexural strength measurements, and changes in thermal properties and cone calorimetry test was performed to

determine flame retardancy. From the results, it was observed that the foams combined with mineral fillers increased their compressive strength up to 182% and their flexural strength up to 351%. Furthermore, the thermal stability of composite foams increased from 192°C to 260°C with the addition of kaolinite clay filler [6]. In the work of Strakowska et al., expanded graphite (EG), fumed silica (SiO_2) and ionic liquid (1-ethyl3-methylimidazolium tetrafluoroborate were added as filler into the rigid PU foam. When the effect of the synergistic system on the foam was examined, it was observed that the compressive strength for PU/EG-SiO_2 samples increased by approximately 60% compared to the reference sample. Expanded graphite and silica increased the combustion resistance and had the highest heat release. It was concluded that it reduced it by 70% [7].

Nowadays, with the increasing importance of concepts such as recycling and sustainability on the agenda, recycling has begun to be considered as an important criterion in the production of structural elements in many areas, material selection and design stages. In this sense, the choice of the main material, but also the selection of the fillers is important. Fly ash, which will be used in this study to improve the non-flammability of the PU foam, is also recyclable in this respect. It has been determined that approximately 45 million tons of coal is burned in a year in Türkiye and an average of 15 million tons of fly ash is produced. This situation, which causes many environmental and economic problems, can be eliminated by using fly ash, which is a recyclable material, by evaluating it in different sectors [8]. In the study of Usta et al., it was observed that fly ash had a positive effect on the non-flammability of the rigid PU foam, in the values measured by the cone calorimeter method, in which fly ash and different reinforcement elements were added [9]. In addition to its effects on the non-flammability properties of fly ash, it also has an effect on the mechanical properties. It was observed that the mechanical and thermal stability values were improved when the fly ash was added to the PU matrix by 10 wt.% [10].

Glass fiber, which is considered as another additive material, is widely used in PU foam composites. In the study of Kumar et al., glass fiber was added to the rigid PU foam at different weight ratios and a reduction in moisture absorption and significant improvements were observed in tensile strength and compressive strength values. It is thought that it will positively affect not only mechanical properties, but also thermal properties and flame resistance [10].

The aim of this study is to observe the effect of a titanate compatibilizing agent and to what extent the properties such as non-flammability, mechanical, thermal and morphological can be improved by reinforcing the rigid PU foam, which has many superior features such as low density, with fly ash and glass fiber. Thus, it is envisaged that materials with high added value, low cost and optimum thermal and mechanical properties will be developed with domestic and national resources and used as an innovative material in a wide variety of applications.

2. MATERIALS AND METHODS

2.1. Materials

Isocyanate (Izokim RD 001, NCO content 31%, density 1.23 g/cm^3, viscosity 0.2 Pa.s) and polyol (KIMrigid RD 057, hydroxyl number 270 mg KOH/g^3, density 1.03 g/cm^3, viscosity 0.4 Pa.s, 4.4 wt.% water content) was supplied by Kimpur Polyurethane (Istanbul, Türkiye). Fly ash was purchased from Ekton (Adana, Türkiye),

2.2. Composite Foam Production

Manual mixing and casting method, which is an easy and low-cost method, has been preferred for the production of rigid PU foams as represented in Figure 1. At the first stage, the

compatibilization of the fillers with titanate agent was realized. Glass fiber and fly ash were firstly dried in an oven at 100°C for 24 hours. From the dried materials, glass fiber was mixed with propanol up to 800 ml using a magnetic stirrer for 10 minutes, then 2.5 wt.% of titanate-based compatibilizing agent was introduced. In the same way, fly ash was mixed with propanol up to 400 ml using a magnetic stirrer for 10 minutes, then the compatibilizing agent is added and mixing is continued until a homogeneous mixture is obtained. Then, the solutions were dried in an oven in order to remove the solvent.

The production of additive-free foam composites, initially labeled as GF-0, is carried out by following the procedure below. The polyol was mixed with an ultrasonic homogenizer for 10 minutes in order to obtain a homogeneous material. Then it was mixed with a mechanical mixer for one more minute and isocyanate was introduced, and the blend was mixed for another 5 seconds and poured immediately into an open aluminum mold of 30x30x4 cm dimensions. The material that has cross-linked and reached sufficient hardness was removed from the mold.

For the production of foam composite labeled as GF-1 to GF-9 (Table 1), the fillers were added into the polyol and mixed with an ultrasonic homogenizer for 10 minutes. The mixing process was continued for one another minute using a mechanical mixer. Then, isocyanate was introduced to the mixture, blended for 5 seconds and poured into the mold. Cross-linking occurred and the composite material that reached sufficient hardness was removed from the mold.

Filler Content (wt.%)	**Glass Fiber/Fly Ash ratio**		
	1:1	**1:3**	**3:1**
2.5	GF1	GF2	GF3
5.0	GF4	GF5	GF6
7.5	GF7	GF8	GF9

Table 1. Formulations of the different PU foam composites.

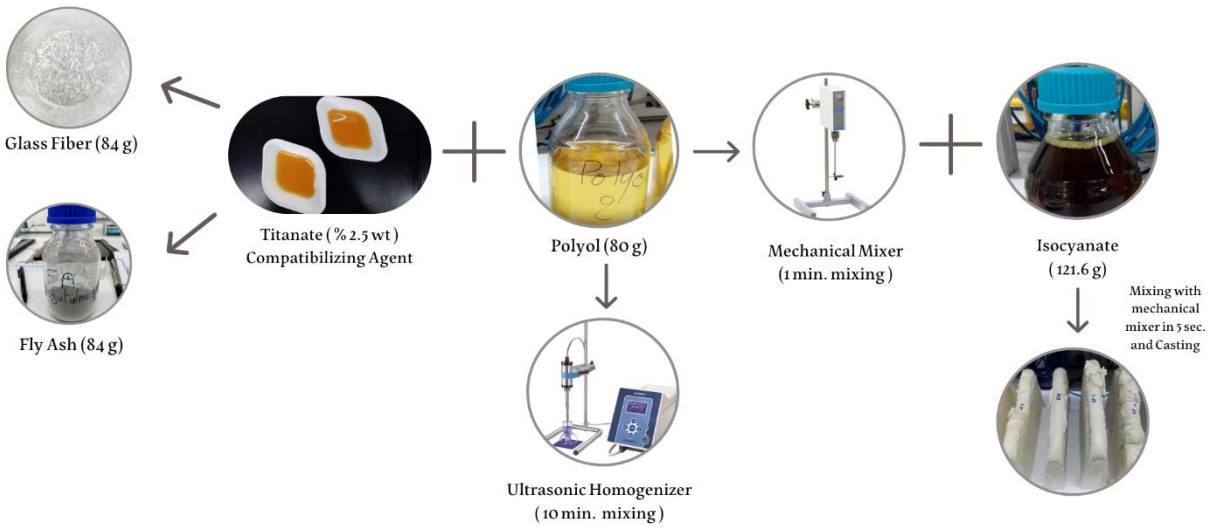

Figure 1. Schematic illustration of rigid polyurethane foam composite production.

2.3. Characterization Methods

2.3.1. Thermal Conductivity Measurements

The produced foam composites with flat and smooth surfaces were selected in order to detect the thermal conductivity of the foams using the device LaserComp Fox 314.

2.3.2. Tensile Test Measurements

The mechanical properties of the foam composites were analyzed by tensile tests using type V samples according to ASTM D638. 1 mm/min test speed and 1 kN load were used in the analysis performed with the Shimadzu AGS-X (Kyoto, Japan) testing machine. Measurements were repeated with five samples for each group.

2.3.3. Morphological Analysis

The morphology and diameters of the foam cells were characterized using a scanning electron microscope (SEM) at 5.00 kV. All characterized samples were first coated with gold/palladium. The characterization of the foams was carried out on the sample sections prepared along the direction perpendicular to the foaming direction. Cell diameters were calculated from several SEM images for each sample (cell diameter distribution of 100 cells) and these measurements were performed using Image J software.

2.3.4. Horizontal Burning Test

Horizontal burning properties of rigid PU foam composites were determined by ATLAS-HMV device according to UL-94 (HB) standard. The test was carried out on 3 samples of 4 different test samples, which showed the best properties according to the mechanical test results and had the highest glass fiber and fly ash additives.

3. RESULTS AND DISCUSSIONS

3.1. Thermal Conductivity Results

One of the most important thermophysical properties used to describe the heat transport properties of materials is thermal conductivity. With the thermal conductivity analyzer, the thermal conductivity constant (k) values of the materials are determined in W/mK, and this value is desired to be low, especially in applications where thermal insulation is critical. When the analysis results were examined (Table 2), it was observed that there was an increase in the average thermal conductivity with increasing additive ratio, but this increase was quite slow, especially in the case of 9 samples, GF-6 and GF-7 samples, where the glass fiber content was 5 wt.% and 7.5 wt.%. On the other hand, in the case of 7.5 wt.% and other hand, in 5 wt.% (3:1) wt.% (3:1) and 7 samples, GF-4 and GF-ash ratio is the where the fly difference highest, the considerably, decreased increase by and only an 8% was observed in the average thermal conductivity values compared to the neat PU.

Sample Code	Thickness (mm)	k (W/mK)
GF-0	50.61	0.02511
GF-1	52.99	0.02609
GF-2	49.16	0.02781
GF-3	53.33	0.02729
GF-4	46.91	0.02612
GF-5	52.70	0.0003101
GF-6	44.04	0.03608
GF-7	48.50	0.02800
GF-8	49.97	0.02711
GF-9	44.74	0.03480

Table 2. Thermal conductivity analysis results.

3.2.

Filler Content (%)	Sample Code	Tensile Strength (N/mm^2)	Elongation at break (%)
0	**GF-0**	0.49±0,16	1.99± 0,386
2.5	**GF-1**	0.57 ±0.072	2.09 ±0.251
	GF-2	0.56 ±0.072	1.98 ±0.251
	GF-3	0.44±0.072	1.61±0.251
5	**GF-4**	0.77±0.015	1.51±0.0196
	GF-5	0.78±0.015	1.79±0.0196
	GF-6	0.75±0.015	1.65±0.0196
7.5	**GF-7**	0.65±0.078	1.27±0.107
	GF-8	0.64±0.078	1.48±0.107
	GF-9	0.78±0.078	1.41±0.107

Tensile Test Results

The tensile test results performed according to ASTM D638 standard were given in Table 3. When the results were examined, it was observed that there was an increase in the tensile strength values of the unfilled PU foam labeled as GF-0 with the increase in the additive ratio. Especially in the case of the samples GF-4,5 and 6, where glass fiber and fly ash ratios reached 5 wt.%, this increase reached a maximum. As a result, an increase of 81% was observed. The reason for this positive increase in maximum stress values can be explained by the strengthening of the interfacial bond between the matrix and the reinforcement elements, and the successful compatibility of the additives with each other and the matrix, thanks to the titanate-based compatibilizing agent used. Furthermore, a general decrease in the maximum elongation at break values with the increase in the additive ratio was observed. The maximum decrease was observed in the case of the sample GF-7, where the fly ash addition increased by 7.5 wt.%. It was noted that this difference is a decrease by 36% compared to the neat PU foam.

Table 3. Tension test results.

3.3. Morphological Analysis Results

The SEM images obtained for the samples GF-0 and GF-8 were given in Figure 2. Considering the mean values of 100 cell diameters measured for each sample using ImageJ software were given in Table 4. From the results, a decrease by 38% of the average cell diameter was observed. It can be said that as the filler ratio and then the surface area increases, the number of nucleation points increases, therefore, smaller and more cells are observed. In addition, a positive effect on the use of foam composite material, whose production results in reduced pore sizes, especially in application areas where thermal insulation and non-flammability properties are important.

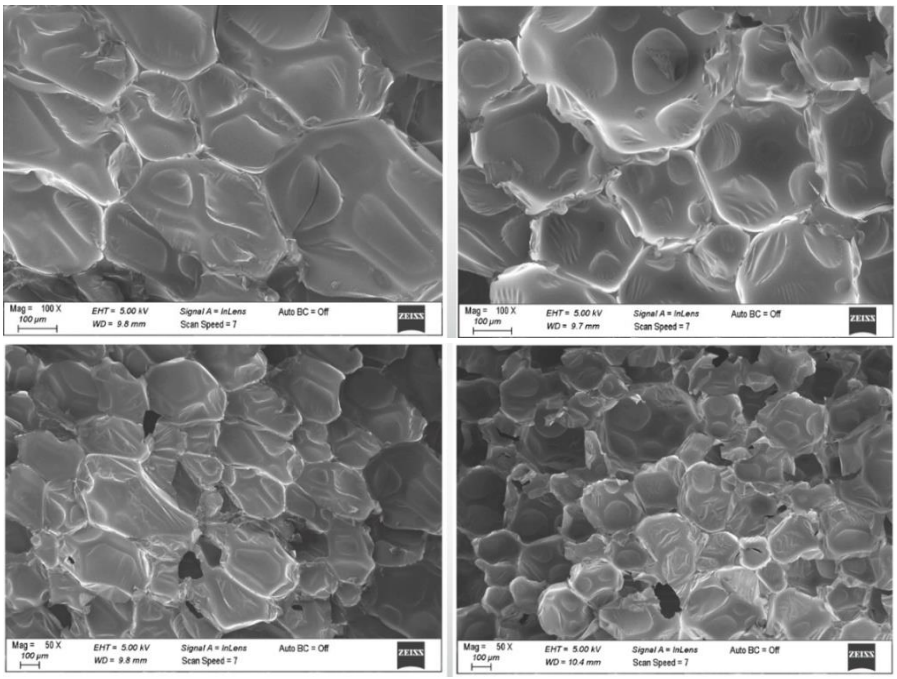

Figure 2. SEM images of foam composites: GF-0 (left) and GF-8 (right).

Table 4. Pore size measurement results.

Filler Content (wt.%)	Sample Code	Average cell diameter (μm)
0	GF-0	149
2.5	GF-1	151
	GF-2	125
	GF-3	116
5	GF-4	113
	GF-5	110
	GF-6	102
7.5	GF-7	99
	GF-8	96
	GF-9	91

3.4.

Horizontal Burning Test Results

The results of the horizontal burning test performed according to the UL-94 standard were gathered in Table 5. In cases where flammability, which is one of the main disadvantage of PU foams, is improved, it is also expected to perform higher mechanical properties when the end-use performance requirements are evaluated. Therefore, the samples GF-5 and GF-6 prepared at 5 wt.% and GF-8 and GF-9 prepared at 7.5 wt.%, having the highest glass fiber and fly ash content, displayed the higher tensile strength results. When the results were examined, it was observed that GF-5 burned with an average of 6.7 seconds and had a linear burning speed of 679 mm/min. In the case of the sample GF-9, where the additive ratio reaches 7.5 wt.%, and especially for the sample GF-9.1, it was observed that the maximum burning time increased up to 12 seconds, with an average value of 11 seconds, and the linear burning rate decreased to 411 mm/min. As a result, it can be concluded that a decrease by 65% is obtained for the average linear burning rate and an increase by 65% for the average time between 25-100 mm marked on the sample as per the standard.

Table 5. Horizontal burning test results.

Sample Code	Time Elapsed Between 25-100 mm marks, t (second)	Average Time Elapsed Between 25-100 mm marks, t (second)	Calculated Linear Burning Rate (mm/min)	Calculated Average Linear Burning Rate (mm/min)
GF-5.1	7	6.7	643	679
GF-5.2	6		750	
GF-5.3	7		643	
GF-6.1	11	10	409	453
GF-6.2	9		500	
GF-6.3	10		450	
GF-8.1	8	8	563	563
GF-8.2	8		563	
GF-8.3	8		563	
GF-9.1	12	11	375	411
GF-9.2	10		450	
GF-9.3	11		409	

4. CONCLUSION

It has been proven by the studies and results in the literature that the final properties of rigid polyurethane composite foams are affected by the fillers. In this study, polyurethane foam composites were produced by mechanical mixing and casting method and 2.5 wt.% of titanate-based compatibilizing agent, glass fiber and fly ash were added as filler. The effects of these additives used at different ratios on the mechanical, morphological and thermal properties of the composite foam were investigated. From the results, it was observed that the mechanical properties improved by 81%, the linear burning rate decreased by 65% and the average pore size decreased by 38% with the increase in the amount of fly ash and glass fiber. Thus, it can be concluded that the innovative foam composite produced can be recommended to be used in many application areas such as a domestic and low-cost, multifunctional alternative material to high-cost foams.

6. REFERENCES

[1] Kompozit Sanayicileri Derneği, Composites Türkiye Dergisi, Eylül 2020, Sayı: 27

[2] Pagev- https://pagev.org/poliuretanlar

[3] A. Konig, U. Fehrenbacher, T. Hirth, E. Kroke, (2008) Flexible Polyurethane Foam with the Flame-retardant Melamin

[4] Po-Ju ChenSung-Jeng JongRen-Kuen ChangChin-Shang HsuJer-Young ChenYih-Her ChangChei Kao , (2009) , Fire-resistant polyurethane foam (Patent US8865782B2)

[5] Ciecierska ve ark. , (2015), Flammability, Mechanical Properties and Structure of Rigid Polyurethane Foams with Different Types of Carbon Reinforcing Materials

[6] Agrawal ve ark., (2019), Investigation on flammability of rigid polyurethane foam- mineral fillers composite

[7] Strakowska ve ark., (2020), New Flame Retardant Systems Based on Expanded Graphite for Rigid Polyurethane Foams

[8] G. Güler, E. Güler, Ü. İpekoğlu, H. Mordoğan, (2005), Uçucu Küllerin Özellikleri ve

[9] Usta N., (2011), Investigation of fire behavior of rigid polyurethane foams containing fly ash and intumescent flame retardant by using a cone calorimeter.
[10] Kuźnia ve ark., (2019), Fluidized bed combustion fly ash as filler in composite polyurethane materials.

ANALYSIS OF THE LENGTH OF DRY PERIODS FOR AGRICULTURAL PRODUCTION USING THE MARKOV CHAIN MODEL: CASE OF SYNOPTIC STATIONS IN BENIN

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ABSTACT
The deficit of last decade rain in West Africa and particularly in Benin pushes us to make the analysis of tendencies of the dry sequences of the tabular stations from daily raining data. The general objective of this survey is the research of probability of the dry sequence sets in the period from 1970 to 2018 from daily raining data of the tabular stations of Benin. We have extract of data daily raining of six stations synoptique of Benin, in the period from1970 to 2018 from daily raining data of the tabular stations of and we analyzed the variation of the probability of length of dry sequences with markov chain model on the period from 1970 to 2018 to raining data of the tabular stations. We determined the critical duration of the dry period analysed his impact of lower yields of maize especially during the heading phase. From the results, we can retain the probability of dry spell length of 5 days was about 75%. The probability of dry spell length of two weeks was also more than 20%. On the other hand, the probability of dry spell length of 20 days was below 20%maxima of dry sequence length to the station of Bohicon, Savè, Cotonou and Kandi. It has been also clarified that in parakou's and natitingou's station, the probability of dry spell lengths of 15 days or the two weeks has been reached about 30% in July. A dry sequence of more than 4 days constitutes a risk of lower yields of maize especially during the heading phase where it could reach the wilting point.

Keywords: The deficit of rain, the probability, the heading phase, the wilting point, Benin.

DEVELOPMENT OF YIELD PREDICTION MODEL FOR GRAPES AND EXPERIMENTAL VALIDATION THROUGH ANDROID MOBILE APP UNDER AGRO CLIMATIC CONDITIONS BASED ON DISEASE MANAGEMENT

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ABSTRACT
Crop development and yield are both influenced by the weather. A generic agro-climatic yield prediction model for grape is created and analytically solved in this research. In the field of mathematical biology, this model is valuable for research scholars, faculty members, and academics. The asymptotic analysis is carried out to obtain the final form of the yield prediction model. In the process of model development, climate, disease and grape yield are considered as dependent parameter. Infection rate, disease incidence, seasonality rate and removal rate of grape yield per harvest time are consideredas independent parameters. Further, the model is studied andthe parameters estimation from the field level data during the period 2015-2021 from GRS and Theni surrounding villages. Stability analysis of this model is also explained. The obtained analytical solution in comparison with the numerical and stability analysis is found to be in satisfactory agreement. In addition, the developed android mobile app for grape and validated using proposed model under climatic scenario.

Keywords: Seasonality rate; Grape yield; Disease incidence; Infection rate; Mathematical modeling; Simulation.

1. INTRODUCTION:
Climate has a profound influence on vine growth, productivity and quality of fruits. Of the factors contributing to the successful cultivation of grape, climate ranks first.The weather parameters viz.,sun light, rainfall, humidity also influencethe qualitydevelopment of the fruits. Downy Mildew (Plasmoparaviticola) is known as one of the most important vineyard diseases inTamilNadu, because it has the capability to develop and spread very quicklyandcause large crop losses in certain areas according to the weather conditions [1]. Farmers must make decisions whetheror not to spraydowny mildew and also how frequently to spray and which agrochemicals to use [2]. A good understanding of the stage is neededin incidence and conditions of congenial for the incidence and development of the disease.The efficacy and mode of action of fungicides help the effective management of any disease, particularly downy mildew.

Some mathematical models are developed to provide short-term and field-scale predictions of DM epidemics resulting from infections caused by P. Viticola sporangia in Switzerland, France, Austria, Germany, and Italy [3-10]. These models are developed by using a common database of previous publications.

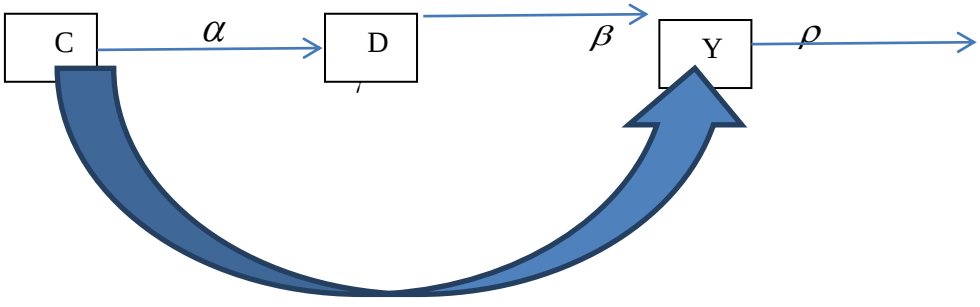
Christopher et al. have reformulated the SIR model with host response to infection load for a plant disease [11]. Daniele et al. [12] have developed the model for temporal dynamics of brown rot spreading in fruit orchards. Jeger et al. [13] have developed a generic modelling framework

to understand the dynamics of foliar pathogen and bio-control agent (BCA) populations in order to predict the likelihood of successful bio-control in relation to the mechanisms involved. Abdul Latif has formulated the induced resistance to plant disease using a dynamical system approach [14]. Mario de la fuentehas compared different methods of grapevine yield prediction in the time window between fruit set and version [15]. Rory Ellis et al. [16] have developed the Bayesian growth model to predict the yield for grape by using simulation. A dynamic model for Plasmoparaviticola primary infections on grapevine was elaborated according to a mechanistic approach by Vittorio Rossi [17]. A generic mathematical model that incorporates the elicitor effect to combat disease infectionwasinitially introduced by Abdul Latif [18]. Manisha S. Sirsat [19] obtained the predictive model for each phenology that predicts yield during growing stages of grapevine and to identify highly relevant predictive variable by machine learning technique. Recently, a prediction model has been developedfor the Godello cultivar, one of the preferential autochthonous white cultivars in the Northwest Spain Ribeiro Designation of Origin vineyards, by means of aerobiological, meteorological and flower production analysis by Estefanía González-Fernández [20]. More recently,Kadbhane et al. [21] have developed the grape yield (ACGY) model under climate change scenario (secondary data) using Multiple linear regression analysis.

According to the literature survey, there are many yield estimating models that can be used to estimate the yield of wheat, rice, maize, sorghum, sugarcane, etc. However,for grapes, there are no models available for estimation without secondary data. So far, no models have been reported for estimation exactly of grape yield in Indian terrain.The present study aims at developing an agro-climatic grape yield prediction model for the study area in Theni district based on current and future climate data.However, to the best of our knowledge, till date no general model and analytical results for the concentration of climate, disease and yield of grape as a function of infection rate, disease incidence, seasonality rate and removal rate of grape yield loss per harvest time**.**The obtained analytical solution in comparison with the numerical and stability analysis is found to be in satisfactory agreement.In addition, the basic reproduction number for yield prediction model for grape is obtained.

2. MATHEMATICAL FORMULATION OF THE PROBLEM:

In the development of the yield prediction model, temperature, relative humidity, rainfall, and rainy days etc., are all considered climate domain characteristics. Climate data is collected by a groundnut centre in Tamil Nadu. Field surveys are used to obtain data on the incidence domain, while the Grape research station in Theni collectedyield data during the period 2015-2021.All grape plants are of common variety cultivated in the study area, namely Muscat Humbug. Figure 1shows the agro-climatic disease grape yield model schematic diagram used for real-life theoretical outcome.



The parameters from the domain γ is the seasonality rate, β is the disease incidence, α is the infection rate and ρ is the removal rate of yield loss per harvest time. It is considered in the development of the agro-climatic grape yield prediction model using the asymptotic analysis. The basic form of the model is indicated below:

$$\frac{dC}{dt} = -\alpha CD - \gamma C \quad (1)$$

$$\frac{dD}{dt} = \alpha CD - \beta D \quad (2)$$

$$\frac{dY}{dt} = \beta D + \gamma C - \rho Y \quad (3)$$

The corresponding initial conditions are:

$$C(0) = C^*; D(0) = D^{*,}, Y(0) = Y^* \quad (4)$$

where C is the concentration of climate, D is the concentration of disease, Y is the concentration of yield, t is the time in days, α is the infection rate for grape, β is the disease incidence rate for grape, γ is the seasonality rate, ρ is the removal rate of grape yield loss per harvest time, using HPM (Appendix A) to find the solution of the equations (1-3) is

$$C(t) = C^* e^{-\gamma t} - \frac{\alpha C^* D^*}{\beta} e^{-\gamma t} + \frac{\alpha C^* D^*}{\beta} e^{-(\beta+\gamma)t} + \left(\frac{\alpha^2 C^{*2} D^*}{\beta\gamma} - \frac{\alpha^2 C^{*2} D^*}{(\beta+\gamma)} - \frac{\alpha^2 C^* D^{*2}}{2\beta^2} \right) e^{-\gamma t} - \frac{\alpha^2 C^{*2} D^*}{\beta\gamma} e^{-(\beta+\gamma)t}$$

$$+ \frac{\alpha^2 C^{*2} D^*}{(\beta+\gamma)} e^{-(\beta+2\gamma)t} + \frac{\alpha^2 C^* D^{*2}}{\beta^2} e^{-(\beta+\gamma)t} - \frac{\alpha^2 C^* D^{*2}}{2\beta^2} e^{-(2\beta+\gamma)t} \quad (5)$$

$$D(t) = D^* e^{-\beta t} + \frac{\alpha C^* D^*}{\gamma} e^{-\beta t} - \frac{\alpha C^* D^*}{\gamma} e^{-(\beta+\gamma)t} + \left(\frac{\alpha^2 C^{*2} D^*}{2\gamma^2} - \frac{\alpha^2 C^* D^{*2}}{\gamma\beta} + \frac{\alpha^2 C^* D^{*2}}{(\beta+\gamma)} \right) e^{-\beta t}$$

$$- \frac{\alpha^2 C^{*2} D^*}{\gamma^2} e^{-(\beta+\gamma)t} + \frac{\alpha^2 C^{*2} D^*}{2\gamma^2} e^{-(\beta+2\gamma)t} + \frac{\alpha^2 C^* D^{*2}}{\gamma\beta} e^{-(\beta+\gamma)t} - \frac{\alpha^2 C^* D^{*2}}{(\beta+\gamma)} e^{-(2\beta+\gamma)t} \quad (6)$$

$$Y(t) = Y^* e^{-\rho t} + \left(\frac{\gamma C^*}{\gamma-\rho} + \frac{\beta D^*}{\beta-\rho} \right) e^{-\rho t} + \frac{\gamma C^*}{\rho-\gamma} e^{-\gamma t} + \frac{\beta D^*}{\rho-\beta} e^{-\beta t} \quad (7)$$

3.1 Application and Validation of Android mobile app using proposed model:

Android app has become a useful tool in agriculture because their mobility matches the nature of farming, the cost of the device is highly accessible, and their computing power allows a variety of practical applications to be created. Moreover, Android app nowadays equipped with various types of physical sensors which make them a promising tool to assist diverse farming tasks. Android app applications under farming category support farming processes of planting crop by sensing the environment using various sensors. Observations can be in the form of snapped pictures, specific locations in the farm, colors of soil, water and plant leaves and light. Main target users of the application aim at improving farm productivity oftentimes by analyzing agricultural specimens, supporting agricultural decisions and solving task-specific problems. Therefore, taking above facts into consideration, the present investigation has been undertaken to developed android app and validated mathematical model in grapes with respect to disease incidence and climatic variables.The generated code for an android mobile app for the proposed model in grape (See Appendix C).

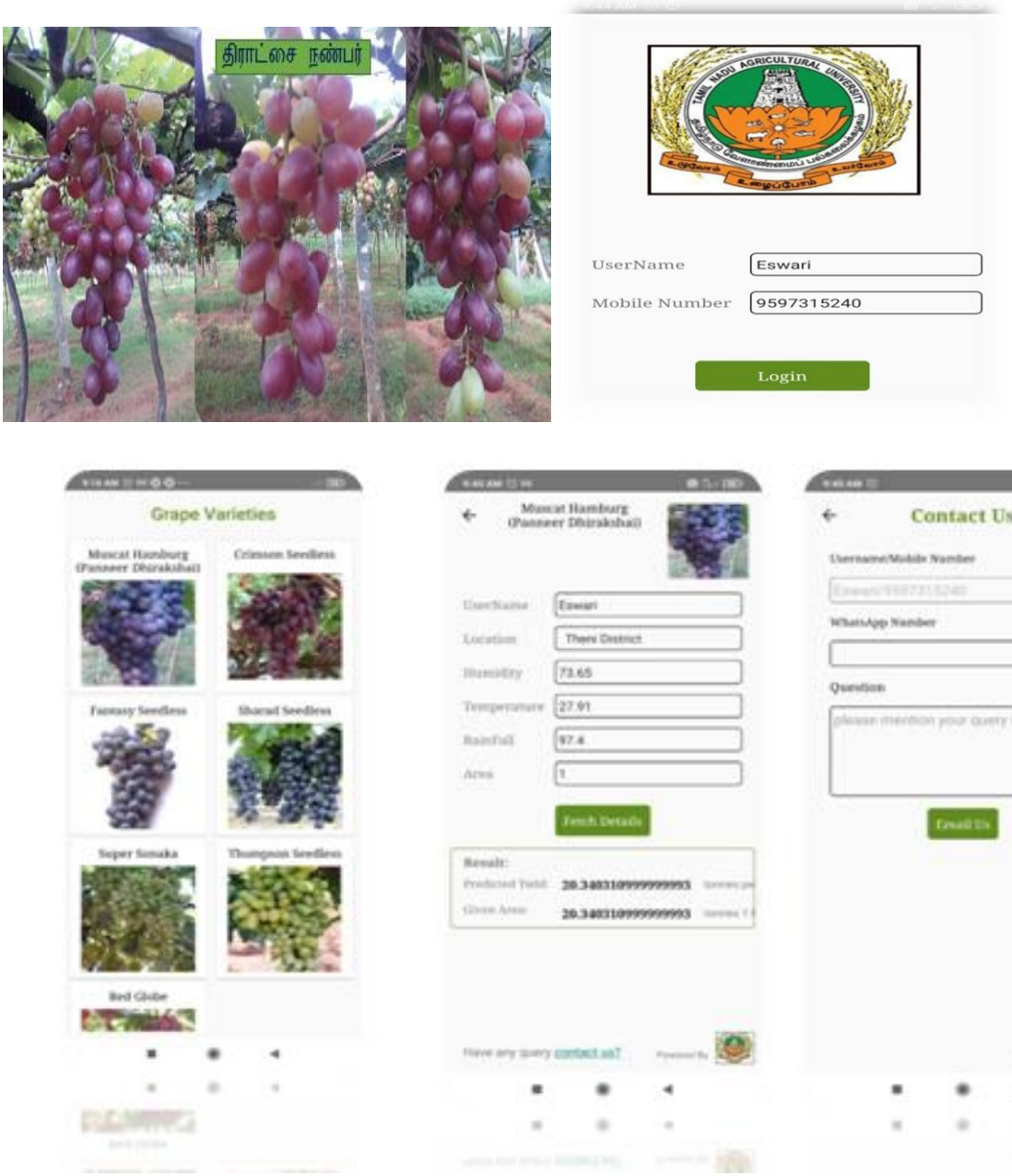


Fig. 2: Structural view of grape yield prediction model

This app is farmer's friendly app; it is easy to download this app through mobile or laptop. After download, click this app to open the login page and enter the Username and password and click the login button. Farmers pictorially show the varieties of grapes from Grape research station, Theni district. Click any one of the variety, to open the input details page related to climatic factors such as temperature, Relative humidity and Rainfall with Area. All such input are given to get a output for grape yield prediction. Using this app, every farmer to estimate grape yield for future perspective.

5. RESULT AND DISCUSSION:

Eqs. (5-7) are the new analytical expressions of the climate, disease and yield as a function of the seasonality index, the disease incidence, the infection rate and the removal rate of yield loss per harvest time. The concentration of a species is determined by the varying relative rates of infection rate, disease severity as well as effective seasonality rate. The concentration of $C(t)$, $D(t)$ and $Y(t)$ involved in the infection rate, seasonality index and diseases severity with respect to the time in days from the agro-climatic grape yield modelandcompared with

numerical results in Fig. 3. From the figure,it is observed that the concentration of climate is increasing whendisease isautomatically increasing and other concentration yield becomes zero at initial time. Due to longtime, the concentration of climate is decreasing whendisease is automatically decreasing at the same time the concentration of yield is increases. The concentration profile is equal to steady state when time in days ($t \geq 1$).Figure 4 is plotted in the Seasonality indices versus the time in days for grape under the influence of climatic factors such as Max. Temperature, Min. Temperature, Relative humidity and Rainfall from Theni district during the years 2016-2021. Highest seasonal index for maximum temperature was noticed in April (1.13%) followed by May(1.09%) and March(1.08%). A seasonal index of 1.13 would indicate that season had 13% more than seasonal average of Maximum temperature in April. Lowest seasonal index for maximum temperature was noticed in December (0.93%) followed by January (0.93%) and August (0.95%). A seasonal index of 1.13 would indicate that season had 0.02% less than seasonal average of Maximum temperature in December. Similarly, all the weather indices can be interpreted for the above format.

Fig. 5 shows the three-dimension space on the concentration of climate for varying effective seasonality rate and infection rate. The concentration of climate is independent of both α and γ but is a function of C^* where reduces the concentration of climate. Fig. 6, the concentration of disease varies with infection rate and disease incidence for large value of t. In this regime, the concentration of disease increases with increasing infection rate when $\beta < 10$. In figure 7, the disease incidence β is extremely high, when the concentration of yield asymptotically reaches a constant value regardless of γ, but it depends on α. It can be concluded that the concentration of yield increases,when the seasonality index and disease incidence slightlydecrease. Analytical expression of climate, disease and yield are compared with simulation results in Table 1. The maximum relative error between numerical simulations with theanalytical result for the developed model is obtained 0.2832%. Stability analysis is carried out for the developed model using the parametric Jacobian transformation method. Based on the obtained results of the mathematical tests, the developed yield prediction model (Eq.5-7) is recommended for its use to estimate the grape yield.Further, phase portraits, for both linear and non linear system can be predicted or analyzed using algebraic method.In figure 8, is easy to see that the globally stable state and the both upper and lower are positive state are stable nodes.

6. CONCLUSION:

The asymptotic method is used to solve the constructed agro-climatic grape yield prediction model (Eq.13).The model is quantified in terms of fundamental seasonality index, disease severity rate, infection rate, removal rate of yield loss, the analytical expression of the climate, disease and yield concentration are derived. The obtained results have a good agreement with that numerical result and stability analysis. It is also validated using android mobile app under different level of climatic variability. Based on the obtained results of the developed yield prediction model, itis recommended for its use to estimate the grape yield. Also, a valuable tool for predicting crop yields in a few years ahead of time.

Conflict of interest:

There is no any conflict of interest

REFERENCES:

1. R.W. Emmett et al. (1992). Grape diseases and vineyard protection, In B.G. Coombe& P.R. Dry (ed) Viticulture Vol.2 Practices. Winetitles, Adelaide, South Australia, 232-278
2. P.A. Magarey et al. (1994). A computer based simulator for rational grapevine downy mildew (Plasmoparaviticola) on grape leaves, Phytopathology 78, 1316-1321
3. Blaise, P., and Gessler, C. (1990).Development of a forecast model of grape downy mildew on a microcomputer in II International Symposium on Computer Modelling in Fruit Research and Orchard Management. 276, 63–70.
4. Hill, G. K. (1990). Plasmopara Risk Oppenheim–a deterministic computer model for the viticultural extension service.Not.sulle Mal. dellePiante 111, 231–238
5. Magarey, P. A., Wachtel, M. F., Weir, P. C., and Seem, R. C. (1991). A computerbased simulator for rational management of grapevine downy mildew (Plasmoparaviticola). *Plant Prot.* Q. 6, 29–33.
6. Magnien, C., Jacquin, D., Muckensturm, N., and Guillemard, P. (1991).MILVIT: a descriptive quantitative model for the asexual phase of grapevine downy mildew. IOBC/WPRS Buletin 21, 451–459.
7. Orlandini, S., Gozzini, B., Rosa, M., Egger, E., Storchi, P., Maracchi, G., et al. (1993).PLASMO: a simulation model for control of Plasmoparaviticola on grapevine. EPPO Bull. 23, 619–626. doi: 10.1111/j.1365-2338.1993.tb00559.x
8. Ellis, M. A., Madden, L. V., and Lalancette, N. (1994). A disease forecasting program for grape downy mildew in Ohio. Special report (New York State Agricultural Experiment Station; USA). 68, 92–95.
9. Blaise, P. H., Dietrich, R., and Gessler, C. (1999). Vinemild: an applicationoriented model of Plasmoparaviticola epidemics on Vitisvinifera in V International Symposium on Computer Modelling in Fruit Research and Orchard Management, 499, 187–192.
10. Leroy, P., Smits, N., Cartolaro, P., Delière, L., Goutouly, J. P., Raynal, M., et al. (2013).A bioeconomic model of downy mildew damage on grapevine for evaluation of control strategies. *Crop Prot*. 53, 58–71. doi: 10.1016/j. cropro.2013.05.024.
11. Christopher a. Gilligan, Simon gubbinsand Sarah A. Simons, (1997) Analysis and fitting of an SIR model with host response to infection load for a plant disease, Phil. Trans. R. Soc. Lond. B 352, 353–364.
12. Daniele Bevacqua, BenedicteQuilot-Turion and Luca-Bolzoni. (2018) A Model for temporal dynamics of brown rot spreading in fruit orchards, *Phytopathology*, 108, 595-601.
13. M.J. Jeger,P. Jeffries, Y. Elad and X.-M. Xu. (2009).A generic theoretical model for biological control of foliar plant diseases, *Journal of Theoretical Biology*, 256, 201–214.
14. Nurul S. Abdul Latif, Graeme C. Wake, Tony Reglinski, Philip A. G. Elmer and Joseph T. Taylor.(2013).Modelling the induced resistance to plant disease using a dynamical system approach, Frontiers in plant science, vol.4, 1-53.
15. Mario, DeLaFuente, Ruben Linares, Pilar Baeza, Carlos Miranda and Jose Ramon Lissarrague.(2015). Comparison of different methods of grapevine yield prediction in the time window between fruitset and veraison, *J . Int. Sci.*Vigne Vin, , 49, 27-35
16. Rory Ellis, Elena Moltchanova, Daniel Gerhard, Mike Trought and LinLin Yang. (2020). Using Bayesian growth models to predict grape yield, OENO One, 54(2), 443-453.
17. Vittorio Rossi, Tito Caffia, Simona Giosue and Riccardo Bugiani.(2008).A mechanistic model simulating primary infections of downy mildew in grapevine, ecological modelling, 212, 480–491.

18. Nurul S. Abdul Latif, Graeme C. Wake, Tony Reglinski and Philip A.G. Elmer. (2014). Modelling induced resistance to plant diseases, Journal of Theoretical Biology, 47, 144–150.
19. Manisha S. Sirsata, Jonao Mendes-Moreiraa, Carlos Ferreiraa and Mario Cunha. (2019).Machine Learning Predictive Model of Grapevine Yield based on Agroclimatic Patterns, Environment and food.
20. EstefaniaGonzalez Fernandez, Alba Pina-Rey, MariaFernandez-Gonzalez, Maria J. Aira and F. Javier Rodriguez-Rajo. (2020). Prediction of Grapevine Yield Based on Reproductive Variables and the Influence of Meteorological Conditions, Agronomy 10, 714; doi:10.3390/agronomy10050714.
21. Kadbhane, S.J., and V.L. Manekar.(2021).Development of agro-climatic grape yield model with future prospective, Italian Journal of Agrometeorology (1): 89-103. Firenze University Press www.fupress.com/ijam ISSN 2038-5625 (print) | DOI: 10.36253/ijam-406.

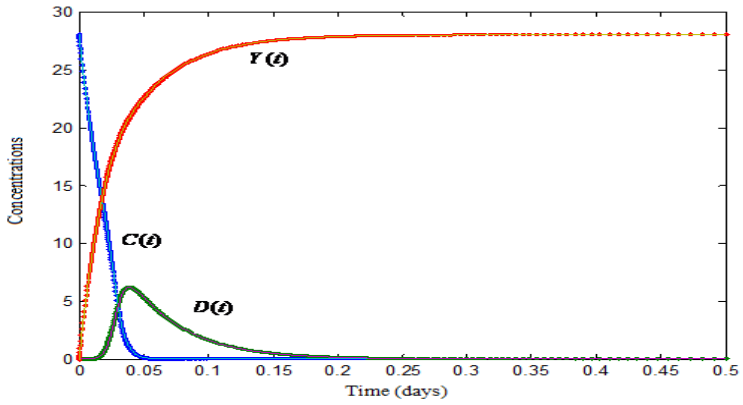
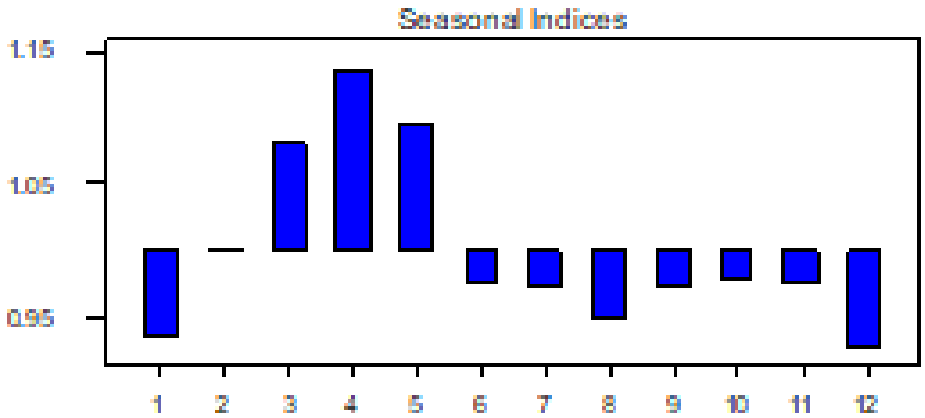


Fig. 3.Concentrations for $C(t), D(t)$ and $Y(t)$ versus time in days for $C^* = 33, D^* = 0, Y^* = 0, \alpha = 23.98, \beta = 24.04, \gamma = 90, \rho = 0.2.$ The dotted line represent the numerical results and solid line represents the analytical results.



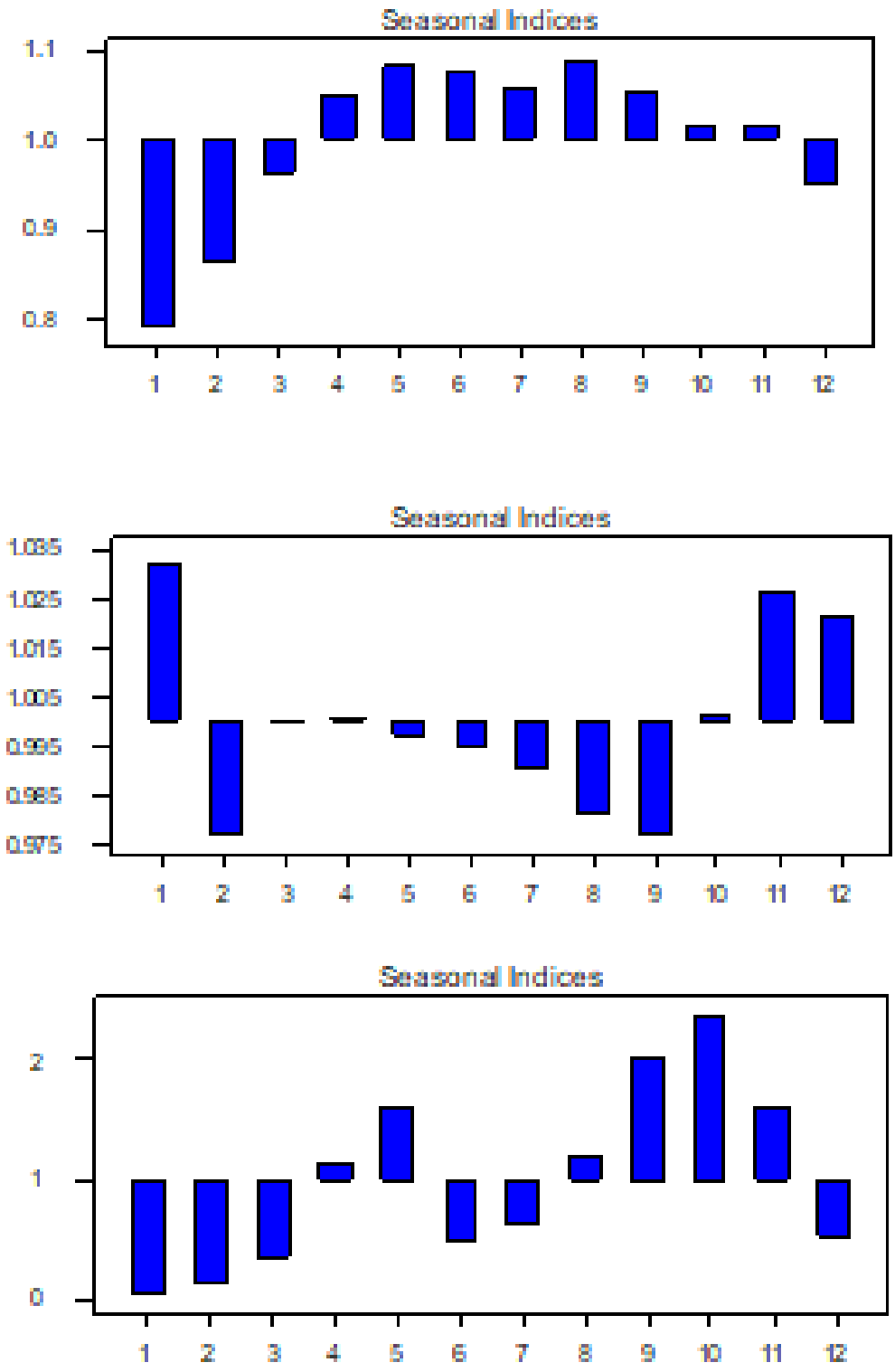


Fig. 4: Seasonality indices versus the time in days for grape under the influence of climatic factors a. Max. Temperature, b. Min. Temperature, c. Relative humidity and d. Rainfall from Theni district during the years 2016-2021.

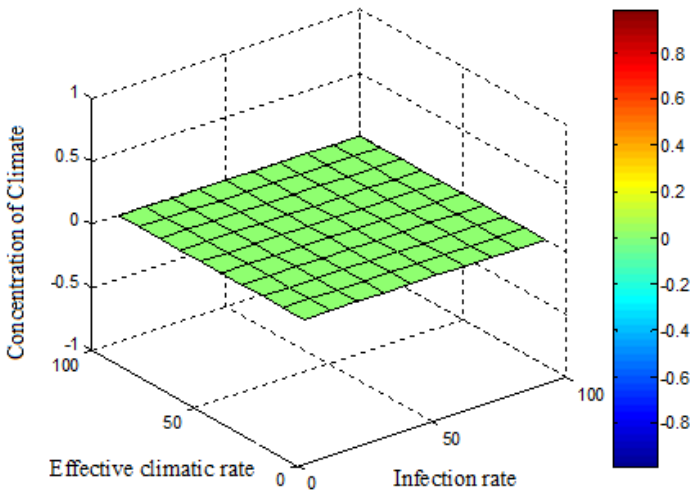


Fig.5. Effects of disease incidence β on concentration of climate for varying effective seasonality rate and infection rate for $C^* = 33, D^* = 0, Y^* = 0.$

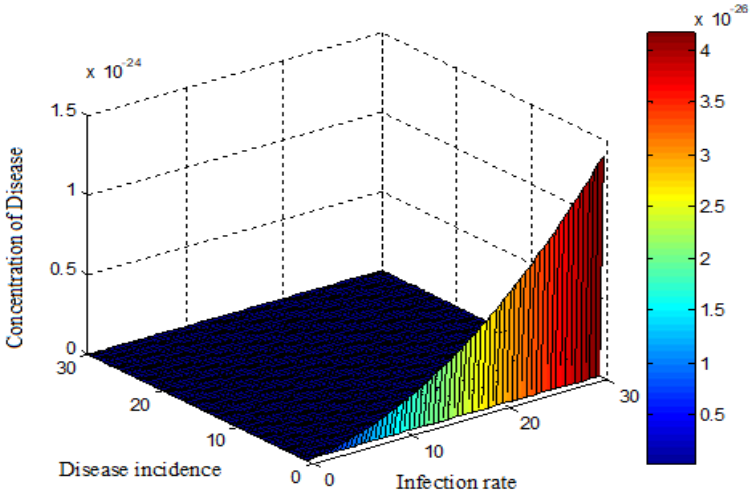


Fig.6. Effects of effective seasonality rate γ on concentration of disease for varying infection rate and disease incidence for $C^* = 33, D^* = 0, Y^* = 0.$

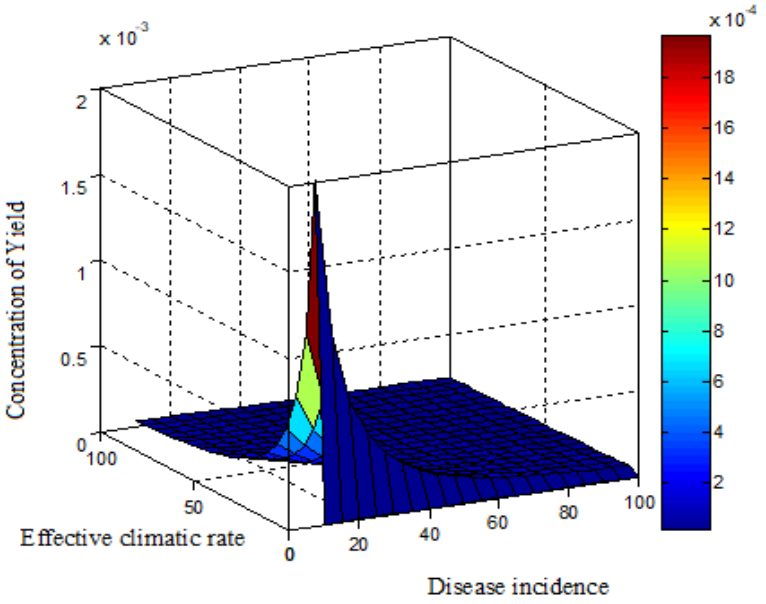


Fig.7. Effects of infection rate α on concentration of yield for varying effective seasonality rate and disease incidence for $C^* = 33, D^* = 0, Y^* = 0, \rho = 0.2.$

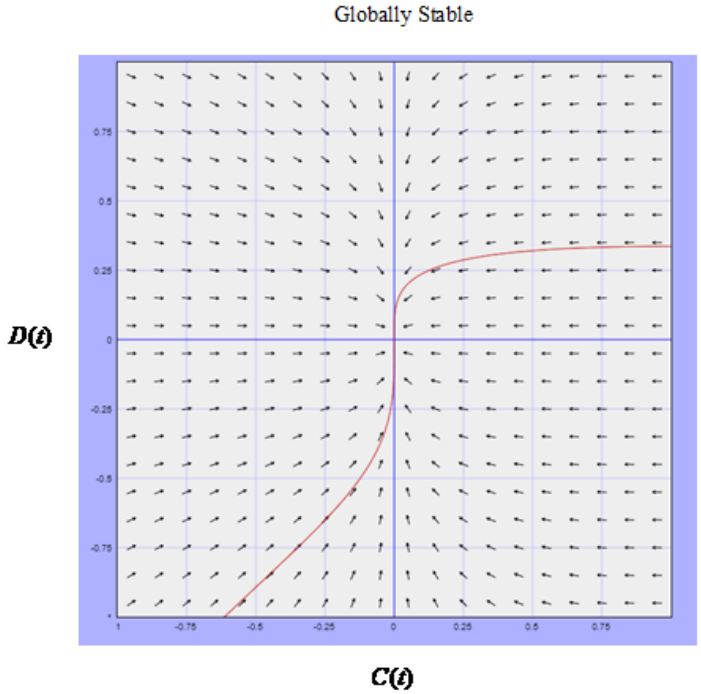


Fig. 8: A sketch of the phase plane of the climate disease yield prediction system. Arrows represent the direction of the phase flows of matter through the system.

Table 1: Comparison of analytical result with numerical result for Concentrations $C(t), D(t)$ and $Y(t)$ using the equations (5-7) for experimental values of parameter $C^* = 33, D^* = 0, Y^* = 0, \alpha = 23.98, \beta = 24.04, \gamma = 90, \rho = 0.2.$

Table 5: Average value of experimental values of the parameters from Grape research station and surrounding villages at Theni district using the measurement table 2-4 during the period 2015-2021.

** Submit your abstract in the same file as Form-5.*

S. No	Parameters	Experimental value (Mean value)
1.	Infection rate (α)	23.98 %
2.	disease incidence (β)	24.04%
3.	seasonality rate (γ)	90%
4.	removal rate of grape yield per harvest time (ρ) (yield loss form GRS)	0.2 to 0.6%
5.	Disease concentration at initial time (D^*)	0
6.	Yield concentration at initial time (Y^*)	0
7.	Climatic concentration at initial time (C^*)(minimum temperature)	33^0c

t	Concentrations								
	$C(t)$			$D(t)$			$Y(t)$		
	This work	Simulation	Error %	This work	Simulation	Error %	This work	Simulation	Error %
0	28.0000	28.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.1	0.00311	0.00312	0.3215	1.6140	1.6150	0.0620	26.3900	26.3800	0.0379
0.2	0.1473	0.1475	0.1358	0.1473	0.1476	0.2037	27.8500	27.8501	0.0004
0.3	0.0120	0.0121	0.8333	0.0121	0.0122	0.8264	27.9900	27.9902	0.0007
0.4	0.0052	0.0052	0.0000	0.00521	0.0052	0.1919	28.0000	28.0000	0.0000
0.5	0.0001	0.0001	0.0000	0.00241	0.00242	0.4149	28.0000	28.0000	0.0000
	Average error %		0.2151	Average error %		0.2832	Average error %		0.0065

THERORETICAL STUDY OF THE DIELECTRIC PROPERTIES OF A BIOPOLYMER ENRICHED WITH SEVERAL BIOFILERS

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Abstract

Natural polymers and their chemically adapted derivatives are known to exhibit applicability in numerous domains due to the fact that they are considered environmentally supportive materials with eco-friendly character. For instance, cellulose ethers display several advantages in regard to the synthetic polymers, such as biodegradability, water solubility, good processability, remarkable mechanical resistance, excellent transaparency, tunable wettability, and interesting electrical features. On the other hand, bio-based fillers represent a fresh alternative in controlling the properties of many materials, including polymers. Therefore, by incorporation of the natural fillers in the polymer, a new category of materials is emerging that might reach the performance of the synthetic ones and introduce the benefit of environmental compatibility. Among the physical properties, the dielectric properties of the reinforced polymers are paramount in certain practical cases, such as insulating layers, passive components or other elements for electronic devices. In particular, high permittivity materials are often implemented for the construction of the capacitors. Such devices are essential for energy storage purposes. In this context, the present research study is aiming to make a theoretical analysis on the dielectric properties of such eco-friendly polymer-based composites. For this aim, a biodegradable polymer matrix is selected, namely hydroxypropyl methylcellulose. The dielectric constant of this cellulosic matrix is assessed by utilization of the theory relying on the connectivity indices. Then, a careful selection of several sorts of fillers, which are often found or extracted from natural resources, is made based on their dielectric performance. The next stage of the study involves application of a set of mathematical approaches to determine the dielectric constant of the designed polymer composites. Evaluation of the dielectric constant variation in concordance with the content of the introduced sort of fillers within the hydroxypropyl methylcellulose is discussed. Such theoretical analyses are of great importance in predicting the dielectric characteristics and to adapt the composite properties involved in the manufacturing of electrical energy storage devices.

Keywords: polymer composites; bio-fillers; eco-compatible; dielectric properties.

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NUMERICAL INVESTIGATION OF HEAT TRANSFER IN A RIBBED TRIANGULAR WAVY CHANNEL UNDER NANOFLUID FLOW

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ABSTRACT
In this study, the effects on the flow and heat transfer of nanofluids in a ribbed triangular wavy channel were numerically examined. The numerical study was performed with the Computational Fluid Dynamics (CFD) based ANSYS-Fluent program and the governing equations were solved using the SIMPLE algorithm. The present study was compared with the literature studies. CuO-water nanofluid was used as the working fluid and aluminum was considered as the channel material. Fluid is incompressible, single-phase, and Newtonian type. The channel flow is steady, two-dimensional and in a laminar regime. The upper surface of the channel is adiabatic and contains vertical ribs. The lower surfaces of the triangular wavy channel are kept at a constant temperature of 360 K. The nanoparticle volume fraction (φ) was considered constant as 5%. Nusselt number (Nu) and friction factor (f) were calculated for different Reynolds numbers ($100 \leq Re \leq 900$) along the channel and this study was also compared with channel flow without ribs. To comprehend the flow and heat transfer mechanism, the velocity and temperature contours were obtained at different Reynolds number in the triangular wavy channel with/without ribs. The numerical results shown that the flow and heat transfer were significantly affected by the channel geometry and nanofluids. CuO-water nanofluid increased the thermal performance, especially at high Reynolds numbers. Moreover, it was observed that the vertical ribs considerably changed the flow structure and thermal fields compared to the channel without ribs. The highest Nusselt number was obtained at Re=900 in the ribbed triangular wavy channel under the nanofluid flow with a slight pressure drop.

Keywords: Triangular wavy channel, Vertical rib, Nanofluids, Heat transfer, Friction factor

1. INTRODUCTION
Wavy channels and extended surface modifications such as fin, rib and baffle are commonly used to enhance heat transfer. These surfaces have an important effect on heat transfer improvement as they both increase the heat transfer surface area and provide self-flow oscillation, but a slight pressure drop occur compared to straight ducts. Wavy channels and extended surfaces with different geometries have been investigated experimentally and numerically by many researchers (Nakhchi, 2019; Modi and Rathod, 2019; Ameur et al. 2021; El Habet et al., 2022; Mehta et al., 2022).

Promvonge et al. (2015) experimentally investigated the heat transfer performance in a channel where inclined horseshoe baffles were used and reported that the heat transfer increased by approximately 92-208% and the friction factor increased by 1.76-6.37 compared to straight ducts. Kumar et al. (2016) experimentally studied the heat transfer behavior of the solar air channel using multiple V-type baffles. Sahel et al. (2016) reported that the different baffle design in a rectangular channel improved heat transfer by 65%. Li and Gao (2017) numerically investigated the flow and heat transfer for turbulent flow in cross corrugated triangular ducts

with delta-shaped baffles. As a result of these studies, it has been reported that wavy channels and different surface modifications improved heat transfer. Kumar et al. (2018) carried out a numerical work to enhance the heat transfer in triangular duct solar air heater due to forward facing chamfered rectangular ribs. Karabulut (2020) numerically examined heat transfer and pressure drop of different triangular baffle angles in cross-corrugated triangular channels. Alnak (2020) studied thermo-hydraulic performance of different square baffle angles in cross-corrugated triangular channels. Bensaci et al. (2020) carried out a numerical and experimental study to examine the heat transfer and hydraulic performance of solar air heaters with different baffle positions.

On the other hand, the thermal properties of conventional fluids used in engineering applications are quite low. Nano-sized particles are added to improve the thermal properties of these fluids. Some researchers have used nanofluids together with wavy channels and extended surfaces. Manca et al. (2012) studied the hydraulic and thermal characteristics of Al_2O_3-water nanofluid at different particle volume ratios ($0\% \leq \varphi \leq 4\%$) in a channel with different rib heights. As a result, they reported that as *Re* and particle volume ratio increased, the heat transfer improved and at the same time an increase was observed in the pumping power. Heshmati et al. (2014) numerically studied the heat transfer at $50 \leq Re \leq 400$ with the baffles of different geometries at varying particle volume ratios ($0.01 \leq \phi \leq 0.04$) of different nanofluids. It was reported that nanofluids with high particle volume ratios and small particle diameter significantly improve heat transfer. Huminic and Huminic (2016) presented a review study on hydraulic and thermal behaviour of basic fluids and nanofluids in the wavy channel. Akdag et al. (2014) numerically investigated the heat transfer of nanofluids in a sinusoidal wavy channel, trapezoidal corrugated channel (2017) and triangular wavy channel (2019) in three different studies. They reported that the Nusselt number increased with increasing nanoparticle volume fraction and Re. Menni et al. (2021) examined the thermal behaviour of nanofluids in the channel with different baffle angles and reported that the highest thermal improvement was obtained when vertical baffles were used at high Reynolds numbers. Qi et al. (2017) numerically and experimentally researched the flow and heat transfer of TiO_2-water nanofluid in a wavy channel. Mei et al. (2019) numerically investigated the heat transfer of Fe_3O_4-water nanofluid using magnetic field in a wavy channel. Kaood and Hassan (2020) numerically investigated the flow and heat transfer of different nanofluids in different wavy channels. They reported that nanofluids were increased heat transfer according to smooth ducts. The thermal behaviour of triangular vortex generator in a channel with different cross-sectional areas were examined by Tian et al. (2020). In their study, air, water and two different nanofluids (Al_2O_3-water and CuO-water) were used. They declared that the vortex generators enhanced significantly heat transfer when nanofluids was employed as the working fluid. However, nanofluids caused more exergy destruction as well. Ajeel et al. (2021) numerically examined the heat transfer of ZnO-water nanofluid with L-shaped baffles in a curved wavy channel and reported that the baffles and nanofluids have a considerable influence on heat transfer enhancement. Akcay (2021) numerically investigated thermo-hydraulic performance of nanofluids in a zigzag channel with baffles.

As seen from previous studies, the ribs/baffles added to the wavy channel increase heat transfer. Even if the thermal performance with these applications is improved, the friction factor increases due to the reduced flow area. Thus, a definite criterion has not been reported for

determining optimum baffles and wavy channel geometries in the literature works. Further studies on nanofluid flow in wavy channel with ribs/baffles needed. In the presented study, the effects of both wavy channel geometry and ribs on heat transfer and friction factor under CuO-water nanofluid for laminar flow were numerically investigated.

2. NUMERICAL STUDY

2.1. Numerical Model

Figure 1 shows the geometry of the ribbed triangular wavy channel. The numerical model is considered as two dimensional. The height of the channel (H) is 12 mm. At the entrance and exit of the channel, the lengths of unheated flat section are L_1 = 5H and L_3=10H, respectively. The length and the thickness of ribs are H/2 and t = 2mm, respectively. The distance between baffles is considered as 2H. The length and height of triangular wavy section are H and H/2, respectively. Distance between triangular wavy parts is H.

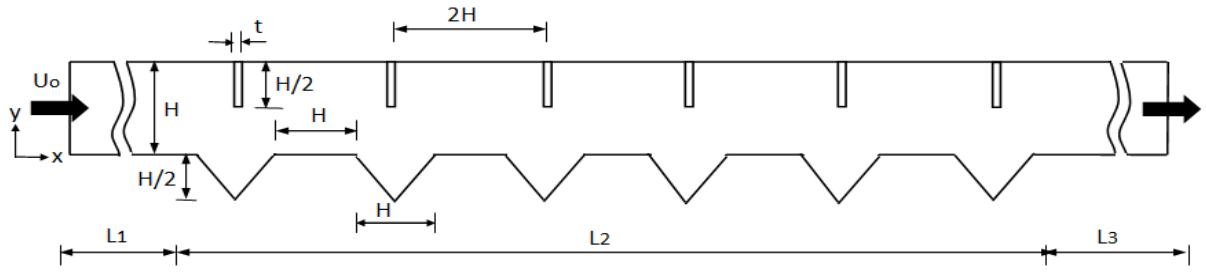


Figure 1. Geometry of the ribbed triangular wavy channel.

The simulations were applied for 100 ≤ Re ≤ 900. CuO-water nanofluid was used as the working fluid. The nanoparticle volume fraction (φ=5%) was considered as a constant.

2.2. Numerical Procedure

The flow is considered steady, laminar, incompressible, two-dimensional, Newtonian type and single-phase. Heat transfer with radiation and gravity were neglected. The governing equations for these assumptions are given below;

$$\nabla(\rho u) = 0 \tag{1}$$

$$\frac{\partial(u_i u_j)}{\partial x_i} = -\frac{\partial p}{\partial x_i} + \frac{1}{Re}\nabla^2 u_j \tag{2}$$

$$u_i \frac{\partial T}{\partial x_i} = \frac{1}{RePr}\nabla^2 T \tag{3}$$

The relevant parameters in this study are Reynolds number, Re, friction factor (f), Nusselt number (Nu). The equations used according to these assumptions are presented below.

The Reynolds number (Re) is calculated as follows:

$$Re = \frac{\rho u D_h}{\mu} \tag{4}$$

Here, D_h, ρ, μ and u are hydraulic diameter, density, dynamic viscosity and mean velocity,

respectively.

The local Nusselt number (Nu) is calculated given by

$$Nu_x = \frac{hD_h}{k} \tag{5}$$

Here, k is the heat conductivity of the fluid, h is heat convective coefficient.

The average Nusselt number can be calculated as follows:

$$Nu = \frac{1}{L}\int_0^L Nu_x \, dx \tag{6}$$

The thermal performance (η) calculated according to the Nusselt number is:

$$\eta = \frac{Nu_n}{Nu_s} \tag{7}$$

Here, Nu_n and Nu_s are the Nusselt number for the nanofluid flow and base fluid, respectively.

The friction factor (f) is given by the following equation:

$$f = \frac{2\Delta P D_h}{\rho u^2 L} \tag{8}$$

The relative friction factor (Γ) is determined as follows:

$$\Gamma = f_n / f_s \tag{9}$$

where, ΔP is the pressure difference, f_n and f_s are the friction factor for nanofluid flow and base fluid, respectively.

Thermo-physical properties of CuO-water nanofluid are calculated with the help of the following equations (Kakac and Pramuanjaroenkij, 2009; Akdag et al., 2019).

$$\rho_{nf} = (1-\varphi)\rho_{bf} + \varphi\rho_{pt} \tag{10}$$

$$c_{nf} = \frac{(1-\varphi)\rho_{bf}c_{bf} + \varphi\rho_p c_{pt}}{\rho_{nf}} \tag{11}$$

$$k_{nf} = k_{bf}\frac{\left[k_{pt} + 2k_{bf} - 2\varphi(k_{bf} - k_{pt})\right]}{\left[k_{pt} + 2k_{bf} + \varphi(k_{bf} - k_{pt})\right]} \tag{12}$$

$$\mu_{nf} = \mu_f(1 + 2.5\varphi) \tag{13}$$

Thermo-physical properties of water and CuO nanoparticle are given in Table 1 (Akdag et al.,

2019).

Table 1. Thermo-physical properties of water and CuO nanoparticle.

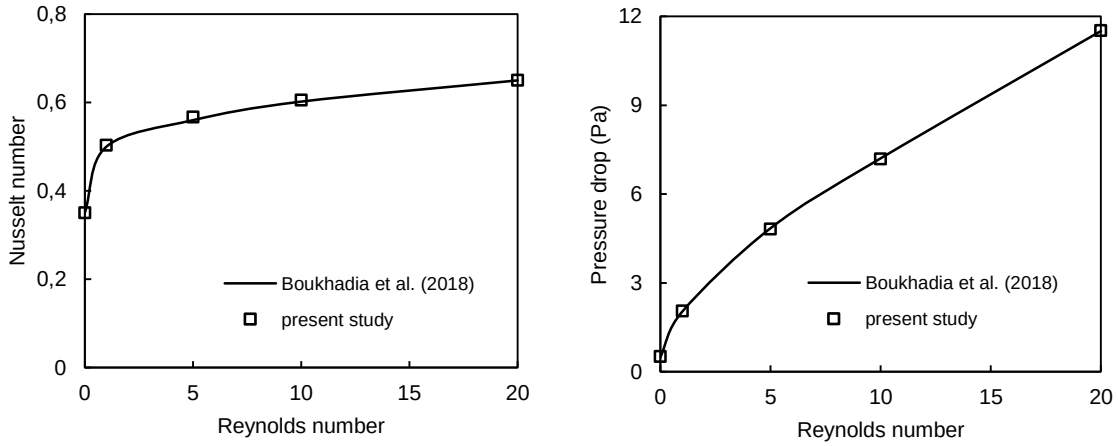
	ρ [kg/m^3]	C [J/kgK]	k [W/mK]	μ [kg/ms]
water	998	4182	0.613	0.001003
CuO	6500	533	17.65	-

Computational Fluid Dynamics (CFD) based FLUENT 15.0 (2015) program was used for numerical solutions. The equations were solved using the SIMPLE algorithm. Various tests were applied for grid independence at cell numbers of 48364, 73318, 100020, 144378, 168502 After 100020 element numbers, the difference between Nusselt numbers was determined to be less than 1%. Therefore, the element number of 100020 was adopted for the numerical model.

The fluid enters the channel at a constant temperature of T_o = 300 K. At the channel entrance, the "velocity inlet" boundary condition was defined. The “outflow” boundary condition is used at the channel outlet. The triangular wavy surfaces of the channel are preserved at a constant temperature of T_w = 360 K. Non-slip and adiabatic boundary conditions are defined for the unheated section at the entrance and exit of the channel. Non-slip and adiabatic conditions are also used for the ribs.

3. RESULTS AND DISCUSSION

To validate of the numerical solutions, this work was compared with the study conducted by Boukhadia et al. (2018). Nusselt number and pressure drop were calculated with Reynolds numbers ($0 \leq Re \leq 20$) in a channel with a hydraulic diameter of 12 mm. The agreement between the results of those studies is shown in Figure 2.



a b

Figure 2. Validation of the numerical study with previous work (Boukhadia et al., 2018).

In this section, the effects of vertical ribs, CuO-water nanofluid and Reynolds number on flow and heat transfer are discussed. The velocity and temperature contours were acquired to elucidate the flow and heat transfer mechanism in the channel. Figure 3 indicates the velocity contours (a) and the temperature fields (b) for the nanofluid and the base fluid in a triangular wavy channel with/without ribs at Re=100. The velocity contours for the nanofluid and the base fluid in the ribless channel are very close to each other. It is seen that the flow generally flows

parallel to the channel surfaces and directed towards the triangular spaces on the lower surface. The velocity contours for the nanofluid flow in the ribbed channel are quite different from the ribless channel. The vertical ribs are considerably changed the flow structure in the channel. These ribs directed the flow towards triangular wavy surfaces, causing flow oscillation. In the ribbed channel, it is seen that the flow loops occur between each vertical ribs (Fig.3a). Figure 3b shown that the temperature fields were affected from the wavy channel structure depending on the ribs. In the ribless channel, the temperature of the triangular wavy walls of the channel maintained at constant temperature is quite high and there is completely hot fluid inside the triangular segments. It is also observed that the temperature of the channel surface for nanofluid flow is lower than the base fluid in the channel without ribs. The vertical ribs cause a decrease in the thermal resistance by disrupting the flow structure. Thus, the temperature gradient in the surface decreases and the heat transfer improves. It is observed that the surface temperature for nanofluid flow in the ribbed channel is lower than the channel without ribs.

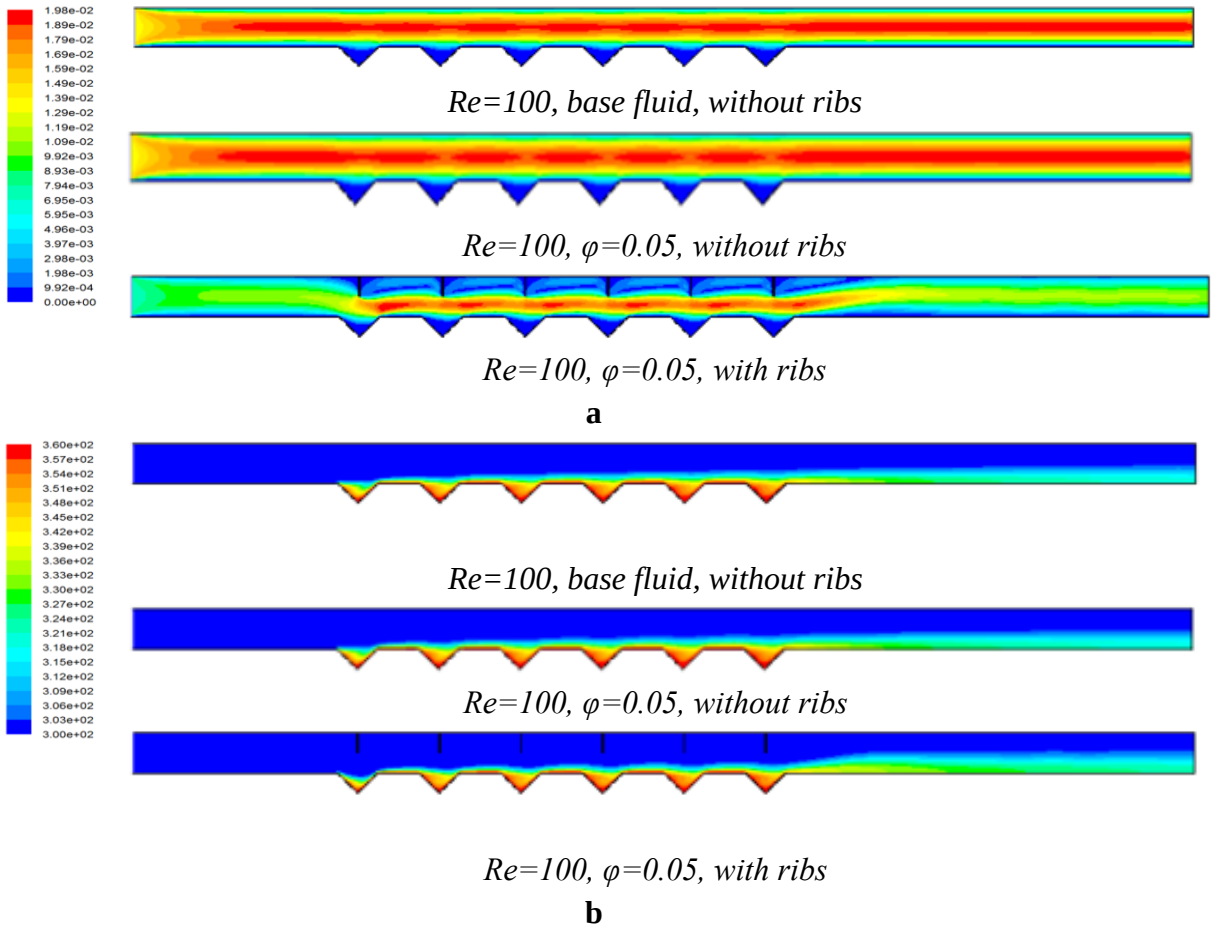


Figure 3.a-Velocity contours, **b-** temperature fields in the channels with/without ribs for nanofluid and base fluid flow at Re=100.

Figure 4 shows the velocity contours (a) and the temperature fields (b) for the nanofluid and the base fluid flow in channel with/without ribs at Re=900. In the ribless channel at Re=900, the flow structure is intact, only flow fluctuations are observed towards the channel outlet. In the ribbed channel, the flow structure completely deteriorated and ruptures occurred in the flow. Recirculation zones occurred between the vertical ribs and in the triangular spaces (Fig. 4a). These flow loops help heat transfer improvement due to a homogeneous flow mixture. The heat transfer increased with increasing the Reynolds number. It is seen that the temperature of the

triangular wavy walls at Re=900 is quite low compared to Re=100. It is observed that the temperature gradient on the wavy surfaces is quite low in nanofluid flow in the ribbed channel (Fig. 4b).

Figure 5 shows the variation of Nusselt number (a), thermal performance (b), and relative friction factor (c) with Reynolds numbers. In the channel without ribs, the heat transfer in the nanofluid flow is higher than in the base fluid. The increase in the Nusselt number for nanofluid flow in the ribbed channel is considerably higher than in the channel without ribs. Also, the heat transfer increases with the increase in the Reynolds number. The highest heat transfer was obtained as approximately Nu=7.38 in the ribbed channel at Re=900 (Figure 5a).

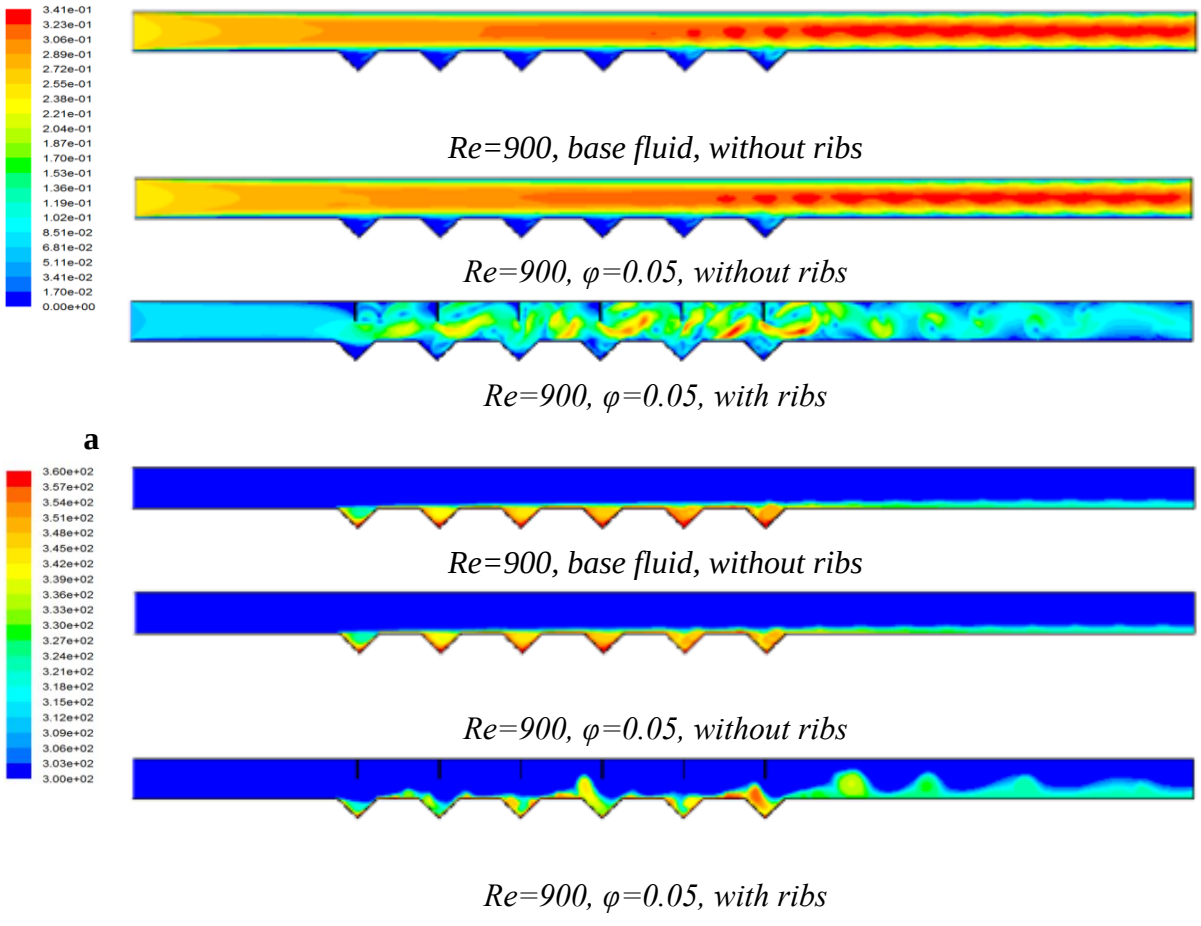


Figure 4.a-Velocity contours, **b-** temperature fields in the channels with/without ribs in nanofluid and base fluid flow at Re=900.

Figure 5b shows the thermal performance in channel with/without ribs for different Reynolds numbers. $Nu_{(r,n)}$, $Nu_{(n)}$ and Nu_s represent Nusselt number for the nanofluid flow in the ribbed channel, friction factor for the nanofluid flow in the ribless channel and friction factor for the base fluid in the ribless channel, respectively. The highest thermal performance was obtained in the $Nu_{(r,n)}/Nu_s$ case. Because the highest Nu was obtained in the nanofluid flow in the ribbed channel, while the lowest Nu was found for the base fluid in the channel without ribs. The highest thermal performance was obtained to be approximately 1.48 in nanofluid flow conditions in the ribbed channel at Re=900.

Figure 5c indicates the relative friction factor with Reynolds numbers. $f_{(r,n)}$, $f_{(n)}$ and f_s, represent friction factor for the nanofluid flow in the ribbed channel, friction factor for the nanofluid flow in the ribless channel and friction factor for the base fluid in the ribless channel, respectively. The relative friction factor increased dramatically with increasing Reynolds number in the ribbed channel. The highest dimensionless friction factor was obtained in the case $f_{(r,n)}/f_s$. Highest pressure drop was obtained in the nanofluid flow in the channel with ribs, while the lowest pressure drop was obtained for the base fluid in the channel without ribs. The highest relative friction factor was found to be approximately 4.66 at Re=900 in the case of $f_{(r,n)}/f_s$.

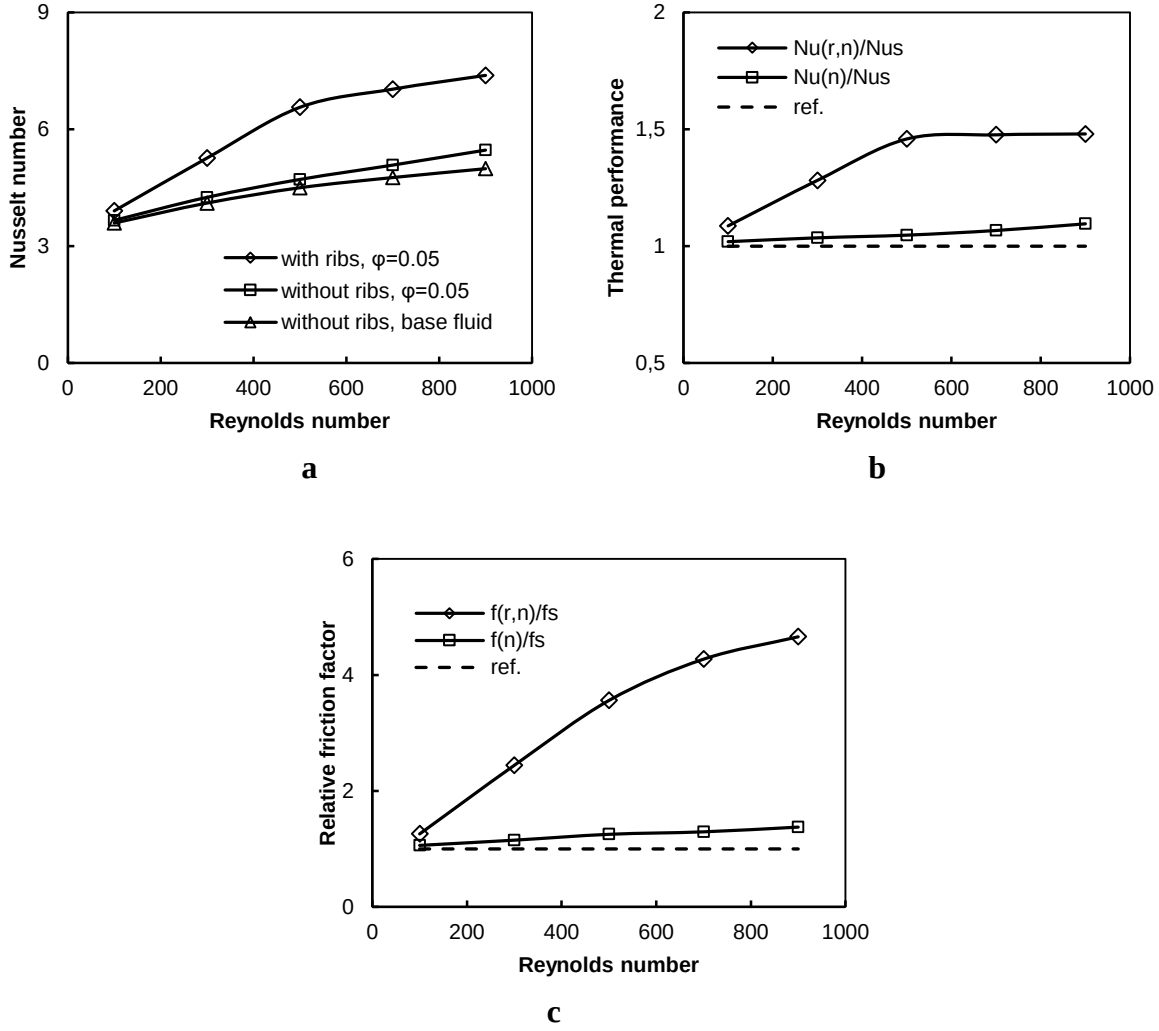


Figure 6. Variation of Nusselt number (a), thermal performance (b), and relative friction factor (c) with Reynolds numbers.

This numerical study showed that the use of extented surfaces in wavy channels significantly affects the flow structure and heat transfer. Preferring nanofluid as the working fluid increases the heat transfer enhancement compared to the base fluid. However, pressure drop in the channel increase some due to extented surfaces and nanoparticles.

4. RESULTS

This study numerically investigated the thermal performance and relative friction factor of a triangular wavy channel with/without ribs under nanofluid flow. The effects on the flow and heat transfer of the vertical ribs, CuO-water nanofluid and Reynolds numbers were examined. The velocity and temperature contours in the channel were obtained. The prominent findings

of the study were as follows:

- The velocity and temperature contours were highly influenced by channel geometry. It was observed that vertical ribs caused flow oscillations, creating recirculation zones between ribs and in triangular wavy sections.
- The use of CuO-water nanofluid was increased the Nusselt number compared to the base fluid. Heat transfer increased with increasing Reynolds number.
- The highest Nusselt number was obtained as about Nu=7.38 in the nanofluid flow in the ribbed channel at Re=900.
- The highest thermal performance was obtained as about 1.48 in the nanofluid flow in the ribbed channel at Re=900.
- The pressure drop increased in the channel due to ribs and nanoparticles. The highest relative friction factor was obtained as approximately 4.66 at Re=900.

REFERENCES

Ajeel, R.K., Sopian, K., and Zulkifli, R., (2021), Thermal-Hydraulic Performance and Design Parameters in a Curved-Corrugated Channel with L-Shaped Baffles and Nanofluid. *Journal of Energy Storage*, 34, 101996.

Akcay, S., (2021), Investigation of Thermo-Hydraulic Performance of Nanofluids in a Zigzag Channel with Baffles. *Adiyaman University Journal of Engineering Sciences*, 15, 525-534.

Akdag, U., Akcay, S., and Demiral, D., (2014), Heat Transfer Enhancement with Laminar Pulsating Nanofluid Flow in a Wavy Channel. *Int. Commun. Heat Mass Trans.* 59, 17–23.

Akdag, U., Akcay, S., and Demiral, D., (2017), Heat Transfer Enhancement with Nanofluids Under Laminar Pulsating Flow in a Trapezoidal-Corrugated Channel. *Progress in Computational Fluid Dynamics*, 17, 5, 302-312.

Akdag, U., Akcay, S., and Demiral, D., (2019), Heat Transfer in a Triangular Wavy Channel with CuO-Water Nanofluids under Pulsating Flow. *Thermal Science*, 23, 1, 191-205.

Alnak, D.E., (2020), Thermohydraulic Performance Study of Different Square Baffle Angles in Cross-corrugated Channel. *Journal of Energy Storage*, 28, 101295.

Ameur, H., Sahel, D., and Menni, Y., (2021), Numerical Investigation of the Performance of Perforated Baffles in a Plate-Fin Heat Exchanger. *Thermal Science*, 25, 5B, 3629-3641.

ANSYS Inc., (2015), *ANSYS Fluent User Guide & Theory Guide- Release 15.0,* USA.

Bensaci, C.E., Moummi, A., Sanchez de la Flor, F.J., Rodriguez Jara, E.A., Rincon-Casado, A., and Ruiz-Pardo, A., (2020), Numerical and Experimental Study of the Heat Transfer and Hydraulic Performance of Solar Air Heaters with Different Baffle Positions. *Renew Energy*, 155, 1231–1244.

Boukhadia, K., Ameur, H., Sahel, D., and Bozit, M., (2018), Effect of the Perforation Design on the Fluid Flow and Heat Transfer Characteristics of a Plate Fin Heat Exchanger. *International Journal of Thermal Sciences*, 126, 172-180.

El Habet, M.A., Ahmed, S.A., and Saleh, M.A., (2022), The Effect of Using Staggered and Partially Tilted Perforated Baffles on Heat Transfer and Flow Characteristics in a Rectangular Channel. *Int. J. Thermal Sciences*, 174, 107422.

Heshmati, A., Mohammed, H.A., and Darus, A.N., (2014), Mixed Convection Heat Transfer of Nanofluids Over Backward Facing Step Having a Slotted Baffle. *Applied Mathematics and Computation*, 240, 368–386.

Huminic, G., and Huminic, A., (2016), Heat Transfer and Flow Characteristics of Conventional Fluids and Nanofluids in Curved Tubes: A review. *Renewable and Sustainable Energy Reviews*, 58, 1327–1347.

Kakac, S., and Pramuanjaroenkij, A., (2009), Review of Convective Heat Transfer Enhancement with Nanofluids. *Int. J. Heat Mass Trans.*, 52, 3187–3196.

Kaood, A., and Hassan, M.A., (2020), Thermo-hydraulic Performance of Nanofluids Flow in Various Internally Corrugated Tubes. *Chemical Engineering & Processing: Process Intensification*, 154, 08043.

Karabulut, K., (2020), Heat Transfer and Pressure Drop Evaluation of Different Triangular Baffle Placement Angles in Cross-corrugated Triangular Channels. *Thermal Sci.*, 24, 355-365.

Kumar, R., Goel, V., and Kumar, A., (2018), Investigation of Heat Transfer Augmentation and Friction Factor in Triangular Duct Solar Air Heater due to Forward Facing Chamfered Rectangular Ribs: A CFD based analysis. *Renew Energy*, 115, 824–835.

Kumar, R., Kumar, A., Chauhan, R., and Sethi, M., (2016), Heat Transfer Enhancement in Solar Air Channel with Broken Multiple V-type Baffle. *Case Stud. Therm. Eng.*, 8, 187–197.

Li, Z., and Gao, Y., (2017), Numerical Study of Turbulent Flow and Heat Transfer in Cross Corrugated Triangular Ducts with Delta-shaped Baffles. *Int. J. Heat Mass Trans.*, 108, 658–670.

Manca, O., Nardini, S., and Ricci, D., (2012), A Numerical Study of Nanofluid Forced Convection in Ribbed Channels, *Applied Thermal Engineering*, 37, 280-297.

Mehta, S.K., Pati, S., and Barany, L., (2022), Effect of Amplitude of Walls on Thermal and Hydrodynamic Characteristics of Laminar Flow Through an Asymmetric Wavy Channel. *Case Studies in Thermal Engineering*, 31, 101796.

Mei, S., Qi, C., Luo, T., Zhai, X., and Yan, Y., (2019), Effects of Magnetic Field on Thermo-hydraulic Performance of Fe_3O_4-water Nanofluids in a Corrugated Tube, *International Journal of Heat and Mass Transfer*, 128, 24–45.

Menni, Y., Chamkha, A.J., Ghazvini, M., Ahmadi, M.H., Ameur, H., Issakhov, A., and Inc, M., (2021), Enhancement of the Turbulent Convective Heat Transfer in Channels Through the Baffling Technique and Oil/Multiwalled Carbon Nanotube Nanofluids. *Numerical Heat Transfer, Part A: Applications*, 79, 4, 311-351.

Modi, J.A., and Rathod, M.K., (2019), Comparative Study of Heat Transfer Enhancement and Pressure Drop for Fin-and-Circular Tube Compact Heat Exchangers with Sinusoidal Wavy and Elliptical Curved Rectangular Winglet Vortex Generator. *International Journal of Heat and Mass Transfer*, 141, 310-326.

Nakhchi, M.E., (2019), Experimental Optimization of Geometrical Parameters on Heat Transfer and Pressure Drop Inside Sinusoidal Wavy Channels. *Thermal Science and Engineering Progress*, 9, 121–131.

Promvonge, P., Tamna, S., Pimsarn, M., and Thianpong, C., (2015), Thermal Characterization in a Circular Tube Fitted with Inclined Horseshoe Baffles, *Appl. Therm. Eng*., 75, 1147–1155.

Qi, C., Wan, Y.L., Li, C.Y., Han, D.T., and Rao, Z.H., (2017), Experimental and Numerical Research on the Flow and Heat Transfer Characteristics of TiO_2-water Nanofluids in a Corrugated Tube. *International Journal of Heat and Mass Transfer*, 115, 1072–1084.

Sahel, D., Ameur, H., Benzeguir, R., and Kamla, Y., (2016), Enhancement of Heat Transfer in a Rectangular Channel with Perforated Baffles. *Appl. Therm. Eng*., 101, 156–164.

Tian, M.-W., Khorasani, S., Moria, H., Pourhedayat, S., and Dizaji, H.S., (2020), Profit and Efficiency Boost of Triangular Vortex-Generators by Novel Techniques, *International Journal of Heat and Mass Transfer*, 156, 19842.

DEVELOPING A HYDROECONOMIC OPTIMIZATION MODEL FOR THE EUPHRATES BASIN

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ABSTRACT

Climate change and global warming are important issues that humankind faces in this century and the near future**.** With climate change, the regional precipitation regime is expected change and hydrologic variablity is predicted to increase. Negative consequences of climate change can be lessened with sustainable water management that considers the water-food-energy nexus and the ecosystem and their relationship with each other. The success of this sustainable water management depends on realistic models that includes climate change and human-hydrology interactions. Capable of representing these interactions, hydroeconomic optimization models provide a suitable medium for climate change studies in water resources. Hydroeconomic optimization models use hydrologic and economic data. The objective in hydroeconomic optimization models is to either minimize overall costs or maximize overall benefits. Not requiring existing operating rules, these economics-driven models estimate behavior of water systems under future conditions, allowing adaptation capabilities and capacities to be assessed. Hydroeconomic optimization models mathematically represent relations between water demands of different water users (such as agricultural, industrial, municipal and hydropower) and the basin hydrology.

In the climatic conditions envisaged in the future, adaptation strategies for the Euphrates Basin were evaluated and adaptations were proposed that could reduce the cost of increased hydrological variability. After the database was created with data from various institutions, Euphrates Hydroeconomic Optimization Model FEHEM was developed. Fehem model study identified possible water shortages that may occur in the near future as a result of climate change and global warming and developed basin-scale adaptation strategies for water operations. The model revealed the effects of climate change on the energy market and prices. As a result, this study will guide the development of a basin-scale action plan for climate change.

Keywords: Hydroeconomic model, Energy, Adaptation strategies.

A LANGUAGE RECOGNITION SYSTEM FOR PHILIPPINES INDIGENOUS B'LAAN LANGUAGE USING HYBRID CONVOLUTIONAL AND RECURRENT NEURAL NETWORK

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ABSTRACT

Automatic Speech Recognition (ASR) being a subset of Natural Language Process (NLP) under the knowledge area of Artificial Intelligence (AI), aims to make communication between humans and computers as natural as possible. Deep Neural Networks (DNNs), a neural network with more than two layers of complexity and uses mathematical modeling to process data, has been used in speech recognition as early as 2010. In the Philippines setup, the accent of a speaker can be highly influenced by other speakers in an approximate geographical location where people can speak the same language but with a different accent resulting to a language (e.g. Local Filipino or Indigenous Dialect) used with multiple accents. The aim of this study is to develop in Hardware-based Automatic Speech Recognition for Philippines B'laan Indigenous language using Integrated Convolutional and Recurrent Neural Network Algorithm through the speech corpus that was collected by the researcher from the souther part of the country. B'laan has fifteen consonant and seven vowel phonemes which unlike most other Philippine languages and Austronesian languages in general, B'laan (as its related language Tboli, permits a variety of consonant clusters at the onset of a syllable. These datasets are composed of audio files that contain unedited recordings of natural voices of participants, which are raw audio output from raspberry pi powered recording device. The CNN Layer, Dense Layer, and RNN were used is to predict the transcription of the audio input using several layers that would determine the output of the audio. The researchers use a Python package that is capable of reading the signal from the audio and transforming it into input data for the model. After the noise reduction and filtering process, each cleaned audio recordings were imported to PRAAT application tool for speech/voice feature extraction. Overal the result emphasize the accuracy of the model in training has reached up to 96.67 while having 84.7% during testing and word error rate of 3.33%.

Keywords: Speech Recognition, Convolutional Neural Network, Natural Language Process, Dialect

DETERMINING CUSTOMER SATISFACTION INDEX FOR CIVIL AVIATION ORGANIZATIONS BASED ON FUZZY LOGIC AND SERVQUAL METHOD

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ABSTRACT
The aviation sector in Türkiye is one of the sectors with the highest growth rate. Competition in the aviation industry in recent years has greatly affected the activities of businesses. For businesses to survive in the long run, it is necessary to implement customer-oriented policies that give importance to customer satisfaction. Within the scope of this study, a survey was conducted to measure how satisfied the customers are with the service offered to customers by some aviation companies that are active in Türkiye. With this study, 115 survey data were obtained in Antalya airport. The questionnaire consists of two parts. In the first part, 8 questions were asked to determine the demographic characteristics of the participants who filled out the questionnaire. In the second part, 14 questions prepared with a 10-point Likert scale were asked, which they could evaluate according to their last flight. Three sub (environmental factor quality, relationship quality, and Service quality) and one main (Customer Satisfaction) Fuzzy Logic inference systems are used as the method for the evaluation of the survey data obtained. By entering the survey data into the inference systems, we obtain the customer satisfaction index for the aviation companies. On the other hand, the SERVQUAL model was also applied to measure service quality. According to the SERVQUAL, service quality is determined by measuring the difference between the quality of service perceived by customers and the service quality that customers expect from companies. Along with the data and methods used, it is aimed to make a comparison according to the perceived service quality levels among the relevant aviation companies, and a quality index ranking is made.

Keywords: Service quality; Customer satisfaction; Aviation companies; Servqual; Fuzzy Logic.

STUDY TO IMPROVE SAFETY FOR REPAIR WORKSHOPS OF THE INTERNAL COMBUSTION ENGINES

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ABSTRACT
The warehouses, technical repair workshops, and repair for internal combustion engines often contain flammable and explosive substances such as fuel, gas, lubricating oil, and other gases. Besides, human subjectivity, combined with the breakdown of the vessels and containers containing the above substances, can lead to leakage. These leaks, if not detected in time in hot weather, can cause fire and explosion and cause considerable damage to property and people. To well implement solutions to ensure safety and prevent fire and explosion. The application of technological equipment to monitor and warn is necessary. In particular, equipment that is not too complicated, easy to use and replace, and suitable for all conditions will to prioritized for manufacturing and assembly. This article presents the manufacturing, installation, and use of monitoring equipment with a fuel leak gauge sensor to provide early warning when a leak occurs. A warning information will be alerted directly through the sound device, signal lights, and via phone waves to managers, and technical experts, to promptly detect and limit dangerous incidents, ensuring safety for people and property. Research results show that the safety monitoring equipment is manufactured and assembled, applied in the repair workshops of the diesel engines, with high reliability.

Keywords: safety, monitoring, warning, fuel, internal combustion engines

1. INTRODUCTION
To properly implement solutions to ensure safety against fire and explosion. The application of technological equipment used for monitoring and warning in warehouses, and technical repair workshops, especially for internal combustion engine repair workshops, is very necessary because those are many flammable substances such as fuel and lubricating oil for engine repair and maintenance [3]. For the solution to be highly feasible and the equipment to be easy to use and replace when damaged, devices that are not too complicated and are suitable for all conditions of use will prioritize manufacturing and assembly [1].

Research to improve safety for internal combustion engine repair workshops concentrate mainly on manufacturing and mounting warning devices. The technology for manufacturing and mounting equipment is to use sensors, transmit modules, microcontrollers, and Arduino boards [2, 7]. Warning device after manufacturing and assembling, responsible for safety monitoring for technical workshops and internal combustion engine repair workshops. A warning information will be warned directly through the sound, signal lights, and via phone waves to managers and technical experts to promptly detect and limit dangerous incidents, ensuring safety for people and property [8-9].

2. RESEARCH CONTENT

2.1. Microcontroller and Arduino board

A microcontroller is a computer integrated on a chip, commonly used to control electronic devices [6]. A microcontroller is essentially a system consisting of a microprocessor with enough performance, low cost (different from Multifunction microprocessors used in computers), combined with peripheral blocks such as memory, I/O modules, digital-to-analog, and analog-to-digital converter modules. Whereas in computers, modules are built commonly by chips and external circuits [4].

Microcontrollers are also often used to build embedded systems and appear mainly in electrical, electronic, telephone, DVD players, multimedia devices, automatic systems, etc. Most microcontrollers today are built on the Harvard architecture, which defines the four essential components of an embedded system. These components are the CPU core, program memory (usually ROM or flash memory), data memory (RAM), one or more timers, and I/O ports for communicating with devices peripherals and external environments, all of which are designed in an integrated circuit [7]. Microcontrollers differ from multifunction microprocessors because they can operate with only a few external support circuits.

The Arduino board is an easy-to-use hardware and software-based prototype platform (open source). Arduino consists of a circuit board and supporting software called the Arduino IDE (integrated development environment for Arduino), which is used to write and load computer code to the physical board.

Main features of Arduino board and Arduino IDE [7, 10]:

- Arduino boards read analog or digital signals as input from various sensors and convert them to output to activate different operations in the system control.
- Can control the functions of the Arduino board by loading the commands to the microcontroller on board through the supporting software, the Arduino IDE.
- Arduino only needs to use the USB cable to load the code into the board.
- Arduino IDE software uses the C++ version, so programming able is not too complicated.
- Currently, on the market there are many types of Arduino boards, depending on the type of microcontroller that Arduino uses. However, all Arduino boards have one thing in common, they can program through the Arduino IDE. The difference lies in the number of inputs and outputs, specifically the number of inputs sensors, indicator lights, buttons, etc, that can be used on a single circuit.
- The Arduino IDE software interface is shown in Fig. 1 [2].

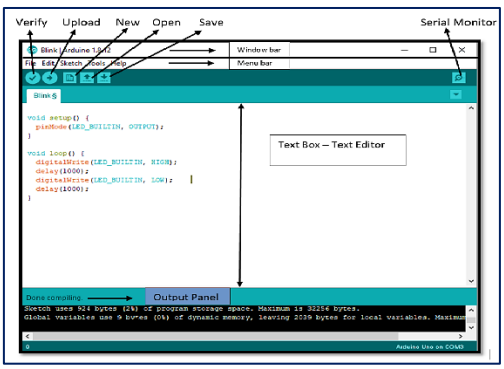

Fig. 1. Arduino IDE software interface

Below are the current Arduino boards on the market and are often applied in control and alarm systems (Table 1, Table 2, Table 3, Table 4) [2, 7, 10].

Table 1. Circuit board using ATMEGA328 microcontroller

Circuit name	Power supply	Pulse speed	I/O number	Analog input number	PWM	UART	Programming interface
Arduino Uno R3	5 V	16 MHz	14	6	6	1	USB to ATMega16U2
Arduino Uno R3 SMD	5 V	16 MHz	14	16	14	4	USB to ATMega16U2
Arduino Nano	5 V	16 MHz	14	8	6	1	UART CH340
Red Board	5 V	16 MHz	14	6	6	1	USB to FTDI
Arduino Pro 3.3v/8 MHz	3.3 V	8 MHz	14	6	6	1	FTDI
Arduino Pro 5v/16 MHz	5 V	16 MHz	14	6	6	1	FTDI
Arduino Mini 05	5 V	16 MHz	14	8	6	1	FTDI
Arduino Pro mini 3.3v/8mhz	3.3 V	8 MHz	14	8	6	1	FTDI
Arduino Ethernet	5 V	16 MHz	14	6	6	1	FTDI
Arduino Fio	3.3 V	8 MHz	14	8	6	1	FTDI

Table 2. Circuit board using ATMEGA32u4 microcontroller

Circuit name	Power supply	Pulse speed	I/O number	Analog input number	PWM	UART	Programming interface
Arduino Leonardo	5 V	16 MHz	20	12	7	1	USB
LilyPad Arduino USB	3.3 V	8 MHz	14	6	6	1	USB

Table 3. Circuit board using ATMEGA2560 microcontroller

Circuit name	Power supply	Pulse speed	I/O number	Analog input number	PWM	UART	Programming interface
Arduino Mega 2560 R3	5 V	16 MHz	54	16	14	4	USB to ATMega16U2B
Arduino Mega Pro 3.3V	3.3 V	8 MHz	54	16	14	4	FTDI
Arduino Mega Pro 5V	5 V	8 MHz	54	16	14	4	FTDI

Table 4. Circuit board using AT91SAM3X8E microcontroller

Circuit name	Power supply	Pulse speed	I/O number	Analog input number	PWM	UART	Programming interface
Arduino Mega 2560 R3	3.3 V	84 MHz	54	12	12	4	USB

The advantages of Arduino such as Arduino comes in complete package form including power regulator, recorder, oscillator, micro-controller, serial communication interface, led, USB port, and com with technology simple coding technique. In this study, select Arduino nano board using ATMEGA328 microcontroller. The parameters are shown in Table 1, and the diagram of connecting the Arduino board to the computer to write a program for the microcontroller is shown in Fig.2 [2].

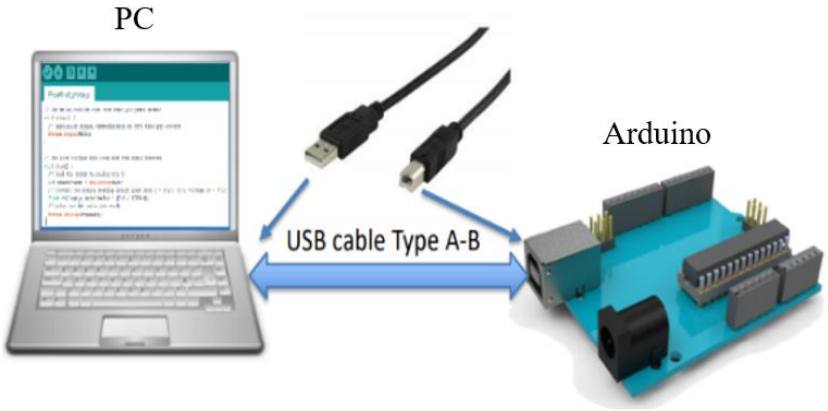

Fig. 2. Connecting the Arduino board to write a program in the Arduino IDE

2.2. Fuel leak detection sensor

The leakage of spilled fuel can cause fire and explosion, so it is necessary to have a leak detection sensor for the fastest alarm and timely repair [5]. Fuel leak detection sensors are designed to detect the presence of leaking substances. The above leaks can be diesel, gasoline, lubricating oil, etc, the fuel leak sensor is selected and manufactured by capacitive technology with very high sensitivity. Specifications of fuel leak detection sensor [11]:

- Manufacturer: Dinel - Czech (EU)
- Model: CLS-23N-10-A-P-G1/2-E30-K2-SHV
- Dimensions Φ12 x 30 mm
- PNP relay output when detecting oil spill
- G1/2 threaded connection
- Sensor material 304 SS
- Response time: 0.1s almost instantaneously when oil is detected
- Maximum working temperature 80^0C on sensor body and 105^0C at sensor probe
- Can be used for all types of gasoline-oil

Such, the fuel leak detection sensor has an almost instantaneous response time as soon as an oil leak comes into contact with the sensor.

Based on the selection of the central processing board, the sensor, and the manufacture of the GSM transceiver with the Quectel M66 chip [12], the module connection diagram for the application of early detection of unsafe incidents in the warehouses and workshops for repairing internal combustion engines are shown in Fig. 3.

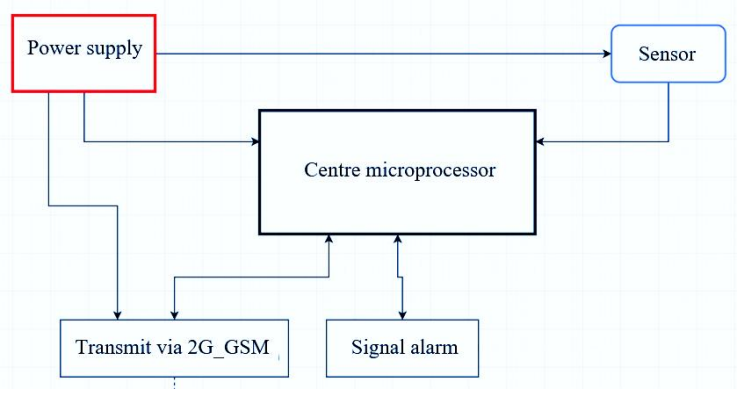

Fig.3. Schematic overview of the device for detecting unsafe incidents

3. RESEARCH RESULTS AND DISCUSSION

Sensor: After selecting the appropriate sensor and circuit board, the installation diagram of the sensor for measuring fuel leakage and connecting to the control circuit is shown in Fig.4.

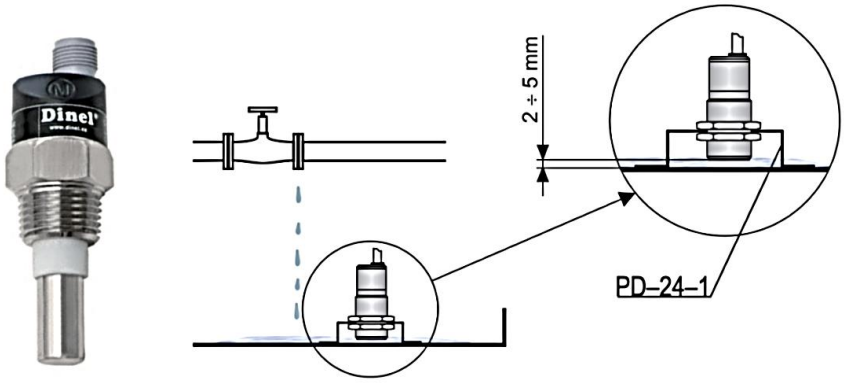

Fig. 4. Sensor and installation diagram of fuel leak sensor

Arduino nano controller circuit: Arduino nano controller circuit has a base shown in Fig.5, used to receive signals from sensors, process signals, and generate alarms by two methods: Local warning by sound, light (speakers, signal lights), and alarms via phone waves to the user's phone, through the phone number loaded into the control program of the control circuit.

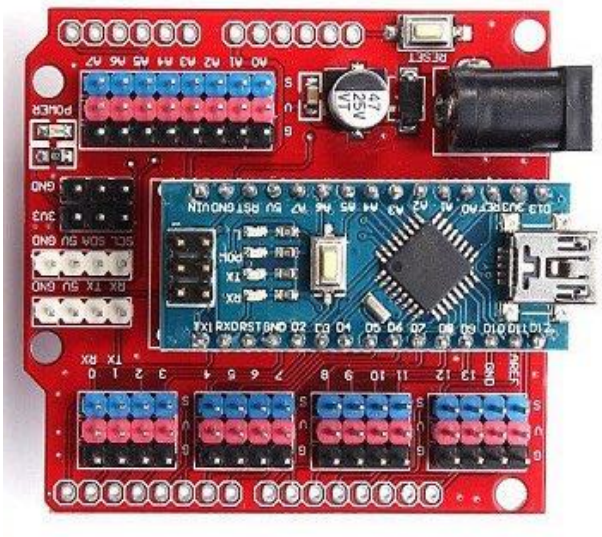

Fig. 5. Arduino nano controller circuit

GSM transceiver module: The GSM transceiver module uses the Quectel M66 chip (using C++ to write programs for the module). M66 is an ultra-compact quad-band GSM/GRPS module

using LCC castellation packaging. Based on the latest 2G chipset, it has the optimal performance in SMS & data transmission and audio service even in a harsh environment. The highly compact profile makes it a perfect selection for size-sensitive applications, and low power consumption and extended temperature range make M66 the best choice for applications (Fig. 6).



Fig. 6. GSM transceiver module using Quectel M66 chip

Connection and installation of equipment: The equipment after inspection, installation, and assembly are shown in Fig.7. The equipment is arranged for testing at the internal combustion engine repair workshops shown in Fig. 8.

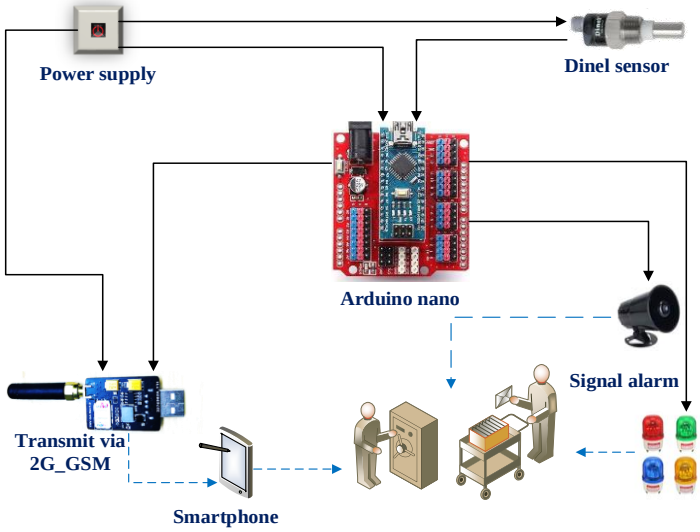

Fig. 7. Diagram of connection and installation of equipment



Fig.8. Experimental setup diagram
1 - fuel leak sensor location, 2 - warning device

4. CONCLUSION

The research has selected the sensor, and control circuit and manufactured the GSM transceiver module using the suitable Quectel M66 chip, warning when there is a fuel leak problem in the warehouse, the internal combustion engine repair workshops, the devices are easy to use, it's control program can be changed according to the warning requirement. The warning device can be put in warehouses and internal combustion engine repair workshops without affecting other activities. The research results have contributed to limiting incidents in the internal combustion engine repair workshop, ensuring the safety of people and property, and at the same time serving as a basis for building a monitoring and warning system for incidents and other safety loss may occur.

REFERENCES

[1] Asgeir J. Sorensen, Marine Control Systems, Norwegian University of Science and Technology, 2013.
[2] Eli Santistevan, Programming With Arduino, Sparkfun Electronics, 2018.
[3] K. Mollenhauer, H. Tschoeke, Handbook of Diesel Engines, DOI 10.1007/978-3-540-89083-6, Springer-Verlag Berlin Heidelberg, 2010.
[4] Ngo Dien Tap, Microprocessor in Measurement and Control, Science and Technology Publishing House, 2000.
[5] Phan Quoc Pho, Nguyen Duc Chien, Textbook of Sensors, Science and Technology Publishing House, 2000.
[6] https://www.microchip.com/ atmega2560 | microchip technology.
[7] https://www.electronics-notes.com/articles/analogue_circuits/.
[8] https://www.checkengine.me/monitors.
[9] https://www.gov.uk/government/publications/fishermens-safety-guide.
[10] https://arduinokit.vn.
[11] https://thietbikythuat.com.vn/cam-bien-phat-hien-ro-ri-dau/.
[12] https://pdf1.alldatasheet.vn/datasheet-pdf/view/1251036/quectel/M66-R2.0.html.

OCCUPATIONAL EXPOSURE TO DUST AND RESPIRATORY SYMPTOMS AMONG LATEX GLOVE WORKERS AT DIFFERENT WORKSTATIONS IN SENAWANG, NEGERI SEMBILAN

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ABSTRACT
The latex glove process has been known to produce a high amount of organic dust in the working environment. Without any protection, the workers in the factory were exposed to dust in their daily routines for a long time. This study aims to determine occupational exposure to inhalable dust and the respiratory symptoms of workers in the latex glove industry. A DustTrak was used to identify the level of dust exposure at the respective workstation. An adapted questionnaire was used among 90 respondents, and their lung function was assessed by using an electronic spirometer. The highest exposure to dust was found at the stripping station (0.437 mg/m3). Some of the respondents reported respiratory symptoms according to their workstation; Stripping station (Coughing: 43.3%, Phlegm: 37.7%, Wheezing: 32.2%, Shortness of breath: 32.3%), Quality Control (Coughing – 18.8%, Phlegm – 17.7%, Wheezing – 16.6%, Shortness of breath – 12.2%), and Technical and Maintenance (Coughing – 5.5%, Phlegm – 6.7%, Wheezing – 6.7%, Shortness of breath – 4.4%). Lung abnormalities were reported at different workstations; Stripping station (46.7%), Quality Control (20%), and Technical and Maintenance (5.5%). There was a significant relationship between exposure to dust and respiratory symptoms at a p-value < 0.05 in coughing and wheezing. The various workstation groups and lung function are statistically different with FEV1/FVC ($F = 0.923$, $p = 0.016$) and the difference between exposure to dust and different groups of workstations is statistically significant at $p = 0.035$. According to the findings, the stripping station has the most risk of respiratory health problems. It is suggested to provide more prevention and control, such as job rotation and good ventilation, to reduce the risk. In conclusion, recognition of the hazards associated with occupational lung disease and prevention of exposure must be a high priority.

Keywords: respiratory symptoms, lung function test, spirometer, latex glove workers

INTRODUCTION
According to Malaysian Rubber Export Production, the total global rubber production increased

to 26.9 million tonnes in 2016 from 23.7 million tonnes in 2010, growing at an annual average rate of 2.2 percent, and Malaysia surpassed Thailand, Indonesia, Vietnam, and China to become the world's fifth-largest producer of Natural rubber (NR) (The Office ff Chıef Statıstıcıan Malaysıa Department of Statıstıcs, Malaysıa, 2022). Based on the Ministry of International Trade and Industry (MITI,n.d), several products are based on latex rubber such as tires, safety or special function gloves, and dry rubber products such as belting, hoses, pipes, tubing, and rubber profiles.

The manufacturing industry workers were exposed to many harmful factors in their work environments, such as dust, fumes from rubber-making and vulcanization processes, and potential carcinogenic exposures including N-nitrosamines, polycyclic aromatic hydrocarbons, solvents, and phthalates reported by Birkett et al. (2019). However, in this study, chemical hazards in latex manufacturing which was the dust scattered all around the working area will be assessed. Exposure to dust was known to produce a variety of clinical responses, including asthma, chronic bronchitis, chronic airways obstructive disease (COPD), allergic alveolitis, and organic dust toxic syndrome (ODTS) stated by Viegas et al. (2013).

As stated by Zilaout H. et al (2016) and Rodríguez-Zamora et al. (2017), occupational exposure to dust was detrimental to the workers. It was important to take into account that dust exposure can decline respiratory symptoms. Overall, latex gloves manufacturing in this factory can be simplified into several stages: rinsing, brushing, dripping, leaching, beading, powder/slurry tank, and stripping process. Workers that are exposed to a high level of dust in their work unit or workplace will tend to get respiratory symptoms which can lead to occupational lung diseases such as bronchitis, asthma, and Chronic Obstructive Pulmonary Disorder (COPD) (Alif et al., 2016). Therefore, the main objective of this study is to determine the occupational exposure to inhalable dust and respiratory symptoms of workers in the latex glove industry.

RESEARCH AND FINDINGS

This was a cross-sectional study conducted among 90 latex glove workers employed in small and medium-sized establishments of glove production at the Stripping, Quality Control, and Technical and Maintenance station in Senawang, Negeri Sembilan. The respiratory symptoms were recorded using a questionnaire that has been adopted from European Community Respiratory Health Survey II (European Community Respiratory Health Survey II Steering Committee, 2002). It emphasizes an inquiry regarding an occurrence of chest tightness, chest compression, wheezing, cough, and phlegm appearing in them, and the frequency of occurrence, the day of occurrence, duration, and related work was recorded.

The dust measurement was taken using DustTrak Aerosol Monitor 8534 which was suitable for clean office settings as well as harsh industrial workplaces, construction and environmental sites, and other outdoor applications (Petsas et al., 2020). This instrument measures aerosol contaminants such as dust, smoke, fumes, and mists corresponding to Particulate Matter (PM) particularly, PM_1, $PM_{2.5}$, respirable, or PM_{10} size fraction with a concentration range from 0.001 to 150 $\mu g/m^3$. The dust level was measured according to each workstation with the instrument placed near the breathing zone of the workers.

Chestgraph H1 – 101 Spirometer was used to measure the lung function status of the workers

in the latex gloves company. After taking a detailed history and anthropometric data, the workers were informed about the whole maneuver using the procedure by the American Thoracic Society (Graham et al., 2019). The workers were encouraged to practice this maneuver before performing the pulmonary function test. The test was performed with the subject in a standing position and repeated three times after adequate rest and results were obtained in the spirometer.

All statistical analysis was performed by SPSS version 22. Descriptive data were expressed as frequency and percentage. The descriptive test was used to calculate the mean, median, mode, and standard deviation. Besides, the Kolmogorov Smirnov test and Skewness will be used to determine the normality of the data. Descriptive analysis, Pearson correlation, and Spearman's Rho will be used for association in parametric and non-parametric data respectively. ANOVA was used to compare the difference between more than two variables and a p-value of <0.05 as the significance level will be used.

In this study, 90 respondents were recruited and their sociodemographic background was as shown in Table 1. To summarize their background, more Indian employees made up the workforce, they had lower secondary education levels, and poorer incomes (RM 1000–1900), and most of them were married.

According to Zimmerman, Woolf, & Haley, (2015), educational level was related to health because it has a lot of benefits that may lead to improved health by a higher income, increase resources and knowledge to adopt healthier behavior, and the resources to live in healthier neighborhoods and also decrease the level of unemployment. Besides, the information about salary and marital status is also recorded as socio-economic factors. The salary level was considered a factor that influences attitudes among the workers as explained by Balouch, & Hassan, (2014). While according to Robards et al. (2012) stated that marital status and living arrangements have been shown to have a significant effect on a person's health and mortality.

Table 1. Socio-demographic on the subject

Variables	Frequency	Percent	Mean	sd
Race			2.59	0.982
Malay	22	24.4		
Chinese	3	3.3		
Indian	55	61.1		
Others	10	11.1		
Educational level			2.68	0.776
None	8	8.9		
Primary/UPSR	22	24.4		
Secondary/ PMR/SPM/STPM	51	56.7		
Diploma/Degree	9	10.0		

Salary			1.37	0.529
RM 1000 – 1900	59	65.6		
RM 2000 – 2900	29	32.2		
RM 2900 – 3900	2	2.2		
Status			1.63	0.529
Single	35	38.9		
Married	53	58.9		
Divorced	2	2.2		
Total	**90**	**100.0**		

Exposure to dust according to workstation

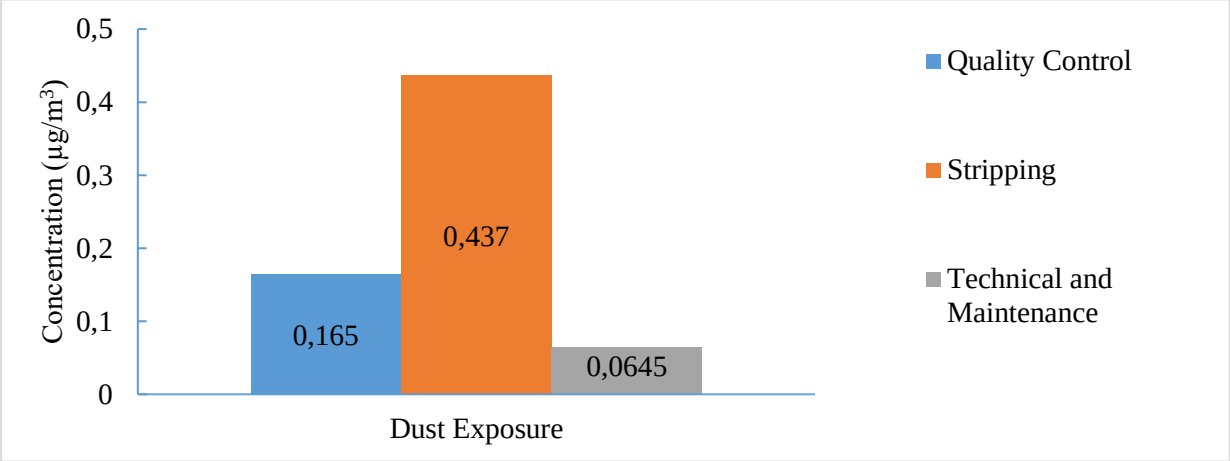

Figure 1 Dust concentration level at different workstations

As shown in Figure 1, it can be seen clearly that workers in the stripping section were exposed to the highest concentration of dust (0.437µg/m^3). Second to the stripping section is the quality control section (0.165 µg/m^3), where the workers' task is to perform a finalized inspection of the gloves. Finally, the technical and maintenance section recorded 0.0645µg/m^3g/m^3. It may be due to the nature of working processes which are dusty with high humidity/temperature. It implies that humidity/temperature may condense dust and increase exposure in the workplace and is supported by Moghaddasi et al. (2014).

Besides, the workplace (design layout) also can be one of the factors. The stripping station was a closed space with low ventilation compared to the worker's quality control station (have good local exhaust ventilation) and technical and maintenance station (open space). Even though air pollution can't be reduced by ventilation alone, it can reduce the pollutants to the recommended or regulated levels given by indoor air quality guidelines or by national standards (WHO Guidelines for Indoor Air Quality: selected pollutants, 2010).

Distribution of respiratory symptoms according to workstation

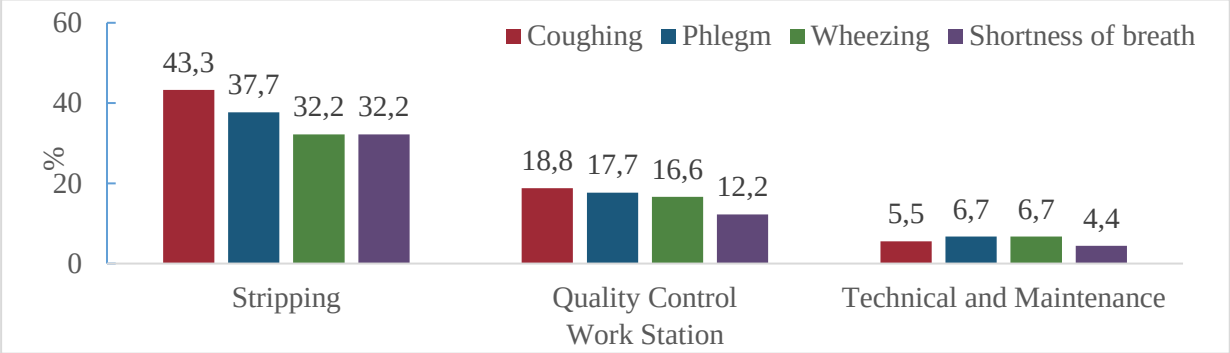

Figure 2 Distribution of respiratory symptoms according to workstations

By referring to Figure 2, Coughing was present highest in Stripping (43.3%) compared to QC (18.8%) and Technical and Maintenance (5.5%) section. It also has similar results for phlegm, wheezing, and shortness of breath.

Overall, most of the workers in the stripping station and quality control were coughing. This might be due to the nature of the work in which they were exposed directly to the dust while the workers in the technical and maintenance section do not expose directly to the source of hazard which is cornstarch dust due to better ventilation in the room. This is harmonized with a study by Mohammadien, Hussein, & El-Sokkary (2013), which showed that respiratory complaints in the study group are high.

Besides, another study by Wu, McIntosh, & Liu, (2016), stated that corn starch is an example of organic dust that contains the nutrient, which bacteria can grow. These bacteria can cause pathogenic reactions including not only fever, but also coughs, aches, nausea, shortness of breath, and acute airflow obstruction when inhaled. In addition, World Health Organization (WHO) reported that exposure to heavy concentrations of organic dust contaminated by microorganisms can lead to serious respiratory and systemic illnesses, such as Organic Dust Toxic Syndrome (ODTS).

Lung function abnormalities according to workstation

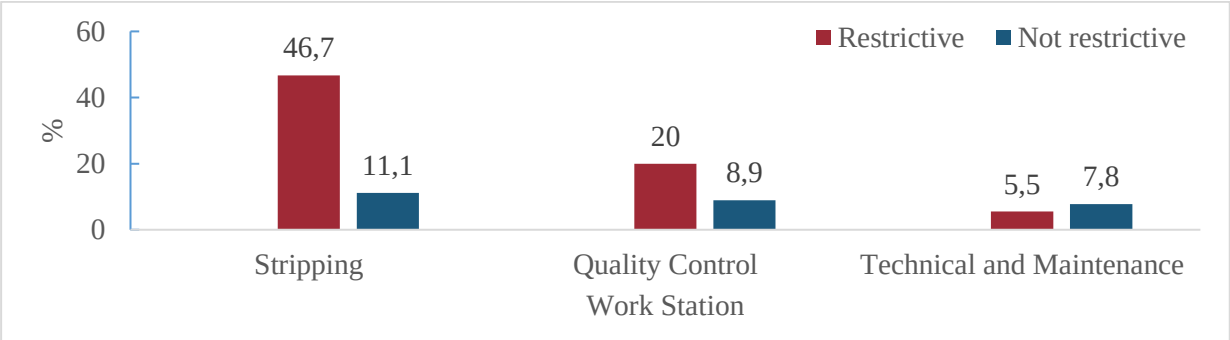

Figure 3 Lung function abnormalities between workstations

Among the various section of the factory, workers in stripping have the highest number of workers with restrictive patterns of lung function (46.7%), whereas quality control (20%) and technical and maintenance (5.5%) had the least (Figure 3). These results are an outcome of the different processes in each station. The workers in the stripping station were responsible in remove the glove from the artificial hand that has been mixed with corn starch as a lubricant, to enable easy donning of the glove by tumbling the gloves in a slurry of starch and biocide which was proven by Hamilton & Dabmli, (2014), Vaysse et al., (2012) and Gawchik, (2011). Thus, as the workers removed the glove, the highest volume of dust was exposed them. Besides,

the high production rate also indirectly causes the workers to have higher and longer exposure to this dust from the corn starch.

As stated by Cabañes et al. (2012), corn starch is a nutrient, thus it can cause allergic reactions involving the upper airways that lead to lung function abnormalities and respiratory problems. A worker with an obstructive pattern of impairment occurs as a result of damage to the small airways or bronchioles, resulting in a decreased ability to exhale air. While workers with a restrictive pattern of impairment describe a condition in which there is a reduction in the volume of air that can be taken in and then pushed out of the lungs. Both patterns of impairment can occur at the same time. These are explained in an article by Suryadi et al. (2022).

Occupational exposures to dust and lung function among latex gloves workers

Table 2 shows no significant exposure to dust between FEV1 and FVC. However, there is a significant relationship between occupational exposure to dust with FEV1/FVC. There is no significant between exposures to dust and measured FEV1 as well as exposure to dust and measured FVC. However, the association between exposure to dust and ratio FEV1/FVC variables was found statistically significant. FEV1/FVC is the fraction of air exhaled in the first second relative to the total volume exhaled. If the value is below 0.7, it indicates an obstructive disease while above 0.7 indicates a restrictive disease. A study by Khalid et al. (2022) suggests that exposure to dust was associated with lung function status deterioration. This result was also agreed upon by several scholars, including Jamil et al. (2018), Putri et al., (2020), and Sundram et al. (2022) in similar studies researching exposure to dust and its correlation with lung function.

Table 2. Exposure to dust with lung function

Variables	*r* value	p-value
FEV 1	0.074	0.490
FVC	0.454	0.454
FEV1/FVC	0.226*	0.038*

p-value is significant at $p < 0.05$

Occupational exposure to dust and respiratory symptoms

According to Table 3, among the respiratory symptoms that have been asked in the questionnaire, only coughing in the morning and wheezing show a significant relationship due to exposure to dust. While phlegm and shortness of breath did not show any significant relationship. This study shows that there is a significant association between occupational exposure to dust and coughing in the morning and wheezing. This was supported by Pramchoo, Geater, Jamulitrat, Geater, & Tangtrakulwanich, (2015) that stated a decrease in lung function or an increase in the prevalence of respiratory symptoms such as cough, dyspnea, wheeze, and sneezing was associated with long-term occupational exposure to air pollutants, including wood smoke, and other dust.

Table 3. Relationship between occupational exposure to dust and respiratory symptoms

Variables	Exposure to dust	
	***r* value**	**p-value**
COUGHING		
Frequent	0.090	0.385
Cough in the morning	0.233*	0.014*
Cough all the days	0.040	0.677
Cough for 3 months continuously	0.033	0.837
PHLEGM		
Frequent	0.616	0.610
Phlegm in the morning	0.010	0.917
Phlegm all the days	0.040	0.689
Phlegm for 3 months continuously	0.626	0.454
COUGH AND PHLEGM	0.096	0.340
WHEEZING	0.228*	0.021*
SHORTNESS OF BREATH	0.209	0.273

p-value is significant at $p < 0.05$

Differences in lung function and exposure to dust between workstations

The results in Table 4 shows that there is a statistical difference in the mean ratio FEV1/FVC between the different workstation (F = 0.923, p-value = 0.016). Furthermore, there are no significant differences between other groups of the workstation (p-value > 0.05). Results in Table 5 shows there is a significant difference in exposure to dust between workstations.

The mean in ratio FEV1/FVC and between the different workstations was significantly different in stripping and quality control probably due to high exposure compared to technical and maintenance stations. This is similar to a study by Sanguanchaiyakrit, Povey, & De Vocht, (2014) that labeled the "high exposure group" which includes glove stripping, inspection, powdered glove packaging, and curing. In addition, the stripping area was located near the main oven and industrial fans, which may have increased the dispersion of airborne dust.

Table 4. Comparison of lung function between workstations

Variables		Mean	sd	F	p-value
FEV1	Quality Control	2.572	0.659		
	Stripping	2.638	0.696	0.333	0.718
	Technical and Maintenance	2.742	0.784		
FVC	Quality Control	3.007	0.794		

	Stripping	3.061	0.762	0.245	0.783
	Technical and Maintenance	3.227	0.822		
FEV1/FVC	Quality Control	0.868	0.124	0.923	0.016*
	Stripping	0.865	0.095		
	Technical and Maintenance	0.853	0.107		

p-value is significant at $p < 0.05$

Table 5. Comparison of exposures to dust between workstations

Variables		Mean	F	p-value
Dust Exposure	Quality Control	0.873	0.767	0.035*
	Stripping	0.731		
	Technical and Maintenance	0.918		

CONCLUSION

In conclusion, this was the first study evaluating occupational exposure to inhalable dust and respiratory symptoms of workers in latex glove manufacturing in Senawang, Negeri Sembilan. The majority of the workers had abnormal lung function status, justifying the necessity for an additional suitable clinical screening program. In addition, a significant respiratory issue was identified among the study's latex glove participants. In addition, compared to the quality control, technical, and maintenance stations, the stripping station has the most exposure to dust.

The workers' exposure to dust was flagged as a health risk. To uncover the variables that consistently determine the presence of occupational dangers connected to respiratory symptoms, further research was necessary. The workers have a strong correlation with respiratory symptoms including morning cough and wheeze from dust exposure. Additionally, workers who used latex gloves were mostly exposed to chemical risks in the form of organic dust created throughout the operation. As a result, identifying the risks of occupational lung illness and preventing exposure must be a top concern.

REFERENCES

1. The Office of Chıef Statıstıcıan Malaysıa Department of Statıstıcs, Malaysıa. (2022, June 15). Monthly Rubber Statistics Malaysia, April 2022. Https://Www.Dosm.Gov.My/v1/Index.Php?R=column/cthemeByCat&cat=73&bul_id=aWlaZEZuWXZmTmluY0lmenc3eVlNdz09&menu_id=Z0VTZGU1UHBUT1VJMFlpaXRRR0xpdz09. Retrieved July 22, 2022, from

https://www.dosm.gov.my/v1/index.php?r=column/cthemeByCat&cat=73&bul_id=aWlaZEZuWXZmTmluY0lmenc3eVlNdz09&menu_id=Z0VTZGU1UHBUT1VJMFlpaXRRR0xpdz09
2. MINISTRY OF INTERNATIONAL TRADE AND INDUSTRY. (n.d.). Rubber products. Https://Www.Miti.Gov.My/Index.Php/Pages/View/463. Retrieved July 22, 2022, from https://www.miti.gov.my/index.php/pages/view/463
3. Birkett, N., Al-Zoughool, M., Bird, M., Baan, R. A., Zielinski, J., & Krewski, D. (2019). Overview of biological mechanisms of human carcinogens. Journal of Toxicology and Environmental Health, Part B, 22(7-8), 288-359.
4. Viegas, S., Faísca, V. M., Dias, H., Clérigo, A., Carolino, E., & Viegas, C. (2013). Occupational exposure to poultry dust and effects on the respiratory system in workers. Journal of Toxicology and Environmental Health, Part A, 76(4-5), 230-239.
5. Zilaout, H., Houba, R., & Kromhout, H. (2016). O47-1 15 years of monitoring occupational exposure to respirable dust and quartz within the European industrial minerals sector.
6. Rodríguez-Zamora, M. G., Medina-Escobar, L., Mora, G., Zock, J. P., de Joode, B. V. W., & Mora, A. M. (2017). Dust exposure in workers from grain storage facilities in Costa Rica. International Journal of Hygiene and Environmental Health, 220(6), 1039-1045.
7. Alif, S. M., Dharmage, S. C., Bowatte, G., Karahalios, A., Benke, G., Dennekamp, M., ... & Matheson, M. C. (2016). Occupational exposure and risk of chronic obstructive pulmonary disease: a systematic review and meta-analysis. Expert review of respiratory medicine, 10(8), 861-872.
8. European Community Respiratory Health Survey II Steering Committee. (2002). The European community respiratory health survey II. European Respiratory Journal, 20(5), 1071-1079.\
9. Petsas, C., Stylianou, M., Zorpas, A., & Agapiou, A. (2020). Measurements of local sources of particulates with a portable monitor along the coast of an Insular City. Sustainability, 13(1), 261.
10. Graham, B. L., Steenbruggen, I., Miller, M. R., Barjaktarevic, I. Z., Cooper, B. G., Hall, G. L., ... & Thompson, B. R. (2019). Standardization of spirometry 2019 update. An official American thoracic society and European respiratory society technical statement. American journal of respiratory and critical care medicine, 200(8), e70-e88.
11. Zimmerman, E. B., Woolf, S. H., & Haley, A. (2015). Understanding the relationship between education and health: a review of the evidence and an examination of community perspectives. Population health: behavioral and social science insights. Rockville (MD): Agency for Health-care Research and Quality, 347-84.
12. Balouch, R., & Hassan, F. (2014). Determinants of job satisfaction and its impact on employee performance and turnover intentions. International Journal of Learning & Development, 4(2), 120-140.
13. Robards, J., Evandrou, M., Falkingham, J., & Vlachantoni, A. (2012). Marital status, health and mortality. Maturitas, 73(4), 295-299.
14. Moghaddasi, Y., Mirmohammadi, S., Ahmad, A., Nejad, S. E., & Yazdani, J. (2014). Health–risk assessment of workers exposed to flour dust: A cross-sectional study of random samples of bakeries workers. Atmospheric Pollution Research, 5(1), 113-118.
15. WHO Guidelines for Indoor Air Quality: selected pollutants. (2010). [E-book]. WHO Regional Office for Europe. Retrieved July 21, 2022, from https://www.euro.who.int/__data/assets/pdf_file/0009/128169/e94535.pdf

16. Mohammadien, H. A., Hussein, M. T., & El-Sokkary, R. T. (2013). Effects of exposure to flour dust on respiratory symptoms and pulmonary function of mill workers. Egyptian journal of chest diseases and tuberculosis, 62(4), 745-753.
17. Wu, M., McIntosh, J., & Liu, J. (2016). Current prevalence rate of latex allergy: why it remains a problem?. Journal of occupational health, 15-0275.
18. Vaysse, L., Bonfils, F., Sainte-Beuve, J., & Cartault, M. (2012). 10.1. 7-Natural rubber. Polymer Sci-ence: A Comprehensive Reference. Polymers for a Sustainable Environment and Green Energy, 281.
19. Gawchik, S. M. (2011). Latex allergy. Mount Sinai Journal of Medicine: A Journal of Translational and Personalized Medicine, 78(5), 759-772.
20. Hamilton, R. G., & DABMLI, F. (2014). Latex allergy: Management. UpToDate, last updated April, 21.
21. Cabañes, N., Igea, J. M., de La Hoz, B., Agustín, P., Blanco, C., Domínguez, J., ... & Martínez-Cócera, C. (2012). 1 Latex Allergy: Position Paper. Journal of Investigational Allergology and Clinical Immunology, 22(5), 313.
22. Suryadi, I., Nugraha, A. P., Fitriani, N., & Rachmawati, S. (2022). The Determinant Of Lung Function Dissorders Of The Textile Industry Spinning Section. KEMAS: Jurnal Kesehatan Masyarakat, 17(4).
23. Khalid, F., Wang, W., Mannino, D., & Diaz, A. A. (2022). Prevalence and Population Attributable Risk for Early Chronic Obstructive Pulmonary Disease in US Hispanic/Latino Individuals. Annals of the American Thoracic Society, 19(3), 363-371.
24. Jamil, P. A. S. M., Karuppiah, K., Rasdi, I., Tamrin, S. B. M., Sambasivam, S., Yusof, N. A. D. M., & Azmi, I. (2018). Respiratory symptons prevalence among traffic policemen in Malaysia. Health, 201, 300.
25. Putri Anis Syahira, M. J., Karmegam, K., Nur Athirah Diyana, M. Y., Irniza, R., Shamsul Bahri, M. T., Vivien, H., ... & Sivasankar, S. (2020). Impacts of PM 2.5 on respiratory system among traffic policemen. Work, 66(1), 25-29.
26. Sundram, T. K. M., Tan, E. S. S., Cheah, S. C., Lim, H. S., Seghayat, M. S., Bustami, N. A., & Tan, C. K. (2022). Impacts of particulate matter (PM2.5) on the health status of outdoor workers: observational evidence from Malaysia. Environmental Science and Pollution Research, 1-11.
27. Pramchoo, W., Geater, A. F., Jamulitrat, S., Geater, S. L., & Tang-trakulwanich, B. (2015). Occupational Tasks Influencing Lung Function and Respiratory Symptoms Among Char-coal-Production Workers: A Time-Series Study. Safety and Health at Work, 8(3), 250–257. https://doi.org/10.1016/j.shaw.2016.11.006
28. Sanguanchaiyakrit, N., Povey, A. C., & De Vocht, F. (2014). Personal exposure to inhalable dust and the specific latex Aero-Allergen, Hev b6.02, in latex glove manufacturing in Thailand. Annals of Occupational Hygiene, 58(5), 542–550. https://doi.org/10.1093/annhyg/meu013

MINING INDUSTRY AFTER COVID-19

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ABSTRACT
At our time the Covid-19 is undoubtedly the biggest health crises in the world which affected all the life and economic sectors. One of the biggest sectors in economy is mining industry, which also was impacted from this crisis, bringing economic changes, affecting technology and innovation in the field. The reaction of the mining industry against the Covid was concentrated in two main directions: Employees and community health protection and safety; and Creating the supporting base of long term economic recovery for the community. This paper discusses the impact of the Covid-19 in Mining Industry, presents a general view of consequences of these impacts, and gives some recommendation for future situation improving.

Keywords: Covid 19, Impact, Mining industry

FASHION-TECH, ECO-TECH AND HIGH-TECH IN CONTEMPORARY KNITTING

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ABSTRACT
Throughout history, fashion and technology have developed independently and simultaneously, but they have also greatly influenced each other. The common field of fashion technology or fashion-tech combines fashion, design, natural sciences, engineering, and economics and management. Technology is ubiquitous, and there is no contemporary fashion without the latest technology. Fashion is no longer just fashion, it has become fashion tech, including knitting. Eco-tech is technology developed to address environmental issues and prevent or repair environmental damage, or to manage specific ecosystems. High-tech textiles and clothing use advances in science and technology to design contemporary, high-performance products. The methods used in the production of high-tech textiles and clothing draw on ideas and concepts from chemistry, computer science, aerospace engineering, automotive engineering, architecture, industrial textiles, high-performance sportswear, and the like. Fashion tech, eco-tech and high-tech concepts play an important role in the knitting industry. Knitted textiles and knitwear represent an important sector in the field of fashion and technical textiles. With sustainable, multifunctional, high-tech and high-performance knitted products designed through material, mechanical and chemical functionalisation, a new awareness of the potential of knitted textiles and knitwear has emerged. With the rapid development in technical, design, social and cultural aspects, knitted fabrics and knitwear can adapt, expand and evolve towards sustainability, circular economy and industry 4.0.

Keywords: knitting, knitwear, fashion-tech, eco-tech, high-tech.

1 INTRODUCTİON
Technical inventions and innovations have influenced every human activity and well-being since the dawn of mankind. Science has been the driving force behind all four industrial revolutions that have brought society into a more modern era, further influencing both science and technology and having both positive and negative effects. With the development of science and technology, as well as society and daily needs in general, both professional and personal life is becoming more and more »technical« in every aspect. Modern life encompasses a large amount of very different information. The increasing fast pace of life and the pursuit of a higher standard of living are accompanied by ever-increasing demands, as well as the need to use engineering devices and assistive technologies that facilitate manual labour, shorten work processes, and provide greater safety, accuracy, and repeatability in every aspect of life and work. Science and technology have transformed our lives and impacted important areas of society such as education, health, communications, transportation, business, and more. They have invaded every aspect of our daily lives and have changed the way we work, the way we learn, and the way we shop. In today's world, we cannot imagine our lives without technology (in conjunction with science) as it has made our lives easier and faster. However, efforts must

be made to ensure that inventions and discoveries in these areas are always used in the interest of all humanity and make the world a better place (Sci-Teh Society, 2021). In addition to improved communication, better access to information, more flexible working, smarter health monitoring, reduced privacy, and virtual social life, shopping has also become more accessible. It's convenient to shop online, and what's more, it's become a necessity during the lockdown caused by the Covid 19 pandemic. But technology has not made physical shopping obsolete either, even if we sometimes forget to think about contactless cards and paying by phone. Technology has also democratised retail. Instead of being physically present to open a shop, you can now do it online, and the ease of creating professional-looking websites further helps sell products or services (Turner, 2022).

The textile and clothing sector is an important part of the European manufacturing industry and plays a crucial role in the economy and social well-being of many regions in Europe. According to 2019 data, there are 160 000 companies in the industry, employing 1.5 million people and generating sales of 162 billion euros. The sector in the EU is based on small businesses. Companies with fewer than 50 employees provide more than 90% of the workforce and generate almost 60% of value added. Southern EU countries contribute more to total clothing production, while northern countries contribute more to textile production, especially technical textiles. European manufacturers are world leaders in technical textiles as well as in high-end clothing with a high design content (European Commission, 2022a).

It is becoming increasingly clear that overconsumption drives the economy, but on the other hand it is socially and environmentally controversial. European consumption of textiles has the fourth highest impact on the environment and climate change, after food, housing and mobility. It ranks third in terms of water consumption and land use, and fifth in terms of primary raw material consumption and greenhouse gas emissions. The average European throws away 11 kg of textiles every year. Global textile production almost doubled between 2000 and 2015, and consumption of clothing and footwear is expected to increase by 63% by 2030. In parallel with this unstoppable expansion, the negative impacts on resources, water, energy consumption and climate continue to increase. The need to change the production and consumption of textiles is now more urgent than ever (European Commission, 2022b). A shift to multifunctional, higher quality products with durable design and longer life has become a necessity.

All this also applies to the fashion, textile and clothing industry, which includes knitted fabrcis and knitwear. Contemporary products such as knitted textiles and clothing, especially technical and multifunctional knits, are the result of an extensive exchange of knowledge and the merging of formerly almost unconnected textile and non-textile industries with the knitting industry.

2 FASHION, TECHNOLOGY AND ECOLOGY

On the one hand, technology has brought numerous benefits to humanity and has allowed us to evolve as a race. On the other hand, it has brought several negative effects that have harmed us at our core, such as privacy concerns and pollution (Patel, 2021), not to mention cybercrime, loneliness in crowds and loss of contact with reality.

Sustainably conscious consumers have already begun to demand change, aware of excessive fashion waste and ready for the transition to slow, sustainable fashion. Many fashion brands are turning to technology to achieve this goal. For example, some designers are using virtual models to showcase their creations and curb waste. Because the avatar models are wearing clothes that were not actually made, textile waste is reduced and water and energy resources are effectively conserved. Digital sampling instead of physical samples and virtual try-on of garments when

shopping online also reduce textile waste. Machine learning gathers data directly from consumers and uses the information to predict demand, identify trends and help brands make better business decisions. Conscious designers are using biodegradable alternative textiles, such as those made from cork, bamboo, and even seagrass. Artificial intelligence helps reduce the return rate of purchased garments. Brands can segment their customer database to determine exactly why and what customers are returning (Miller, 2021).
Therefore, understanding the complex synergy between fashion, technology and ecology is critical to act for the benefit of local and global economies, prosperity and sustainability.

2.1 Fashion-tech

Fashion and technology have evolved independently and simultaneously throughout history, but they have also found points of contact, intertwined, and strongly influenced each other. Because both are multidisciplinary and interdisciplinary processes that combine different disciplines and tools to create user experiences, the common field of fashion technology links the fields of fashion, design, natural sciences, engineering, and economics and management. It is also referred to as »fashion-tech« and is defined as »technology that enables a fashion experience for the user who wears or interacts with it.« Fashion-tech products and/or services can be developed for their functionality, to create communication opportunities, and for greater sustainability. Simply put, fashion technology or fashion-tech creates contemporary tools for the fashion industry with the goal of improving the way we produce and consume fashion. (W4FT, 2018; Knox, 2021)
Fashion-tech designers are creating wearables that give the human body new functions and interact with the environment. Wearables are body-worn products such as clothing, footwear, accessories, and jewellery that enable communication/interaction through technologies such as digital and virtual technologies. They enhance and extend the natural capabilities and performance of the human body. Tools such as 3D printing, artificial intelligence, augmented reality, and digital fabrication are among the recent technological advances that enable the design of these smart textiles. Fashion-tech design lies at the intersection of wearable technology (or wearables), smart textiles, and digital fabrication. Smart textiles are textile systems designed to sense and respond to external stimuli such as mechanical, thermal, chemical, biological, magnetic, and electrical, enabled by advanced physical and digital technologies. Technology can enable faster and more ethical processes in fashion, while fashion often has to wait for technology, which develops much more slowly, to catch up, especially in times of market acceptance. One very important technology related to fashion is communications technology. Its importance was particularly evident during the lockdown due to the Cocid-19 pandemic. (W4FT, 2018; Shakeri, 2022)
2021 was the year that fashion entered the metaverse, an online 3D universe that combines different virtual spaces and connects multiple platforms, much like the Internet. It contains different websites accessible through a single browser. As the industry embraced virtual worlds, fashion-tech also moved into the spotlight, with a focus on digital clothing and avatars. (Binance Academy, 2021; McDowell, 2021) Digital fashion can be quite challenging for generations that did not grow up in the digital age, but the Covid-19 lockdown has changed many approaches and beliefs, and to some extent accelerated the transition of many individuals and generations to digital applications. Finally, there is no contemporary fashion without the latest technology. Fashion is no longer just fashion, it has become fashion-tech, even in knitting.

2.2 Eco-tech

According to the Oxford English Dictionary Lexico, »ecotehnnology« is a noun meaning »technology designed to deal with environmental concerns«. »Ecotechnological« is an adjective meaning »involving or relating to technologies designed to avoid or remedy damage to the environment, or to manage particular ecosystems.« Both terms date back to the 1970s, with the earliest use found in the works of Alvin Toffler. Toffler's work foresaw the far-reaching effects of rapid technological development on people, businesses, and governments. In his book, which brought together a wide variety of facts from all parts of the world, he concluded that the convergence of science, capital, and communications was bringing about such rapid change that an entirely new kind of society was emerging. His predictions about the consequences for culture, family, state, and economy were remarkably accurate. He foresaw the development of cloning, the popularity and influence of personal computers, and the invention of the Internet, cable television, and telecommuting. The year in which the book was written suggests that linking technology and ecology is not exactly a new concept. (Lexico, 2022; ACIMIT, 2015, Schneider, 2016)

Eco-tech fashion was first defined by Sarah Scaturro in a 2008 article titled »Eco-Tech Fashion: Rationalizing Technology in Sustainable Fashion« in the journal Fashion Theory. The term »eco-tech« comes from the field of architecture and refers to the belief that technology is a necessary component of a truly sustainable system. Nowadays, attention to issues such as sustainability, environmental protection and health is growing both in public opinion and among policy makers. In this context, the textile and clothing industry as a whole, as well as individual sectors such as the knitting industry, are considering adopting sustainable development as a business model that pays more attention to environmental issues and human well-being. However, the path to sustainability as a means to promote growth requires innovation, both technological and cultural. (Lexico, 2022; ACIMIT, 2015; Scaturro, 2008; Eco-tech fashion, 2022)

Product design and development play a fundamental role in the design and manufacture of sustainable products. Decisions made during the product design and development process influence up to 80% of a product's environmental and social impacts. The 80/20 rule applies. The selection of materials, forms, colours and production systems also affects the use and disposal of the product throughout its life cycle. Ecodesign was initially defined as »any form of design that minimises environmentally destructive impacts by integrating with living processes.« (Taieb et al, 2014; VanDenRyn and Cowan, 2007; Tardi, 2022)

In knitting, this applies to both knitted products and knitting machines, i.e. knitting hardware and software. Ecodesign perspectives must be integrated into product development processes, and all decisions and actions must lead to sustainable approaches and harmonious business visions (Ghezzo, 2018).

2.3 High-tech

High-tech textiles and clothing take advantage of advances in science and technology to design contemporary, high-performance products. The methods used in the production of high-tech textiles and clothing borrow ideas and concepts from chemistry, computer science, aerospace engineering, automotive engineering, architecture, industrial textiles, high-performance sportswear, etc. High-tech textiles occupy a special position. Part of their production has become more and more merged with everyday life, as the once specific and extravagant needs of consumers that could only be met by special or technical textiles and clothing have gradually

become conventional needs. (High-tech fashion, 2022; Chanodil, 2022)
Modern technical textiles have changed the general perception of textiles and textile processes as everyday, simple products and technologies. They have become very popular worldwide due to various (multi)functional requirements; user friendliness, eco friendliness, health and safety, durability, high strength, light weight, versatility, customisation, logistical convenience, etc.

3 EXAMPLES AND DISCUSSION

Techno fashion, i.e. fashion-tech has been conceptualised by Hussein Chalayan or is evident in the proliferation of garments with embedded circuits made of high-performance fabrics. The term »wearable technology« is often used to describe this phisicality of technological fashion, specifically referring to garments with some type of connected electrical device or component. However, this definition is inherently limiting and inaccurate, as fashion has always been a wearable expression of the technological state of society. In the 1960s, Paco Rabanne, Pierre Cardin, and Diana Dew designed modular, streamlined, and space-age garments, while fashion magazines and their advertisers urged their customers to celebrate the development of synthetic fibres as excitingly futuristic. (Scaturro 2008). In knitting, fashion-tech can nowdays be presented through seamless and bodymapping sportswear, which enables athletes to achieve excellent results and support their body performance with the help of the cutting-edge garments. When we think of textiles and clothing, we often forget that there is a large sector of non-clothing textiles that is becoming increasingly important, i.e. various categories of technical textiles such as medical textiles, agricultural textiles, architectural and construction textiles. FabBRICK, a France-based company, for example, is working to recycle textile waste into bricks, which are said to have excellent thermal and sound insulation properties. In addition to cotton, polyester, elastane and PVC can also be used in the process. Using an environmentally friendly adhesive, this waste is first mixed and then pressed into a brick (Mezenes, 2021). In knitting, sustainability or eco-tech can be achieved in the form of zero waste through all-in-one knitting, also called seamless knitting, whole-garment or knit-and-wear knitting. Apart from reducing waste by skipping the cutting phase in production, seamless technology means that production processes are merged, resulting in less space and time required in production and contributing to sustainable production.
High-tech textiles are becoming ever more important in the construction industry. New coatings and multilayer casings offer improved heat insulation, unconventional material composites lend the fibers greater tensile strength than iron, and new processing and manufacturing methods enable customized solutions. After all, ten percent of all technical textiles are used in construction and demand for building textiles surges by almost eight percent every year (Seidel, 2019). In knitting, Stoll developed the 3D knitted balaclava, which features a fully automatic integrated heated mouth area, passive visibility in the dark, four-way stretch, and moisture and heat management in a wool/Lycra construction. The balaclava not only protects the head area from cold and wind, but also warms cold breath in the mouth area before it reaches the bronchi and lungs, for example when running or skiing. Thanks to fully automated 3D pre-shaping, waste in the manufacturing process is said to be less than 1% (Knitting Industry, 2016).

4 SUMMARY

The synergy of design and function expressed in the combination of protection, fashion and comfort requires some research initiatives and in-depth knowledge of complex technologies, such as smart textiles, nanotechnology, special properties of textiles and clothing, and current

production and engineering technologies. Fashion tech, eco-tech and high-tech concepts play an important role in the knitting industry. Knitted textiles and knitwear represent an important sector in the field of fashion and technical textiles.

With sustainable, multifunctional, high-tech and high-performance knitted products designed through material, mechanical and chemical functionalisation, a new awareness of the potential of knitted textiles and knitwear has emerged. With the rapid development in technical, design, social and cultural aspects, knitted fabrics and knitwear can adapt, expand and evolve towards sustainability, circular economy and industry 4.0.

5 REFERENCES

ACIMIT Servizi (ed.). (2015) The ACIMIT green guide 2015. Normanton: MCL Global, pp. 4-6.

Binance Academy. (2021) What Is the Metaverse? Available at: https://academy.binance.com/en/articles/what-is-the-metaverse?.

Chanodil. The Future of Tech Fashion. Available at: https://chanodil.com/blog/the-future-of-tech-fashion/.

Eco-tech fashion. (2022) In *Wordpress*. Available at: https://ecotechfashion.wordpress.com/about/.

European Comission. (2022a) Questions and Answers on EU Strategy for Sustainable and Circular Textiles. Available at: https://ec.europa.eu/commission/presscorner/detail/en/QANDA_22_2015.

European Comission. (2022b) Internal Market, Industry, Entrepreneurship and SMEs. Textiles and clothing in the EU. Available at: https://single-market-economy.ec.europa.eu/sectors/fashion/textiles-and-clothing-industries/textiles-and-clothing-eu_en.

GHEZZO, P. Ecodesign. (2018) Unit 09. Ecodesign approaches in textile products. In: Ecodesign in the Textile Sector. Available at: http://www.ecosign-project.eu/wp-content/uploads/2018/09/TEXTILE_UNIT09_EN_lecture.pdf.

High-Tech fashion. (2022) In: *Encyclopedia.com. Fashion. Encyclopedias almanacs transcripts and maps*. Available at: https://www.encyclopedia.com/fashion/encyclopedias-almanacs-transcripts-and-maps/high-tech-fashion.

Knitting industry. (2016) Smart balaclava wins gold for Stoll at Outdoor Industry Awards. Available at: https://www.knittingindustry.com/smart-balaclava-wins-gold-for-stoll-at-outdoor-industry-awards/.

KNOX, B. (2021) What Is Fashion Technology In *2022 – Best Expert Definition & Examples*. Available at: https://thevou.com/fashion/what-is-fashion-technology/.

Lexico. (2022) UK Dictionary. Available at: https://www.lexico.com.

McDOWELL, M. (2021) 2021: The year in fashion-tech. Available at: https://www.voguebusiness.com/technology/2021-the-year-in-fashion-tech.

MEZENES, F. (2021) This architect transforms old clothes into bricks. Available at: https://brightvibes.com/2307/en/this-architect-transforms-old-clothes-into-bricks.

MILLER, A. (2021) New technologies will make the fashion industry more sustainable. In *Sustainable Times*. Available at: https://www.sustainability-times.com/green-consumerism/new-technologies-will-make-the-fashion-industry-more-sustainable/.

SCATURRO, S. Eco-tech fashion: Rationalizing technology in sustainable fashion. *Fashion theory*, let. 12 (2008), št. 4, str. 469-488. DOI:10.2752/175174108X346940.

SCHNEIDER, K. (2016) Alvin Toffler, Author of 'Future Shock,' Dies at 87. In *The New York Times*. Available at: https://www.nytimes.com/2016/06/30/books/alvin-toffler-author-of-future-shock-dies-at-87.html.
SEIDEL, A. (2019) More movement. Available at: https://www.stylepark.com/en/news/techtextil-2019-textile-architecture.
Sci-Tech Society. (2021) Importance of Science and Technology in Contemporary Society. Available at: https://www.scitechsociety.com/importance-of-science-and-technology-in-contemporary-society/.
SHAKERİ, S. (2022) 10 Fashion-Tech Designers Revolutionizing The Fashion Industry. Available at: https://parametric-architecture.com/10-fashion-tech-designers-revolutionizing-the-fashion-industry/.
TURNER, J. (2022) The 7 Main Ways Technology Impacts Your Daily Life. In: *Tech.Co*. Available at: https://tech.co/vpn/main-ways-technology-impacts-daily-life.
W4FT. (2018) What is Fashion-Tech? Available at: https://www.e4ft.eu/what-is-fashion-tech.
TAİEB, A.H., MSAHLİ, S. & SAKLY F. (2014) An eco-design approach for the functional textile. The 6th International Conference on the Future Technical Textile Conference (FTT 2014), 15-17th October 2014, Istanbul, Türkiye. Available at: https://www.researchgate.net/publication/316478827_An_eco-design_approach_for_the_functional_textile.
TARDI, C. (2022) 80-20 Rule. In *Investopedia*. Available at: https://www.investopedia.com/terms/1/80-20-rule.asp.
VAN DER RYN, S, COWAN, S. (2007) *Ecological Design*. Annotated edition. Washington: Island Press, 256 p.

INTERNATIONAL TOURISM AS A SOURCE OF INCOME GENERATION IN PORTUGAL

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ABSTRACT
A brief consultation of UNESCO's "World Heritage List" (https://whc.unesco.org/en/list) shows us that Portugal currently has 17 (seventeen) sites classified as UNESCO World Heritage, allowing us to highlight the "Historic Centre of Oporto", since 1996, or the "Alto Douro Wine Region", since 2001, as two regions of the country that are interconnected by "Port Wine".
The classification given by UNESCO to several Portuguese regions as "UNESCO World Heritage" has boosted Portugal as an international tourism destination. This fact has multiple implications in the dynamics of income generation by Portugal, namely in terms of Gross Value Added - GVA, Gross Domestic Product - GDP, balance of international transactions with tourism trips to and from Portugal. Obviously, this analysis can be made under such a multiplicity of parameters, however all of them are demonstrative of the financial growth generated by international tourism that seeks Portugal as a destination for the most varied types of tourism.
We intend with this study to analyze the income generated in Portugal by international tourism, both at the domestic and international market levels, both from the perspective of the economic development generated by the increasing number of tourists coming to Portugal and motivating the increase of companies dedicated to tourism-related activities, as in the increasing employability generated to satisfy the demand that tourism generates in those companies.
As we will have the opportunity to present through the data, tourism has been a driving factor for economic activity in Portugal and, consequently, an increasing factor for the well-being of residents in the country.

Keywords: Tourism; Development; GVA; GDP; Balance of Payments.

INTRODUCTION
This research work has as its final motto an analysis of the income from the growing demand for Portugal by international tourists and that, consequently, generate by that displacement as international tourists the consequent economic development of all industries directly linked to this activity, think in the hotel business, *lato sensu*, and in the food business, *lato sensu*, and indirectly in a whole set of companies that relate to those industries in the supply of goods and services.
Evidently, the existence of companies linked to that tourism activity necessarily needs employees and, for such fact, we will also make an analysis of this productive factor, and then

finish with an analysis of the Gross Value Added - GVA, the Gross Domestic Product - GDP - that generates this tourism industry, the balance of international transactions generated by international tourism in Portugal.

Considering the main subject and the aims we proposed to achieve, the methodology applied in the research and this paper was supported by statistical data from highly international credible and updated institutions. Thus, we can identify it as a mixed methodology (qualitative and quantitative), using research, analysis, and interpretation of scientific data.

RESEARCH

Tourism - conceptualization

The study of any science implies by the first moment that its object should be well defined. This means that when we investigate scientifically "Tourism", first, we must indicate which is the main object of our study, so, we must express what we mean by "Tourism".

According to ET Pakman (2014, p. 2)[1], "*the conceptual misunderstanding in the area of Tourism is great, and it seems distant the moment when it will have basic concepts, consensual and widely accepted*", i.e., this author believes that the research science of Tourism has not yet managed to obtain a single concept that densifies what is the science of Tourism. Despite recognizing that the definition of the object of a science is preliminary, essential, and necessary for a science to exist as such, in fact, at the level of the science of Tourism study, it would not have been possible to densify in a single concept what the "science of Tourism" is.

It is effectively argued that because "Tourism" is intertwined in a *multi*, *pluri*, and *transdisciplinary* with many and different other sciences, namely with Geography, Economics, Private and Public Administration, Ecology, Sociology, Cultural Anthropology, Psychology, Politics, Law, Marketing and Statistics, this fact imposes great obstacles to finding a definition that briefly aggregates the concept of Tourism.

ET Pakman bases his assertion on the fact that there are few theoreticians who have undertaken the difficult task of methodologically and conceptually densifying the science of Tourism, citing those who, in his opinion, would be the most relevant, such as Luis Fernández Fúster, Manoel Figuerola Palomo and Muñoz de Escalona from Spain, Victor T. C. Middleton and Marc Sölter from Brazil, Margarita Barretto and Alexandre Panosso Netto from Brazil.

According to the same author (Pakman, 2014, p. 3), this has led to scholars of Tourism science choosing to adhere to the conceptualizations of International Organizations, with the World Tourism Organization (WTO) playing a predominant role, based on the argument that the WTO, in defining what it defines as "Tourism", represents an authority argument (*argumentum ad verecundiam*).

It should be in mind that the WTO 's conceptualization of "Tourism" has the only aim to be for statistical purposes at world level, i.e., to aggregate all relevant tourism data worldwide and to present this data statistically. However, this reality should not be mistaken between the purposes and consequent definitions of a statistical-operational nature, which is the specific case of the WTO, and the definitions of a theoretical-conceptual nature, which are of interest to the study of tourism as a science.

ET Pakman presents in this work the evolutionary description of the WTO, from its origins to the present day, under the title *"From the origins in 1925 and the stages in the formation of the*

[1] Pakman, E. T. (2014). Sobre as definições de turismo da OMT: uma contribuição à História do Pensamento Turístico. XI Seminário da Associação Nacional Pesquisa e Pós-Graduação em Turismo, 24, 1-20. Web site- https://www.anptur.org.br/anais/anais/files/11/34.pdf

WTO" (Pakman, 2014, pp. 5-6), to be possible to describe the evolution of the description of "Tourism" concept presented by the WTO, under the title "*Character and scope of the WTO definitions*". (Pakman, 2014, pp. 6-18).

According to this author, the League of Nations (*Societé des Nations, Sociedad de Naciones, League of Nations*) in the year 1937/1938 established the concept of "International Tourist" as being "*Every person who travels for a period of 24 hours or more to a country other than that of his usual residence*" (Pakman, 2014, p. 8). It should be noted that at the time, it was only referred to the fact that someone was travelling to another country than the one where the person normally lived, highlighting that the time of stay outside his country should take place for a period longer than "24 hours", without referring to any reason that was at the origin of his trip. In this same study it´s stated in the "United Nations Conference on Tourism and International Travel, Rome, 1963" that concept of "International Tourist" has changed and is now assumed to be the "*Activity carried out by a person who visits a country other than that of his or her habitual residence, for purposes other than the exercise of a remunerated occupation, and for a period of time of at least 24 hours*." (Pakman, 2014, p. 9). This new concept emphasized above all the fact that the purpose of the international tourist was not to engage in gainful employment.

The evolution of this concept underwent a new revision when the "*International Conference on Travel and Tourism Statistics, Ottawa, 1991*" was held, organized by the WTO in the city of Ottawa, Canada, which came to conceptualize that "*Tourism comprises the activities carried out by people during their travels and stays in places other than their usual environment, for a consecutive period of time of less than a year, for leisure, business or other reasons*". (Pakman, 2014, p. 10).

It should be noted that the WTO, in its conceptualization of "Tourism", now understands this activity as being for "*leisure, business or other reasons*", carried out through "*activities performed by people during their trips and stays*" and which are practiced beyond their "usual environment". İ That is, outside their normal place of residence, and for a "*consecutive period of time of less than one year*". In other words, there is a paradigm shift in the conceptualization of tourism for the WTO.

Pakman continuing his analysis, indicates that the WTO in the "*Update of the Recommendations on Tourism Statistics, 1999*", carried out by the "UN Committee on Statistics", establishes a new concept of "Tourism" in which it states that "*Tourism includes activities performed by people during their trips to and stays in places other than their usual environment, for a consecutive period of time of less than a year, for leisure, business or other reasons not related to the exercise of an activity remunerated in the place visited*" (Pakman, 2014, p. 12-13)

It should be noted that this new concept only adds to the old one the fact that those who practice "Tourism" do not do so with a view to "*carrying out a paid activity in the place visited*", that is, the "Tourist" does not go in search of obtaining remuneration for the place where he/she is visiting. Finally, according to the same author, the WTO, fixed in 2008 the current designation of "Tourism" through the following conceptualization. "Tourism is a social, cultural and economic phenomenon, which involves the movement of people to places outside their usual place of residence, usually for pleasure" (Pakman, 2014, p. 18). In other words, the WTO analyses "Tourism" statistically from a "*social, cultural and economic*" point of view, through the "*movement of people*", who do it "*to places outside their usual place of residence*", with the aim of "*pleasure*".

Tourism - Tourism as a source of income generation

As expressed before, our research and this paper aims to analyze the "economic" phenomenon generated by "Tourism".

According to John K. Walton, Professor of Contemporary History, "*tourism, (is) the act and process of spending time away from home in pursuit of recreation, relaxation and pleasure, while making use of the commercial provision of services*".[2]

Once again, two essential aspects of tourism are highlighted here. First, the purpose of tourism is "*recreation, relaxation, and pleasure*", second, "*Tourism making use of the commercial provision of services*". This fact, which is well understood, generates economic/financial wealth in the places where the "tourist" goes, and which is the subject of our analysis.

According to the "*International Recommendations for Tourism Statistics 2008*"[3] – IRTS 2008, "*Tourism is a social, cultural and economic phenomenon related to the movement of people to places outside their usual place of residence, pleasure being the usual motivation*", (IRTS 2008, Chapter 1, item 1.1).

As we know, the "*tourism has an impact on the economy*", and "*owing to this range of impacts*", it's necessary having "*tourism statistics (...) for designing (...) and measuring tourism throughout the national economy*", and so the "*International Recommendations for Tourism Statistics 2008 (International Recommendations 2008) focuses on the activities carried out by visitors and on measuring them with both monetary and non-monetary indicators. Its purpose is to provide a common reference framework for countries to use in the compilation of tourism statistics*" (IRTS 2008, Chapter 1, *items* 1.3., 1.4., 1.6., 1.7.).

Tourism - The economic impact on the economy through a review he most relevant literature review.

Regarding the relevant Literature review, the Tourism, and its economic impact, Niccolò Comerio and Fernanda Strozzi[4], "*in this literature review, a quantitative bibliometric analysis has been performed, relying on both algorithms and software tools which allowed us to carry out a dynamic representation of the flow of knowledge evolution over time*." (Comerio & Strozzi, 2018, p. 16) In fact, according to different research and publications, the Tourism can be in the economy with other benefits, as an increase of tax revenues, employment creation and provision of additional sources of income (Archer, 1995; Belisle and Hoy, 1980; Davis et al., 1988; Durbarry, 2002; Khan et al., 1990; Uysal and Gitelson, 1994; West, 1993). The big international events (as sportive as World Cup Football; Olympic Games; Music; etc.) are a singular contribution to boost the economies. Different authors have developed studies identifying events, the places and the economic impact, the benefits translated into the tax revenues, the employment, investments, and infrastructures for the need development -

[2] John K. Walton, Professor of Contemporary History, University of the Basque Country, Bilbao, Spain. Editor of the Journal of Tourism History and the author of The British Seaside: Holidays and Resorts in the Twentieth Century, among others, in ENCYCLOPAEDİA BRİTANNİCA – vide https://www.britannica.com/topic/tourism

[3] Department of Economic and Social Affairs - Statistics Division - in "*International Recommendations for Tourism Statistics, 2008*", ST/ESA/STAT/SER.M/83/Rev.1, United Nations Publication, Sales No. E.08.XVII.28, ISBN 978-92-1-161521-0, United Nations, New York, 2010. – Website - https://unstats.un.org/unsd/publication/seriesm/seriesm_83rev1e.pdf

[4] Comerio, N.; Strozzi, F. (2019) Tourism and its economic impact: a literature review using bibliometric tools. Tourism Economics. Vol. 25(1) 109–131. sagepub.com/journals-permissions. DOI: 10.1177/1354816618793762. journals.sagepub.com/home/teu

Bohlmann and van Heerden, 2008; Kim et al., 2006; Lee and Taylor, 2005; Li and Jago, 2013. However, to understand the whole context, there are authors studying the residents' opinions and perceptions - Kim and Petrick, 2005. Regarding the negative effects, Copeland (1991) presented studies about Tourism and the phenomenon of the deindustrialization in different sectors. Although the contradictions and the diversity of the research, studies and publications, there are many and different areas needing to be studied. (Comerio & Strozzi, 2018, pp. 22-23).

FINDINGS

The WTO guidelines on the statistical analysis of the economy generated by tourism

In accordance with "International Recommendations for Tourism Statistics 2008", "*Tourism is a social, cultural and economic phenomenon related to the movement of people to places outside their usual place of residence, pleasure being the usual motivation*", (IRTS 2008, Chapter 1, item 1.1).

As we know, the "*tourism has an impact on the economy*", and "*owing to this range of impacts*", it's necessary having "*tourism statistics (...) for designing (...) and measuring tourism throughout the national economy*", and so the *International Recommendations for Tourism Statistics 2008* (International Recommendations 2008) focuses on the activities carried out by visitors and on measuring them with both monetary and non-monetary indicators. Its purpose is to provide a common reference framework for countries to use in the compilation of tourism statistics" (IRTS 2008, Chapter 1, items 1.3., 1.4.; 1.6.,1.7.).

International Tourism - global overview

According to the statistical data taken from the "TOURISM DASHBOARD" - World Tourism Organization (UNWTO) - the first analysis that we are going to do on International Tourism is related to the global vision of the Tourism phenomenon.

Our analysis is based mainly in the statistical data of the year 2019, since all global data show us that it was the best year for "Tourism" and as the pandemic generated by the "Covid-19" in the year 2020 caused globally, as we all know, a reception such that even in the year 2021 was not enough to recover the values then existing.

The first aspect we analyze is the flow of tourists worldwide.

To better understand the importance of "International Tourism" we will present the "Table 1" below.

World International Tourism						
Year	International Tourist Arrivals in World-Million	International Tourism Receipts per arrival - USD	International Tourism Receipts - USD billion	International Tourism Exports – USD billion	Share of International Tourism of total exports – (%)	Share of International Tourism of total Service exports – (%)
2010	957,2	1.020	976,6	1.148,3	6%	29%
2015	1.209,5	1.000	1.209,6	1.436,1	7%	29%
2019	1.465,5	1.012	1.482,7	1.749.7	7%	29%

2020	405.2	1.348	546,2	649.3	3%	13%
2021	426,9	1.411	602,1	713,2	3%	12%

Table 1 – General Data from "International Tourism": source: "TOURISM DASHBOARD" - World Tourism Organization (UNWTO), last update – 02-06-2022 [5]

Following we´ll present Table 2 about the International Tourism from UNWTO.

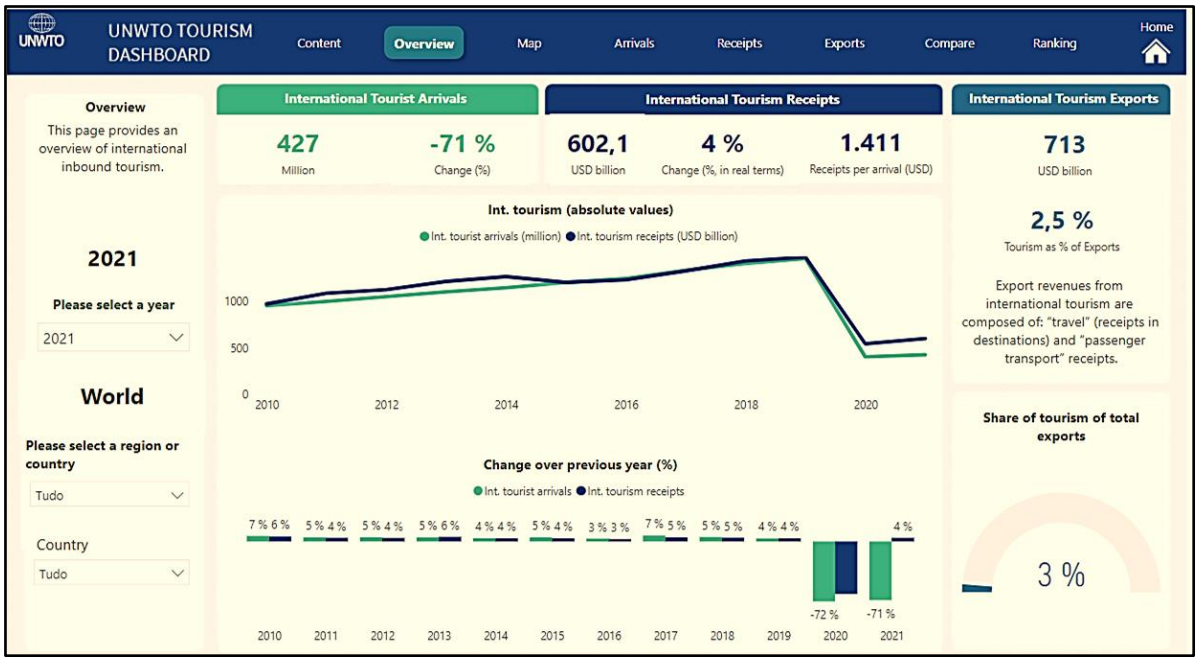

Table 2 – General Data about International Tourism. Source: "TOURISM DASHBOARD"- World Tourism Organization (UNWTO), last update – 02-06-2022[6]

This data allows us to highlight some facts. The number of international tourists has been in constant increase, reaching 1465,5 million in 2019, which represented the "World Revenues" of 1,482.7 USD billion.

If we look at "Table 2" above, we see that between the years 2010 and 2019, the "International Tourists Arrivals" has been constantly increasing in percentages ranging between 3% and 7%, except for the years 2020 and 2021, motivated by the global pandemic caused by "Covid 19", when there was a drastic decrease of 72% and 71%, respectively.

International Tourism - Distribution by continents and the main countries

After having obtained data on the "International Tourism" at a world level, we will now present data on the preference of "International Tourists" by continents and by the main 10 countries with more tourists received.

Tourists International Destinations – by sub-region of destination

To understand which Continents, receive more "International Tourists", Table 3 below is based on UNWTO data.

[5] UNWTO GLOBAL TOURISM DASHBOARD - https://www.unwto.org/tourism-data/country-profile-inbound-tourism

[6] *Idem.*

Note that the continent most visited by "International Tourists" is Europe, with approximately double the number of tourists received, compared to the second most visited continent, Asia, and the Pacific. See, for example, that in 2019 half of the "International Tourists" visited Europe.

International tourists - Arrivals - Million					
CONTİNENT/Year	2010	2015	2019	2020	2021
Europe	490,8	612,1	745,0	238,5	286,8
Asia and the Pacific	208,0	284,4	360,1	59,1	20,7
Americas	151,8	194,1	219,3	69,8	82,4
Middle East	56,1	65,1	73,0	19,8	18,5
Africa	50,5	53,9	68,1	18,0	18.4

Table 3 – General Data from "International Tourism". Source: "TOURISM DASHBOARD" - World Tourism Organization (UNWTO), last update – 02-06-2022[7]

When our analysis looks at the 10 (ten) countries most visited by "International Tourists", see "Table 4" below, we find that France is the country that globally receives the most tourists, with 90.0 million in 2019.

International tourists - Arrivals - Million															
2019	90,0	83,5	79,4	65,7	64,5	51,2	45,0	39,9	39,4	35,2	32,9	31,9	31,3	26,1	25,3	24,6
COUTRY/Year	France	Spain	United States	China	Italy	Türkiye	Mexico	Thailand	United Kingdom	Germany	Denmark	Japan	Greece	Malaysia	Utd Arab	Portugal
World Ranking	1.º	2.º	3.º	4.º	5.º	6.º	7.º	8.º	9.º	10.º	11.º	12.º	13.º	14.º	15.º	16.º

Table 4 – General Data from "International Tourism" Source: "TOURISM DASHBOARD" - World Tourism Organization (UNWTO), last update – 02-06-2022[8]

International Tourism: Analysis of Portugal

General Data

The first aspect we are going to research is the number of "International Tourists" who have visited Portugal, and for that we will resort once again to the UNWTO statistical data.

If we analyze those statistics, Portugal is ranked 16th in the world with the most international tourists - see "Table 4" above.

When we develop a global analysis of "Table 5" below, we become certain of the importance of "International Tourism", both for the monetary revenues it generates in Portugal, and for the importance in its balance of exports.

[7] *Ibidem.*

[8] *Ibidem.*

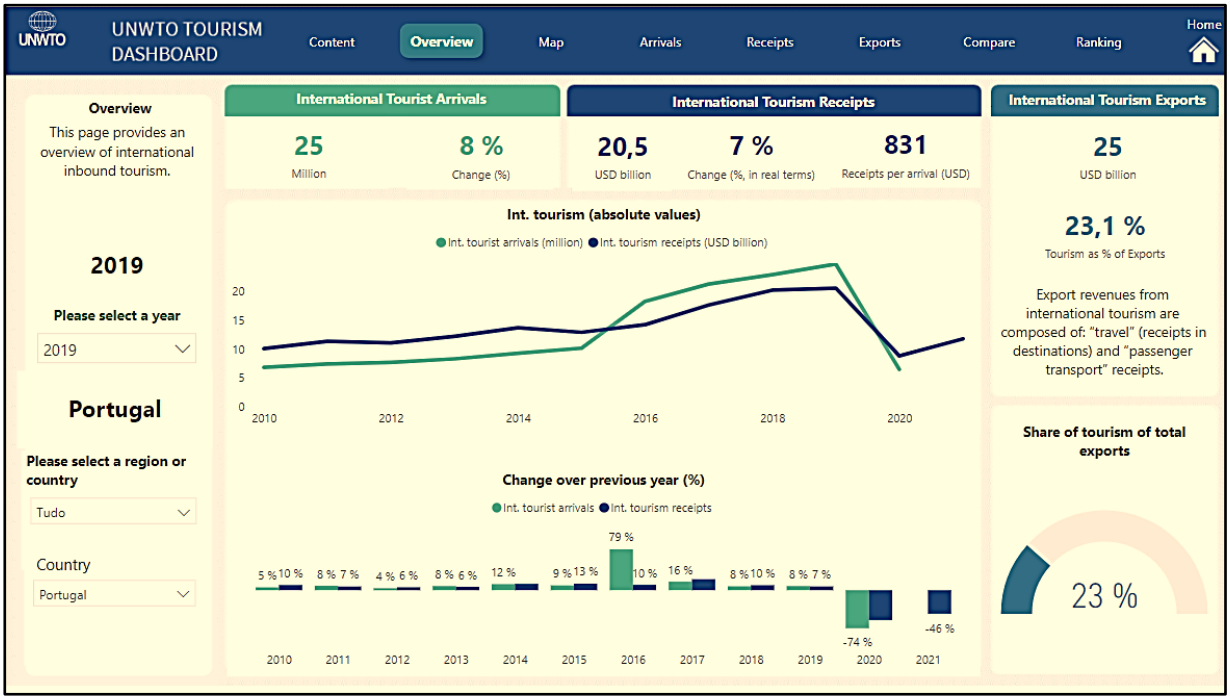

Table 5 – General Data about "Portugal International Tourism" Source: "TOURISM DASHBOARD" - World Tourism Organization (UNWTO), last update – 02-06-2022[9]

As we have already evidenced, at a global level 2019 was the best year for "International Tourism", a fact that was of enormous importance also for Portugal, which is reflected in "Table 6" below, that we elaborated based on the data we spoiled from the "TOURISM DASHBOARD" – UNWTO.

Portugal International Tourism	2019
International Tourist Arrivals - Million	24,6
International Tourist – Receipts per arrival - USD	831
International Tourism Receipts – USD billion	20,5
International Tourism export revenues – are composed with "travel" (receipts in destination) and "passenger transport" receipts – USD billion	24,6
Tourism of total exports - Share	23,1%
Tourism of service exports - Share	62,37%

Table 6 – This table was written by the authors based on the data from "TOURISM DASHBOARD" - World Tourism Organization (UNWTO), last update – 02-06-2022[10]

Hotel and restaurant industry and employment

Obviously, to receive tourists in any country, and in the specific case of Portugal, it is necessary to have establishments that offer places to sleep and to eat. Table 7 below, extract from the statistical database of the Organization for Economic Co-operation and Development - OECD, presents how hotel, food, and beverage companies, as well as transport companies, among others, have been growing in Portugal.

[9] *Ibidem.*
[10] *Ibidem.*

Country - Portugal							
Variable - Enterprises							
Unit - Enterprises							
Year	2013	2014	2015	2016	2017	2018	2019
Total tourism	99 055	100 928	109 271	116 470	125 773	137 289	146 871
Tourism industries	96 880	98 640	106 594	112 947	121 288	132 096	141 342
Accommodation services for visitors	7 630	9 660	16 394	21 861	28 831	37 408	41 860
Food and beverage serving industry	74 664	74 462	75 432	75 701	75 995	75 783	76 171
Passenger transport	11 295	11 076	10 989	11 159	11 794	13 802	17 866
Travel agencies and other reservation services industry	3 291	3 442	3 779	4 226	4 668	5 103	5 445
Other industries	2 175	2 288	2 677	3 523	4 485	5 193	5 529

Table 7 - Enterprises in tourism – General data about "companies" connected with "Tourism". Source - OECD.Stat[11]

Between 2013 and 2019, companies dedicated to "Tourism" increased by 48.27%, from 99.,055 to 146871. It is easy to understand that for these companies to function, labour is essential, that is, employees to work there.

According to OECD data, "Employment in tourism" has also grown, as shown in "Table 8", increasing, for example, from 58,600 in 2008 to 115,803 in 2019 in "Accommodation services for visitors", or from 242,252 in 2008 to 283,438 in 2019 in "Food and beverage serving industry", which represents an increase of 97.61% in the first case and 16.95% in the second.

Country - Portugal												
Variable - Employment												
Unit - Employment												
Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Tourism industries	347 330	342 575	329 757	336 390	317 595	322 887	330 947	352 700	..	..	..	..
Accommodation services for visitors	58 600	56 443	55 358	56 941	54 808	54 466	58 703	69 706	80 260	92 963	107 590	115 803
Food and beverage serving industry	242 352	239 631	237 713	233 187	218 149	211 228	214 635	223 772	237 548	253 523	267 477	283 438
Passenger transport	46 378	46 501	36 686	46 262	44 638	43 783	43 565	43 858	48 465	50 367	54 617	..
Travel agencies and other reservation services industry	..	..	..	..	..	13 410	14 044	15 364	16 618	18 213	19 815	21 173

Table 8 - Employment in tourism – General data about "companies" connected with "Tourism". Source - OECD.Stat[12]

It is clear to anyone that all these employees have their remuneration for the work they do. Given this reality, we will now make a brief analysis of the values of wages in this industry and for that we insert below the "Table 9" with the compilation of "Average MONTHLY earnings of employees: By sector of economic activity - Hotels and Restaurants and Similar Activities", taken from "PORDATA - Statistics About Portugal and Europe", where we can see.

[11] OCDE.Stat - https://stats.oecd.org/Index.aspx?ThemeTreeId=10&DatasetCode=tourism_rec_exp

[12] *Idem*.

Year - EURO	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020
Hotels and restaurants and similar activities	372,50	462,50	563,00	657,80	673,90	690,50	713,50	739,40	764,10	780,10
Total - average	493,00	612,00	764,70	899,00	913,90	924,90	943,00	970,4	1 005,10	1 042,00

Table 9 - Average MONTHLY earnings of employees: By sector of economic activity – Hotels and Restaurants and Similar Activities – Source- PORDATA[13]

This "Table 9" highlights two fundamental aspects. First, there has been a steady increase in the wages paid to employees of "Hotels and restaurants and similar activities". Secondly, that these employees earn less than the average of other employees. Less 23.97% in 2019, or 25.13% in 2020, the year in which "Covid-19" emerged.

The importance of International Tourism in Gross Domestic Product (GDP)

If we look at the heading "Tourist Balance (TB)" inserted in the publication "Tourism Statistics - 2019" of the "*Instituto Nacional de Estatística* - Statistics Portugal", we see that "International Tourism" has a great importance both in GDP and TB.

As we can see in (Tourism Statistics - 2019 - pp. 15 to 18) "International Tourism" has a relevant importance, since, as we can see in "Table 10" below, it has been a source of revenue that, for example, in the year 2019 represented 8.5% of GDP.

If we make the same analysis in the "Tourist Balance" (TB), that is, that we ascertain the difference between what "International Tourism" contributes to Portugal's balance of payments (Esports) and the monetary values that "Portuguese Tourists" spend when they holiday abroad (Imports), we find that Portugal has a positive balance which has been ascertained in a positive diff for Portugal by 6.1 in the year 2019.

Travel and Tourism account as a % of GDP			
Years	Exports (1)	Imports (2)	Balance (3) (1) – (2) = (3)
2000	4.5	1.9	2.6
2005	3.9	1.5	2.4
2010	4.2	1.6	2.6
2015	6.5	1.9	4.6
2016	6.9	1.9	5.0
2017	7.9	2.1	5.9
2018	8.3	2.2	6.1
2019	8.5	2.4	6.1
2020	3.9	1.4	2.5

Table 10 - Travel and tourism account as a % of GDP- Source - PORDATA[14]

As we can see from "Table 10", Portugal has for many years now had a growing balance with "International Tourism" both in GDP and TB, reaching its peak in the year 2019.

[13] PORDATA- https://www.pordata.pt/en/DB/Portugal/Search+Environment/Table

[14] PORDATA- https://www.pordata.pt/en/DB/Portugal/Search+Environment/Table

CONCLUSION

From all the above, we can draw the following general conclusions.

As we have observed, Portugal had in 2019 its best economic year with "International Tourism", which placed it in 16th place worldwide in terms of the amount of "International Tourists" it receives, and this reality has favorable repercussions at various levels.

It has caused a very significant increase in hotel and restaurant establishments and, consequently, an increase in employment and salaries, although it is regrettable that these salaries are lower than the national average.

It has caused an increase in the inflow of foreign currency with International Tourism, which positively influences both the Tourist Balance and the Gross Domestic Product.

REFERENCES

Comerio, N.; Strozzi, F. (2019) *Tourism and its economic impact: a literature review using bibliometric tools. Tourism Economics*. Vol. 25(1) 109–131. sagepub.com/journals-permissions. DOI: 10.1177/1354816618793762. journals.sagepub.com/home/teu

Department of Economic and Social Affairs - Statistics Division - in "*International Recommendations for Tourism Statistics, 2008*", ST/ESA/STAT/SER.M/83/Rev.1, United Nations Publication, Sales No. E.08.XVII.28, ISBN 978-92-1-161521-0, United Nations, New York, 2010. – Website- https://unstats.un.org/unsd/publication/seriesm/seriesm_83rev1e.pdf

Instituto Nacional de Estatística - Estatísticas do Turismo: 2019. Lisboa: INE, 2020. Available online: https://www.ine.pt/xurl/pub/133574>. ISSN 0377-2306. ISBN 978-989-25-0542-8

John K. Walton, Professor of Contemporary History, University of the Basque Country, Bilbao, Spain. Editor of the Journal of Tourism History and the author of The British Seaside: Holidays and Resorts in the Twentieth Century, among others, in ENCYCLOPAEDİA BRİTANNİCA – vide https://www.britannica.com/topic/tourism

OCDE.Stat:https://stats.oecd.org/Index.aspx?ThemeTreeId=10&DatasetCode=tourism_rec_exp

Pakman, E. T. (2014). Sobre as definições de turismo da OMT: uma contribuição à História do Pensamento Turístico. XI Seminário da Associação Nacional Pesquisa e Pós-Graduação em Turismo, 24, 1-20. WebSite - https://www.anptur.org.br/anais/anais/files/11/34.pdf

PORDATA- https://www.pordata.pt/en/DB/Portugal/Search+Environment/Table

UNWTO GLOBAL TOURISM DASHBOARD - https://www.unwto.org/tourism-data/country-profile-inbound-tourism

COVID-19 PANDEMİ KRİZİNİN TÜRKİYE EKONOMİSİNİN MAKROEKONOMİK PERFORMANSI ÜZERİNE ETKİLERİNİN DEĞERLENDİRİLMESİ

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ÖZET

Türkiye ekonomisinde 2018 yılının ikinci yarısında başlayan ekonomik daralma, yüksek enflasyon ve yüksek işsizlik süreci 2019 yılının ilk yarısında da devam etmiştir. 2019 yılının ikinci yarısında ekonomi toparlanma sürecine girmesine rağmen, yılsonunda Çin'de başlayan COVID-19 salgınının hızla dünyaya yayılarak küresel pandemiye dönüşmesiyle, 2020 yılında Türkiye ekonomisi de ciddi biçimde etkilenmiştir. 2018 yılında yaşanan makroekonomik performansdaki bozulma 2020 yılında COVID-19 salgını ile ciddi boyutlara ulaşmıştır. Türkiye ekonomisinde 2020 yılında, pandemi ile birlikte daha yüksek durgunluk, yüksek işsizlik ve yüksek enflasyon süreci devam etmiştir. 2021-2022 döneminde pandeminin etkilerinin azalmasına ve ekonominin canlanmasına rağmen, yüksek enflasyon ve yüksek işsizlik devam etmekte olup ekonominin makroekonomik performansı beklendiği gibi iyileşememiştir.

Bu amaçla çalışma, COVID-19 pandemi krizi dönemi Türkiye ekonomisinin makroekonomik performansını değerlendirilmeye yöneliktir. Çalışmada, Türkiye'nin 2019-2022 dönemi makroekonomik performansının ölçülmesinde, en önemli iki temel gösterge olan enflasyon oranı ve işsizlik oranı toplamından oluşan, A. Okun tarafından geliştirilen "İktisadi Hoşnutsuzluk Endeksi" (Orjinal Sefalet Endeksi) kullanılmaktadır. Endekste her iki değişken ekonomik açıdan aynı derecede önemli olarak kabul edilmekte olduğundan, her ikisine de eşit ve sabit ağırlık verilmektedir. Endeksin hesaplanmasında kullanılan yılsonu TÜFE oranı ile genel işsizlik oranı, Türkiye İstatistik Kurumundan (TÜİK) alınmıştır. Sonuç olarak Türkiye'de endeksin değerinin yüksek olması, makroekomik performansın güçsüz olduğunu göstermektedir. Ayrıca endeksin değeri yükseldikçe toplumda huzursuzluk, ekonomide karamsarlık ve ülkede refah kaybı artmaktadır. Genellikle kriz dönemlerinde yükselen endeks değerinin kriz sonrasında ekonominin canlanmaya başlamasıyla düşmesi beklenir. Ancak Türkiye'de ekonomi toparlanmaya başlamasına rağmen, endeks değeri düşmemiş tam tersine yükselişine devam etmiştir. Pandemi krizi döneminde diğer birçok ülke gibi Türkiye'de de bozulan makroekonomik performans, pandemi sonrası dönemde de artarak devam etmektedir. Türkiye'nin makroekonomik performansının güçlendirilmesi için, endeks değerinin sürekli yükselmesinde etkisi daha fazla olan enflasyon oranının düşürülmesine yönelik politikaların öncelikle uygulanması gerekmektedir.

Anahtar Kelimeler: Covid-19 Pandemi Krizi, Makroekonomik Performans, Türkiye Ekonomisi

EVALUATION OF THE EFFECTS OF THE COVID-19 PANDEMIC ON THE MACROECONOMIC PERFORMANCE OF THE TURKISH ECONOMY

ABSTRACT

The economic contraction, high inflation, and high unemployment period that had started in the second half of 2018 in the Turkish economy continued in the first half of 2019. Although the economy started to recover in the second half of 2019, the economy of Türkiye was also

seriously affected in 2020 due to the COVID-19 outbreak, which started in China at the end of 2019 and spread rapidly to the world and turned into a global pandemic. The deterioration in macroeconomic performance experienced in 2018 reached serious levels with the COVID-19 pandemic in 2020. With the pandemic, the period of higher recession, high unemployment, and high inflation continued in the Turkish economy in 2020. Despite the decline in the effects of the pandemic and the recovery of the economy in the 2021-2022 period, high inflation and high unemployment have continued and the macroeconomic performance of the economy has not improved as expected.

Therefore, the study aims to evaluate the macroeconomic performance of the Turkish economy during the COVID-19 pandemic. In the study, the "Economic Discontent Index" (Original Misery Index) which was developed by Arthur Okun and consisted of the sum of the two most significant indicators -the inflation rate and the unemployment rate- was used to measure Türkiye's macroeconomic performance in the 2019-2022 period. Since the index considers that both variables have equal economic importance, equal and constant weight is given to both variables. The year-end CPI rate and the general unemployment rate used in the calculation of the index were obtained from the Turkish Statistical Institute (TURKSTAT). As a result, the high value of the index in Türkiye indicates that the macroeconomic performance is weak. Moreover, the increase in the value of the index leads to the rise of unrest in the society, pessimism in the economy, and the loss of welfare in the country. The index value, which usually rises during crisis periods, is expected to decline as the economy begins to recover after the crisis. However, although the economy started to recover in Türkiye, the index value has not declined but continued to rise on the contrary. The deteriorating macroeconomic performance of Türkiye during the pandemic crisis, as in many other countries, has been getting worse also in the post-pandemic period. The government should implement policies to reduce the inflation rate, which has a greater impact on the constant rise of the index value, to strengthen the macroeconomic performance of Türkiye.

Keywords: Covid-19 Pandemic Crisis, Macroeconomic Performance, Turkish Economy

DO SHOCKS AFFECT FOREIGN VISITOR ARRIVALS PERMANENTLY OR TEMPORARILY? A RESEARCH ON RUSSIAN VISITORS TO TURKEY

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ABSTRACT
This study aims to investigate whether shocks can have a permanent effect on the number of Russian visitors to Turkey. Knowing the response of Russian visitors to shocks will aid in implementing appropriate public policy. This study uses the number of Russian visitors to Turkey as a variable. Annual data are used in this study, which cover the years from 1998 to 2021. The data were obtained from the Ministry of Culture and Tourism of the Republic of Turkey. Unit root tests were preferred to determine whether shocks could persistently impact the number of Russian visitors to Turkey. In this study, the unit root test with one break recommended in the study of Perron (1997), the unit root test with one break suggested in the study of Lee and Strazicich (2013), the unit root test with two breaks recommended in the study of Lee and Strazicich (2003), and the RALS-LM (residual augmented least squares–Lagrange multiplier) unit root test (with one break and two breaks) suggested in the study of Meng et al. (2017) were applied. According to the results of all the tests applied, the series regarding Russian visitors to Turkey has been determined to be stationary. Accordingly, it can be said that a shock, like a change in government policy, cannot permanently affect the number of Russian visitors to Turkey.

Keywords: Permanent Effect, Russian Visitors, Shocks.

REFERENCES
Lee, J., & Strazicich, M. C. (2003). Minimum Lagrange multiplier unit root test with two structural breaks, *The Review of Economics and Statistics*, 85(4), 1082-1089.

Lee, J., & Strazicich, M. C. (2013). Minimum LM unit root test with one structural break, *Economics Bulletin*, 33(4), 2483-2492.

Meng, M., Lee, J., & Payne, J. E. (2017). RALS-LM unit root test with trend breaks and non-normal errors: application to the Prebisch-Singer hypothesis, *Studies in Nonlinear Dynamics & Econometrics*, 21(1), 31-45.

Perron, P. (1997). Further evidence on breaking trend functions in macroeconomic variables, *Journal of Econometrics*, 80(2), 355-385.

HOW DO MANAGERS PERCEIVE GROWTH IN A CRISIS CONTEXT? CASE OF MOROCCAN SMES

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ABSTRACT

SMEs are the cornerstone of the Moroccan economy. They recruit, invest, and contribute strongly to economic growth. Indeed, the latter remains dependent on their growth and development. Nevertheless, contrary to what many people think, growth is not a common goal among SME managers. Some want to grow their businesses, while others are satisfied with the status quo. This research develops an in-depth analysis of the growth intention of Moroccan SMEs, while taking into account the crisis context in which it was conducted. In this sense, the study has two objectives: to understand through the eyes and perceptions of managers the impact that the crisis may have had on their business, and to understand their intention to grow during this context. After a literature review highlighting the role of the manager within the SME, and the results of the work on growth intention, we conducted, through a qualitative approach, four interviews with four Moroccan SME managers, located in Marrakech. The interviews, conducted between month 3 and month 4 of 2022, were transcribed according to the sociological method, and then analyzed by hand, through a horizontal and vertical analysis. Following this analysis, the results generated demonstrate that growth is a polyphonic concept, and that the intention to grow is protean: four modalities of the intention to grow have emerged. Strong growth intention, moderate growth intention, pending growth intention, and no growth intention.

Keywords: SME, crisis, growth intention.

ANALYSIS OF GROWTH INTENTION AND ITS INFLUENCE ON GOVERNANCE: CASE OF MOROCCAN FAMILY SME'S

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ABSTRACT

According to Delmar and Wiklund (2003), and Foidart and Surlemont (2009), the intention to grow leads to effective growth. Therefore, it is wise to study the ambitions and motivations of the manager in order to understand the strategic behavior of the family SME. Opinions may vary on growth, the key is to always ask whether the leader wants to grow, as not all leaders have the same goals and visions for the future of their companies (Chabaud, Degeorge, 2016). Achieving stable growth is no easy task. It requires changes in the structure and management of the company, and this is where good governance is useful and necessary.

Our study aims to address the following issue: How does the intention to grow impact the governance of Moroccan family SMEs?

To carry out this study, two theories will be mobilized: The theory of extended governance (Charreaux, 2008; Writz, 2011) and the theory of planned behavior (Ajzen, 1991).

For our study, we have chosen an interpretativist epistemological paradigm, with the aim of building knowledge that captures the complexity of the object studied, in order to discover and explore the reality of family SMEs in terms of growth and governance, through an abductive approach. As a corollary to the previous methodological choices, we recommend the use of a qualitative approach. This choice is more dictated by the orientation of this study, which is the exploration and construction of valid knowledge. The research method that seems to us to be the most adapted to our project is the study of multiple cases, allowing us to account for the complexity of family SMEs, their strategic behaviors and their governance.

Keywords:: Intention de croissance, gouvernance, PME familiales.

PRODUCT DONATION AS A REVERSE LOGISTIC PRACTICE: PERCEPTION IN THE MOROCCAN AGRO-FOOD INDUSTRY

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ABSTRACT

The success of a company has often been linked to its economic performance. However, in today's world, characterized by intense globalization, sustainability is rather dependent on other dimensions, notably social and environmental, now grouped under the concept of CSR.

Throughout the literature, this concept has been linked to the different functions of the company by calling for the selection of activities that simultaneously contribute to the achievement of performance on the three levels mentioned, while involving, not only, the shareholders, but also all the different stakeholders existing in the environment of the company, namely the partners, the state and society.

According to Carter (1979), the company must respect its fundamental economic, legal, ethical, and philanthropic responsibilities, knowing that this last type is often ignored and considered a charity or an expense without economic utility, which decreases its performance.

Through this study, we aim to see how the company can take charge of its philanthropic responsibility through its reverse logistics, thus making this function a lever that is both economic (less costs), environmental (less product destruction) and social (allowing the needs of the less fortunate to be met). This study is part of the search for ways to make logistics a mechanism to facilitate the integration of CSR within companies without compromising their overall performance.

This study aims to explore the perception of managers in the agro-food industry, on the role of reverse logistics in improving the living conditions of the society. This choice is justified by the desire to better identify, according to the vision of managers, the various antecedents to the implementation of product donations as a practice among others of reverse logistics and to determine the success factors and obstacles in the Moroccan context.

Through this study, we aim to understand how this approach could be integrated into the Moroccan context.

To achieve the objective of our study, we consider a qualitative approach based on semi-directive interviews with managers occupying positions of responsibility directly related to the activities of reverse logistics.

Based on the existing literature, our interview guide will focus on the following areas:

1. The profile of the respondent,
2. The characteristics of the company,
3. Perception of reverse logistics,
4. The perception of product donations as a practice for closing the loop,
5. The antecedent of product donation implementation,
6. The obstacles to its implementation,

7. The impacts of this approach.

Keywords: CSR; sustainability; social impact; Product donation; reverse logistics.

THE EFFECT OF RETURN POLICY LENIENCY ON ONLINE PURCHASE INTENTION

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ABSTRACT

The best and most effective way to find out if a person is going to act in a certain way or not is to ask them if they intend to take that action (Fishbein and Ajzen, 1975).

Moving from purchase intention to completion requires an understanding of the online purchase decision process. This requires the identification of factors that influence online consumer behavior as this information can help in improving the offer and the environment in which it is offered in terms of website designs, transaction security, information accessibility and others to encourage the consumer to execute the online purchase (Cao and Mokhtarian, 2005; Chang et al., 2005).

The return policy, considered as a very important element of reverse logistics, is apprehended in the literature as one factor among others which, according to the researchers, can exert a direct influence on the purchase intention, or indirectly through the mediation of the perceived risk and the perceived trust.

Based on the theoretical contributions of the theory of planned behavior (Ajzen, 1991), the theory of signaling (Spence, 1974) and the SOR theory (A. Mehrabian and J. Russell, 1974), we aim at providing an answer to the following question: *What is the effect of return policy on purchase intention in online commerce?*

The epistemological posture chosen for our study is post-positivism, which is a less rigid version of positivism. This can be justified by the nature of the approach to be followed, which is mixed, a first qualitative exploratory phase will allow us to make the necessary modifications, based on interviews, to the conceptual scheme derived from the literature, followed by a quantitative confirmatory phase to validate it.

Keywords: Purchase intention, return policy, e-commerce, perceived risk, perceived trust.

COVID 19 | FOOD RETAILING AND HOME DELIVERY SERVICE: A PREFERRED ALTERNATIVE AND A CURRENT TREND THAT RESISTS THE CRISIS

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ABSTRACT

This study is in line with the studies that relate to e-commerce during a pandemic. Faced with the health crisis of covid-19, many consumers have turned to e-commerce which, in Morocco has experienced an extremely strong evolution despite the pandemic. This upheaval in the consumption habits of Moroccans has made the major retailers question the need to position their offer in e-commerce by proposing home delivery as a new form of service in response to the new expectations of customers and also to maintain contact with suppliers and ensure communication with all interested parties. The home delivery service becoming very important was able to contribute to provisioning household food and other goods and also led to the emergence of a new buyer profile with new preferences and priorities. **Objective:** To assess the satisfaction levels of home delivery service users and their perception of the service provided by the retailers. **Material and Methods:** A descriptive study was made. 1000 users of this type of service were evaluated in the food retail sector. The evaluation of our survey was done by using a questionnaire whose reliability and validity have been scrupulously tested. Some correlates were also assessed: Age, gender, family situation, and occupation category. **Results:** Consideration the result obtained, the global satisfaction among users of the service was high and it has even been found that most of them have a positive perception of the service provided and are willing to repeat the experience. **Conclusion:** The results achieved in this study seem to give home delivery a fairly positive role while realizing that this service, although adequate and even important, was able, on the one hand, to develop the activity of the brands and, on the other hand, to cause with certainty to Moroccan consumers to do their shopping online even after the decline of the pandemic.

Keywords: Food retailing, home delivery service, E-commerce.

KAMU HARCAMALARI İLE VERGİLERİN İKTİSADİ BÜYÜME ÜZERİNDEKİ ETKİLERİNİN ANALİZİ

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ÖZET
Türkiye'de kamu maliyesi politikalarının iktisadi büyüme ile ilişkisini ele alan 1960-2009 dönemini kapsayan çalışmada, Wagner ve Keynes hipotezlerini ekonometrik testlerle sınanarak analizi yapılmıştır. Çalışmada, GSMH ile kamu maliyesi enstrümanları değişkenler olarak (vergiler, kamu gelirleri, toplam borç stoku, konsolide bütçe ve kamu harcamaları) kullanılmıştır. ADF, P-P ve KPSS birim kök testleri, Granger nedensellik ve Toda-Yamamato-Dolado-Lutkepohl (MWALD) nedensellik testleri kullanılmıştır. Ayrıca Zivot-Andrews kırılma testi kullanılmıştır. Granger nedensellik testleri ile MWALD nedensellik testlerinde kısa ve uzun dönem ilişkisi incelenmiştir. Granger nedensellik testi "**kısa dönem**" nedensellik analizine imkan sağlarken, MWALD testi "**uzun dönem**" nedensellik analizine imkan sağlamaktadır. Bu testler sonucunda, Keynes'in hipotezini doğrular nitelikte sonuçlar elde edilmiştir. Nedensellik ilişkisi tespit edilmiştir. Türkiye üzerine yapılan ampirik çalışmada, kamu harcamalarındaki artışın iktisadi büyüme üzerindeki etkisinin pozitif, anlamlı ve tek yönlü olduğu tespit edilmiştir. Kısa dönemde Wagner hipotezini doğrulayacak, iktisadi büyümeden kamu harcamalarına doğru bir nedensellik görülmemekle birlikte, uzun dönemde çift yönlü bir nedensellik ilişkisi görülmüştür. Türkiye'de iktisadi büyüme üzerinde birçok değişken etkili olmakla birlikte, kamu maliyesi enstrümanları ile ilgili değişkenlerin etkisi daha belirgin olarak karşımıza çıkmaktadır.

Anahtar Kelimeler: İktisadi büyüme, Kamu Maliyesi politikaları, Kamu Harcamaları, Vergiler, Granger Nedensellik testleri, Wagner Hipotezi, Keynes Hipotezi.

ANALYSIS OF THE EFFECTS OF PUBLIC EXPENDITURE AND TAXES ON ECONOMIC GROWTH

ABSTRACT
This paper attempts to test Wagner and Keynesian hypothesis by examining econometrics tests the relationship between economic growth and total government expenditures as well as its various government instruments as taxes, total debt stocks, public incomes and consolidated budget for the Turkish case over the period of 1960-2009. The relationship between Wagner's and Keynes's hypothesis and ecenomic growth is analyzed by using econometric tests. In the study, GNP and public finance instruments (taxes, public revenues, the total debt stock, consolidated budget and public expenditure) are used as variables. ADF, PP and KPSS unit root tests, Granger causality and Toda-Yamamoto-Dolado-Lütkepohl (MWALD) causality tests are used. Moreover; Zivot-Andrews breaking test is also used. Short and long term relationships are examined in Granger causality tests MWALD causality tests. While Granger causality tests allow for "Short-term" causality analysis, MWALD causality tests allow for "Long-term" causality analysis. Test results confirm the Keynes's hypothesis. Causal relationship has been found. In the empirical study on Türkiye, the effect of the increase in public spending on economic growth is one-way, positive and significant. While there is no causality from

economic growth towards public expenditures that confirms Wagner hypothesis in the short term, there is a bidirectional causality relationship in the long term. There are many variables on economic growth in Türkiye; however variables that are about public finance instruments are more obvious.

Keywords: Economic Growth, Public Finance Politics, Public Expenditures, Taxes, Granger Causality Tests, Wagner Hypothesis, Keynes Hypothesis.

1.GİRİŞ

Günümüzde yaşanan küresel ekonomik krizden çıkışta, devletlerin kamu harcamalarına başvurması ve krizden çıkış reçetelerinde devletçi ve korumacı iktisat politikalarıyla reel ekonomiye bizzat müdahalesi kamu harcamalarının önemini ortaya çıkarmıştır (Aksu,2013:129). Ekonomide durgunluk sürecinin hüküm sürdüğü bir dönemde, kamu harcamalarında yapılacak artış, toplam talebin artmasına ve bu suretle ekonominin yeniden canlanma sürecine girmesine katkıda bulunur. Bu durum toplam üretim kapasitesinin arttırıcı nitelikteki (alt yapı yatırımları vb.), devlet tarafından verilen her türlü üretimi arttırmaya yönelik sübvansiyonlar ile istihdamı arttırıcı işsizliği azaltıcı politikalar iktisadi büyüme üzerinde etkili olmaktadır. Sosyal ve ekonomik gelişme, özellikle gelişmekte olan ülkelerde, büyük oranda hükümetlerin genişleyen kamu hizmetlerini ve ekonomik sosyal altyapı geliştirme programlarını finanse edebilmesi için yeterli gelir kaynakları yaratabilme yeteneğine bağlıdır (Kotler ve diğ.,2000:263). Bu çalışmada, kamu maliyesi parametrilerinin (kamu harcamaları, kamu gelirleri, vergilerin, toplam borç stokunun ve toplam bütçenin) 1960-2009 dönemini kapsayan iktisadi büyüme üzerindeki etkilerini ekonometrik testlerle incelenecektir.

2.Kamu Harcamalarının İktisadi Büyümeye Etkisi

2.1.Kavram Analizi

Kamu harcamalarının

[1] makro ekonomide yarattığı etkiler, harcamaların türüne ve niteliğine göre değişiklik arz etmektedir. İktisadi büyüme üzerindeki en olumlu etkiyi **yatırım harcamaları** yapmaktadır. Cari harcamalar ise, toplam talebi artırmak suretiyle iktisadi büyüme üzerinde dolaylı etkide bulunur. Transfer harcamaları da yine toplam talebi arttırarak, iktisadi büyümeyi dolaylı yoldan etkilemektedir (Pehlivan,2009:80). Barro çalışmasında, vergilerle finanse edilen kamu harcamalarının iktisadi büyümeyi nasıl etkilediğini araştırmıştır. Buna göre, tasarruf ve büyüme oranları, kamu harcamaları ve vergilerle ilgili bilinen dışsallıklar nedeniyle beklenen optimum seviyenin altında kalmakta olduğunu vurgulamıştır. Bu durum, bazı ülkelerde kamu harcamalarının faydalı ve verimli kullanımları sonucunda, büyüme oranlarını ve tasarrufları arttırırken, bazı ülkelerde alınan vergilerin kamuda verimli kullanılamaması nedeniyle, dezavantajlar yaratabilmektedir (Barro,1988:7-11). Kamu harcaması politikaları gelişmekte olan verimli alanlara, özellikle beşeri sermayeye yönelik öğrenme potansiyelinin yüksek olduğu sektörlere kaydırılırsa, örneğin, Ar-Ge, bilim ve teknoloji, eğitim, sağlık, finansal kalkınma gibi alanlara yöneltildiğinde azgelişmiş ülkelerin iktisadi büyümelerini hızlandırabilmeleri

[1]1 Kamu harcamaları, "devletin, ekonomik, sosyal, siyasi ve idari amaçlarını gerçekleştirmek için, bu faaliyet alanlarında verdiği hizmet ve ürettiği mallar için yapmış olduğu harcamalar toplamıdır" (Akyüz ve Ertel,1990:152-153).Özetlemek gerekirse; "Kamu harcamaları genellikle tamamlayıcı mal ve hizmetlerin üretilmesi, alt yapı yatırımların yapılması, mülkiyet haklarının güvence altına alınması, yasal çerçevelerin güçlendirilmesi, bu bağlamda,ekonomiksel, kurumsal ve hukuksal bir yapının tüm toplumu kucaklayacak, bütün sosyal devlet hizmetlerini kapsayan kamu tarafından yapılan büyük ölçekli giderlerdir." (Çolak ve diğ.,2007:689).

mümkündür.

2.2. Literatür Analizi

Kamu harcamalarının iktisadi büyüme ile ilişkisi bir çok iktisatçı tarafından ampirik çalışmalarla incelenmiş ve çeşitli hipotezler geliştirilmiştir. Devletçi bir ekonomik yapı anlayışına sahip olan Keynes modelinde ve tezlerinde kamu harcamaları kamu sektörünce sağlanan bir üretim süreci olarak değerlendirilmiş, yani büyümeye etki eden bir faktör olarak düşünülmüştür. Keynes'e göre kamu harcamaları; iktisadi büyümeyi etkilemek ve kısa dönem dalgalanmaları düzeltmek için tasarlanmış bir politika aracı olarak kullanılabilecek **dışsal bir faktördür**. Wagner Yasasına göre; **"*kamu harcamaları içsel bir değişken olarak görülmektedir ve nedenselliğin yönü iktisadi büyümeden kamu harcamalarına doğru olacaktır***" (Edizdoğan,2004:49, Erdem ve diğ., 2008:36-37). Keynesyen analize göre ise; "***dışsal bir değişken olarak görülen kamu harcamalarındaki artış milli gelirde de bir artışa neden olacaktır ve dolayısıyla nedenselliğin yönü kamu harcamalarından iktisadi büyümeye doğru olacaktır***" (Arısoy,2005:63-80).

Literatürde geliştirilen hipotezlerden ilki 19. yy'da Adolph Wagner'in "**Kamu Harcamalarının Artışı Kanunu'dur**."[2] Buna yönelik eleştiriler, Peacock ve Wiseman (1967) tarafından geliştirilen **"Sıçrama Etkisi"**[3] ile yetmişli yılların ortalarında Wildawsky'nin (1975) öne sürdüğü kamu ekonomisindeki genişleme derecesinin iktisadi büyüme ile doğru orantılı olmadığını ortaya koyan görüşlerdir (Edizdoğan,2004:49-50,55; Altay ve Altın,2008:267-285). Wagner'e göre devletin ekonomiye müdahalesi ve kamu harcamaları, ekonomik ve sosyal gelişme ile birlikte artar ve bu artış bir rastlantı sonucu değil, sosyal bir yasa sonucu meydana gelir. Kamu harcamalarındaki artış, kamusal faaliyetlerin artması anlamındadır. Dolayısıyla iktisadi büyüme beraberinde toplumun sosyal isteklerini arttıracak, toplumun sosyal isteklerinin artması da kamusal faaliyetleri arttıracaktır. Bu doğrultuda kamusal faaliyetlerin ekonomideki ağırlığı (kamusal büyüklük) artacağından kamu harcamalarının gelir (GSMH) esnekliği 1'den büyük olacaktır (Edizdoğan,2004:49; Erdem,Şenyüz ve Tatlıoğlu,2008:36-37; Altay ve Altın, 2008:267-285).

Barro'nun iktisadi büyüme modelinde, kamu bütçesinin en büyük gelir kalemi vergilerdir. Barro, özellikle, gelir vergileri olup, vergilerle finanse edilen kamu harcamalarının ülke ekonomisinde üretimi ve geliri nasıl artırdığı üzerinde ampirik çalışmalar yapmıştır. Barro ampirik çalışmalarında, kamu harcamalarının GSMH' deki payı ile kişi başına milli gelir büyüme oranı arasında içsel bir model kurmaya çalışmıştır (Barro,1988:7-11). Modelin varsayımları sırasıyla şunlardır:

1) Üretim süreci, özel sermayenin ortaya koyduğu hizmetler ve kamu hizmetlerini içermektedir ki, bu durumda kamusal hizmetler, özel sektör üretim sürecinde bir girdi niteliğindedir,

2) Özel ve kamusal hizmetlerin bir sabit getirisi olmakla birlikte, azalan marjinal verimlilik özelliği gösterirler.

3) Kamu hizmetleri, düz oranlı bir vergi ile finanse edildiğinden, sonuçta İktisadi büyüme ve

[2] Bu kanuna göre, Uzun dönemli bir süreci kapsayan kamu harcamalarının seyrine ilişkin A.Wagner'in yaptığı analizde,kamu harcamalarındaki artış hızının milli gelirdeki artış hızından daha yüksek olduğunu tespit etmiştir.Buna göre, kamu harcamaları her yıl milli gelirdeki artış oranından daha fazla ve hızlı artmaktadır.Ancak, bu durumun ülkeden ülkeye değiştiğinden ve sürekli kamu harcama artışı olmadığından eleştiri olarak öne sürülmüştür.

[3] Wagner Kanununun eksikliğini gidermeye çalışır;bu nedenle sadece uzun dönemi değil,kısa dönemi de analiz ederler.Kamu harcamalarında kısa dönem dalgalanma ve trend değişimi çok önemlidir. Bu yaklaşıma göre, kamu geliri ile kamu harcamaları arasında organik bir bağ vardır. kamu harcamalarındaki bir artışın milli geliri arttıracağını öne süren Keynesyen yaklaşım ile gelirdeki büyümeye bağlı olarak kamu hizmetlerine yönelik artan talebin, kamu harcamalarındaki artışın bir nedeni olacağını öne süren Wagner Kanunu ampirik olarak test etmeye yönelik pek çok çalışma mecuttur.

tasarruflar, başlangıçta verimli kamu harcamalarının GSMH'ye oranı belli bir noktaya kadar artar, optimal bir seviyeye ulaştıktan sonra azalmaya özelliği göstereceğini belirtmiştir (Barro,1991:407-444).

Ancak demokrasi ve ekonomisi kurumsallaşmış özelliği gösteren ülkelerdeki kamu harcamalarını baz almıştır. Yani kaynakların nereye harcandığını sorgulayan toplumlar için geçerli bir analizdir (Barro,1991:407-444). Robert J.Barro modeli iktisadi büyümeyi mali değişkenlere ve politikalara bağlamaya çalışan bir büyüme modeli oluşturmuştur. Bu modelde kapalı ekonomide kamu sektörü sabit getiri koşullarında iktisadi büyüme modeline sokulmaktadır. Barro modelini şöyle formüle etmek mümkündür: (Çolak ve diğ.,2007:689)

$$y = f(k, g) = A.k^{1-\alpha}.g^{\alpha} \qquad (1.1)$$

Modelde üretim fonksiyonu kamu harcamaları (g) ve sermayeden (k) oluşmaktadır. Modele göre, devletin tek geliri, **gelir vergisi**, tek giderinin de **kamu malı arzı** olduğunu ve **bütçenin denk** olduğu kabul edilmektedir. Modelde firmalar kendileri için optimal olmayan faaliyetleri devlet yerine getirmektedir. Bunun devlet bu faaliyetleri yerine getirebilmek için (artan oranlı ve) sürdürülebilir büyüme oranını sağlatan vergi oranına ihtiyaç vardır. Modelde kamu harcamalarının rolü özel yatırımların ana girdisini oluşturmakta, bir yerde sübvanse etmektedir. Toplumun tüm unsurları bundan tam ve uygun (optimal) şartlarda istifade etmektedir.

Böylece kamu harcamalarının üretimdeki (ve büyümedeki) rolü, hükümet politikalarıyla büyüme arasında pozitif ilişkiye dayalı bir bağ kurmuştur. Kamu harcamaları yoluyla özel kesime yapılan transfer ve sübvansiyonlar sayesinde özel sermaye birikimine (artışına) olanak sağlarken, buna paralel olarak yapılan alt yapı yatırımlarında verimli bir artış olmazsa , üretimin azalan getirisi ortaya çıkacağından büyüme üzerinde ister istemez negatif bir etkiyi gösterecektir. Yatırımlar, sermaye stokunu arttırırken, buna bağlı olarak vergi gelirlerini de arttırmaktadır. Artan vergi oranları modeldeki denk bütçe ilkesi gereği kamu malının arzını arttırmakta ekonomiye ikinci bir yoldan kaynak sağlamaktadır (Çolak ve diğ.,2007:689-690).

Klasik görüşü savunanlar, devlet faaliyetlerinin sınırlı tutulmasını ve mümkün olduğu ölçüde az kamu harcaması yapmasını istemişlerdir. Yine, devlet faaliyetlerinin arttırılması piyasa ekonomisinin işleyişini bozar, bu anlayışa göre, devletin asıl fonksiyonu toplumun iç ve dış güvenliğin sağlamaktan ibaret saymaktadır (Pehlivan,2009:74).

Günümüzde temelini klasik ekolün oluşturduğu yeni düşünce ekollerinin (Monetarist ekol, arz yanlı iktisatçılar, Neo klasikçi iktisatçılar, kamu tercih teorisini ortaya koyan iktisatçılar) aşağı yukarı hepsi ekonomik sorunların çözümünde kullandıkları temel düşünceleri, kamu harcamalarının azaltılması gerektiğini belirtmişlerdir. Bu iktisatçılar, kaynakların devlet tarafından etkin ve verimli kullanılmadığını ve dağıtılmadığını, bu nedenle devletin ekonomiye müdahalesine karşı çıkmışlar, özel sektöre karşı devletin uyguladığı politikalar ve özel sektör yatırımlarının dışlanması,bunun sonucu olarak verimliliğin düşmesine sebep olması, iktisadi büyümenin azalmasına, istihdam sorununun ciddiyet arz etmesine ve işsizliğin arttığını dile getirmişlerdir (Ulusoy ve Zengin,1998:3). Arz yanlı iktisat anlayışının temsilcilerinden olan Amerikalı Milton Friedman, klasik iktisat anlayışının yeniden gündeme getirilmesinin bir tezahürü olarak görüşler öne sürmüştür; Friedman'a göre, kamu ekonomik kesiminin küçültülmesi, enflasyonla mücadele için harcamaların kısılmasını ve sıkı para politikası izlenmesini öngörmektedir (Pehlivan,2009:77).

İktisadi büyüme ile kamu harcamaları arasında bir ilişkinin olup olmadığını, kamu harcamalarının içinde yer alan cari, yatırım, transfer, transfer dışı harcamalar ile toplam harcamaların büyüme üzerindeki uzun dönemdeki yapacağı etkinin test edilmesi konusunda bir çok ampirik çalışmalar bulunmaktadır. Türkiye Ekonomi Kurumu'nun yaptığı ampirik

çalışmalara göre, kamu harcamaları ile iktisadi büyüme arasındaki ilişkide mutlak bir ilişki yerine kamu harcamalarının niteliği ile ilgili olarak belirli bir ayrıma gidilmesi (cari, yatırım, transfer yada transfer dışı harcamalar gibi hangi kısma harcandığının belirlenmesi) gerekliliğini ortaya koymaktadır. Buna göre, verimsiz alanlara yönelen kamu harcamaları iktisadi büyüme üzerinde olumsuz bir etki doğururken, söz konusu harcamaların kamu yatırımı şeklinde ortaya çıkması durumunda, iktisadi büyüme ile kamu harcamaları arasında pozitif bir ilişkinin varlığı görülmektedir. Kamu yatırımlarının doğrudan yatırımlara yönelik harcamalar düzey etkisi yaratırken, altyapıya yönelik olanlar ise dışsallıklar ve büyüme etkisi yaratmaktadır (TEK,2003:14,http://www.tek.org.tr).

Fischer, küçük bütçe açıklarının devamlı büyümeye yardımcı olmakla birlikte yüksek büyüme için gerekli olmadığı, büyük bütçe açıkları büyümeyle negatif ilişkili iken bütçe fazlalarının daha hızlı büyümeyle, daha büyük sermaye birikimi ve yüksek verimlilik artışı aracılığıyla, güçlü bir şekilde ilişkili olduğu sonucuna ulaşmıştır (Fischer,1993:1-13).

Sarı çalışmasında, Wagner hipotezini test etmiştir. Koentegrasyon ve nedensellik testlerini kullanmıştır. Veri olarak 1987-2000 dönemini kapsayan dönemde toplam personel, cari, yatırım harcamaları ve dış borç ödemeleri, kişi başına düşen yatırım, transfer harcamaları ve dış borç ödemleri ile toplam yatırıma ait üçer aylık verilerle değişkenleri kullanmıştır. Wagner Hipotezi ile ilgili değişkenleri eş bütünleşme ve nedensellik analizi çerçevesinde test etmiş ve bütün modeller için yapılan testlerde Wagner Hipotezi'ni destekleyici sonuçlar elde etmiştir. Yani kamu harcamalarındaki artışın büyümeyi arttıracağı bulgusuna erişmiştir (Sarı,2003:25-38).

Landau'nun, geniş çaplı olarak 96 Gelişmiş ve Azgelişmiş Ülke üzerinde yaptığı ampirik çalışmasında, 1961-1976 dönemini kapsayan bir data setini kullanarak devlet kamu ve tüketim harcamalarının GSMH'daki payı ve reel kişi başı hasıla büyüme oranı arasındaki ampirik ilişkiyi incelemiştir. Kamu Harcamalarındaki artışın iktisadi büyümeyi (Kişi Başına GSMH'yı) olumsuz (Negatif) yönde etkilediği bulgusuna ulaşmıştır. Kamu harcamalarında meydana gelen bir artışın büyüme oranı üzerinde negatif bir etkisi bulunmaktadır (Landau,1983:783-792).

Ram, Türkiye'nin de bulunduğu 115 ülkeyi kapsayan ampirik çalışmada, 1960-1980 dönemini kapsayan zaman serilerine ve yatay kesit araştırması sonucunda, toplam 100 ülkede kamu harcamalarının iktisadi büyümeye etkisi olumlu (pozitif), 15 ülkede ise olumsuz (negatif) çıkmıştır. Türkiye için yaptığı analizde 1960-1980 döneminde kamu harcamalarındaki bir artışın ve kamu büyüklüğünün iktisadi büyümeye etkisini olumlu (pozitif) ve %5'te anlamlı bulmuştur (Ram,1986:191-203).

Devarajan, Swaroop ve Zou'nun ampirik çalışmasında kamu harcamaları ile büyüme ilişkisini incelemişlerdir. Çalışmada, 43 Gelişmekte Olan Ülkeyi kapsayan ve 20 yıllık verilerini kullanarak yaptıkları OLS ve nedensellik testlerinde, cari harcamaların payındaki bir artışın iktisadi büyüme üzerine anlamlı bir pozitif etkisinin olmasına rağmen, kamu harcamalarının sermaye unsurları ile kişi başına büyüme arasında negatif bir ilişki bulunduğu sonucuna ulaşmışlardır. Kamu harcamalarının yapısında meydana gelebilecek bir değişim büyümeyi daha yüksek konuma getirebilecektir. Kamu harcamalrı ile verimlilik arasında negatif bir ilişki tespit etmişlerdir. Ayrıca gelişen ülkelerde kaynakların akıllıca kullanılmadığından verimlilik ve büyümenin düşük gerçekleştiğini belirtmektedirler. Açıklayıcı değeri R^2=0.44 ile 0.62 arasında bir değer bulmuşlardır (Devarajan, Swaroop ve Zou,1996:313-344).

Gwartney, Holcombe ve Lawson'un, 23 OECD Ülkesi için 1960-1996 yıllarını kapsayan, kamu büyüklüğü ile iktisadi büyüme arasındaki ilişkiyi, uzun bir dönem için test etmişler ve GSYİHnın payı olarak kamu harcamalarındaki %10'luk bir artışın yıllık büyüme oranını %1 azalttığı sonucuna ulaşmışlardır. Güçlü ve negatif bir ilişki söz konusudur. Örneğin ABD'de

Kamu harcamalarının büyüme üzerinde etkisi 1960'larda %4,4'lük bir azalma yaratırken, 1990-1996 döneminde %1,9'luk düşme yaratmıştır. R^2=0,42, kamu harcamalarının, OECD Ülkelerindeki iktisadi büyüme farklılıklarının yaklaşık %42'sini açıkladığını göstermektedir (Gwartney ve diğ., 1998: 163-190).

Sjöberg'in, İsveç ekonomisi üzerine yaptığı çalışmada, 1960-2001 dönemine ait kamu harcamaları ile iktisadi büyüme ilişkisini zaman serilerine dayalı regresyon testleri uygulayarak incelemiştir. Veri olarak yatırımlar, özel harcamalar, hükümet harcamaları ve yatırımları faiz oranları ve transferleri kullanmıştır. Veriler ile iktisadi büyüme ilişkisi arasındaki R^2=0.77 olarak tespit etmiştir. Büyüme ile değişkenler arasında sıkı ve anlamlı bir ilişkinin olduğunu göstermektedir. Çalışmada, kamu harcamaları ile iktisadi büyüme ile negatif ilişki görülürken, özel yatırımlarla pozitif bir ilişki tespit etmiştir (Sjoberg,2003:1-25).

Grenada ve Moore, 13 Karayip adası ülkesine yönelik olarak, 1970-2006 dönemlerini kapsayan panel veri analizi yapmışlardır. Çalışmada, bir çok devlet için panel-data sonuçlarının uzun dönemde kamu harcamaları ile hasıla-çıktı arasında bir paralellik tespit etmişlerdir. Bir çok ülke için kamu harcamalarının gelir esnekliği vardır. Uzun dönem elastikiyeti 4 ülke için Wagner hipotezini desteklediğini tespit etmiştir. Kamu harcamalarında beklenilen fayda ancak devletlerin kurumsallaşması ve hükümet politikalarıyla sağlanabileceğini belirtmiştir. Testin veri değişkenlere yönelik açıklayıcılık değerini R^2= 0.137 gibi düşük bir değer bulmuşlardır (Grenada ve Moore,2008:1-27).

Sattar'ın 24 ülkeye yönelik 1975-1985 dönemlerini kapsayan 5'er yıllık çalışmasında, OLS Panel veri yöntemini kullanmıştır. Asya ülkelerindeki hükümetin ekonomik yapıyı kontrolü iktisadi büyüme, bütçe ve üretim üzerinde pozitif etkisini tespit etmiştir. Hong Kong, G.Kore, Singapur ve Tayvan'da kamu harcamaları ile iktisadi büyüme arasında bir ilişki saptayamamıştır. Kamu harcamalarının gelişmekte olan ülkelerde iktisadi büyüme üzerinde pozitif, gelişmiş ülkelerde negatif bir etkiye sahip olduğuna dair bulgular elde etmiştir. Ayrıca gelişmiş ülkelerde kamu harcamalarının verimlilik üzerinde de negatif bir etkisinin olduğunu tespit etmişlerdir. Bu iki farklı eğilim, son zamanlarda kamu harcamalarındaki bir artışın milli geliri arttıracağını öne süren Keynesyen yaklaşım (çarpan mekanizması yolu) ile gelirdeki büyümeye bağlı olarak kamu hizmetlerine yönelik artan talebin, kamu harcamalarındaki artışın bir nedeni olacağını öne süren Wagner Kanunu'nu desteklemektedir (Sattar,1993:179-197).

Yavuz'un, 1990-2000 dönemlerine ait üçer aylık veriler baz alarak Türkiye üzerine yaptığı ampirik çalışmada, Nedensellik testleri, Durağanlık testleri, Koentegrasyon testleri ve Hata düzeltme modelinden yararlanılmıştır. Bu çalışmayla, kamu yatırım harcamalarının, özel yatırım harcamaları üzerindeki (dışlama veya çekme) etkisini analiz etmiştir[4]. Çalışma sonucuna göre, Türkiye'deki kamu yatırım harcamaları ve faiz oranları ile özel sektör yatırım harcamaları arasında uzun dönemli ilişkinin olduğunu göstermek için koentegrasyon analizi ve hata düzeltme modeli sonuçlarına göre, özel sektör yatırım harcamaları üzerinde kamu yatırım harcamalarının ve faiz oranının negatif etkisi olduğu anlaşılmaktadır. Bu sonuçlar, kamu yatırım harcamalarının özel sektör yatırım harcamalarını dışlayıcı etkisi olduğunu bulgulamıştır (Yavuz,2001:1-18)

Ulutürk'ün, Türkiye ekonomisi üzerine yaptığı ampirik analizinde, Beş Yıllık Kalkınma Planlarının başladığı tarihi baz alarak, 1963-1994 dönemini kapsayan iki sektörlü üretim fonksiyonu modelini kullanmıştır. OLS VE Kalman Filtre yöntemini kullanmıştır. Türkiye'de kamu harcamalarının büyüme yönlü bir etki yaratmadığını ve kamu kesiminin büyük olmasının

[4] Çalısmanın kuramsal çerçevesi Yatırımın Marjinal Etkinliği Teorisi'ne dayandırılmıstır. Teori, özel yatırım ile faiz oranı arasında ters yönlü ilişkinin olduğu varsayımına dayanır.

iktisadi büyümeyi hızlandırdığını bulmuştur. Kamu harcamalarındaki büyüme ile iktisadi büyüme arasında incelenen dönemde olumlu (pozitif) bir ilişki olduğu sonucuna ulaşmıştır.Buna karşın, kamu harcamalarının finansmanı önemli bir sorun olarak ortada durmaktadır. Finansman biçimi harcamaların, doğrudan ekonomi üzerindeki etkisini belirleyebilmektedir. Bu dönemde kamu sektöründeki faktör verimliliği ve pozitif dışsallık etkisi nedeniyle, özel sektöre göre yüksek çıkması olumluluk nedeni olmuştur (Ulutürk,2001:131-139).

Kar ve Taban, Türkiye ekonomisi üzerine yaptıkları çalışmada, 1971-2000 dönemine ait yıllık verileri ve Eşbütünleşme yaklaşımını kullanmışlardır. İçsel büyüme modelini kullanarak yaptıkları ekonometriye dayanan test çalışmalarında, Türkiye'de eğitim ve sosyal güvenlik harcamalarının iktisadi büyümeyi pozitif olarak etkilediği, sağlık ve altyapı yatırımlarının ise, iktisadi büyümeyi negatif etkilediğine ilişkin sonuçlar elde edilmiştir. Bu sonuçlar, gelişmekte olan bir ülke olarak Türkiye'de eğitim ve sosyal güvenlik harcamalarının verimli, sağlık ve altyapı harcamalarının ise verimsiz bir şekilde dağıtıldığını ima etmektedir (Kar ve Taban,2003:145-169).

Bağdigen ve Çetintaş, 1965-2000 dönemini kapsayan Türkiye ekonomisine yönelik çalışmada, Koentegrasyon ve Granger nedensellik testlerini kullanarak, Wagner Kanununun geçerliliğini saptamak için uzun dönem kamu harcamaları ile milli gelirdeki büyüme arasındaki ilişkiyi araştırmışlardır. Araştırmada, iki değişken arasında bir nedensellik tespit edilememiştir. Bu bağlamda Türkiye örneğinde, ne Wagner'in ne de Keynes'in hipotezleri geçerli olmamaktadır (Bağdigen ve Çetintaş,2004:53-72).

Şimşek, 1965-2002 dönemini kapsayan Türkiye ekonomisi üzerine yaptığı ampirik çalışmasında, Johansen-Juselius eş bütünleşme ve nedensellik testlerine kullanmış, Wagner ve Keynes hipotezlerini test etmiş ve Türkiye'de kamu harcamalarından GSMH'ya ve ondan da tekrar kamu harcamalarına doğru çift yönlü işleyen bir nedensellik ilişkisinin varlığını ortaya koymuştur. Yani elde edilen bulgular, Wagner'in ve Keynes'in hipotezlerinin her ikisini de desteklemektedir. Kamu harcamaları ile iktisadi büyüme arasında olumlu bir ilişki saptamıştır (Şimşek,2004:37-52).

Arısoy, 1950-2003 yıllarını kapsayan zaman serilerini ele alarak Türkiye ekonomisi üzerine yaptığı ampirik çalışmasında, Koentegrasyon ve Granger nedensellik testlerini kullanmıştır. Wagner ve Keynes hipotezlerinin doğruluğunu kanıtlamaya yönelik çalışmasında, tek yönlü bir nedensellik ilişkisi bulmuştur ve iktisadi büyümenin, kamu harcamaları üzerinde artırıcı bir etkisinin olduğunu tespit etmiştir. (Arısoy,2005:63-80).

Kaya'nın Türkiye'yi ele alan 1968-2004 dönemini kapsayan yüksek lisans tez çalışmasında, toplam kamu harcamaları ile GSMH arasındaki nedensellik ilişkisini incelemiştir. Granger nedensellik testi sonucunda ise kısa dönem için kamu harcamalarından GSMH' ya doğru nedensellik tespit edilmiştir. Keynes'in görüşlerini destekleyen mahiyette bir sonuca ulaşmıştır. Buna göre, kamu harcamalarının iktisadi büyümeyi etkileyebilecek ve kısa dönemde dalgalanmaları düzeltebilecek bir etkiye sahip olduğunu tespit etmiştir (Kaya,2006:65-66).

Altın ve Altay, 1980-2005 dönemini baz alarak Türkiye ekonomisi üzerine yaptıkları ampirik çalışmada, iki sektörlü üretim fonksiyonu şeklinde model oluşturmuşlardır. Çalışmada, toplam kamu harcamalarının iktisadi büyüme ve toplam yatırımlar üzerindeki etkileri araştırılmıştır. Kamu harcamaları, ekonomik sınıflandırma ölçütüne göre cari, transfer ve yatırım harcamaları şeklinde dikkate alınmıştır. Çalışmada, kamu harcamalarındaki artışın iktisadi büyümeyi olumsuz etkilediği ve incelenen 1980-2005 döneminde özel sektörün faktör verimliliğinin kamu sektöründen daha fazla olduğu sonucuna ulaşılmıştır. Ayrıca, kamu harcamalarındaki

artışın kısa dönemde, pozitif dışsallıklar sayesinde toplam yatırımları olumlu etkilediği, uzun dönemde de kamu büyüklüğünde meydana gelen artış nedeniyle toplam yatırımlar üzerinde dışlama etkisi yarattığı bulgusuna ulaşmışlardır (Altın ve Altay,2008:267-285).

Selen ve Eryiğit, 1923-2006 yıllarını baz aldıkları ve Türkiye ekonomisi üzerine yaptıkları ampirik çalışmalarında, koentegrasyon testleri ile analizinde yapısal kırılmaların etkisini ortaya koyan Johansen prosedürünü kullanmış ve uzun dönem elastikiyetleri tahmin eden toplam kamu harcaması, GSMH ve nüfus verilerinden oluşan zaman serilerini ele almışlardır. Wagner Kanununu yorumlayan beş model kullanılmıştır. Yapısal kırılmaların varlığında Wagner Kanunun geçerliliğini araştırmışlardır. Bu modeller üzerinden gerçekleştirilen analizlerde 1923–2006 dönemine ilişkin Wagner Kanununun doğruluğunu destekleyen bulgular elde etmişlerdir. Modeller açısından bakıldığında destekleme güçleri farklılaşmakla birlikte, genel olarak GSMH'den kamu harcamalarına doğru işleyen pozitif yönlü bir etkileşimin var olduğunu tespit etmişlerdir (Selen ve Eryiğit,2009:177-198).

Aşağıdaki tabloda Türkiye'deki kamu harcamalarının gelişim sürecini vermek gerekirse, 1960'da kamu harcamaları GSMH'nın %15,5'i iken, bu oran 1970'de %19,5, 1975'de %20,1'e çıkmıştır. 1980'de %14,3'e düşen bu oranda 1978-1979'larda yaşanan krizlerinde etkisi vardır. 1990'da %15,8'e, 1994'te %21,1'e çıkan bu oran 1995'te ise %16,9'a düşmüştür. Bu düşüşte ülkede yaşanan krizin etkisi bulunmaktadır. 2000'de %37,2 ye çıkarken 2001'de %27,4'e bir düşüş olmuştur. Bunda 1999 ve 2000 yıllarında yaşanan ekonomik ve sosyal krizlerin etkisi vardır. Bu oran 2002'de ise %42,3'e çıkarken 2004'te ise %33,1'e düşmüştür (Edizdoğan,2004:47).

Tablo 1: Türkiye'de Kamu Harcamalarının GSMH İçindeki Payı

YILLAR	TOPLAM KAMU HARCAMALARI	CARİ HARCAMA (MİLYON TL)	YATIRIM HARCAMA (MİLYON TL)	TOPLAM KAMU HARCAMALARININ GSMH İÇİNDEKİ PAYI (%)
1960	7526	----	----	20,3
1965	14848	----	----	26,8
1970	33522	----	----	27,8
1975	117921	0,07	0,03	25,8
1980	1133707	0,5	0,2	25,1
1985	3829117	2,1	1,1	18,4
1990	45399534	33,5	9,9	16,8
1995	1704845000	644,10	91,8	24,2
2000	46384290000	13.613,90	2.475,1	10,3
2005	143685761000	50.783,70	11.351,0	25,1
2007	204067680000	63.760,70	7.479,2	31,2
2009	259155933000	----	----	33,1

Kaynak: Memduh YAŞA,1980, s.569'daki çalışmadan alınmıştır. Maliye Bakanlığı verilerinden derlenmiştir.

2005'te %30'a düşerken, 2006'da %30,4'e çıkmış ve 2007'de ise %27,3'e düşmüştür (Eren,2008:131'deki tablodan hesaplanmıştır). Gerçek bütçe harcamalarının (cari+yatırım)

GSMH'ya oranı, 1975-1980'de %13,3 iken, 1981-1993'de %10,7'ye düşmüştür. 1994-1998'de %13,7'ye çıkmıştır ve 1999-2006'da %13,5 civarında seyretmiştir. Gerçektende reel kamu harcamalarında devletin uzun yıllardır geri çekilişi Türkiye'de ekonomik istikrarsızlığın, gelir dağılımı bozukluğunun ve siyasal istikrarsızlığın çözümü önündeki en büyük engeli de oluşturmaktadır (Oyan,2001:304).

3.Vergilerin İktisadi Büyümeye Etkisi

3.1. Kavram Analizi

Kamu gelirlerinin özellikle vergilerin[5], iktisadi büyüme üzerindeki etkilerinin analizi, literatürde, daha çok vergi kapasitesi, vergi oranları, vergi yükü ve vergi indirimleri üzerinde yoğunlaşmaktadır. Sağlıklı bir vergi sistemi, iktisadi büyüme, adil bir gelir dağılımı ve makro ekonomik istikrar için ne kadar önemli olduğu uygulanacak politikaların; adil olarak toplumun tüm kesimlerinden (eşitliğe dayalı) alınacak kişisel (ve kurumsal) gelirleri ile orantılı vergi gelirleri makro ekonomik yapı üzerinde olumlu etki yaratırken, aşırı vergiler ya da yüksek oranlı vergiler, tüm ülkedeki üreten ve tüketen kişiler üzerinde negatif bir etki yaratacağından çalışma eforunu, tasarrufları, yatırımları, üretimi, iktisadi büyümeyi ve en sonunda kalkınmayı olumsuz olarak etkileyecektir. Arz yönlü iktisat politikasının önemle üzerinde durduğu bu sürecin temel karakterleri **Haldun-Laffer etkisi** ile açıklanmaktadır. Bu etkiye göre, devletin kamu gelirinde önemli azalma yaratacağı ve nihayetinde ülke ekonomisinde daralma meydana getireceği ortadadır. Bunun için kamu otoriteleri vergi gelirleri ile vergi oranları arasındaki makası iyi ayarlamalıdırlar (Pehlivan,2009:55-56).

Ricardo, devletin vergilendirme gücünün ve yetkisinin olmadığı durumda, sermaye artışının çok daha büyük olabileceğini belirtmektedir. Her vergi sermaye biriktirme gücünü zayıflatma eğilimi taşır. Dolayısıyla tüm vergiler ya sermayenin ya da gelirin üzerinde etkili olmaktadır. Vergi sermayeye yüklenirse, büyümeleriyle ülkenin üretken işkollarını da büyütecek ödenekleri aynı oranda zayıflatacak bir durum yaratır. Gelirin üzerine binerse, ya birikimleri zayıflatır ya da birikimciler vergilendirilecek miktar kadar değeri ellerinde tutmak zorunda kalır (D.Ricardo,2008,124-125). Dolayısıyla, bu eldeki değer üretim sürecine giremediğinden atıl kalmakta olup, büyümeyi yavaşlatan bir durum arz etmektedir.

Buna göre, vergi indirimlerinden beklenen ana hedef, ekonomik birimlerin kararlarını etkileyerek, özellikle toplam üretim ve vergi gelirlerinde artış sağlamaktır. Aksi takdirde vergiler, iktisadi büyüme üzerinde negatif bir etki yaratacaktır. Bir ülkenin vergi kapasitesi, ekonomik verimliliğin doğrudan bir fonksiyonudur. Verimlilik artarsa, milli gelirde artar; böylece vergi kapasitesi milli gelirden daha yüksek oranda artar. Tersi durumunda ise, milli gelir düşerse, vergi kapasitesi daha yüksek oranda düşer (Korkmaz,1982:18).

Vergiler bir ekonomide üretilen mal ve hizmetlerin miktarını, üretim faktörlerinin gelir ve gider fiyatlarını doğrudan veya dolaylı olarak etkileyebilmektedir. Kalkınmakta olan ülkelerde

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[5] Edizdoğan (2004) vergiyi şöyle açıklamıştır: "Vergi, devletin, mahalli idarelerin ve kamu kudretine sahip diğer toplulukların, gördükleri kamu hizmetlerinin gerektirdiği giderleri karşılamak üzere, esas olarak gerçek ve özel hukuk tüzel kişilerden ve bazı kamu hukuku tüzel kişilerinden belli bir yarar karşılığı olmaksızın, onların mali güçlerine göre, kamu zoruyla, kesin olarak aldığı paralardır." (Edizdoğan,2004:158-159) Ricardo'nun yaklaşımına göre vergi; "bir ülkenin toprak ve emek ürününden, hükümetin emrine verilen bir parçadır" (D.Ricardo,2008:123-125).

verginin kalkınma aracı olarak, tasarruf düzeyinin belirlenmesinde ve kaynak dağılımı üzerinde etkisi bulunmaktadır(Yılmaz,1996:212-225). Vergi gelirleri dolaylı, dolaysız ve toplam olmak üzere üç şekilde adlandırılır. Dolaysız vergiler daha çok istihdam, gelir ve sermaye üzerinden elde edilen vergilerden, dolaylı vergiler ise, tüketim üzerinden alınan vergilerden oluşmaktadır. Bu bağlamda, sermaye üzerinden alınan vergiler sermaye stokundaki net artışı azaltmaktadır. İstihdam üzerinden alınan vergiler ise, tüketim vergilerine oranla bireylerin tüketim–tasarruf ve/veya işgücü arzı ile boş zaman arasındaki tercihlerini daha fazla değiştirmektedir. Bu nedenle, dolaysız vergilerin büyüme üzerinde etkili olması beklenirken, dolaylı vergilerin büyüme üzerinde nispeten daha az etki yapması yada hiç etki yapmaması beklenmelidir (Erdem ve diğ.,2008:100-105;Pehlivan,2009:118-121).

Kamu harcamalarının finansmanında başvurulacak vergi çeşitleri ve vergi alınacak ekonomik kesimlerde önem arz eder (Berber,2006:375). Gelişmiş ülkelerde alınan vergiler daha çok gelire yani müteşebbise dayalıdır. Az gelişmiş ülkelerde ise daha çok çalışan kesim olan memur, işçi ve çiftçiden alınan vergiler önemli bir yer kapsar. Düz, artan ya da azalan oranlı vergiler, iktisadi büyüme üzerinde farklı etkilerde bulunabilir. Ekonomiyi yöneten politika birimlerinin karar verme aşamasında, kazanacakları ilave gelirin ne kadarının vergiden sonra kişilerin kendi kullanımına kalacağını dikkate almaları nedeniyle artan oranlı vergilerin iktisadi büyümeyi daha olumsuz etkileyebileceği kabul edilmektedir (Turan,2008:17-35).

Kayıt dışı ekonomik faaliyetlerin (vergilendirilmeyen ekonomi, yer altı ekonomisi vb. kavramlar) GSMH rakamlarına dahil edilmesi veya tespiti oldukça güçtür. Bu yüzden, az gelişmiş ülkelerde düzenli bir mali yapı denetimi ve düzenlemesinin eksikliği GSMH'ya dahil edilmesi gereken kalemlerin girmemesinden dolayı çok düşük çıkabilmektedir. Örneğin, Türkiye ekonomisi'nde bu oranın % 40'lar seviyesinde olduğu rakamlarla tespit edilmiştir.

Ayrıca, GSMH rakamlarının ve büyüme hızının sağlıklı anlamlar ifade edilebilmesi için ülkedeki gelir dağılımının adaletli ve yolsuzluk düzeyinin çok düşük olması gerekir. Kişi Başına Milli Gelir, o ülkenin toplam nüfusuna bölünmesiyle elde edilmektedir. Eğer toplum katmanları arasında gelir paylaşımında uçurum varsa, Kişi Başına Düşen Milli Geliri hesap etmek bir anlam ifade etmez.Yolsuzluk düzeyinin yüksekliği, büyüme oranları üzerinde negatif etkisi tespit edilmiş bir olgu olup, azgelişmiş ülkelerde yüksek oranda görülmesini nedeniyle büyümenin düşük oranlarda çıkmasında ve azalma göstermesinde diğer bir önemli konudur.

3.2. Literatür Analizi

Barro çalışmasında, vergilerle finanse edilen kamu harcamalarının iktisadi büyümeyi ve faydayı nasıl etkilediğini araştırmış, tasarruf ve büyüme oranlarının, kamu harcamaları ve vergilerle ilgili bilinen dışsallıklar nedeniyle beklenen optimum seviyenin altında kaldığını vurgulamıştır. Bu durum, kamu harcamalarının faydalı ve verimli kullanıldığında bazı ülkelerde büyüme oranlarını ve tasarrufları artırırken, alınan vergilerin kamuda verimli kullanılamaması nedeniyle bazı ülkelerde dezavantajlar yaratabilmektedir (Barro,1991:407-443). Vergiler, bazı ülkelerin kalkınmasında tuzaklar yaratabilir, bazı ülkelerin ise büyümesinde etkili olur ve mucizeler yaratabilir. Bu bağlamda ülkelerin vergi politikaları ile kamu kaynaklarının etkin ve doğru kullanımı arasında bir paralellik vardır (Gürak;2006:122-123).

Romer ve Lucas tarafından geliştirilen "içsel büyüme teorisi" ise ülkelerin büyüme hızlarındaki farklılıkların sermaye ve emek faktörlerinden çok, devlet politikaları, beşeri sermaye birikimi, nüfus artışı ve teknolojinin yayılması gibi unsurlar tarafından belirlendiği fikrine dayanmaktadır (Barro, 1988:14-23). Bu kapsamda vergilerin milli hasıla çıktı düzeyi

üzerindeki etkisi kabul edilmekte ancak etkinin büyüklüğü konusunda farklı değerlendirmeler yapılmaktadır (Engen ve Skinner, 1996:618). Vergi oranları arttıkça, ekonomideki verimlilik kaybı da vergi oranlarındaki artıştan daha hızlı bir oranda yükselecektir (Şen, Saruç ve Keskin;2004:204). Ekonomideki toplam vergi yükü sabit kalmak şartıyla, gelir üzerinden alınan vergilerin, tüketim vergilerine doğru nispi bir kayma durumunda, bunun vatandaş üzerindeki etkisi, tasarrufları teşvik edecek ve sermaye birikimini hızlandıracaktır (Tanzi ve Zee,1997:185). Arz yönlü iktisatçılar, kalkınmanın teşviki için üretim ve üretim faktörleri üzerinde bire bir etkili olan dolaysız vergilerde indirime gidilmesi gerektiğini belirtmektedir (Şen, Saruç ve Keskin;2004:204). Gelişmekte olan ülkelerde kalkınmanın finansmanında vergi ve vergi benzeri gelirler çok önem arz etmektedir. Amaç kalkınmaksa, devletin başvuracağı temel ve tek mali yol vergiye başvurmaktır (Türk,2003:308).

Vergiler ile iktisadi büyüme arasındaki ilişkiyi ortaya koyan pek çok ampirik çalışma bulunmaktadır. H.T.Oshimo ampirik çalışmasında, 1948-1954 yıllarını kapsayan 20 gelişmiş ve 12 az gelişmiş ülkeyi veri olarak kullanmış, ülkelerin kamu gelirlerini (vergileri) GSMH'ya oranlamıştır[6]. Bu çalışmaya göre, gelişmiş ülkelerde kamu gelirlerinin gayri safi milli hasılaya oranı %19-%35 arasında, azgelişmiş ülkelerde %8 ile %19 arasında değişmektedir. Oshimo, gelişmiş ülkelerde görülen kamu gelirlerinin GSMH içinde yüksek oranda olmasının nedenini vergi kapasitesindeki artışla izah etmektedir. Ülkelerin milli gelir, verimlilik seviyesi ve vergi kapasitesi arasında pozitif bir ilişkiye rastlamıştır. Savaş, kriz ve bir takım ciddi sorunların ortaya çıktığı durumlarda, kamu gelirlerinin GSMH içindeki payının artacağını belirtmiştir. Dolayısıyla, savaş ve diğer sosyal kriz serilerinde kamu gelirlerinin artmasını anlamlı bulmuştur (Oshimo,1957:381-390).

Martin ve Lewis ampirik çalışmalarında, 1953-1954 yılları arasında 55 gelişmiş ülke ve 10 az gelişmiş ülkeyi temel alan verileri kullanmışlar ve kamu harcamaları ile kamu gelirlerinin (vergi ve benzerlerinin) GSMH içindeki paylarını mukayese etmişlerdir. Kamu gelirleri içinde yer alan dolaysız vergiler ile dış ticaret üzerinden alınan vergilerin GSMH içindeki paylarını incelemişlerdir. Bu araştırmaya göre, gelişmiş ülkelerde kamu gelirlerinin GSMH içindeki payı %24 ile %37 arasında değişirken, az gelişmiş ülkelerde bu oran %22 ile %9 arasında değişmektedir. Kamu gelirlerinin zaman içerisinde artış göstermesi ülkelerin gelişmişlik seviyeleri ile ilgilidir. İktisadi gelişme ile beraber üretim de artar. Üretim artışı kamu harcamalarına olan ihtiyacı artırır. Bu harcamaları finanse etmek için kamu gelirleri de artar. Kamu gelirlerinin (vergilerin) artış nedeni olarak sadece iktisadi gelişmeyi değil, bunun yanında kamu sektörünün verimsizliğini de etken olarak görürler. Aynı ürün ya da hizmet için daha fazla kamu harcaması yapılması gerektiği düşüncesiyle hareket ederler (Martin ve Lewis,1956:203-244).

Widmalm, 23 OECD ülkesini baz alan ve 1965-1990 yıllarını kapsayan çalışmasında 25 senelik bir veri seti kullanmıştır. Bu çalışmada elde ettiği bulgularda; artan oranlı vergilerin büyümeyi olumsuz etkilediğini tespit etmiştir (Widmalm,2001:199-219).

Arsan, 1966-1969 yılları arasındaki verileri kullandığı çalışmasında, ülkeleri gelir kategorisine göre sınıflandırmıştır[7].Kamu gelirleri ile GSMH ve Kişi Başına GSMH arasında pozitif bir ilişki olduğunu tespit etmiştir. Toplam vergi gelirleri ile kişi başına GSMH arasında pozitif

[6] Oshimo'nun,ele almış olduğu ülkeler: A) Az gelişmiş ülkeler; Seylan, Brezilya, Porto Riko, Küba, Endonezya, Malezya, Burma, Kolombiya, Meksika, Pakistan, Filipinler ve Hindistan'dır. B) Gelişmiş ülkeler; İngiltere, A.B.D.,Finlandiya,Hollanda, Fransa, İsveç, Norveç, Avustralya, Yeni Zelanda, İrlanda, Kanada, Belçika, Almanya (o zamanlar Federal Batı Almanya), Danimarka, Japonya,İsviçre,Şili, İtalya,İsrail, Venezuella.

[7] Ülkeleri fert başına GSMH'larına göre 1000 $ üstü,1000-500 $ arası ve 500 $ az olmak üzere 3 sınıfa ayırmıştır.

ilişki bulmuştur (Arsan,1973:91).
Vergi gelirleri ve iktisadi büyüme ilişkisi arasında bir çok ampirik çalışma yapılmıştır. Vergilerin en önemlisi gelir vergileridir. Çünkü gelir vergileri, toplam vergi oranları içerisinde önemli bir paya sahiptir. Gelir vergisi oranlarında bir artış olduğunda, toplam ve sabit yatırım faaliyetlerinin getirisini düşürmektedir. Bu durum özel yatırımlar ve sermaye birikimlerini (beşeri ve fiziki birikimler) caydırıcı bir unsur oluşturmakta, böylece büyüme oranında düşüşe sebebiyet vermektedir (Rebello,1991:500-521).
Vergilendirme kavramı olmasaydı sermaye artışı çok daha büyük olabilirdi. Her vergi, sermaye biriktirme gücünü zayıflatma eğilimi taşır. Dolayısıyla tüm vergiler ya sermayenin ya da gelirin üzerinde etkili olmaktadır. Vergi sermayeye yüklenirse, ülkenin üretken işkollarının üzerinde büyütücü etki yaparken, sermaye ödeneklerini ise aynı oranda zayıflatacak bir durum yaratır. Gelirin üzerine binerse, ya birikimleri zayıflatır yada birikimciler vergilendirilecek miktar kadar değeri ellerinde tutmak zorunda kalır (D.Ricardo,2008,124-125). Dolayısıyla, bu eldeki değer üretim sürecine giremediğinden atıl kalmakta olup, büyümeyi yavaşlatan bir durum arz eder.
Vergi gelirleri ile iktisadi büyüme ilişkisi konusunda, Türkiye'de son dönemde pek çok ampirik çalışma yapılmıştır. Aktan (1998:41-45), Ateş(2001,http://idari.cu.edu.tr// sanli.7.pdf), Gürdal (2001:292-294), Şen ve Diğerleri (2004, s.206-207), Durkaya ve Ceylan (2006:79-89), Yılmaz ve Tezcan (2007), Temiz'in (2008) çalışmaları bu konuya örnek verilebilir.
Aktan, 1980-1990 yılları arasında 14 ülkenin vergi yapısını ele aldığı çalışmasında düz ve düşük oranlı vergilerin iktisadi büyüme ile ilişkisini incelemiştir. Elde ettiği sonuçlara göre, vergi oranlarının düşük olduğu ülkelerde ekonomik refah düzeyi daha yüksektir. Daha düşük vergi oranları insanları daha fazla çalışmaya, daha fazla tasarruf etmeye, daha fazla yatırımda bulunmaya yöneltmektedir. Daha fazla çalışma, daha fazla tasarruf ve yatırım ise ekonomide toplam üretimi artırmaktadır. Vergi oranları ile iktisadi büyüme arasında çok yakın bir korelasyon söz konusudur. Düşük vergi oranları neticesinde ekonomide toplam yatırımların dolayısıyla üretimin arttığını belirlemiştir (Aktan,1998:41-45).
Ateş (2001), vergiler ve iktisadi büyüme konusunda yaptığı çalışmada 1924-2000 yılları arasındaki veri setini kullanmış ve bu çalışmasında Türkiye'de ortalama vergi oranlarının uzun dönemde büyümeyi etkilemediği sonucuna ulaşmıştır. Gürdal, 1960-2000 dönemlerini kapsayan ampirik çalışmasında gelir vergisinin ilk ve son dilimlerini incelemiştir. Gelir vergisinin ilk ve son diliminin iktisadi büyümeyi etkilemediğini, son dilimindeki oran artışının tasarrufları olumsuz etkilediği ve yatırımları azalttığı sonucuna ulaşmıştır. Yine gelir vergisi oranlarındaki son dilimindeki artışın tasarrufları olumsuz etkilediği ve dolayısıyla yatırımları azalttığı ve büyüme üzerinde negatif etkisi olduğunu belirlemiştir (Gürdal,2001:292-294).
Durkaya ve Ceylan'ın 1980-2004 dönemine ait yıllık verileri kullanarak Türkiye ekonomisi üzerine yaptıkları çalışmada veri değişkeni olarak, Gayri Safi Milli Hasıla (GSMH), toplam vergi gelirleri (TV), dolaysız vergi gelirleri (DSV) ve dolaylı vergi gelirlerinden (DV) kullanılmıştır. Vergi gelirleri (dolaylı ve dolaysız vergilerin gelirleri) ile iktisadi büyüme ilişkisini Engle-Granger koentegrasyon tekniği, hata düzeltme modeli ve Granger nedensellik analizi kullanarak test etmişlerdir. Engle-Granger koentegrasyon sonuçları ise toplam vergi gelirleri ile GSMH ve dolaysız vergi gelirleri ile GSMH değerlerinin uzun dönemde birlikte hareket ettiklerini göstermiştir. Kısa dönem ilişkileri incelemek amacıyla tahmin edilen hata düzeltme modeli ve Granger nedensellik sonuçları ise, toplam vergi gelirleri büyüme oranı ile GSMH büyüme oranı arasında, GSMH büyüme oranından toplam vergi gelirleri büyüme oranına doğru tek yönlü nedensel ilişkisi olduğunu göstermiştir. Dolaysız vergiler ile GSMH

büyüme oranı arasında ise çift yönlü nedensel ilişkinin varlığını tespit etmişlerdir. Dolaylı vergiler ile iktisadi büyüme arasında nedensel bir ilişki tespit edilememiştir (Durkaya ve Ceylan,2006:79-89).

Yılmaz ve Tezcan, 1980–2005 dönemini kapsayan 25 yıllık verileri kullandıkları çalışmada Türkiye üzerine inceleme yapmışlardır. Veri değişkeni olarak, GSMH, toplam vergi gelirleri (dolaylı ve dolaysız vergi gelirleri) ve sabit sermaye yatırımlarını kullanmışlar ve bunların iktisadi büyümeye olan etkisini Birim Kök Testleri, Johansen–Juselius Koentegrasyon Testi ve Granger Nedensellik Analiziyle ortaya koymuşlardır. Analiz sonucunda; değişkenler arasında uzun süreli, pozitif yönlü ilişki olduğu belirlenmiştir. Vergi gelirleri ve iktisadi büyüme ile sabit sermaye yatırımları arasındaki ilişkiler incelendiğinde, ele alınan dolaysız vergiler ve GSMH arasında pozitif çıkması vergileme ilkeleri bakımından anlamlıdır. GSMH ve dolaylı vergiler arasında negatif yönlü ilişki çıkmasıyla dolaylı vergilerin büyümeyi etkilemediği bulgusuna ulaşmışlardır (Yılmaz ve Tezcan,2007:1-14).

Mucuk ve Alptekin, 1975-2006 dönemine ait yıllık verileri kullanarak Türkiye ekonomisi üzerine yaptıkları çalışmada, VAR analizi tekniğini kullanmışlardır. Eşbütünleşme test sonuçlarında, temel vergi türleri ile iktisadi büyüme arasında uzun dönemli bir ilişkinin olduğunu, Granger nedensellik testi sonuçları ile de dolaysız vergilerden büyümeye doğru kısa dönemli bir bağlantı olduğunu belirtmişlerdir (Mucuk ve Alptekin,2008:159-174).

Temiz, II.İktisat Kongresinde sunduğu çalışmasında, toplam vergi gelirleri ile iktisadi büyüme oranı arasındaki ilişkiyi bulmak için nedensellik testlerine dayalı bir çalışma yapmıştır. 1960–2006 dönemini kapsayan 46 yıllık süreçte, birim kök testlerini, uzun dönemli ilişkileri araştırmak için Johansen Eşbütünleşme testini ve kısa dönemli ilişkileri bulmak için hata düzeltme modellerini kullanmıştır. Veri değişken olarak, toplam vergi gelirleri (dolaysız vergi gelirleri ve dolaylı vergi gelirleri) ile reel GSMH arasındaki ilişkiyi ele alıp incelemiştir. Elde edilen bulgular doğrultusunda, toplam vergi gelirleri ile reel GSMH arasında uzun dönem bir korelasyon tespit etmiş, kısa dönemde ise GSMH büyüme oranından toplam vergi gelirleri büyüme oranına doğru bir nedensellik ilişkisinin bulunduğunu göstermiştir (Temiz,2008:1-18).

Cashin (1994), Roubini ve Milesi-Feretti (1994), Beaney, Gemmell ve Kneller'ın çalışmaları (2001) verginin iktisadi büyüme üzerinde olumsuz etkisinin olacağını savunan çalışmalara örnek verilebilir.

Cashin, 1971-1988 dönemlerini baz alarak yaptığı çalışmasında, 23 OECD ülkenin vergi gelirlerini GSMH'ya oranlamış, bu orandaki 1 puanlık artışın, işçi üretiminde %2'lik bir düşüş yarattığı ve bununda verimliliği düşürdüğünü tespit etmiştir. Vergi ile büyüme arasında olumsuz bir ilişkiyi ortaya koymuştur (Cashin,1994,1-17).

Roubini ve Milesi-Feretti, 21 OECD ülkesini ele alan 1970-1995 dönemlerini kapsayan 25 yıllık LSDV zaman serilerine dayalı çalışmalarında vergi ile büyüme ilişkisini incelemişlerdir. Vergi/GSYİH oranındaki %1'lik artışın sermaye başına üretimi %0,3 ile %0,6 oranları arasında azalttığını tespit etmişlerdir (Roubini ve Milesi-Feretti,1998:721-744).

Bleaney, Gemmell ve Kneller çalışmalarında, 17 OECD ülkesini, 1970-1994 dönemini baz alarak incelemişler ve vergi gelirlerindeki %1'lik bir artışın, GSYİH büyümesi üzerinde %0,4'lük bir azalışa neden olduğunu tespit etmişlerdir. Buna göre, iktisadi büyüme ile vergi gelirleri arasında negatif bir ilişki bulmuşladır. Buna göre vergiler ile büyüme arasında negatif (-0.46) bir ilişki vardır. Bütçe fazlalığı da büyüme üzerinde pozitif (0.39) bir etkisi bulunmaktadır. Regresyon açıklayıcı değeri R^2=0.660 olarak bulmuşlardır (Bleaney, Gemmell ve Kneller,2001:36-57).

Lee ve Gordon 1970-1997 dönemini baz alan ekonometrik çalışmalarında, gelişmiş ve

gelişmekte olan 70 ülkeyi incelemişler ve kurumlar vergisi oranının iktisadi büyümeyle önemli biçimde negatif ilişkili olduğu, işgücü gelirleriyle ilgili ortalama vergi oranlarının iktisadi büyüme oranlarıyla ilişkili olmadığı sonucuna ulaşmışlardır (Lee ve Gordon,2005: 1027-1043). Fölster ve Henrekson'un 1970-1995 dönemini temel alan OLS regresyon ve panel VERİ testlerini kullanarak yaptıkları ampirik çalışmada bazı zengin 23 OECD ülkesi ile 29 OECD üyesi olmayan ülkeler birlikte ele alınmıştır. Kamunun büyüklüğü, vergiler ve büyüme ilişkisine yönelik bu çalışmada, Vergi/GSYİH oranındaki %10'luk bir artışın, GSYİH büyümesi üzerinde %7-8'lik bir azalışa (negatif etkiye) neden olduğunu tespit etmişlerdir. Zengin ülkelerde kamu harcamaları ile iktisadi büyüme arasında negatif bir ilişki tespit edilmiştir. Ayrıca kamu genişliği ile iktisadi büyüme arasında güçlü bir negatif ilişki tespit edilmemiştir. Açıklayıcı değer olarak R^2=0.46 ile 0.70 bulmuşlardır (Fölster ve Henrekson,2001:1-18).
Aşağıdaki tabloda vergi gelirlerinin toplam kamu gelirleri içindeki oranı %85 ile %95 arasında değiştiğini söylemek mümkündür. Devletin ağırlıkla elde ettiği kamu geliri vergilerdir. Bütçeninde en önemli gelir kaynağı, %70 - %80'ini oluşturan vergi gelirlerinden kaynaklanmaktadır.

Tablo 2: Türkiye'de Vergi Gelirleri ile GSMH İlişkisi

YILLAR	GENEL BÜTÇE GELİRLERİ (BİN)	VERGİ GELİR. (BİN)	VER.GEL./ GSMH (%)	VERGİ DIŞI NORMAL GELİRLER
1960	6.933	5.177	11,1	778
1965	13.188	10.295	13,4	576
1970	32.520	23.003	15,6	3.951
1975	105.400	95.009	17,8	9.772
1980	925.238	749.849	16,9	139.711
1985	4.578.420	3.829.117	17,2	443.974
1990	55.066.933	45.399.534	11,4	4.266.784
1995	1.387.759.990	1.084.350.504	17,9	86.043.516
2000	33.040.902.853	26.503.698.413	26,8	3.486.492.924
2005	148.237.974.000	119.250.807.000	28,3	25.626.260.000
2009	232.975.221.000	196.289.914.000	25,3	9.973.722.000

Kaynak: Uludağ ve Arıcan,2003:434'deki tablodan alınmıştır. Eren,2008:131'deki tablodan hesaplanmıştır.

Vergi gelirleri ile iktisadi büyüme ilişkilerini analiz etmeye 1960 Planlı dönemiyle başlarsak; 1960'da vergi gelirleri 5.177 milyon iken, 1965'de 10.294 milyona, 1970'de 23 milyona çıkmıştır. Vergi gelirlerinin GSMH'ya oranı, 1960'da %11,1 iken, 1965'te %13,4'e çıkmış, 1970'de %15,6'ya ulaşmıştır. 1975'de ise %17,8'e 1980'de 16,9'a 1985'de ise 17,2 olmuştur (Uludağ ve Arıcan,2003:434). 1990'da %11,4, 1995'de %17,9, 2000'de %26,8, 2005'te % 28,3 ve 2007'de ise %26,6 olarak gerçekleşmiştir (Eren,2008:131'deki tablodan hesaplanmıştır).

4.Ekonometrik Analiz

4.1. Değişken olarak Kullanılan Kavramların Tanımları

Gayri Safi Milli Hasıla (GNP): Bir ülkede bir dönemde üretilmiş toplam nihai mal ve hizmetlerin piyasa fiyatlarıyla toplamıdır.

Konsolide Bütçe (Consolidated Budget): Devletin bütün gelir ve giderlerinin tek bir bütçe

içinde toplanmasını amaçlayan bütçenin birliği ilkesinin sağlanabilmesi amacıyla kamuya ait tüm birimler bütçelerinin biraraya getirilmesi (konsolidasyonu) ile elde edilen bütçedir (Aypek, Ban ve Diğ.,2009:395).

Kamu Geliri (Public Incomes): Devletin kamu hizmetlerini karşılamak üzere başta vergi toplamak, sahip olduğu menkul ve gayrimenkul değerleri işletmek, ürettiği mal ve hizmetleri satmak ve piyango tertiplemek suretiyle elde ettiği değerlerin toplamıdır (Aypek, Ban ve Diğ., 2009:395).

Kamu Harcamaları (Public Expenditures): Devletin, belirli bir dönemde ekonomik, sosyal, siyasi ve idari faaliyetlerini gerçekleştirmek için yapmış olduğu mal ve hizmet satın alma yönündeki harcamaların tümüdür (Aypek, Ban ve Diğ.,2009:395).

Vergi Geliri (Taxes Incomes) : Devletin, mahalli idarelerin ve kamu kudretine sahip diğer toplulukların, gördükleri kamu hizmetlerinin gerektirdiği giderleri karşılamak üzere, esas olarak gerçek ve özel hukuk tüzel kişilerden ve bazı kamu hukuku tüzel kişilerinden belli bir yarar karşılığı olmaksızın, onların mali güçlerine göre, kamu zoruyla, kesin olarak aldığı paralardır (Edizdoğan,2004:158-159).

Toplam Borç Stoku (Total Debt Stock) : Bir ülkenin belirli bir dönem sonu itibariyle iç ve dış borçlarının toplam tutarını ifade etmektedir. Bu hesaplamaya kamu kesimi iç borçlarıyla kamu kesimin ve özel sektörün toplam dış borçları hesaba dahil edilmektedir (Aypek, Ban ve Diğ.,2009:636).

4.2. Ekonometrik Testler

Türkiye'ye ait sağlıklı veri edinme kısıtı nedeniyle, çalışmamızda Türkiye`ye ait 1960 ile 2009 yılları arasındaki veriler kullanılmıştır. Analizlerimizde temel olarak Stata/SE 9.1 programını ayrıca KPSS testlerinin, Toda-Yamamoto (MWALD) testinin gerçekleştirilmesi için Eviews.5.1 programı kullanılmıştır. Bu çalışmadaki veri seti, TÜİK, DPT, TCMB, Maliye Bakanlığı, Hazine Müsteşarlığı ve Dış Ticaret Müsteşarlığının verilerinden yararlanılarak hazırlanmıştır.

Analizimizde bağımlı değişken olan Gayri Safi Milli Hasıla (GSMH) değişkeninin yanında 5 adet bağımsız değişken kullanılmıştır. Değeri fonksiyonel ilişkinin dışında belirlenen değişkene bağımsız (açıklayıcı) değişken denirken, değeri bağımsız değişkenin değerine bağlı olarak belirlenen değişkene ise bağımlı (açıklanan) değişken denilmektedir (Bulut,2010:9). Aşağıdaki tablo'da bu değişkenlerin adı, aldığı değerleri ve kullanılan kısaltmaları gösterilmiştir.

Tablo 3: Çalışmada Kullanılan Datanın Özet Bilgileri

Variable	Obs	Mean	Std. Dev.	Min	Max
datevar	50	1984.5	14.57738	1960	2009
gsmh	50	321326.4	169496.3	83811	781869
Konsbutce	50	3.23E+10	6.84E+10	7789	2.59E+11
kamgel	50	2.78E+10	6.24E+10	7139	2.33E+11
vergel	50	2.34E+10	5.29E+10	5177	1.96E+11
kamharc	50	3.17E+10	6.72E+10	7526	2.59E+11
topborc	50	104346.6	149435.1	1036	601145

4.2.1. Birim Kök Testleri

Bir seride durağanlığın söz konusu olup olmadığı ise birim kök testleri yardımıyla belirlenir. Birim kök, bir zaman serisini ifade eden eşitliğin temel karakteristik köklerinin mutlak

değerlerinin 1'e eşit olması demektir. Zaman serilerinin birinci farkında d(1) ve regresyon artıklarında ortaya çıkan durağanlık değil, asimtotik durağan olmasıdır. Yani, yukarıdaki denklemedeki otokorelasyon kat sayısı için, k gecikmesi sonsuza gittikçe, otokorelasyon sayısı sıfıra yaklaşır ve seriler asimtotik durağan ve kovaryans durağan hale gelir. Bir zaman serisi, ilgilenilen bir büyüklüğün zaman içerisinde sıralanmış ölçümlerinin bir kümesidir. Zaman serisi ile ilgili bu analizin yapılma amacı ise, gözlem kümesince temsil edilen gerçeğin anlaşılması ve zaman serisindeki değişkenlerin gelecekteki değerlerinin doğru bir şekilde tahmin (forecast) edilmesidir (Allen,1964:133-152). Bir zaman serisi analizinde, analizin anlamlı ve tutarlı olabilmesi için öncelikle "durağan olması" gerekmektedir. Durağan zaman serileri , uzun dönemde çeşitli kırılma ve şoklar olsa dahi "sabit ortalamaya" sahiptir. Ayrıca zaman serisinin varyansı sabit ve sonlu yapı sürecindedir. Çünkü durağan bir seri, geçici şoklar ve dalgalanmalar görülsede, uzun dönemde sabit bir ortalamaya kavuşur. Bir zaman serisinin durağan olması ortalamasının, varyansının ve kovaryansının zaman içerisinde sabit olup değişmediği anlamına gelir. Ekonomik değişkenlerin logaritması alındığında, doğrusal bir nitelik taşımaktadır. Bu durumda zaman serilerinde gerçek değer yerine logaritmik değerler kullanılır. Box ve Jenkins'in (1970) "time series analyses" çalışmasında, makro ekonomik değerlerin logaritması alınarak durağanlığının sağlanması için birinci veya ikinci dereceden farkı alınarak, serilerin durağanlığı sağlanır. Logartiması alınan değerlerin varyansı ile fark almanın ortalamayı durağan kılmasıdır (Box ve Jenkins,1970:85-86).

Basit anlamda bir durağanlık sınaması için, gecikmesi k (1,2,..) iken, P_k otokorelasyon katsayısı ile gösterilen otoregresyon kavramına dayanır. $P_k = \gamma_k / \gamma_0$ Burada, yer alan γ_k değişkenin gecikme değeri ile gecikme k (1,2,..) iken kovaryansının, γ_0 değişkenin kendisi ile ilgili kovaryansı göstermektedir k=0 olduğunda, $P_0=1$ olacaktır. Durağanlık şartlarını sağlamaksızın serilerin denklemelere konulması, iktisadi ilişkilerin var olmadığı halde varmış gibi görünmesine neden olacağından anlamsız öngörülere sebebiyet verir. Durağanlığa sahip olmayan değişkenler arasında uzun dönemli bir ilişkinin kurulması da mümkün değildir. Durağan olmayan serilerin d(1,2,...) sayıda farkları alınarak, durağan hale getirilir. Seriler aynı derecede I(d) durağan olduklarında, eşbütünleşik seriler elde edilmiş olur (Kennedy,2006:356).

4.2.1.1. Augmented Dickey-Fuller Testi (ADF)

Otoregresif bir modelde yer alan hata terimini ardışık bağımlılık (otokorelasyon) özelliğine sahipse, Dickey-Fuller (DF) test modelinin içerdiği kabul edilen otoregresif süreç sayısı AR (1) kabul edilmektedir. Ancak her zaman serisinde durum böyle olmamaktadır. Bu sorunu gidermek için, hata terimlerinin otokorelasyon içermesi durumunda, zaman serilerinin gecikmeli değerleri ile bu otokorelasyon ortadan kalkmaktadır. Dickey-Fuller, modelde yer alan bağımlı değişkenin gecikmeli değerlerini bağımsız değişken olarak modele alan farklı bir yöntem geliştirmiştir. Bundan dolayı D.A. Dickey ve W.A.Fuller, (1981:1057-1073) 'Econometrica' dergisinde yayınlanan çalışmasında bu konuyu işlemişler ve mevcut olan test denklemini en genel haliyle şu şekilde kullanmışlardır: ADF denklemi (geniş ADF denklemi) (Dickey ve Fuller,1981:1057-1073):

$$\Delta Yt = a + bt + \gamma Y(t-1) + c\Sigma\Delta Y(t-1) + ut \qquad (1.2)$$

Genişletilmiş Dickey-Fuller (ADF) zaman serilerinin durağan olup olmadıkları aşağıdaki alternetif regresyon modelleri kullanılarak da belirlenebilmektedir (Dickey-Fuller,1979:427-431).

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum \sum_{i=1}^{k} \beta \Delta Y_{t-i} + \varepsilon_t \qquad (1.3)$$

$$\Delta Y_t = \alpha_0 + \alpha_1 trend + \alpha_2 Y_{t-1} + \sum_{i=1}^{k} \beta_i \Delta Y_{t-i} + \varepsilon_t \qquad (1.4)$$

Yukarıdaki regresyon denklemlerinde Y, birim kök testine konu olan zaman serisini, Δ birinci derece fark operatörünü, ε ise hata terimini,α parametresi sabit terimi, t deterministik trendi ifade etmektedir. Denklem (1.4)' te yer alan deterministik trend, ekonomik serilerde AR(1) serilerde mutlaka görülen bir etkidir. Zaman serilerinde sürekli bir artışın izlendiğini göstermektedir. Modelde bu etkiyi açıklayabilmek için, logaritmik etkileri belirlenerek doğrusal trende yer verilmelidir. Trend etkisi ortadan kaldırılmalıdır. Modeldeki gecikmeli fark terimleri de ; $\Delta Y_{t-i} = Y_{t-i} - Y_{t-(i+1)}$ şeklinde ifade edilir. Gecikmeli fark terimlerine modelde yer verilmesinin temel nedeni, hata terimlerinin arasındaki ardışık bağımlılık (otokorelasyon) sorununu ortadan kaldırmak içindir. Genişletilmiş Dickey-Fuller (ADF) testinin en temel hipotezi, hata terimlerinin bağımsız ve sabit varyansa sahip olduklarıdır.

4.2.1.2. Phillips - Perron Testi (P-P)

DF ve ADF metodlarına yapılan eleştiriler neticesinde geliştirilen alternatif bir model de P-P testidir. P-P testi yine bir birim kök testi olup, Z istatistiği, Z-alfa ve Z-tau istatistiklerini hesaplamak yolu ile testi gercekleştirilir (Phillips ve Perron,1988:335-346). Dickey-Fuller Testi hata terimlerinin istatistiki olarak bağımsız olduklarını ve sabit varyansa sahip olduklarını varsayar. Ayrıca zaman serilerinin otoregresif özelliğini dikkate almaktadır. Bu metodoloji kullanılırken hata terimleri arasında korelasyon olmadığına ve sabit varyansa sahip olduklarına emin olmak gerekir. Phillips ve Perron (1988) Dickey-Fuller 'ın hata terimleri ile ilgili olan bu varsayımı genişletmişlerdir. Bu durumu daha iyi anlamak için şu regresyon dikkate alınır.

$$Yt = a0^* + a1^* yt\text{-}1 + \mu t \qquad (1.5)$$

$$Yt = a0\bullet + a1\bullet\ yt\text{-}1 + a2\bullet\ (t\text{-}T/2) + \mu t \qquad (1.6)$$

Burada T gözlem sayısı μt hata terimlerinin dağılımını göstermekte olup bu hata teriminin beklenen ortalaması sıfıra eşittir. Fakat burada hata terimleri arasında içsel bağlantının (serial correlation) olmadığı veya homojenlik varsayımı gerekli değildir. Bu açıdan bakıldığında Dickey-Fuller testinin bağımsızlık ve homojenite varsayımları Phillips-Perron testinde terk edilmiş hata terimlerinin zayıf bağımlılığı ve heterojen dağılımı kabul edilmiştir. Böylece Phillips-Perron, Dickey – Fuller t istatistiklerini geliştirmesinde hata terimlerinin varsayımları konusundaki sınırlamaları dikkate almamıştır. Ayrıca, her iki test için t istatistik değeri kritik değerlerden büyük olması durumunda, birim kökün olduğu ve zaman serisi durağan değildir şeklindeki sıfır hipotezinin rededilmesini gerektirir.

Phillips-Perron'un Dickey-Fuller testinin hata terimleri konusundaki sınırlayıcı varsayımlarından vazgeçmesinin nedeni hata terimlerini ya da bu hata terimlerinin geçmiş değerlerinin hareketli ortalama olarak (MA-Moving Avarage) kullanmalarıdır. Bu açıdan bakıldığında Dickey-Fuller testindeki AR süreci, Phillips- Perron testinde ARMA sürecine dönüştürülmüştür. MA sürecinin kullanılmaya başlanması trend durağanlık kavramı testinin daha güçlü yapılmasına imkan vermektedir. Özellikle trend içeren serilerde MA süreçlerinin artan olması durumunda Phillips-Perron testi Dickey-Fuller testine göre daha güçlü olmaktadır.

4.2.1.3. KPSS (Kwiatkowski, Phillips, Schmidt, Shin) Birim Kök Testleri

Şu ana kadar üzerinde durulan birim kök testlerinde boş hipotez birim kökün varlığını ileri sürerken alternatif hipotez durağanlığı göstermektedir. Kwiatkowski, Phillips, Schmidt ve Shin (KPSS) (1992:159-178) çalışmalarında birim kök hipotezini farklılaştırarak birim kök testinin gücünün arttığını ileri sürmüşlerdir. KPSS birim kök testinde, sıfır hipotezi diğer testlerden farklı olarak serinin durağan olduğunu savunur. ADF ve P-P testlerinin, birim kök sonuçlarının gecikmelere karşı duyarlıdır. KPSS testi bu iki testin zayıf olan noktasını gidermede başarılıdır. Temelde KPSS testinin amacı yine serileri trendden arındırarak birim kök testi gerçekleştirmektir. KPSS testi için tahmin edilen modeller aşağıdaki gibidir:

$$y_t = \beta_t + \gamma w_t + \varepsilon_t$$
$$w_t = w_{t-1} + u_t \qquad (1.7)$$

Burada, w_t model için rassal yürüyüş süreci, t deterministik trend, ε_t durağan hatalar ve u_t ise (0, σ_u^2) dir. KPSS testinin ilk aşaması y_t serisinin kesme ve trend üzerine regresyonundan elde edilen hataları temel almaktadır (Sevüktekin ve Nargeleçekenler,2006:243-265).

$$S_t = \sum_{t:1}^{T} \varepsilon_t \qquad \text{t= 1,2,3, ...,T için} \qquad (1.8)$$

Daha sonra LM testi aşağıdaki gibi hesaplanır:

$$LM = \sum_{t:1}^{T} S_t^2 \Big/ s^2(l) \qquad (1.9)$$

KPSS testi, P-P testine benzer olarak, genel hata sürecini dikkate alır. Ancak KPSS testi, diğer iki birim kök testleriyle çelişiyorsa, zaman serisi parçalı bir yapıdadır ve anlamlı değildir.

Yaptığımız birim kök testlerine ilişkin özet tablo aşağıda yer almaktadır. I(1) grubunda yer alan değişkenlerde, 1. dereceden fark alındığında durağanlık yakalandığını, I(2) grubu için 2. Dereceden durağanlığın elde edildiğini belirtmek mümkündür. Kısaca özetlemek gerekirse, kullandığımız zaman serisinin durağan olması, serinin geçmişe ait çok az bilgi taşıması veya geçmişten gelen etkiye maruz kalmaması anlamına gelmektedir. Dolayısıyla şok etkisi ya hiç olmayacak ya da etkisi geçici olacaktır.

Birim Kök Testleri Analiz Sonuçları

Tablo 4: Birim Kök Testleri Özet Tablo

		ADF		**P-P**		**KPSS**	
Değişkenler	**Düzey Durumu**	**C**	**C&T**	**C**	**C&T**	**C**	**C&T**
gsmh	Düzey I (0)	2.643	1,27	0.9991	0,997	X	0,11521
dgsmh	Birinci Fark I (1)	3.524	4,1	0	0	X	X
d2gsmh	İkinci Fark I (2)	X	X	X	X	X	X
konsbut	Düzey I (0)	0	0	1	1	0,56305	X
dkonsbut	Birinci Fark I (1)	0	0	1	1	0,622789	X
d2konsbut	İkinci Fark I (2)	X	X	X	X	0,353748	X
kamgel	Düzey I (0)	0	0	1	1	0.537267	X
dkamgel	Birinci Fark I (1)	0	0	1	0.1232	0.550110	X
d2kamgel	İkinci Fark I (2)	X	X	X	X	0.081341	X
vergel	Düzey I (0)	0	0	1	1	0.533544	X

dvergel	Birinci Fark I (1)	0	0	1	1	0.544680	X
d2vergel	İkinci Fark I (2)	X	X	X	X	0.082574	X
kamharc	Düzey I (0)	0	0	1	1	0.567384	X
dkamharc	Birinci Fark I (1)	0	0	1	1	0.634424	X
d2kamharc	İkinci Fark I (2)	0	0	1	1	0.500000	X
topborc	Düzey I (0)	6.613	4.845	1	1	0.739632	X
dtopborc	Birinci Fark I (1)	X	X	0.0344	0.0001	0.650734	X
d2topborc	İkinci Fark I (2)	X	X	0	0	0.500000	X

AÇIKLAMA= C: Sabit teriminin varlığında birim kök testinin uygulandığına işaret eder. -C&T: Sabit terim ve Trend'in varlığında birim kök testinin uygulandığına işaret eder.-Tabloda yer alan rakamlar ilgili birim kök test istatistikleridir.(X) işareti ise ilgili testin uygulanamayacağını ifade etmektedir. Örneğin I (1) davranışı sergileyen bir seriye, 2. kez fark alınıp tekrar birim kök testi uygulanamayacağından bu durum X olarak ifade edilmiştir.

BİRİM KÖK TEST SONUÇLARININ ANALİZİ; GSMH, konsolide bütçe, kamu geliri ve **vergi geliri** I(1) davranışı sergileyen bir seriye sahiptir. **Kamu harcamaları** ve **toplam borç stoku** ise I(2) özelliği gösteren bir seriye sahiptir.

4.2.Nedensellik Testleri

4.2.1.Granger Nedensellik Analizi

Granger nedensellik ilişkisinin anlamı, regresyonda bağımsız değişken X'in bağımlı değişken Y ile bir nedensellik ilişkisi içinde olduğudur ve bunun için iki temel koşulun sağlanması gerekir. Bunlardan birincisi; bağımlı değişken X'in, bağımsız değişken Y'yi tahmin etmeye aracılık etmesidir. İkinci varsayım ise, Y'nin X'i tahmin etmede etkili olmayacağıdır. Buna tek yönlü nedensellik denir. Nedensellik testlerinde, testlerin yönü önem arz eder, yani değişkenlerin bağımlı ve bağımsız olduğunu belirleme açısından çok önemlidir. Nedenselliğin yönü, iki veya daha çok değişkenin birbiri arasındaki ilişkilerin; tek yönlü mü, çift yönlü mü veya hiçbir ilişkinin olmamasını anlamada çok önemlidir (Granger,1969:424-438, Kennedy,2006:81-82, Gujarati,2006:620-623). Granger nedensellik testi "**kısa dönem**" sürecinde bağımlı ve bağımsız değişkenler arasındaki nedensellik analizine imkan sağlamaktadır. Bu testin hipotezi şöyle kurulur;

Model $Yt=\Sigma\alpha i\ Yt-1 + \Sigma\beta i\ Xt-1 + \varepsilon i$ şeklinde olduğunda; (1.10)

Ho: $\beta1= \beta2=\ldots= \beta n=0$ (X, Y'nin Granger nedeni değildir.)
H_a: En az bir β sıfırdan farklıdır. (X, Y'nin Granger nedenidir.)

Eğer Ho hipotezi red edilirse bunun anlamı X'in Y ile Granger nedensellik ilişkisi içinde olduğudur. Granger nedensellik testinde, hem X'ten Y'ye doğru, hem de Y'den X'e doğru olabilir. Bu durum, çift yönlü nedensellik olarak adlandırılır. X↔Y olarak gösterilir. Her iki H_0 hipotezi rededilirse X ve Y değişkenleri arasında iki taraflı bir nedensellik olduğunu söylemek mümkündür. X ve Y serileri arasındaki Granger nedensellik testinin yapılabilmesi için, her iki değişkenin kovaryans durağan ve stokastik olması gerekmektedir. Genellikle seriler trend içerdiğinden kovaryans durağan değildir. Dolayısıyla, bu serileri bu tür şok ve etkilerden arındırmak gerekir. İdeal durum şöyle ifade edilebilir: Her bir bağımsız değişkenden bağımlı değişkene doğru Granger nedensellik ilişkisi söz konusu iken, bağımlı değişkenden bağımsız

değişkenlere doğru bu ilişki söz konusu değildir.

Aşağıda yer alan tablolar incelendiğinde görülecektir ki, Konsolide bütçe, Kamu gelirleri, Vergi gelirleri, Kamu Harcamaları ve Toplam borç bağımsız değişkenleri, GSMH bağımlı değişkeni ile ideal Granger nedensellik ilişkisi içindedir. Başka bir ifadeyle söz konusu bağımsız değişkenlerin geçmiş yıllara ait değerleri, GSMH'yi açıklamaktadır.

Tablo 5: Granger Nedensellik İlişkisi Özet Tablosu	
BAĞIMSIZ DEĞİŞKENLER	GRANGER İLİŞKİSİNİN YÖNÜ (GSMH İLE)
konsbutce	→
kamgel	→
vergel	→
kamharc	→
topborc	→

Yukarıdaki tabloda yer alan → işareti, ilgili bağımsız değişkenin GSMH'nin Granger nedeni olduğunu ifade etmektedir. Yukarıda ifade edildiği üzere, bu ideal durumu yansıtmaktadır. ↔ İsareti, GSMH'nin ilgili değişkenin Granger nedeni olduğunu, aynı zamanda, ilgili değişkenin de GSMH'nin Granger nedeni olduğunu ifade etmektedir.

Tablo6: Granger Wald Testinin Sonuçları

DEĞİŞKENLER		chi2	df	Prob > chi2
GSMH	konsbutce	25.839	2	0.000
konsbutce	GSMH	44.136	2	0.110
GSMH	kamgel	22.795	2	0.000
kamgel	GSMH	29.542	2	0.228
GSMH	vergel	22.47	2	0.000
vergel	GSMH	3,81	2	0.149
GSMH	kamharc	26.453	2	0.000
kamharc	GSMH	33.532	2	0.187
GSMH	topborc	18,3	2	0.000
topborc	GSMH	22.255	2	0.329

P değeri 0.05 olarak alınmıştır. Bu değerden küçük olan hipotezler ret edilir, bu değerden büyük olan hipotezler ret edilmez.

4.2.2.Toda- Yamamoto –Dolado- Lutkepohl (MWALD) Testi

MWALD testi (modifiye edilmiş WALD testi), Toda, Yamamoto, Dolado ve Lutkepohl tarafından geliştirilmiş bir test olup, Granger nedensellik testinin uyarlanmış VARL (Vector Autoregressive in Levels) sistemi kullanılarak gerçekleştirilmesi mantığına dayanır (Toda ve Yamamoto,1995:225-250). Böylece test istatistiğinin Ho hipotezi dağılımı, sistemin birim kök özelliğine rağmen standartlaştırılır.

MWALD test, VAR (k+amax) kestirimi için, k serbestlik dereceli χ^2 (chi-squared) testini kullanır. Notasyondaki k gerçek lag uzunluğunu, amax ise maksimum bütünleşme düzeyini ifade eder. MWALD testinin uygulanması 4 adımda gerçekleştirilir: İlk adımda serilerin durağanlık durumları tespit edilir ve maksimum bütünleşme sayısını ifade eden amax tespit

edilir. İkinci adımda ise gerçek lag uzunluğunu ifade eden k sayısı tespit edilir. K sayısı tespit edilirken VAR sistemi kullanılır.
Son aşamada ise, VAR matrisinin ilk k adet katsayısına Wald testi uygulanır. Böylece Toda ve Yamamoto'nun önerdiği modifiye edilmiş Wald testi (MWALD), katsayı matrisindeki lineer ve lineer olmayan kısıtlamaların standart asimptotik teori kullanılarak test edilmesini mümkün kılmıştır. Ayrıca MWALD testi, ilk elden yapılması gereken eşbütünleşme testlerine de gerek görmemektedir.
Çalışmamızda uygulayacağımız MWALD test süreci için Eviews programı kullanılmıştır. VAR modeli sistemsel bir yapıya dönüştürüldükten sonra, uygulanan SUR metoduna ilişkin kestirimler yer almaktadır.
İkinci tabloda ise, uygulanan MWALD test sonuçları yer almaktadır. MWALD sonuçlarının yer aldığı tabloyu takiben Ho hipotezi ve nedensellik ilişkisi bulgusu yer almaktadır.

Tablo 7: MWALD Testi Sonuçları Özet Tablo

BAĞIMSIZ DEĞİŞKEN	NEDENSELLİK İLİŞKİSİNİN YÖNÜ	BAĞIMLI DEĞİŞKEN
konsbutce	→	gsmh
kamgel	→	gsmh
vergel	→	gsmh
kamharc	↔	gsmh
topborc	↔	gsmh

Yukarıdaki tabloda yer alan → işareti, ilgili bağımsız değişkenin GSMH'nin nedeni olduğunu ifade etmektedir. Yukarıda ifade edildiği üzere, bu ideal durumu yansıtmaktadır.
↔ İsareti, GSMH'nin ilgili değişkenin nedeni olduğunu, aynı zamanda, ilgili değişkenin de GSMH'nin nedeni olduğunu ifade etmektedir.

Şekil 1: MWALD TESTİ NEDENSELLİK ANALİZİ



Tablo 8: MWALD Testi Sonuçları Özet Tablo

Ho HIPOTEZİ	MWALD TEST İSTATİSTİĞİ	P-DEĞERİ	SONUÇ
Konsbutce, Gsmh'nin Granger nedeni değildir.	30,7454	0.0000	RED
Gsmh, konsbutce'nin Granger nedeni değildir.	7,1668	0.0668	KABUL
Kamgel, gsmh'nin Granger nedeni değildir.	50,8479	0.0000	RED
Gsmh kamgel'in Granger nedeni değildir.	4,8175	0.1857	KABUL
Vergel, gsmh'nin Granger nedeni değildir.	53,1691	0.0000	RED
Gsmh, vergel'nin Granger nedeni değildir.	6,4007	0.0937	KABUL
Kamharc, gsmh'nin Granger nedeni değildir.	57,6562	0.0000	RED
Gsmh, kamharc'in Granger nedeni değildir.	11,8102	0.0081	RED
Topborc, gsmh'nin Granger nedeni değildir.	17,3261	0.0006	RED
Gsmh, topborc'un Granger nedeni değildir.	8,0752	0.0455	RED

Renkli dolgulu alanlar, ilgili değişkenlerin Granger Wald nedensellik ve MWALD nedensellik testlerinde farklı sonuçlar ürettiğini vurgulamak için kullanılmıştır.

Yukarıda yer alan MWALD test sonuçlarını topluca ifade etmek gerekir ise; Konsolide bütçe, Kamu gelirleri, Vergi gelirleri, içermek üzere toplamda 3 değişken ideal durumu yansıtmaktadır; bu 3 değişken GSMH değişkenini açıklamaktadır, Birinci değişkenden, ikinci değişkene doğru tek yönlü ve pozitif bir nedensellik ilişkisi mevcuttur.

Öte yandan, Kamu harcamaları, Toplam borç ile GSMH değişkeni ile çift yönlü ve pozitif bir ilişki sergilemektedir. Bu değişkenler GSMH'yi açıklarken, GSMH de bu değişkenleri açıklamaktadır.

Granger nedensellik testi "**kısa dönem**" nedensellik analizine imkan sağlarken, MWALD testi "**uzun dönem**" nedensellik analizine imkan sağlamaktadır. Çalışmamızın önceki bölümünde uygulamış olduğumuz Granger Wald nedensellik testi ile MWALD nedensellik testi sonuçlarının büyük oranda benzerlik gösterdiği, sadece 2 değişken için, bu iki testin farklı sonuçlar verdiği açıktır. Farklı sonuçlar veren 2 değişken Kamu Harcamaları ve Toplam Borç değişkenleridir. Kamu harcamaları ve Toplam borç değişkenleri ilk yapılan Granger Wald testi

sonuçlarına göre ideal durumu yansıtmaktadır, ancak MWALD testi sonuçlarına göre bu iki değişkenin ideal durumu yansıtmamaktadırlar. Öte yandan Granger Wald testi, istihdam değişkeni için ilişkisizlik sonucunu üretirken, MWALD testi bu değişkenin ideal durumu yansıttığını göstermektedir.

Konsolide Bütçe (konsbütçe), Kamu Gelirleri (kamgel), Vergi Gelirleri (vergel), ve Kamu Harcamaları (kamharc) değişkenleri; kamu maliyesinin birer enstrümanları olması nedeniyle, bu değişkenleri bir arada ele almayı uygun bulduk. Konsolide bütçenin GSMH ile ilişkisi, bütçeden GSMH' ya doğru ve pozitiftir. Kamu gelirleri ve özellikle bu gelirler içerisinde yer alan vergi gelirleri ile GSMH arasındaki ilişkide de aynı durum mevcuttur. Bu sonuç, önceki çalışmalar tarafından da genellikle desteklenmektedir. Kamu harcamaları ile GSMH' nın ilişkisi konusunda da birinciden ikinciye doğru pozitif bir nedensellik ilişkisinden söz etmek mümkündür. Burada akla bir soru gelebilir: Kamunun harcamaları şüphesiz ki büyük oranda kamu gelirlerine ve bütçeye bağlıdır. Acaba bu durumda sadece kamu harcamaları üzerinde durulamaz mıydı? Acaba niçin bu değişkenlerin hepsi üzerinde durduk? Bu sorunun cevabı burada da verilebilir. Fakat konuyu dağıtmamak açısından, bu tip hususlarla ilgili tartışmayı çalışmamızın "Sonuç" bölümüne saklamayı tercih etmekteyiz.

4.3. Kırılma Testi

4.3.1.Zivot-Andrews Kırılma Testi

Augmented Dickey-Fuller testinin yaygınca bilinen zayıf yanı şudur; I(1) özelliği gösteren bir seri için kurulan Ho hipotezinin testi gerçekleşirken, seride var olan bir yapısal kırılma, birim kökün varlığı olarak algılanabilir. Zivot ve Andrews 1992 yılında yayınladıkları, "Further Evidence on the Great Crash" adlı makalede, sorunun giderilmesine yönelik olarak şu yöntemi savunmuşlardır (Zivot ve Andrews,1992: 251-270); modeldeki sabitte ya da lineer trendde (ya da hem sabitte hem de lineer trendde) gerçekleşmek koşulu ile, belirsiz bir noktada gerçekleşecek bir kırılmaya izin verilecek şekilde bir birim kök testi tasarlamışlardır. Zivot-Andrews testinin işleme mantığı şu şekildedir; serideki her nokta potansiyel bir kırılma noktası olarak görülür ve her nokta için regresyon süreci işletilir. Tüm bu potansiyel kırılma noktalarından, tek taraflı t-istatistiğini minimize eden nokta, kırılma noktası olarak belirlenir. Zivot ve Andrews'a göre serinin başlangıç ve bitiş noktalarının analize dahil edilmesi, t istatistiğinin asymptotic dağılımının sonsuza yönelmesine neden olmaktadır. Bu nedenle serinin başından ve sonundan, (0.15T, 0.85T) oranındaki alanın kırpılması gerektiğini ileri sürmüşlerdir. Söz konusu kırpma alanı "trimming region" olarak ifade edilmiştir. Çalışmamızda 50 adet gözleme sahip olduğumuzdan (1960-2009), Stata.11 programı analizleri gerçekleştirirken serilerin başından ve sonundan 7 değişkeni "kırparak" kırılma tarihlerini belirlemiştir (Zivot ve Andrews,1992: 251-270). Zivot-Andrews kırılma testinin eksikliği ise, seride sadece 1 adet kırılmaya izin veriyor olmasıdır.

%5 anlamlılık düzeyindeki kritik değer (-5.08), hesaplanan t-test istatistiğinden küçük olduğu durumlarda, Ho hipotezi red edilmiştir. Buna göre; GSMH (2001), vergel (1998), kamharc (1998), topborc (1999) değişkenleri için Ho hipotezi red edilememiştir. Bunun anlamı serilerdeki yapısal kırılmalar, normal birim kök test sonuçlarını değiştirecek kadar etkili değildir.

Öte yandan, konsbut (1999), kamgel (1999) değişkenleri için, Ho hipotezi red edilmiştir. Bu değişkenler sabitte ve trendde kırılmaya izin verildiğinde trendsel olarak durağan (birim kök özelliğinde olmayan) bir yapı sergilemektedirler. Aşağıdaki tablo 9'da bütün değişkenlerin (bağımlı ve bağımsız) Zivot-Andrews testi kırılma sonuçları özet olarak verilmiştir.

Tablo 9: Zivot-Andrews Test Sonuçları Özet Tablo

Değişkenler	t-istatistigi	Kritik Değer (%5)	Kırılma Yılı	Ho Hipotezi
gsmh	-4,460	-5,08	2001	Red edilemez
konsbutce	-5,924	-5,08	1999	Red
kamgel	-5,476	-5,08	1999	Red
vergel	-5,067	-5,08	1998	Red edilemez
kamharc	-4,666	-5,08	1998	Red edilemez
topborc	-2,159	-5,08	1999	Red edilemez

4.4. AMPİRİK TEST ANALİZ SONUÇLARI

1-Her vergi, sermaye biriktirme gücünü zayıflatma eğilimi taşır. Dolayısıyla tüm vergiler ya sermayenin ya da gelirin üzerinde etkili olmaktadır. Vergi sermayeye yüklenirse, ülkenin üretken işkollarının üzerinde büyütücü etki yaparken, sermaye ödeneklerini ise aynı oranda zayıflatacak bir durum yaratır. Gelirin üzerine binerse, ya birikimleri zayıflatır ya da birikimciler vergilendirilecek miktar kadar değeri ellerinde tutmak zorunda kalır (D.Ricardo,2008,124-125). Dolayısıyla, bu eldeki değer üretim sürecine giremediğinden atıl kalmakta olup, büyümeyi yavaşlatan bir durum arz eder.

2-Her şey sabitken bütçe açıklarında bir artış, özel tasarruflardaki bir artış tarafından dengelenmedikçe, ulusal tasarrufların ve yatırımların dolayısıyla ulusal gelirin düşmesi anlamına gelebilir (Turan,2008:28-29). Bu bağlamıyla konsolide bütçenin dengeli ve tutarlı hazırlanması iktisadi büyüme üzerinde olumlu etki oluşturacaktır.

3-Konsolide bütçenin iktisadi büyüme üzerine etkisini incelediğimizde, iktisadi büyümeye kaynak oluşturduğunu test etmek istediğimiz bağımsız değişken olan Konsolide bütçeden (konsbütçe), bağımlı değişken GSMH'a yönelik bir nedensellik ilişkisi bulunmaktadır. Bu ideal durumu yansıtmaktadır. Fischer, küçük bütçe açıklarının devamlı büyümeye yardımcı olmakla birlikte yüksek büyüme için gerekli olmadığı, büyük bütçe açıkları büyümeyle negatif ilişkili iken bütçe fazlalarının daha hızlı büyümeyle, daha büyük sermaye birikimi ve yüksek verimlilik artışı aracılığıyla, güçlü bir şekilde ilişkili olduğu sonucuna ulaşmıştır (Fischer,1993:1-11). Genel olarak devletler topladıkları kamu gelirlerinden daha fazla kamu harcaması yaptıklarından bütçe açıklarının finanse edilmesi sorunu ortaya çıkmaktadır. Aşırı bütçe açıklarının makroekonomik istikrarsızlıklar yaratarak büyümeyi olumsuz yönde etkileyebileceği ileri sürülebilir.

4-Kamu gelirleri (kamgel) ve vergi gelirleri (vergel) ile iktisadi büyüme üzerine etkisini incelediğimizde, iktisadi büyümeye kaynak oluşturduğunu test etmek istediğimiz bağımsız değişken olan kamu gelirleri (kamgel) ile vergi gelirlerinin (vergel), bağımlı değişken GSMH'ya doğru kısa ve uzun dönemde bir nedensellik ilişkisi mevcuttur. Bu ideal durumu yansıtmaktadır. Kamu gelirlerinin özellikle vergilerin, iktisadi büyüme üzerindeki etkilerinin analizi, literatürde, daha çok vergi kapasitesi, vergi oranları, vergi yükü ve vergi indirimleri üzerinde yoğunlaşmaktadır. Sağlıklı bir vergi sistemi, iktisadi büyüme, adil bir gelir dağılımı ve makro ekonomik istikrar için ne kadar önemli olduğu uygulanacak politikaların; adil olarak toplumun tüm kesimlerinden (eşitliğe dayalı) alınacak kişisel (ve kurumsal) gelirleri ile orantılı vergi gelirleri makro ekonomik yapı üzerinde olumlu etki yaratırken, aşırı vergiler ya da yüksek oranlı vergiler, tüm ülkedeki üreten ve tüketen kişiler üzerinde negatif bir etki yaratacağından çalışma eforunu, tasarrufları, yatırımları, üretimi, iktisadi büyümeyi ve en sonunda kalkınmayı olumsuz olarak etkileyecektir. Vergi oranları ile iktisadi büyüme arasında çok yakın bir

korelasyon söz konusudur. Düşük vergi oranları neticesinde ekonomide toplam yatırımların dolayısıyla üretimin arttığını belirlemiştir (Aktan,1998:41-45). Arsan, kamu gelirleri ile GSMH ve Kişi Başına GSMH arasında pozitif bir ilişki olduğunu tespit etmiştir. Toplam vergi gelirleri ile kişi başına GSMH arasında pozitif ilişki bulmuştur (Arsan,1973:91). Elde ettiğimiz bulgular doğrultusunda, toplam vergi gelirleri ile reel GSMH arasında kısa dönemde bir korelasyon tespit edilmiş, kamu gelirleri ile toplam vergi gelirlerinden GSMH'ya doğru tek yönlü ve pozitif bir nedensellik ilişkisinin olduğu sonucuna varılmıştır.

5-Bağımsız değişken kamu harcamaları (kamharc) ile bağımlı değişken GSMH'ya doğru kısa dönemde tek yönlü ve pozitif bir nedensellik ilişkisi mevcuttur. Bu durum Keynes'in hipotezini doğrular nitelikte olup, ideal durumu yansıtmaktadır. Ekonomide durgunluk sürecinin hüküm sürdüğü bir dönemde, kamu harcamalarında yapılacak artış, toplam talebin artmasına ve bu suretle ekonominin yeniden canlanma sürecine girmesine katkıda bulunur. Bu durum toplam üretim kapasitesinin arttırıcı nitelikteki (alt yapı yatırımları vb.), devlet tarafından verilen her türlü üretimi arttırmaya yönelik sübvansiyonlar ile istihdamı arttırıcı işsizliği azaltıcı politikalar ile büyüme üzerinde etkili olmaktadır. Kamu harcamalarının makro ekonomide yarattığı etkiler, harcamaların türüne ve niteliğine göre değişiklik arz etmektedir. İktisadi büyüme üzerindeki en olumlu etkiyi yatırım harcamaları yapmaktadır. Cari harcamalar ise, toplam talebi artırmak suretiyle iktisadi büyüme üzerinde dolaylı etkide bulunmaktadır. Transfer harcamaları da yine toplam talebi arttırarak, iktisadi büyümeyi dolaylı yoldan etkilemektedir (Pehlivan,2009:80). Türkiye Ekonomi Kurumu'nun yaptığı ampirik çalışmalara göre, verimsiz alanlara yönelen kamu harcamaları iktisadi büyüme üzerinde olumsuz bir etki doğururken, söz konusu harcamaların kamu yatırımı şeklinde ortaya çıkması durumunda, iktisadi büyüme ile kamu harcamaları arasında pozitif bir ilişkinin varlığı görülmektedir. Kamu yatırımlarının doğrudan yatırımlara yönelik harcamalar düzey etkisi yaratırken, altyapıya yönelik olanlar ise dışsallıklar ve büyüme etkisi yaratmaktadır (TEK,2003:14,http://www.tek.org.tr). Literatürde, kamu harcamalarının iktisadi büyüme üzerine etkileri, kamu harcamaları ile iktisadi büyüme arasında bir nedensellik ilişkisinin belirlenmesini Yamak ve Küçükkale (1997:5-14), ve Günaydın (2000:70-86), toplam kamu harcamalarının iktisadi büyümeye katkısını Ulutürk (2001:131-139) ve Ateş (2001) araştırmışlardır. Bu çalışmalar bizim çalışmamızı destekler mahiyette olup, Ram (1986), Ateş (2001), Sarı (2003) ve özellikle de Şimşek'in (2004) çalışmasıyla benzer sonuçlar elde edilmiştir. Diğer çalışmalarda Wagner hipotezini destekleyecek bulgulara ulaşılmış, kamu harcamalarından GSMH'ya doğru bir nedensellik tespit etmişlerdir. Toda-Yamamoto testi ile de karşılıklı bir ilişki bulunmuştur.

6-Toplam borçlar, iktisadi büyümenin istatistiksel olarak anlamlı bir nedenidir. Bu durum alınan dış kaynak tasarruflarının etkin ve verimli olarak kullanıldığını göstermektedir. Hem Granger nedensellik testinde, hem de Toda-Yamamoto (MWALD) testinde birbirleriyle örtüşen bir sonuca ulaşılmıştır. Dış kaynakların daha çok hammadde, tüketim mallarında ve refinansman amaçlı kullanılmakta olduğu görülmektedir (Kara,2001:95-110). Karagöl (2002) çalışmasında borç servisiyle büyüme ilişkisini incelemiş, nedensellik sonucu, borç servisinden büyümeye doğru bir nedensellik tespit etmiştir. Karagöl (2006) çalışmasında ise, dış borç ve GSMH ilişkisini incelemiştir. Dış borçlara verilen bir şokun GSMH üzerinde pozitif etkisini tespit etmiştir. Javed ve Şahinöz'ün (2005) çalışmasında ise, dış borç stoğundaki artış ihracat üzerinde etkili olurken, bunun büyüme üzerinde bir etkisinin olmadığı sonucuna varılmıştır.

5.SONUÇLAR VE ÖNERİLER

Konsolide bütçe, kamu gelirleri, vergi gelirleri, kamu harcamaları ve toplam borç stoku hakkındaki değerlendirmeyi hepsini birlikte ele alarak yapmak uygun olacaktır. Konsolide bütçe tüm kamu harcamaları için tahmin edilen gerekli ödenekler toplamıdır. Bunun başlıca kaynağı kamu gelirleri ve vergi gelirleridir. Fakat bunlardan başka kaynakları da bulunabilir. Örneğin, iç ve dış borçlanma da bir başka kaynaktır. Granger nedensellik testinde "toplam borçlardan" büyümeye doğru tek yönlü ve pozitif bir nedensellik ilişkisi saptanmıştır. Literatürde de bu sonuçlarla örtüşen birçok çalışma mevcuttur. Kamu gelirleri gerek vergi gelirlerini, gerekse vergi dışı gelirleri kapsar. Kamu harcamalarının kaynağı ise konsolide bütçedir. Bu beş değişkenin her biri (ayrı ayrı miktarları) ile GSMH arasında birincilerden ikinciye doğru tek yönlü ve pozitif bir kısa dönem nedensellik ilişkisi saptanmıştır. Ayrıca MWALD testi yoluyla uzun dönem nedensellik ilişkisi incelendiğinde, konsolide bütçe, kamu gelirleri ve vergi gelirlerinden, GSMH'ya doğru tek yönlü ve pozitif bir nedensellik ilişkisi mevcuttur.

Bilindiği gibi, kamu harcamaları dışındaki ilk üç değişken ancak kamu harcamasına dönüşmek suretiyle GSMH'yı pozitif yönde etkileyebilir. Buna rağmen bu ilk üç değişken ile GSMH'nın ilişkisi negatif ya da anlamsız çıkarken, kamu harcamalarının GSMH üzerindeki etkisinin pozitif olarak çıkması aslında mümkündür. Konsolide bütçe, kamu gelirleri ve kamu harcamaları gibi değişkenlerin birbirleriyle ilişkilerinin istikrarsız olması ya da nispeten kopması gibi durumlarda bu daha çok olasıdır. Örneğin konsolide bütçenin tümünün kullanılamaması ya da ihtiyaç olmadığı halde kamu geliri elde edilmesi gibi durumlar bunun örnekleridir.

Buna rağmen, dört değişkenin her birinin GSMH ile ilişkisi benzer türde çıkmıştır. O halde bu sonuç Türkiye'de bu değişkenlerin birbirleriyle olan ilişkilerinin de istikrarlı olduğunun bir çeşit kanıtı sayılmalıdır. Mesela hepimiz biliriz ki, Türk kamu kurumlarında tahsis edilen ödeneği son kuruşuna kadar harcayıp bitirmek adettendir. Bütçenin harcamalarla uyumlu olduğunu (ya da en azından öyle göründüğünü) düşünmek için aslında bu bile başlı başına bir sebep teşkil eder.

Daha ötesi, bilindiği gibi aslında vergi gelirleri (ya da - benzer şekilde - kamu gelirleri) tek başına ele alındığında, gelirden bir sızıntıdır. Talep yönünden aslında GSMH'yı olumsuz yönde etkilemesi beklenir. Oysa sonuç öyle çıkmamıştır. Şüphesiz ki bu, verginin sonradan kamu harcamasına negatif etkiyi telafi etmesiyle ilgilidir. Fakat kamu ve vergi gelirlerinin GSMH üzerindeki etkisi - yukarıda da belirtildiği gibi - nötr de çıkmamıştır. Bu durum makro iktisat teorisindeki "denk bütçe çoğaltanı" (ya da "denk bütçe çarpanı"= Bir taraftan devletin harcama yapıp, bir taraftan da bu harcamaya eşit miktarda vergi almasının çıktı üzerindeki etkisi nötr değildir; çıktı artar) hipotezinin geçerliliğine de bir çeşit kanıt sayılmalıdır.

Bu noktada, okuyucunun aklına gelmesi kuvvetle muhtemel olan bir tartışmaya burada değinmeden geçemeyiz. Bilinen bir gerçektir ki, milli gelirdeki değişmeler vergi hasılatı üzerinde de otomatik olarak değişme yaratır. Bu durumda, çalışmamızda vergi gelirleri ile GSMH arasında çift yönlü değil de, vergilerden GSMH'ya doğru tek yönlü bir ilişki saptamamıza acaba şaşmak gerekmez mi? Bu, gerçekte cevabı ekonometrik içerikte olan bir sorudur. Bir değişkenin diğer bir değişken üzerinde bir etkisi olduğundan söz edildiğinde kastedilen, bu etkinin "anlamlı" (önemli sayılabilecek bir düzeyde) olmasıdır. Çünkü aslında ekonomide her değişken diğer her değişkenle dolaylı ya da dolaysız, karşılıklı ilişki halindedir. Örneğin bir X değişkeni Y değişkenini etkiliyorken, Y değişkeni de X değişkenini etkiliyor olabilir. Fakat X'in üzerinde Y den başka faktörlerin de etkileri varsa, Y' nin etkisini

ekonometrik olarak gözlemlemek mümkün olmayabilir. Örneğin, vergi mevzuatında sık sık yapılan değişiklikler (deyim yerindeyse, fakültelerde okutulan "Türk Vergi Sistemi" gibi derslerin kitaplarının iki yıl sonra işe yaramaması) daha önce vergi alınmayan şeylerden vergi alınmaya başlanması, vb. gibi olgular, hem GSMH'daki değişmelerden bağımsız olan ve hem de vergi hasılatının değişmesine başlı başına sebep olabilen olgulardır. Bu durumda, vergi hasılatı kısmen de olsa GSMH'dan bağımsız olarak değişme gösterebilir ve GSMH'nın vergiler üzerindeki etkisini gözlemlemek zorlaşabilir. Fakat çalışmamızda vergi - GSMH ilişkisinin ilginç bir şekilde tek yönlü çıkması, Türkiye'de istikrarlı bir maliye mevzuatının bulunduğundan şüphe etmemizi gerektiren ve bu alanda araştırmaya ihtiyaç bulunduğuna işaret eden bir ipucu sayılmalıdır.

Kamu harcamalarının büyümeye etki ettiğini yukarıda belirttik. Türkiye'de kamu harcamaları içerisinde prodüktif nitelikte sayılabilecek olan kamu yatırımı harcamalarının oldukça düşük bir düzeyde olduğu, bilinen bir olgudur. Kamu harcamalarının esas büyük kısmı cari harcamalarla transfer harcamalarından oluşmaktadır. Bu da kamu harcamalarının büyümeye esas olarak arz yönünden değil, talep yönünden yardımcı olduğunu düşündürmektedir. Bunun yanında Türkiye ekonomisinde kamu sektörünün ağırlığı ve ekonomideki payı ciddi bir oran oluşturmaktadır. Bu durum ekonominin yönetilmesinde kamu ağırlıklı politikaların önemli bir görevi yerine getirmekte olduğunu göstermektedir.

Buna benzer bir durum, toplam borçlar - GSMH ilişkisi için söz konusudur. Toplam borçlar - Granger nedensellik testine göre - GSMH üzerinde tek yönlü pozitif etkiye sahiptir. MWALD testinde ise çift yönlü bir ilişki çıkmıştır. Türkiye'de iç ve dış borçların yeni yatırım amaçlarından çok cari harcamalar, hammadde ithalatı ya da refinansman gibi amaçlara hizmet ettiği hatırlanırsa, borçların ekonomiyi büyütmekten ziyade, "mevcut büyümenin sürdürülebilirliğini sağladığını ve bulduğumuz sonucun bu görüşle uyumlu olduğunu söyleyebiliriz. Türkiye'nin büyümesinin dış kaynak girişine bağlı olduğunu iddia eden popüler söylemlerin iktisadi açıdan anlamı da bu olsa gerektir. Dış kaynaklar Türkiye'nin büyümesinin doğrudan doğruya nedeni olmasa bile, dış kaynak girişi olmadığında Türkiye büyümek bir yana, mevcut GSMH düzeyini sürdürmede bile zorlanabilir.

Bu noktada, ilginç bir şekilde, teorik iktisadın değeri ve iktisadın sayısal yaklaşımdan ibaret olmaması gerektiği herhalde daha iyi anlaşılmaktadır. Örneğin borçlar büyümenin doğrudan nedeni de olsa, ya da böyle olmayıp sadece büyümenin sürdürülebilirliğinin bir şartı da olsa burada kullanılan testler aynı sonucu verir: "Borçlardan GSMH' ya doğru bir nedensellik söz konusudur". (Belki dil açısından bile, bir şeyin "doğrudan nedeni olmak" ile "sayesinde olmak" arasındaki farkı tarif etmek güçtür). Ama sayısal yöntemler ya da testler bu "nedenselliğin" ne tür bir nedensellik olduğunu bize söylememektedirler.

KAYNAKÇA

- AKSU, Levent, (2013), "Türkiye'de İktisadi Büyümenin Kaynakları", T.C.Balıkesir Üniversitesi Sosyal Bilimler Enstitüsü, Yayınlanmamış Doktora Tezi, Danışman: Prof.Dr. Ali Kemal GÜRBÜZ, Kasım 2013, Balıkesir.
- AKTAN, Coşkun Can, (1998), "Düz Ve Düşük Oranlı Vergiler İle Ekonomik Büyüme İlişkisi", Vergi Dünyası Dergisi, Sayı 203, Temmuz 1998, s.41-45.
- AKYÜZ, Müfit ve ERTEL, Nesrin (1990), Ansiklopedik Ekonomi Sözlüğü, Dünya Yayınları, Üçüncü Basım, İstanbul.
- ALTAY, N.Oğuzhan ve ALTIN, Onur, (2008), "Türkiye'de Kamu Harcamalarının

Ekonomik Büyüme Ve Yatırımlar Üzerine Etkilerinin Analizi (1980–2005)", Ege Akademik Bakış / Ege Academic Review, 8 (1), 2008, İzmir,s. 267-285.

- ARISOY, İbrahim, (2005), "Wagner ve Keynes Hipotezleri Çerçevesinde Türkiye'de Kamu Harcamalari ve İktisadi Büyüme İlişkisi" , Çukurova Üniversitesi, Sosyal Bilimler Enstitüsü Dergisi, Cilt 14, Sayı 2, 2005, s.63-80.
- ARSAN, Ü., (1973), "Kamu Maliyesi Üzerinde Uluslararası İstatistiksel Bir Araştırma" SBF Yayını, Yayın No:365, Ankara.
- ATEŞ, Sanlı, (2001), "Kamu Harcamaları ve Vergi Politikalarının Uzun Dönemli Büyüme Sürecine Etkileri: Yeni İçsel Büyüme Modelleri Açısından Bir bakış ve Türkiye Örneği" (http://idari.cu.edu.tr.sanli/sanli.7.pdf;Erişim Tarihi:09.09.2009).
- AYPEK, Nevzat, BAN, Ünsal, GÜZEL, Adnan, KÜÇÜKÖZMEN Çoşkun ve İLTAŞ Yüksel, (2009), Ekonomik Terimler Sözlüğü, Gazi Kitabevi, Ankara.
- BAĞDİGEN, Muhlis ve ÇETİNTAŞ, Hakan, (2004), "Public Expenditure and Economic Growth: Case of Türkiye", Journal of Economic and Social Research, Vol:6, No:1,s.53-72.
- BARRO, Robert J., (1988), "Government Spending in a Simple Model of Endogenous Growth", NBER Working Paper Series, No:2588, Cambridge, MA,(May 1988), s.1-29.
- BARRO, Robert J., (1991), "Economic Growth in a Cross Section of Countries". Quarterly Journal of Economics,106(2), s.407-443.
- BERBER, Metin, (2006), İktisadi Büyüme ve Kalkınma, Derya Kitabevi, Üçüncü Basım, Trabzon.
- BLEANEY, Michael, Norman GEMMELL ve KNELLER, Richard, (2001), "Testing the endogenous growth model: public expenditure, taxation, and growth over the long run," Canadian Journal of Economics, Canadian Economics Association, Vol:34, No:1, s. 36-57, (February 2001).
- BOX, George, E.P. – JENKINS, Gwilym M., (1970), Time Series Analyses, Forecasting and Control, Holdan Day Publ., San Fransisco, 1970, USA.
- CASHIN, Paul, (1994), "Government Spending, Taxes, and Economic Growth," IMF Working Papers, 94/92, International Monetary Fund.USA.
- ÇOLAK, Ömer Faruk ve İbrahim TOKATLIOĞLU (editör) ve diğ., (2007), İKTİSADA GİRİŞ, Gazi Kitabevi, Ankara.
- DICKEY, D. A ve FULLER, W.A., (1981), "Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root", Econometrica, Vol:49, s.1057-1073.
- DURKAYA, M. ve CEYLAN, S., (2006), "Vergi Gelirleri ve iktisadi büyüme",Maliye Dergisi, Sayı:150, (Ocak – Haziran 2006), s.79-89.
- EDİZDOĞAN, Nihat, (2004), Kamu Maliyesi, Ekin Yayınları, Bursa.
- EĞİLMEZ, Mahfi ve KUMCU, Ercan (2005), Ekonomi Politikası Teori ve Türkiye Uygulaması, Remzi Kitabevi, Sekizinci Basım, İstanbul.
- ENGEN, E. M. ve SKINNER, J., (1996), "Taxation and Economic Growth", National Tax Journal, Vol:49, No:4, s.617-642.
- ERDEM, Metin, Doğan, ŞENYÜZ ve TATLIOĞLU, İsmail, (2008) "KAMU MALİYESİ", Ekin Yayınevi, 6.Basım,Bursa.
- EREN, Aslan, (2008), Türkiye Ekonomisi, Ekin Yayınevi, 2.Basım, Bursa.
- FISCHER, Stanley, (1993), "The Role of Macroeconomic Factors in Growth", NBER Working Paper Series, No. 4565, (December 1993), s.1-11.

- FÖLSTER, Stefan ve HENREKSON, Magnus, (2001), "Growth Effects Of Government Expenditure and Taxation in Rich Countries," European Economic Review, Elsevier, Vol:45, No:8, s. 1-18, (January 2001).
- GRENADE, Kari ve MOORE, Winston, (2008), "The Relationship between Government Expenditure and Potential Output in the Caribbean: Does Efficiency Matter?", ECCB Staff Research Paper, (October 2008), s.1-27.
- GUJARATI, Damodar N., (1995); Basic Econometrics, Mc Graw-Hill – Literatür Yayıncılık, Third Edition, s.728-729.
- GÜNAYDIN, İhsan, (2000), "Türkiye için Wagner ve Keynes Hipotezlerinin Testi," İktisat İşletme ve Finans, 15/175, s. 70-86.
- GÜRAK, Hasan, (2006), iktisadi büyüme ve Küresel Ekonomi, Ekin Yayınları, Bursa.
- GÜRDAL, Temel, (2001), "Türk Gelir Vergisi Tarifelerinin Rasyonel Vergileme Prensipleri Açısından Değerlendirilmesi", D.E.Ü. Sosyal Bilimler Enstitüsü, Doktora Tezi,İzmir (yayınlanmamış çalışma).
- GWARTNEY, J., LAWSON R. and HOLCOMBE, R., (1998): "The Scope of Government and the Wealth of Nations", Cato Institute Journal, Vol:18, No:2, s.163-190.
- KAR, Muhsin ve TABAN, Sami, (2003), "Kamu Harcama Çeşitlerinin Ekonomik Büyüme Üzerine Etkileri", Ankara Üniversitesı SBF Dergisi ,Yıl-Sayı: 58-3, s.145-169.
- KAYA, Ebru, (2006), Kamu Harcamalarının Büyüme Üzerine Etkileri, Yayınlanmamış Yüksek Lisans Tezi (Danışman: Yard.Doç.Dr.Hicran SEREL) Balıkesir Üniversitesi Sosyal Bilimler Enstitüsü, Balıkesir.
- KENNEDY, Peter, (2006), Ekonometri Kılavuzu, çev.:Muzaffer Sarımeşeli ve Şenay Açıkgöz, Gazi Kitabevi, 5.baskı, Ankara.
- KORKMAZ, Esfender, (1982), Vergi Yapısı ve Gelişimi, İstanbul Üniversitesi, İktisat Fakültesi Yayınları, No:489, İstanbul.
- KOTLER, Philip, Somkid JATUSRIPITAK, ve Suvit MAESINCEE, (2000), ULUSLARIN PAZARLANMASI,Çeviren:Ahmet BUĞDAYCI, Türkiye İş Bankası Yayınları, No:489, İstanbul.
- KUMCU, Ercan ve Mahfi EĞİLMEZ, (2005), Ekonomi Politikası Teori ve Türkiye Uygulaması, Remzi Kitabevi, 8.Basım, İstanbul.
- KWIATKOWSKI, D., P. C. B. PHILLIPS, P. SCHMIDT ve SHIN, Y., (1992),"Testing the Null Hypothesis of Stationarity Against the Alternative of A Unit Root", Journal of Econometrics, Vol:54, s.159-178.
- LANDAU, D., (1983), "Goverment Expenditure and Economic Growth : A Cross-Country Study", Southern Economic Journal, Vol: 49, No:3, s.783-792.
- LEE, Young ve GORDON Roger H., (2005), "Tax structure and economic growth," Journal of Public Economics, Elsevier, Vol:89,(5-6), s. 1027-1043, (June).
- MARTIN, Alison ve LEWIS, W.A.(1956), "Patterns of Public Revenue and Expenditures", The Manchester School of Economic and Social Studies,September 1956,Manchester,U.K. s.203-244.
- MILESI-FERRETTI, G.Maria ve ROUBINI, Nouriel, (1998), "Growth Effects of Income and Consumption Taxes," Journal of Money, Credit and Banking, Blackwell Publishing, Vol:30(4), s. 721-744, (November 1998).
- MUCUK, Mehmet ve ALPTEKİN, V., (2008), "Türkiye'de Vergi ve iktisadi büyüme Analizi: VAR Analizi (1975-2006), Maliye Dergisi, Sayı:155, Temmuz-Aralık 2008, s.159-

174.
- OSHIMO, H.T., (1957), “Share of Government in Gross National Product For Varions Countries”, American Economic Review, June 1957, No:3, s.381-390.
- OYAN, Oğuz, (2001), “Kamu Maliyesi ve Politikası”, Türkiye Ekonomisi Sektörel Analiz, Türkiye Ekonomi Kurumu, Ankara, Ekim 2001, s.271-305.
- PEHLİVAN, Osman, (2009), Kamu Maliyesi, Derya Kitabevi, Trabzon.
- PHILLIPS, P.C.B. ve P. PERRON, (1988), “Testing for a Unit Root in Time Series Regression”,Biometrika, Vol:75, s..335-346.
- RAM, Rati, (1986), Government Size and Economic Growth: A New Framework and Some Evidence from Cross-Section and Time-Series Data, American Economic Review, 76, s.191-203.
- REBELO, S., (1991), “Longrun Policy Analysis and Longrun growth”, Journal of Political Economy,99(3), s.500-521.
- RICARDO, David, (2008), Siyasal İktisadın ve Vergilendirmenin İlkeleri, Çev.: B.ZEREN, T.İş Bankası Kültür Yayınları, Birinci Basım, İstanbul.
- SARI, Ramazan, (2003) "Kamu Harcamalarının Dünyada ve Türkiye'deki Gelişimi ve Türkiye'de Ulusal Gelir ile İlişkisi", İktisat, İşletme ve Finans Dergisi, Sayı: 209(Ek), s.25-38.
- SATTAR, Zaidi, (1993) “Growth Control and Economic Growth in Asia: Evidence From Time Series Data” The Pakistan Development Review, Vol: 32, No:2, (Summer 1993), s.179-197.
- SELEN,Ufuk ve ERYİĞİT, Kadir, (2009), “Yapısal Kırılmaların Varlığında, Wagner Kanunu Türkiye İçin Geçerli mi?”, Maliye Dergisi, Sayı 156, Ocak-Haziran 2009, Ankara, s.177-198.
- SEVÜKTEKİN, Mustafa ve NARGELEÇEKENLER Mehmet, (2006), “Istanbul Menkul Kıymetler Borsasında Getiri Volatilitesinin Modellenmesi ve Önraporlanması” Ankara Üniversitesi, SBF Yayınları, Vol:61-4, s.243-265.
- SJÖBERG, Peter, (2003), “Government Expenditures Effect on Economic Growth”, Lulea University of Technology, Bachelor’s Thesis, 2003:130 SHU,s.1-25.,Lulea,Sweden. (http://epubl.ltu.se/1404-5508/2003/130/LTU-SHU-EX-03130-SE.pdf).
- ŞEN, Hüseyin, Tolga N. SARUÇ ve KESKİN, Abdullah, (2004) “İktisadi Kalkınmanın Finansmanı”, içinde Edi: Sami TABAN ve Muhsin KAR, Kalkınma Ekonomisi Seçme Konular, Bursa: Ekin Kitabevi, 2004, s.197-234.
- ŞİMŞEK, Muammer, (2004), “Türkiye’de Kamu Harcamaları ve Ekonomik Büyüme, 1965-2002”, Atatürk Üniversitesi, İ.İ.B.F. Dergisi, Vol:18(1/2), s.37-52.
- TEMİZ, Dilek, (2008), “Türkiye’de Vergi Gelirleri ve iktisadi büyüme İlişkisi:1960-2006”, II.İktisat Kongresi Tebliği, İzmir, s.1-18.
- TODA, Hiro Y. ve Yamamoto, Taku, (1995) ”Statistical inference in vector autoregressions with possibly integrated processes”, Journal of Econometrics, Vol:66, s.225-250.
- TURAN, Taner, (2008),“Maliye Politikası Araçlarının Ekonomik Büyüme Üzerindeki Etkileri: Bir Literatür İncelemesi”,Sayıştay Dergisi,Sayı:69, Ankara, s.17-35.
- TÜRK, İsmail, (2003), Kamu Maliyesi, 5. Baskı, Turhan Kitabevi, Ankara.
- TÜRK EKONOMİ KURUMU (TEK),(2003), Büyüme Stratejler Türkiye İktisat Kongresi Büyüme Stratejileri Çalışma Grubu, Büyüme Çalışma Stratejileri Metni,2003/5,

Ankara.(http://www.tek.org.tr).

- TÜRKİYE İKTİSAT KONGRESİ (2004), Çalışma Grubu Raporları – I, Cilt 11, İzmir.(Büyüme Stratejileri Çalışma Grubu Raporu) (http://ekutup.dpt.gov.tr/ekonomi/tik2004/cilt11.pdf).s.1-49.
- ULUDAĞ, İlhan ve ARICAN, Erişah, (2003), TÜRKİYE EKONOMİSİ, Der Yayınları, No:354, 2.Baskı, İstanbul.
- ULUSOY, A ve ZENGİN, A., (1998), "Türkiye'de Kamu Ekonomisi ve Mali Kriz" XII. Türkiye Maliye Sempozyumu Bildiri Kitabı, İ.Ü Maliye Bölümü Yayınları No:83, İstanbul.
- ULUTÜRK, S., (2001): "Kamu Harcamalarının İktisadi büyüme Üzerine Etkisi", Akdeniz İ.İ.B.F. Dergisi, 1: 131-139, Antalya.
- WIDMALM, F., (2001), "Tax Structure and Growth: Are Some Taxes Beter Than Others?", Public Choice, 107, s.199–219.
- YAMAK, N. ve KÜÇÜKKALE, Y., (1997), "Türkiye'de Kamu Harcamaları İktisadi büyüme İlişkisi", İktisat, İşletme ve Finans Dergisi, Sayı: 131, s.5-14.
- YAŞA, Memduh, (1980), Cumhuriyet Dönemi Türkiye Ekonomisi, İstanbul.
- YAVUZ, Nilgün ÇİL, (2001), "Türkiye'de Kamu Yatırım Harcamalarının Özel Sektör Yatırım Harcamalarını Dışlama Etkisi Üzerine Ekonometrik Bir Analiz (1990-1/2000-IV), Kamu-İş, Cilt: 6, Sayı: 2, s.1-18.
- YILMAZ, F ve TEZCAN Nuray, (2007), "Vergi Hasılatı ve Sabit Sermaye Yatırımlarının İktisadi büyümeye Olan Etkisi: Ekonometrik Bir İnceleme", 8. Türkiye Ekonometri ve İstatistik Kongresi Tebliği, Malatya.
- YILMAZ, Hakan, (1996), "Türkiye'de Vergi Yapısı ve 1980'den Sonra Sektörel Vergi Yüklerinin Gelişimi" Uzmanlık Tezi - Devlet Planlama Teşkilatı İktisadi Sektörler ve Koordinasyon Genel Müdürlüğü. Proje, Yatırımları Değerlendirme ve Analiz Dairesi, Ankara.
- ZIVOT, E. and ANDREWS, Donald W. K., (1992). "Further Evidence on Great Crash, the Oil-Price Shock, and Unit-Root Hypothesis," Journal of the Business and Economic Statistics,Vol: 10, s.251-270.

CULTURE AS A VECTOR FOR SOCIAL INNOVATION AND CREATIVE ECONOMY: CO-CREATIVE PROJECTS IN RIO DE JANEIRO, BRAZIL

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ABSTRACT
This article presents reflections based on research projects carried out in co-creation with local communities in the city of Rio de Janeiro over more than 10 years, having the Cultural Environment as a basis for action for sustainable development. Its starting point is the challenges and perspectives established with the communities, defining the best practices and technologies to be applied, on a case-by-case basis. The objective of the research is to consolidate decision-making platforms and expand their potential in Social Innovation and Creative Economy. This means considering the knowledge of the past to drive the future, where new ideas, services and models support sustainable solutions and practices inspired by Cultural Heritage. This article focuses on co-creation strategies for the development of digital technologies as aggregators of identities in the formation of Smart Cultural Cities.

Keywords: Smart cultural cities, creative economy, social innovation, archaeology, planning heritage cities, Rio de Janeiro, Brazil.

CONTEXT
The recognition of the fundamental role of Culture in achieving the Social Development Goals of the UN 2030 Agenda is well known. In the same year that this Agenda was launched, in 2015, UNESCO developed the Broadening the Application of the Sustainability Science Approach project, with an emphasis on the role of culture and local communities in Co-creation processes. As a result, in 2017 the "Guidelines on Sustainability Science in Research and Education" was finalized and, in 2019, the "Culture / 2030 Indicators" was published, presenting a methodology to demonstrate the role and contribution of culture to the implementation of the UN SDGs (UNESCO, 2017, 2019). These materials served as the basis and inspiration for several other documents and practices, including others from UNESCO itself. Recent bibliography cites that culture mediates the fulfilment of the 17 SDGs, represented by 79% of their targets (Zheng et al., 2021).
Smart cities agendas highlight the sustainability discourse, initially focused on the application of digital technologies as integration tools to support decision making (Campbell, 2012; Stimmel, 2016). More recently, this agenda expanded the role of Cultural Heritage as an aggregator of identities, introducing the concept of Smart Cultural Cities with inspiring challenges (Aburamadan et al., 2021; Watson & Fredheim, 2022; Notarstefano, 2022; Dupeyron, 2121; et al., 2010; Goldsmith & Crawford, 2014; Trillo et al., 2021; UNESCO, 2021; Volont, 2022). The formation of multiple levels of identity as a key element in the dynamics of cultural geography brings the discussion of conviviality processes in multicultural societies (Samanani, 2022; Ganji & Rishbeth, 2020; Sui & Pang, 2022) or their hybridization over time (Straubhaar, 2013; Stockhammer, 2012).
In this diversity of reflections, we highlight the treatment of archaeology as a starting point to support the production of traditional knowledge by communities, generating internal

movements for change (Roberts et al., 2020; Gould, 2018). This is especially important in colonized countries, such as Brazil, where the national society was formed greatly through a drastic rupture between native indigenous occupations and the European element, since the beginning of the colonization, in the sixteenth century. As a result, the current community often does not recognize its ties to the archaeological context, and many times not even to its historical context, considering the intense movement of modernization through which the urban centers passed, especially from the second half of the 20th century. From this approach, Archaeology contributes to society's search for discovering its relationship to the past, which involves several dimensions that frequently reflect broader social tensions and dynamics. These dimensions include procedures of identification, recovery, or oblivion of historical and cultural landmarks. This way, archaeology serves not only as an instrument of contact between society and its past, but also between experiences and management alternatives applied by other communities to the same geographic space (Robrahn-González, 2015).

In the development of our research projects, the concept of Cultural Environment is especially important, as it offers a tool that integrates human experiences and makes dialogue more fluid (Robrahn-González, 2013; Robrahn-González et al, 2016; Fachim & Fracalossa, 2012). The territory is, therefore, the aggregating element, reflecting the sum of the tangible and intangible assets of a location as a result of the dynamic and continuous process of human occupation of the physical environment, revealing culturally constructed landscapes over time.

Effectively, specificities of geographic spaces x cultural realities constitute the basis and source of inspiration for Social Innovation and the Creative Economy. Entrepreneurship for sustainability is based on the development of innovative solutions not only to create economic value, but also to instigate solutions to social and environmental challenges. Creativity and innovation are premises for sustainability (Robrahn-González, 2021; Leicester, 2020; Wahl, 2016).

A CO-CREATION PROJECT DESIGN

For the development of research programs focused on the archaeological and cultural heritage of the city of Rio de Janeiro, and considering the aforementioned perspective, the critical success factors can be summarized in this way:

- ✓ A design of transdisciplinary research practice, as defined by UNESCO in its "Guidelines on Sustainability Science in Research and Education".
- ✓ Develop a Science for Society, capable of providing relevant information in decision-making.
- ✓ Accomplish an Actionable Science, through the combination of good scientific practices built on solid relationships with stakeholders, associated with effective dissemination and communication (Nyboer et al., 2021; Gerber, 2020).
- ✓ Develop and continually update Predictive Modeling that contextualize and provide scientific parameters for research.
- ✓ Integrate research into the concept of Social Territories and Cultural Landscapes.

The premise is to develop works within a bottom-up methodology, since the elaboration of the projects themselves, their development and analysis of results. In this way, they fit into the co-creation model, evolving the passive model of public participation of communities (Grcheva & Vehbi, 2021). In line with this perspective, the driving force of the research programs comes from the demands defined by the communities, representing important challenges for the maintenance of their culture, heritage, and traditional ways of life.

An important step in these initiatives is the organization of a knowledge base based on an Ecosystem structure, and research is one of its essential components (European Commission, 2014). The Ecosystem's function is to make symmetrical all existing knowledge for the region on screen with the social groups involved (stakeholders), especially local communities. For this reason, we structure the Ecosystem of our projects as Learning Organizations, since all those involved (communities, researchers, institutions, companies, other interested) learn continuously (Marquardt, 2011). These Ecosystems are also based on the results of our more than 500 projects developed in the last 30 years throughout the Brazilian territory and, specifically, on the research experience since 2011 in the city of Rio de Janeiro. This ensures that each project is supported and takes advantage of knowledge and experience in actions with communities and their cultural heritage. Thus, the application of a single Ecosystem guarantees that the results of each project converge in the continuous improvement of the scientific and sociocultural results obtained. As a result, the Ecosystem organizes the opportunities and points of sensitivity identified, both scientific and social, defining procedures for the management of cultural risk.

As will be detailed below, this involvement presupposes continuous communication and engagement activities, including both face-to-face activities and, on a large scale, the adoption of digital tools that expand opportunities. Technological advances bring new forms of association and representation of knowledge, based on virtual environments that enhance creative processes. To this end, we create products and tools within the concept of Digital Humanities (Díaz-Guardamino & Morgan, 2019; Parry, 2019).

In addition to the communication and transparency of the works, we emphasize that the use of digital technologies seeks to guide the formulation of questions and support new ways of thinking, rather than obtaining answers. On the other hand, there is a need to analyze, together with communities, the direct and indirect uses those technological systems make of the available content (Bridle, 2018), which is particularly important in the case of traditional communities and indigenous people who have ancestral knowledge of territories and their management.

The challenges of these projects require an Adaptive Management with versatility to incorporate new demands from stakeholders in the Co-creation process. Thus, we design solutions for each context, without losing focus. Includes control measures and evaluation triggers capable of dealing with a great diversity and number of variables. The result is greater assertiveness in decision making, feeding, and adjusting the model in a structured way. Adaptive Management is a path that incorporates reflection into action. Although the Adaptive Management model was designed for natural ecosystems, its principle and model incorporate social and cultural elements. It has been the basis of our management tool since 2005, representing the principle that we apply in all our projects (Salafsky & Margouluis, 1999; Lynch et al., 2022).

PLANNING A SMART CULTURAL CITY: OPPORTUNITIES AND CHALLENGES FOR THE CITY OF RIO DE JANEIRO

Archaeological research done in the port region of Rio de Janeiro has revealed the presence of a complex and well-preserved juxtaposing of building structures in the city’s underground. Dated since the 16th century, when Rio de Janeiro became the center of political occupation for the Portuguese Crown, these remains are representative of colonial and post-colonial Brazilian history. In 2012, Rio de Janeiro became the first city in the world to receive UNESCO’s title of

World Heritage as an Urban Cultural Landscape, precisely considering the prominence of its natural landscapes with its historical and cultural heritage.
The port and central region of Rio de Janeiro has been undergoing intense urban remodeling for at least 10 years. In addition to civil construction and infrastructure, the city has received strong investment in urban technology having won, in 2021, the 1st. place in the general ranking of Connectd Smart Cities in the Technology and Innovation axis.
As one of the main tourist destinations in Latin America, the city seeks to balance the inherent challenges of urban development in an integrated way with monuments and historic buildings. In recent years these efforts have been expanded through private initiative actions through the reuse of historic buildings, or even through the incorporation of material testimonies of this past in architectural design to add unique cultural attractions.
These initiatives adhere to the Circular Economy strategies in terms of reducing the use of natural resources, waste production and energy consumption, in a sustainable economy model (when compared to new constructions). On the other hand, the historical and cultural characteristics of a building are its own heritage, in addition to valuing communities and their cultural practices, contributing to the social and economic development of an entire area (Foster, 2020; Bosone et al., 2021; Gravagnuolo, Micheletti & Bosone, 2021; Szpakowsba-Loranc, 2021).
As defined by the 2011 UNESCO report "Recommendation on Historic Urban Landscape":
“The historic urban landscape is the urban area understood as the result of a historic layering of cultural and natural values and attributes, extending beyond the notion of “historic centre” or “ensemble” to include the broader urban context and its geographical setting. This wider context includes notably the site´s topography, geomorphology, hydrology and natural features, its built environment, both historic and contemporary, its infrastructures above and below ground, its open spaces and gardens, its land use patterns and spatial organization, perceptions, and visual relationships, as well as all other elements of the urban structure.”

The registration and availability of Cultural Heritage through digital technologies allows its integration into urban planning systems, supporting initiatives in Social Innovation and Creative Economy based on Cultural Services. It is important to note that all tools, forms of communication, products, curation, and other actions must consider the universe of stakeholders involved and the knowledge generated. In this way, it is possible to provide organized results to inspire new ideas, cultural services, and opportunities, so widely discussed within the Creative Economy (Barcellos et al., 2015; Valdebenito et al., 2021; Stanojev, 2021).
Digital technologies applied to the Smart Cultural Cities concept are widely used in our projects and include the full and just in time availability of data through GIS tools, 3D records, augmented reality, virtual reality and crowdsensing (data sharing via mobile devices). Among our performances in projects in Rio de Janeiro, we highlight the incorporation of archaeological structures to the projects of the works, through a very close work with the architecture and engineering team. We also carry out a continuous systematization of our study visits to Open Air Museums, historic buildings, restoration and musealization practices, management, and governance systems, including today over 38 countries. Dialogue between experts is essential to seek solutions that meet local demands, but also rely on successful creations and experiences. This material is helping the architecture team to integrate elements of the past into the new construction project, enhancing its design and expanding the personality of the enterprise.
The incorporation of integrated archaeological structures into architectural projects can occur

either through in situ preservation or through their relocation. In the latter case, the structures are reassembled in places with visibility for public access, accompanied by displays and interactive tools that integrate them into the Cultural Landscapes and the historical contexts to which they are related.

In the case of archaeological structures that remain in situ, but without public access or visibility, we have successfully employed 3D records that feed Augmented Reality tools. Thus, commercial, and residential buildings provide internal Cultural Circuits, where the public "sees" the structures present in the basement and has access to all information.

Products such as Simulators, Territory Modeling and Deep Maps are presented, creating a narrative line of Cultural Landscapes. We use Design Thinking in the cognitive process of dialogue between the different worldviews of stakeholders (Brown, 2017).

While Digital Maps locate and overlay traditional data and knowledge, the design of Intelligent and Creative Territories (ICTs) takes a step forward as a decision making tool and territorial development strategy. ICTs integrate sectors and knowledge clusters, innovation networks and collaborative digital spaces, having the territory as a space for the creation, management and application of knowledge (Janowsk, 2016). One of the techniques we have been working on to represent these ICTs is the creation of Deep Maps, which aim to bring narrative experiences of places, evoking memories, and data from thousands of years ago to the present. It works with cartography as a powerful communication device, translating worldviews and our meaning relationships with landscapes (Ribeiro, 2019; Duguma et al., 2022).

The Infovias tool also integrates the project portfolio, aggregating material and immaterial collections in an interactive cartographic environment based on Geographic Intelligence. It is an online tool that, based on georeferenced data, allows navigation through the Smart Cultural Territory with the interaction of multimedia materials (photos, explanatory texts, or videos). Infovias plays different roles in the projects, both internally (monitoring and controlling the licensing bodies and the entrepreneur himself) and externally (with the public), providing transparency to the methodology and making its results tangible in real time. It is an accessibility tool for the project's Big Data, presenting the evolution of the research over time, its predictive variables and historical cartography, placing the research that was carried out in the geographic space. Therefore, it constitutes an important tool in the management and governance of the cultural heritage treated by each project. All these elements were also integrated into a Virtual Museum tool, developed on a GIS basis. With the objective of privileging the intangible heritage of communities in the formation and representation of their Social Territories, this tool is also developed in the format of narratives (storytellers).

We aldo mention the Control Room tool. In dashboard format, it presents the variables of planning and field execution in a dynamic way, being updated daily and in real time. It brings to the field team the predictive scenarios of the Simulator in Geographic Intelligence format, guiding daily planning and supporting decision making. It also allows full monitoring of research and results achieved, including achievement metrics.

Access to information is a critical factor in all stages of this process and in its decision-making. To this end, we developed a Community Management platform in different access formats and considering, especially, the technologies available and used by Stakeholders (Living Labs, Extranets, Teaching-Learning WhatsApp, among others). Different languages are applied in the communication and extroversion of results, to interact with the different audiences involved (social, institutional, scientific, educational).

However, one of the most important aspects is the social and cultural context where the projects

are located. The central and port region of Rio de Janeiro integrates several groups of Afro-descendant communities, resulting in a wide tangible and intangible heritage related to their traditional practices.

The involvement in a Co-creation format with these communities is one of the main aspects of the projects, as already highlighted. Among these initiatives, we highlight the Living Labs, due to the important results that have been obtained. Its objective is to create spaces for exchange between science, technology, and knowledge, encouraging the creation, participation, and enjoyment of all aspects of culture. The implementation of Living Labs constitutes an inspiring model eliminating gaps of lack of information and enhancing public participation in co-creative projects. The Living Lab is, therefore, a tool for urban mobility, connecting stakeholders focused on cultural actions and practices. The objective is to evolve in the construction of bonds of trust in the connections, without generating interruptions in dialogue. The structure of our Living Labs is based on a human-centered design, aiming for positive social impacts. Its Benchmarking is the European Community model and the concept of UI/UX Design (European Commission, 216). Our research now evolves into new metaverse tools focusing the Generation Z (Buhanis & Karatay, 2022; Forte et al., 2010).

Streamlining communication is important for decision making. These tools increase the transparency of actions and integrate the concepts of Governance involved in the projects.

FINAL CONSIDERATIONS

The challenges and methodologies presented by the ESG factors, and the SDGs of the UN 2030 Agenda have promoted an enormous evolution in the relationship between scientific practice and communities. The perspective of Transdisciplinarity, Actionable Science and Convivality are some examples aimed at defining scientifically based research goals. This engagement provides a continuum of possibilities to interact in the Co-creation spaces that communities operate, with the support of technologies applied to Cultural Heritage.

Transformative technological innovations have the potential to change the game, reshaping and expanding sustainable development alternatives for local communities. They are sources of inspiration to advance narratives based on immersive technologies, which generate transformative experiences in cultural heritage.

The consolidation of traditional knowledge in Smart Cultural Cities generates a brand that even allows registration of Geographical Indication/ Denomination of Origin, highlighting the notoriety of cultural management of a given territory.

In the continuous evolution of available technologies and, especially, of interaction possibilities, research projects must prepare spaces for scalability in new products and uses. We highlight here the interaction between Art and Archeology/Cultural Heritage, inspiring applications that boost the Creative Economy. The cognitive potential of gamification, including memes in playful language, constitute other forms of language that expand the dimensions of the past and integrate them into a language of the present, in creative formats that generate new solutions for access and interaction. The future of our past is, therefore, extremely inspiring.

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REFERENCES

Aburamadan, T. C. et al. (2021). Towards smart planning conservation of heritage cities: digital Technologies and heritage conservation planning. *Culture and Computing. Interactive Cultural Heritage Artes: 9th International Conference*. University of Salford, Manchester, England.

Barcellos, E. E. et al. (2015). *A Economia Criativa no ambiente de parques e incubadoras*. 25ª. Conferência ANPROTEC e Empreendedorismo e Ambientes de Inovação. 19 a 23 de outubro, Cuiabá, Brazil.

Barthel-Bouchier, D. (2013). *Cultural Heritage and the Challenges of Sustainability.* California, USA: Left Coast Press.

Bosone, M. et al. (2021). Indicators for ex-post evaluation of cultural heritage adaptive reuse impacts in the perspective os the Circular Economy. *Sustainability*, 13

Bridle, J. (2018). *New Dark Age: technology and the end of the future*. London & New York: Verso Books.

Brown, T. (2017). *Design Thinking: uma metodologia poderosa para decretar fim das velhas ideias*. Rio de Janeiro: Alta Books Editora.

Buhalis, D. & Karatay, N. (2022). Mixed Reality (MR) for Generation Z in Cultural Heritage Tourism towards Metaverse. In: J. L. Stienmetz et al. (Eds.) *ENTER 2022. Information and Communication Technologies in Tourism*, 16-17

Campbell, T. (2012). *Beyond Smart Cities: how cities network, learn, and innovate*. London & New York: Routledge.

Castells, M. (2010). *The rise of the Network Society. The Informational Age: Economy, Society, and Culture.* United Kingdom: Wiley-Blackwell.

Díaz-Guardamino, M. & Morgan, C. (2019). Human, Transhuman, Posthuman Digital Archaeologies: an introduction. *European Journal of Archaeology*, 1-4.

Duguma, D. W. et al. (2022). – From stories to maps: translating participatory scenario narratives into spatially explicit information. *Ecology and Society* 27 (2):13.

Dupeyron, A. (2021). Capturing the impacts of Archaeology for Development: opportunities and challenges in evaluating the sustainable preservation initiative in Peru. *Progress in Development Studies* 21, 2, 161-180.

European Commission (2014). *Social Innovation – A decade of changes*. Retrieved from: https://espas.secure.europarl.europa.eu/orbis/document/social-innovation-decade-changes

European Commission (2016). Living Labs and Open Innovation. Retrieved from: https://digital-strategy.ec.europa.eu/en/news/living-labs-and-open-innovation

Fachin, Z. A. & Fracalossi, W. (2012). *O Meio Ambiente Cultural equilibrado enquanto Direito Fundamental*. Retrieved from: http://www.publicadireito.com.br/artigos/?cod=a34bacf839b92377.

Forte, M. et al. (2010). Metaverse communities and Archaeology: the case of Teramo. *EuroMed2010*, 3rd International Conference dedicated to Digital Heritage.

Foster, G. (2020). Circular economy strategies for adaptive reuse os cultural heritage buildings to reduce environmental impacts. *Resources, Conservation & Recycling* 152.

Ganji, F. & Rishbeth, C. (2020). Conviviality by design: the socio-spatial qualities of spaces of intercultureal urban encounters. *Urban Design International*, 25(3). 215-234
Gerber, L. R. et al. (2020). Producing Actionable Science in conservation: best practices for organizations and individuals. *Conservation Science and Practice*. Wiley Periodicals LLC, Society for Conservation Biology.
Goldsmith, S. & Crawford, S. (2014). *The Responsive City: engagind communities through data-smart Governance*. San Francisco: Jossey-Bass
Gould, P. (2018). *Empowering communities through Archaeology and Heritage – the role of local governance in economic development.* London-New York: Bloomsburry.
Gravagnuolo, A. et al. (2021). A participatory approach for "circular" adaptive reuse of cultural heritage. Building a Heritage Community in Salerno, Italy. *Sustainability*, 13
Grcheva O. & Vehbi, O. (2021). From public participation to co-creation in the cultural heritage management decision-making process. *Sustainability* 13, 9321.
Janowska, A. (2016). ICT and "free" culture. Na analysis of new business models for cultural goods on the internet.
Leicester, G. (2020). *Transformative Innovation: a guide to practice and policy*. Axminster, England: Triarchy Press.
Lynch, A. J. et al. (2021). RAD Adaptive Management for transforming Ecosystems. *BioScience* 72: 45-56.
Marquardt, M. J. (2011). *Building the Learning Organization: achieving strategic advantage through a Commitment to Learning.* Library of Congress, EUA, 3rd. Edition.
Notarstefano, G. (2022). Active and passive sustainability: measuring the anti-fragility ot territopries. *Pollutants* 2, 172-179
Nyboer, E. A. et. al. (2021). Supporting Actionable Science for environmental policy: advice for funding agencies from decision makers. *Frontiers in Conservation Science*, July 2021, vol. 2, Article 693129
Parry, D. (2016). As Humanidades Digitais como uma comunidade de práticas dentro do formalismo académico: dos exemplos internacionais ao caso português. *Ler História*, Espelho de Cio, 69.
Ribeiro, D. M. (2019). Deep mapping: uma introdução ao mapeamento profundo. *Revista Digital de Tecnologias Cognitivas*, n. 19, jan/jun, p. 30-51.
Roberts, J. et al. (Eds.) (2020) *Communities and knowledge production in Archaeology*. Manchester, UK: Manchester University Press.
Robrahn-González, E. M. (2013). A construção do Meio Ambiente Cultural: reflexões e práticas no Brasil. In: JARDIM, Jean (Org.). *Direito, Educação, Ética e Sustentabilidade: diálogos entre os vários ramos do conhecimento no contexto da América Latina e do Caribe*. Vol. 2. Goiânia: Instituto Tueri.
Robrahn-González, E.M. (2015). Integrating communities from the perspective of Continuous Archaeology: a case study of Rio de Janeiro, Brazil. *Proceedings of the II Internacional Conference on Best Practices in World Heritage: People and Communities. Section 6: Transversal Actions*. Menorca, Spain.
Robrahn-González, E. M. (2021). Expanding the concept of Heritage in a disruptive world: the Open Science model. In: Oosterbeek, Luiz (Ed.) *Heritage and Cultural Exchange routes: to debate, preserve and enhance*. IPT, Tomar.
Robrahn-González, E. M. et al. (2016). Inteligência Coletiva em Meio Ambiente Cultural: modelos preditivos, preservação e valorização da identidade cultural. *LEPAARQ* vol. 13, n. 26.

Salafsky, N & Margoluis, R. (1999). *Greater than the sum of their parts: designing conservation and development programs to maximize results and learning.* Biodiversity Support Program. Washington D.C.
Samanani, F. (2022). Tracing Convivality: identifying questions, tensions and tools in the study of living with difference. *Journal of Intercultural Studies*, doi: 10.1080/07256868.2022.2041578
Shi, T. & Pang, C. L. (2022). Intercultural conviviality and cultural commoning: square dancing ant the creatina of inclusive public space by "Dama" or elderly female performers in post-reform urban China. In: Volont, L; Lijster, T. & Gielen, P. (Eds). *The Rise of the Common City*. Chapter 4. *ResearchGate*. Doi 10.46944/9789461173492.5
Stanojev, J. & Gustafsson, C. (2021). Smart specialisation strategies for elevating integration of Cultural Heritage into Circula Economy. *Sustainability*, 13, 3685.
Stimmel, C. L. (2016). *Building Smart Cities: analytics, ICT, and Design Thinking*. CRC Press, Boca Raton, London, New York: CRC Press.
Straubhaar, J. (2013). Sedimented, Hybrid and Multiple? The new cultural geograpy of identities. *Matrizes*, June 2013.
Stockhammer, P. W. (Ed.) (2012). *Conceptualizing Cultural Hybridization. A Transdisciplinary Approach*. Heidelber, Germany: Springer.
Szpakowska-Loranc, E. (2021). Multi-attribute analysis of contemporary cultural buildings in the historic urban fabric as sustainable spaces – Krakow case study. *Sustainability* 13, 6126.
Trillo, C. et al. (2021). *Towards smart planning conservation of heritage cities: digital Technologies and heritage conservation planning*. Culture and Computing – interactive Heritage and Arts: 9th International Conference. Springer. Retrieved from: http://usir.salford.ac.uk/id/eprint/61133/
UNESCO. (2011). Recommendation on Historic Urban Landscape. Retrieved from: World Heritage Centre - Recommendation on the Historic Urban Landscape (unesco.org)
UNESCO. 2017. Guidelines on sustainability Science in Research and Education. Retrieved from: https://unesdoc.unesco.org/ark:/48223/pf0000260600
UNESCO (2019). Culture / 2030 Indicators. Retrieved from: https://whc.unesco.org/en/culture2030indicators/ .
UNESCO, 2021. *Cities, Culture, Creativity. Leveraging culture and creativity for sustainable urban development and inclusive growth*. Retrieved from: https://unesdoc.unesco.org/ark:/48223/pf0000377427.
Valdebenito, G. et. al. (2020). The paradigm of Circular Economy in heritage preservation of Southern Chile. *Arquitetura Revista*, vol. 17, n. 1, 73-89.
Volont, L. at al. (2022). *The rise of the common city ont the culture os commoning*. Academic & Scientific Publishers, Brussels.
Wahl, D.C. (2016). *Designing Regenerative Cultures*. Axminster, England: Triarchy Press.
Watson, S, & Fredheim, H. (2022). Value from development-led archaeolgoy in the UK: advancing the narrative to reflect societal changes. *Sustainability*, 14.
Zheng, X. et al. (2021). Consideration of culture is vital if we are to achieve the Sustainable Development Goals. *One Earth* 4, 307-319, February 19.

DETERMINATION OF SOME PROBIOTIC PROPERTIES OF *ENTEROCOCCUS* STRAINS ISOLATED FROM RAW MILK

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ABSTRACT

In this study, exopolysaccharide (EPS) production, antioxidant activity, and acid and bile tolerance of *E. durans* 19, *E. faecalis* 52, and *E. durans* 77 strains were determined. According to the results of the analysis, the exopolysaccharide productions of the strains were designated as 362 mg/L (*E. faecalis* 52), 428 mg/L (*E. durans* 77), and 440 mg/L (*E. durans* 19). The antioxidant activities of the strains were evaluated according to the 1,1-diphenyl-2-picrylhydrazil (DPPH) radical scavenging activity method. Antioxidant activities of *E. durans* 19, *E. faecalis* 52, and *E. durans* 77 strains were determined as 29%, 35%, and 31%, respectively. The resistance abilities of the strains at low pH (2.0; 3.0; 4.0, and 6.2-control) and different bile concentrations (0.06%, 0.15, and 0.30) were investigated at different times (0-control, 60, 180 min for artificial stomach and 0-control, 1, 240 min for bile). In all strains, at pH 4.0, the number of viable cells was found to be higher than pH 2.0 and 3.0 throughout the entire period. The highest viability was observed in *E. faecalis* 52 strain at pH 4.0 and 0 minutes (8.24 log CFU/mL), while the lowest viability was observed in the same bacteria at pH 2.0 at 180 minutes (7.18 log CFU/mL). Considering the resistance abilities at different bile concentrations, the highest viability was detected at 0 min and at 0.06% bile concentration in *E. durans* 77 strain (8.85 log CFU/mL). In addition, no viability was observed at the 240th minute of incubation at all bile concentrations for three strains. A significant ($p<0.01/0.05$) decrease in bacterial viability was observed as the acidity ratio and bile concentration increased for three strains.

Keywords: Enterococcus, exopolysaccharide, antioxidant activity, acid and bile resistance

MITIGATION OF PLANT STRESS BY PHYTO-NANOTECHNOLOGY

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ABSTRACT
The world's population grows every year, necessitating higher agricultural productivity. Although agriculture is very important to the economy of the developing country, agriculture is the primary source of income for the vast majority of people. Climate change is posing enormous and unprecedented challenges to global agricultural systems. As a result, a push has been made to incorporate emerging technologies such as nanotechnology. Agricultural systems and nanotechnology have shown a keen interest in the current situation and the development of remediation strategies for the environment. Nanoparticles (NPs) produced through plant means are safe for the environment, quick to manufacture, cheap, and stable over time. Using "magic bullets" that target specific plant tissues and deliver their charge to the targeted location of the plant in order to achieve environmental monitoring results, it also provides fertilizers, nutrients, herbicides, fungicides, or nucleic acids. In this context, the transport, modification, and absorption of NPs within plants, as well as the biological activities of various NPs on the agroecosystem, become important topics of discussion. The most promising new technologies for increasing crop agricultural input productivity and reducing abiotic stresses, such as nanotechnology, are discussed. A review of the physiological and biochemical effects of nanoparticles on plants is presented.

Keywords: Nanotechnology, Plant stress, Toxic effect, Plant growth, NPs

1. INTRODUCTION
Throughout their life cycle, plants are constantly subjected to environmental variability and multiple stress factors, either singly or in combination. Plants, on the other hand, develop a variety of mechanisms to respond to adverse conditions, and even within the same species, their responses can differ significantly. As a result, the most important consideration for sustainable agriculture and crop production is identifying tolerant plant material or increasing plant stress tolerance (Fortina et al., 2005). Nanotechnology covers a wide range of topics and opens the door to a wide range of applications in a wide range of fields. The term "nanoparticles" is used to describe nanoparticles (NPs). They form small molecular clusters ranging from 1 to 100 nm in size (Roco, 2003). When compared to bulk materials, such nanoparticles can acquire some physicochemical properties that are one-of-a-kind and diverse. These properties include increased reactivity, flexible pore size, expanded surface area, and a variety of particle morphology (Nel et al., 2006). The high surface energy and surface-to-volume ratio of NPs contribute to the enhancement of their reactivity as well as other biochemical functions. There is a possibility that these NP properties will behave and have effects differently than their collective counterparts (Dubchak et al., 2010). The term "nanobiotechnology" was first conceived of and developed by a biophysicist working at Cornell University in the United States named Lynn W. Jelinski. The application of nanotechnology paves the way for the production of novel materials featuring distinctive properties. Nanoparticles, herbicides, plant growth and

development promoters, nanofertilizers, nano-pesticides, and other available nanoparticles could be a useful tool in the future.

The agricultural sector is the source of nanotechnology's broad scope. Nanoparticles (NPs) have yet to be fully explored in terms of their potential applications (Manzer et al., 2015). In order to raise overall agricultural productivity and keep up with the ever-increasing demand for food, fertilizer use is widespread. Fertilizers are essential for crop growth, development, and production, but they are degraded by natural processes such as soil infiltration, photolysis, hydrolysis, and decomposition, rendering them unusable by most plants (Singh et al., 2015). As a consequence, using nanomaterials and nanotechnology to develop new applications is required. It not only boosts crop yields and production, but it can also help to reduce fertilizer nutrient loss and boost plant yields. It can also be a useful tool for sustainable agriculture, as it has the ability to control plant growth and production in a significant way. Nanofertilizers could be a viable option for improving resource efficiency while also reducing soil toxicity caused by chemical fertilizer and pesticide build-up. The majority of chemical fertilizers used in the field are not used by the plants and instead accumulate in the soil, increasing soil toxicity. As a consequence, the use of nano fertilizers can help to mitigate these issues (DeRosa et al., 2010; Nair et al., 2010). Plants have evolved different adaptation mechanisms at the biochemical and physiological level to cope with adverse weather conditions because they are constantly exposed to all weather conditions, positive and negative. Despite advances in other fields, nanobiotechnology and its applications in agriculture are still in the early stages of development. However, researchers are becoming increasingly interested in the use of exvivo synthesis of NPs in the agricultural sector for a variety of purposes, particularly to improve plant metabolic and physiological functions for growth and development by leveraging the unique properties of NPs. This is because the exvivo synthesis of NPs can be carried out in a variety of environments, including agricultural settings (Giraldo et al., 2014).

2. PHYSIOLOGICAL EFFECTS OF METALLIC NANOPARTICULES ON PLANTS

2.1 Effects on seed germination

According to the findings of a number of studies, high concentrations of NPs have a detrimental effect on the germination of seeds (Lin and Xing, 2007; Kumar et al., 2015; Burman and Kumar, 2018). The germination level and root development of pumpkin seeds were negatively affected after high concentrations of nanoparticulate ZnO were applied in a study on nanoparticulate ZnO. (Stampoulis et al., 2009). Germination was severely inhibited in corn and rye plants treated with 2000 mg/L Zn and ZnO-NP, according to another study (Lin and Xing, 2007). According to the findings of the researchers, various metal oxide nanoparticles may have varying effects on various plant species. Kumar et al. (2015) used nanoparticular ZnO and Fe2O3 to treat seeds from various plant species, finding that ZnO nanoparticles inhibited germination in all species, but Fe2O3 nanoparticles had no effect. According to the adsorption levels on the seed surface, metal oxide nanoparticles can cause ion leakage in seeds, according to another study (Wu et al. 2012).

2.2 Effects on plant growth

According to the findings of a number of studies, it has been discovered that nanoparticular metals, when present in plants at various concentrations, have an inhibiting effect on the growth of both the shoots and the roots (Stampoulis et al., 2009; Burman and Kumar, 2018; Hossain et al., 2016; Lee et al., 2010; Li et al., 2016; Lopez-Moreno et al., 2010; Semida et al., 2021).

Metal nanoparticles can behave differently in different environments. For example, in acidic soils containing 500 ppm ZnO, wheat plant zinc absorption increases more, but root development is inhibited when compared to alkaline environments (Burman and Kumar, 2018). Pokhrel and Dubey (2013) conducted an experiment in which they applied nanoparticular Ag and ZnO to Zea mays and Brassica oleracea species and found that cellular size and weight decreased while intercellular spaces narrowed. In another study, the developmental parameters of buckwheat plants exposed to nanoparticle and volumetric ZnO applications at different concentrations were compared, and it was discovered that the nanoparticle form caused more damage (Lee et al., 2012). In a similar study on NP-ZnO applications, it was discovered that plant biomass was reduced and root and shoot growth was slowed (Zhao et al., 2013). The decrease in indole acetic acid levels in wheat exposed to CuO nanoparticles has been reported to suppress plant growth (Adams et al., 2017). Sugar levels in mustard seeds treated with high concentrations of gold nanoparticles have been found to drop significantly (Arora et al., 2012). Growth parameters, fruit yield, water productivity and photosynthetic efficiency were increased by applying zinc-oxide NPs at 50 and 100 ppm concentrations to *Solanum melongena* L. (Semida et al., 2021).

3. ACCUMULATION, UPTAKE AND TRANSLOCATION OF NANOPARTICLES IN PLANTS

In order to implement nanotechnology strategies in plants, it is necessary to conduct a comprehensive analysis of the interactions between nanoparticles and plants. An understanding of the mechanisms of uptake, displacement, and accumulation, as well as an analysis of the potential adverse effects on plant growth and development, are both necessary components of this analysis. Due to the presence of a cell wall, there is a restriction placed on the amount of NPs that can be absorbed by plants. This restriction can be caused by a number of factors, including (but not limited to) the following: the size, chemical composition, net charge, and surface functionality of the nanoparticle; the routes of administration; interactions with environmental components (soil texture, water availability, and microbiota); and individual differences. The anatomy and physiology of plants are notoriously difficult to forecast. The majority of previous studies in plants have concentrated on the uptake of small metal and metal oxide NPs because of their widespread use in industry, as well as the ease with which they can be detected and followed-up using microscopy techniques (González-Melendi et al., 2008). Only a few integrated comparative analyses have been designed to determine the contribution of physicochemical properties of NPs (such as size, charge, coatings, etc.) in plant-nanoparticle interaction, in contrast to the vast amount of information that is currently available for metazoans. This is because there is a vast amount of information that is currently available for metazoans. These properties include, among others, dimensions, charges, and coatings (Vidyalakshmi et al., 2017; Garca-Gómez et al., 2018).

4. NANOPARTICLE PHYTOTOXICITY IN ABIOTIC STRESS

It is not well understood whether or not nanomaterials present in agricultural plants are toxic. Nevertheless, it is essential for the development of innovative agronanotech tools and merchandise. In most of the existing research on NP in plants, short-term and high-dose exposure in model media and plant species have been used, but the results have been mixed. According to the majority of studies, an oxidative burst is caused when there is an excess of metal-based NPs in cultivated species. This occurs because the NPs disrupt reactive oxygen

species and interfere with the electron transport chain. In many cases, this causes damage to the hormonal balance, secondary metabolism, and overall growth of the plant. Only a few integrated comparative analyses have been designed to determine the contribution of physicochemical properties of NPs (such as size, charge, coatings, etc.) in plant-nanoparticle interaction, in contrast to the vast amount of information that is currently available for metazoans. This is because there is a vast amount of information that is currently available for metazoans. These properties include, among others, dimensions, charges, and coatings. This suppression of genes may have adverse effects on the plant. A new method of systems biology that included omics data from tobacco, wheat, rice, arugula salad, and beans revealed a general stress response in metal NMs with the prevalence of oxidative stress components. These findings imply that, even in the absence of obvious toxicity at the phenotypic level, more research based on high-throughput analysis of genetic and metabolic responses induced by NP exposure is needed to shed light on many aspects of NP phytotoxicity in crops. This research should be conducted in order to shed light on the many aspects of NP phytotoxicity in crops. Engineered NMs in plants, such as soft polymeric NPs, that have established a safe profile in animal systems should benefit from future applications in light of this evidence (Sanzari et al., 2019). Under salinity stress, Germination, seedling growth parameters, fresh and dry weight, proline, and total phenolic contents all increased in *Zea mays* L. plant. Additionally, it enhanced antioxidant enzyme activity and decreased Na^+ ion, and MDA levels (Shah et al., 2021).

Salinity and drought are two abiotic stresses that pose a major threat to crop production around the world. This threat will become more severe. It increases the frequency and severity of various stresses, in addition to global climate change. In addition, abiotic stresses such as salinity and drought can bring about a reduction in crop production that is fifty percent lower than normal (Nxele et al. 2017). As a result, agricultural production faces significant problems and challenges related to abiotic stresses in plants, necessitating the development of novel solutions. The use of nanomaterials is one of the most important solutions for reducing the harmful effects of these stresses. Abiotic stresses have a major impact on plant metabolic functions and turgor pressure maintenance, as well as disrupting the redox balance by increasing the production of reactive oxygen or nitrogen species that cause oxidative damage (Chakrabarty et al. 2016) (Fig. 1)

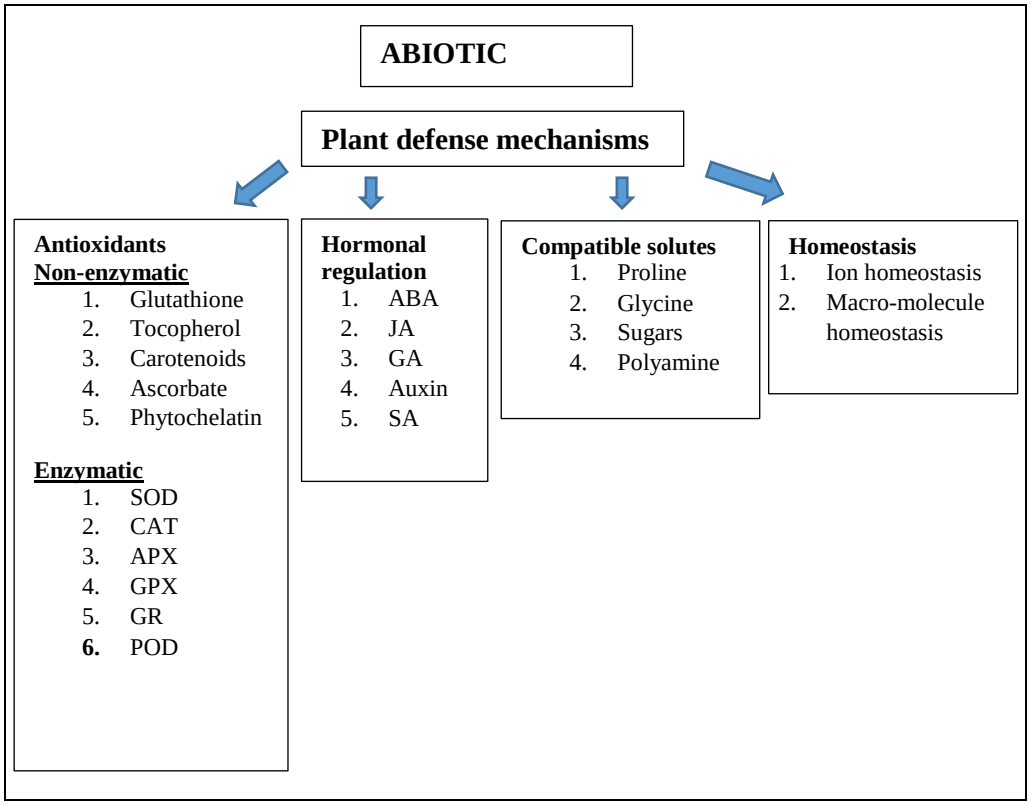

Fig. 1 Different plant defence mechanisms induced in response to abiotic stress (Elsakhawy et al., 2018)

5. PHYTOREMEDIATION OF NANOPARTICLE METAL OXIDES

According to reports, nanomaterials can be utilized for sustainable crop production by lowering nutrient losses, preventing diseases, and increasing yields (Khan et al. 2017). It has also been demonstrated that low concentrations of nanomaterials can enhance various stages of plant growth, including seed germination, seedling viability, root initiation and growth, and photosynthesis that culminates in flowering, amongst other things (Kole et al. 2016; Banerjee and Kole 2016). Nanomaterials can act as antioxidant enzymes or mimic antioxidant enzymes to protect plants from oxidative stress (Zaytseva and Neumann 2016). Phytotoxicity may occur as a result of the generation of reactive oxygen species at higher nanomaterial concentrations, and the accumulation of these reactive species can damage cell membranes, proteins, and nucleic acids (Khan et al. 2017).

Understanding the characteristics of nanoparticles and their relationships with the environment and living things is critical in today's world in order to better understand nanoparticle synthesis and applications (Mahmood et al., 2012). Although nanoparticles can be made from a variety of bulk materials, they can differ in chemical and physical properties, particle sizes, and morphological structures.

Ruffini-Castiglione and Cremonini (2009) classified nanoparticle diffusion sources into three categories:

i. Natural Resources (volcanic activities, Moon dust, natural disasters and mineral composites)

ii. Unfortunate events (incidents of anthropogenic origin, coal use, exhaust gas)

iii. Industrial Production (use in electricity, electronics, pharmaceutical and cosmetic industries)

Because heavy metals' nano-sized structure varies in comparison to their volumetric state,

bioabsorption and phytoremediation requirements may change at the same time. As a result, plants that are normally tolerant to heavy metals can develop different responses to nanoparticle metal oxides (Shi et al., 2013).

Metallic nanoparticles' reactivity is significantly increased by the fact that their surface/volume ratios are higher than their bulk forms (Iravani, 2011). Tobacco seedlings (*Nicotiana xanthi*) were exposed to different sizes of gold nanoparticles (3.5 and 18 nm), and it was found that 3.5 nm Au nanoparticles accumulate in the cytoplasm of stem cells and 18 nm Au nanoparticles accumulate on the root surfaces as a result (Sabo-Attwood et al., 2011). The relationship between plant species and their relationship is largely responsible for the accumulation of nanoparticles (Andreotti et al., 2015). They investigated the accumulation potential of 7 aquatic plant species (*Vallisneria spiralis, Elodea canadensis, Limnobium laevigatum, Pistia stratiotes, Riccia fluitans, Salvinia natans,* and *Najas guadelupensis*) prepared with manganese, copper, zinc, and silver nanoparticles (Olkhovych et al., 2016). Because of the solutions that were applied, it was discovered that species of *P. stratiotes* and *S. natans* have phytoremediation potentials that are quite high. Plants absorb Cu nanoparticles at a rate of 69 percent and Zn nanoparticles at a rate of 77 percent, according to research. Ionic Cu+2 and NP-Cu added solutions were applied to *Halimione portulacoides* and *Phragmites australis* plants growing in salt marsh habitats separately for 8 days in a study on the phytoremediation potential of Cu nanoparticles, and the accumulation rate of nanoparticles form was 4 times lower than ionic form applications (Andreotti et al., 2015). In another study on *Elsholtzia splendens*, however, it was discovered that the NP-CuO levels in plants were higher than the H-CuO levels (Shi et al., 2013). Another study found that *Prosopis farcta* callus grown in tissue culture medium had a high accumulation capacity after being exposed to ZnO nanoparticles at different concentrations (1, 10, 50, 100 g ml^{-1}) and could be used in phytoremediation in contaminated areas (Rana and Al- Saleh, 2014). The plant Pistia stratiotes, a macrophyte species, was exposed to various concentrations of silver nanoparticles, and it was discovered that the plant can survive at concentrations below 0.02 mg/L^{-1} and that the pollutant can accumulate in the plant (Hanks et al., 2015). Although research into the phytoremediation or nanoremediation potential of nanoparticle metals is still in its early stages, there is a paucity of literature on the subject (Gomes et al., 2016).

6. CONCLUSIONS AND FUTURE PERSPECTIVES

In the past few years, research in the field of nanotechnology has suggested that the production of NPs could be a powerful technique for reducing the problems caused by conventional fertilizers in the agricultural practices that have been practiced for centuries. The efficacy of nutrients containing NPs (i.e. Se, Cu, Co, and Fe) in improving plant micronutrients has been demonstrated by improved growth parameters and physiologically significant improvements. The accurate dosing of NPs on the surface of plant targets, as well as their activity, presents a significant obstacle. As a result of this, one of the most essential aspects for the continued use of NPs is the reduction of the amount of leaching that occurs when chemical products are extracted from bulk materials (like mineral fertilizers, for example). For the development of an application strategy, it is necessary to know the baseline dosage, exposure time, NP displacement and accumulation, and the mechanism of action on plants. Despite the fact that nanotechnology is a technology that is experiencing rapid development, applications of the technology as well as the use of nanoparticles in sustainable agriculture and the improvement of crop quality are still in the development stage. Therefore, in order to maximize the potential

benefits of NPs' idiosyncratic and one-of-a-kind properties in the agricultural sector, it is necessary to have a fundamental understanding of the interactions that NPs have with plants on a cellular and molecular level. NPs interact with plants in a number of different ways.

REFERENCES

Adams, J., Wright, M., Wagner, H., Valiente, J., Britt, D. and Anderson, A. (2017). Cu from dissolution of CuO nanoparticles signals changes in root morphology, *Plant Physiology and Biochemistry,* 110, 108–117. doi:10.1016/j.plaphy.2016.08.005

Andreotti, F., Mucha, A. P., Caetano, C., Rodrigues, P., Rocha Gomes, C. and Almeida, C. M. R. (2015). Interactions between salt marsh plants and Cu nanoparticles – Effects on metal uptake and phytoremediation processes, *Ecotoxicology and Environmental Safety*, 120, 303–309. doi:10.1016/j.ecoenv.2015.06.017

Arora, S., Sharma, P., Kumar, S., Nayan, R., Khanna, P. K. and Zaidi, M. G. H. (2012). Goldnanoparticle induced enhancement in growth and seed yield of Brassica juncea, *Plant Growth Regulation*, 66 (3), 303–310. doi:10.1007/s10725-011-9649-z

Aswani, R., Gayatri, R., Radhakrishnan, G. P. and Remakanthan, A. (2017). Comparative analysis of the effect of silver nanoparticle and silver nitrate on morphological and anatomical parameters of banana under in vitro conditions. Inorg. Nano Metal Chem. 47, 1530–1536. doi: 10.1080/24701556.2017.1357605

Banerjee, J. and Kole, C. (2016). Plant Nanotechnology: An Overview on Concepts, Strategies, and Tools. In: C. Kole et al. (eds.), *Plant Nanotechnology,* pp: 1 -14. DOI: 10.1007/978-3-319-42154-4_1, Springer International Publishing Switzerland

Burman, U. and Kumar, P. (2018). *Plant Response to Engineered Nanoparticles,* Nanomaterials in Plants, Algae, and Microorganisms, 103–118. doi:10.1016/b978-0-12-811487- 2.00005-0

Chakrabarty A., M. Aditya, N. Dey, N. Banik and S. Bhattacharjee (2016). Antioxidant Signaling and Redox Regulation in Drought- and Salinity- Stressed Plants. In: M.A. Hossain et al. (eds.), *Drought Stress Tolerance in Plants,* pp: 465 – 498. DOI: 10.1007/978-3-319-28899-4_20, Springer International Publishing Switzerland.

DeRosa, MC., Monreal, C., Schnitzer, M., Walsh, R. and Sultan, Y. (2010). " Nanotechnology in fertilizers". Nat Nanotechnol, 5:91. doi:10.1038/nnano.

Dubchak, S, Ogar A , Mietelski, J.W. and Turnau, K. (2010). "Influence of silver and titanium nanoparticles on arbuscular mycorrhiza colonization and accumulation of radiocaesium in *Helianthus annuus*", Span. J. Agric. Res., 8, S103–S108.

Elsakhawy, T., Omara, A. E. D., Alshaal, T. and El-Ramady, H. (2018). Nanomaterials and plant abiotic stress in agroecosystems. *Environment, Biodiversity and Soil Security*, *2*(2018), 73-94.

Fortina, P., Kricka, LJ., Surrey, S. and Grodzinski, P. (2005). Nanobiotechnology., "The promise and reality of new approaches to molecular recognition, Trends Biotechnol, 23, 168.

García-Gómez, C., Obrador, A., González, D., Babín, M., and Fernández, M. D. (2018). Comparative study of the phytotoxicity of ZnO nanoparticles and Zn accumulation in nine crops grown in a calcareous soil and an acidic soil. Sci. Total Environ. 644, 770–780. doi: 10.1016/j.scitotenv.2018.06.356

Giraldo, JP., Landry, MP., Faltermeier, SM., McNicholas, TP., Iverson, NM., Boghossian, AA., Reuel, NF., Hilmer, AJ., Sen, F., Brew, JA. and Strano, MS. (2014). "Plant nanobionics approach to augment photosynthesis and biochemical sensing," Nat Mater., doi:10.1038/nmat3890.

Gomes, M. A., Hauser-Davis, R. A., de Souza A. N. and Vitória A. P. (2016). Metal phytoremediation: General strategies, genetically modified plants and applications in metal nanoparticle contamination, *Ecotoxicol Environ Saf.* 134 (1), 133-147. doi: 10.1016/j.ecoenv.2016.08.024.

Hanks, N. A., Caruso, J. A. and Zhang, P. (2015). Assessing *Pistia stratiotes* for phytoremediation of silver nanoparticles and Ag(I) contaminated waters, *Journal of Environmental Management*, 164, 41–45. doi:10.1016/j.jenvman.2015.08.026

Hossain, Z., Mustafa, G., Sakata, K. and Komatsu, S. (2016). Insights into the proteomic response of soybean towards Al2O3 , ZnO, and Ag nanoparticles stress, *Journal of Hazardous Materials*, 304, 291–305. doi:10.1016/j.jhazmat.2015.10.071

Iravani, S. (2011). Green synthesis of metal nanoparticles using plants, *Green Chemistry* 13, 2638–2650.

Khan, M. N., Mobin, M., Abbas, Z. K., AlMutairi, K.A. and Siddiqui, Z. H. (2017). Role of nanomaterials in plants under challenging environments. *Plant Physiology et Biochemistry,* 110, 194-209. DOI: 10.1016/j. plaphy.2016.05.038.

Kole, C., Kumar, D. S. and Khodakovskaya, M V. (2016). Plant Nanotechnology: Principles and Practices. DOI: 10.1007/978-3-319-42154-4, Springer International Publishing Switzerland.

Kumar, S., Patra, A. K., Datta, S. C., Rosin, K. G. and Purakayastha, T. J. (2015). Phytotoxicity of nanoparticles to seed germination of plants, *International Journal of Advanced Research*, 3(3), 854–865.

Lee, C. W., Mahendra, S., Zodrow, K., Li, D., Tsai, Y.-C., Braam, J. and Alvarez, P. J. J. (2010). Developmental phytotoxicity of metal oxide nanoparticles to *Arabidopsis thaliana*, *Environmental Toxicology and Chemistry*, 29 (3), 669–675. doi:10.1002/etc.58

Lee, S., Kim, S., Kim, S. and Lee, I. (2012). Assessment of phytotoxicity of ZnO NPs on a medicinal plant, *Fagopyrum esculentum*, *Environmental Science and Pollution Research,* 20 (2), 848–854. doi:10.1007/s11356-012-1069-8

Li, M., Ahammed, G. J., Li, C., Bao, X., Yu, J., Huang, C., Yin H. and Zhou, J. (2016). Brassinosteroid Ameliorates Zinc Oxide Nanoparticles-Induced Oxidative Stress by Improving Antioxidant Potential and Redox Homeostasis in Tomato Seedling, *Frontiers in Plant Science*, 7, 615. doi:10.3389/fpls.2016.00615

Lin, D. and Xing, B. (2007). Phytotoxicity of nanoparticles: Inhibition of seed germination and root growth, *Environmental Pollution,* 150 (2), 243–250. doi:10.1016/j.envpol.2007.01.016

López-Moreno, M. L., de la Rosa, G., Hernández-Viezcas, J. A., Castillo-Michel, H., Botez, C. E., Peralta-Videa, J. R. and Gardea-Torresdey, J. L. (2010). Evidence of the Differential Biotransformation and Genotoxicity of ZnO and CeO2 Nanoparticles on Soybean (*Glycine max*) Plants, *Environmental Science & Technology*, 44 (19), 7315–7320. doi:10.1021/es903891g

Mahmood, T., Malik, S. A., Hussain, S. T. and Aamir, S. (2012). Metallic phytoremediation and extraction of nanoparticles, *International Journal of Physical Sciences,* 7 (46), 6105-6116, doi: 10.5897/IJPS12.605

Manzer, H., Siddiqui, Mohamed H. Al-Whaibi, Mohammad Firoz and Mutahhar Y. Al-Khaishany, (2015). "Role of Nanoparticles in Plants", book nanotechnology and plant science, pp19-35.

Melendi, P., Fernández-Pacheco, R., Coronado, M. J., Corredor, E., Testillano, P. S., Risueño, M. C., et al. (2008). Nanoparticles as smart treatment-delivery systems in plants: assessment of

different techniques of microscopy for their visualization in plant tissues. Ann. Bot. 101, 187–195. doi: 10.1093/aob/mcm283
Nair, R., Varghese, SH., Nair, BG., Maekawa, T., Yoshida, Y. and Kumar, DS. (2010). "Nanoparticulate material delivery to plants", Plant Sci., 179,154–163.
Nel, A., Xia, T., Madler, L. and Li, N. (2006). "Toxic potential of materials at the nanolevel". Science, 311, 622-627.
Nxele, X., A. Klein and B.K. Ndimba (2017). Drought and salinity stress alters ROS accumulation, water retention, and osmolyte content in sorghum plants. *South African Journal of Botany,* 108, 261-266.
Olkhovych, O., Svietlova, N., Konotop, Y., Karaushu, O. and Hrechishkina, S. (2016). Removal of Metal Nanoparticles Colloidal Solutions by Water Plants, *Nanoscale Research Letters*, 11, 518. doi: 10.1186/s11671-016-1742-9
Pokhrel, L. R. and Dubey, B. (2013). Evaluation of developmental responses of two crop plants exposed to silver and zinc oxide nanoparticles, *Science of The Total Environment,* 452- 453, 321–332. doi:10.1016/j.scitotenv.
Rana, T. Y. and Al-Salih, H. S. (2014). Uptake of Zinc Nanoparticles by *Prosopis farcta* L. Plants Callus Cultures, *Eng. & Tech. Journal*, 32 (3), 615-622.
Roco, M.C. (2003). "Broader societal issue of nanotechnology", Journal of Nanoparticle Research, 5, 181-189.
Ruffini-Castiglione, M. and Cremonini, R. (2009). Nanoparticles and higher plants, *Caryologia*, 62 (2), 161-165.
Sabo-Attwood, T., Unrine, J. M., Stone, J. W., Murphy, C. J., Ghoshroy, S., Blom, D., Bertsch, P. M. and Newman, L. A. (2011). Uptake, distribution and toxicity of gold nanoparticles in tobacco (*Nicotiana xanthi*) seedlings, *Nanotoxicology*, 6 (4), 353–360. doi:10.3109/17435390.2011.579631
Sanzari, I., Leone, A. and Ambrosone, A. (2019). Nanotechnology in plant science: to make a long story short. *Frontiers in Bioengineering and Biotechnology*, *7*, 120.
Semida, W.M., Abdelkhalik, A., Mohamed, G.F., Abd El-Mageed, T.A., Abd El-Mageed, S.A., Rady, M.M. and Ali, E.F. (2021). Foliar application of zinc oxide nanoparticles promotes drought stress tolerance in eggplant (*Solanum melongena* L.). Plants, 10, 421.
Shah, T., Latif, S., Saeed, F., Ali, I., Ullah, S., Abdullah Alsahli, A., Jan, S. and Ahmad, P. (2021). Seed priming with titanium dioxide nanoparticles enhances seed vigor, leaf water status, and antioxidant enzyme activities in maize (*Zea mays* L.) under salinity stress. J. King Saud. Univ. Sci., 33, 101207.
Shi, J., Peng, C., Yang, Y., Yang, J., Zhang, H., Yuan, X., Chen, Y. and Hu, T. (2013). Phytotoxicity and accumulation of copper oxide nanoparticles to the Cu-tolerant plant *Elsholtzia splendens*, *Nanotoxicology*, 8 (2), 179–188. doi:10.3109/17435390.2013.766768
Singh, A., Singh, NB., Imtiyaz Hussain, I., Himani Singh, H. and Singh, SC. (2015). "Plant-nanoparticle interaction: An approach to improve agricultural practices and plant productivity". International Journal of Pharmaceutical Science Invention , 4 , Issue 8, 25-40.
Stampoulis, D., Sinha, S. K. and White, J. C. (2009). Assay-Dependent Phytotoxicity of Nanoparticles to Plants, *Environmental Science & Technology,* 43 (24), 9473–9479. doi:10.1021/es901695c
Wu, S. G., Huang, L., Head, J., Chen, D. R., Kong, I. C., Yinjie, J. and Tang, Y. G. (2012). Phytotoxicity of metal oxide nanoparticles is related to both dissolved metals ions and adsorption of particles on seed surfaces, *J. Pet. Environ. Biotechnol*, 3, 1–6.

Zaytseva, O. and Neumann, G. (2016). Carbon nanomaterials: production, impact on plant development, agricultural and environmental applications. *Chem. Biol. Technol. Agric.* 3, 17, DOI: 10.1186/s40538-016-0070-8.

Zhao, L., Hernandez-Viezcas, J. A., Peralta-Videa, J. R., Bandyopadhyay, S., Peng, B., Munoz, B., Keller, A. A. and Gardea- Torresdey, J. L. (2013). ZnO nanoparticle fate in soil and zinc bioaccumulation in corn plants (*Zea mays*) influenced by alginate, *Environ. Sci.: Processes Impacts*, 15 (1), 260–266. doi:10.1039/c2em30610g

THE EFFECT OF L-TRYPTOPHAN PRE-TREATMENT ON GERMINATION CHARACTERISTICS OF TOLERANT AND SENSITIVE MAIZE (*Zea mays* L.) CULTIVARS UNDER SALINITY STRESS

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ABSTRACT
The aim of this study was to investigate the effect of seed priming with L-tryptophan (L-Trp) on germination characteristics under NaCl stress comparing tolerant (DKC6590) and sensitive (DKC6724) two maize (*Zea mays* L.) cultivars. Seeds were treated before sowing with 0, 0.05, 0.1 and 0.3 mM of L-Trp for 12 hours and then re-dried. The seeds were then germinated in petri dishes between two filter paper moistened with 0, 25, 50, 100 and, 150 mM of NaCl solutions in the dark at 25°C for 4 days. The results showed that all different germination characters evaluated in this study, except final germination percentage (FGP), had been affected significantly ($P < 0.05$) by the increase of the NaCl concentration in both cultivars. However, seed priming with L-Trp influenced differently the germination characteristics in both maize cultivars and according to the priming dose. Thus, although the radicle and hypocotyl lengths increased slightly in line with the L-Trp priming concentration increase in, those values were not significantly different ($p>0.05$) between them. In 'DKC6590' cultivar Seedling vigor index (SVI) showed better results at 0.3 mM L-Trp, Coefficient of Velocity of germination (CVG) at 0.05 mM, germination rate index (GRI) at 0.1 and 0.3 mM, Superoxide dismutase (SOD) at 0.3 mM, Catalase (CAT) at 0.1 and 0.3 mM, Peroxidase (POD) at 0.3 and sucrose content at 0.05 and 0.1 mM. However, in DKC6724 cultivar, seed priming with L-Trp did not show any significant difference at $p<0.05$ on CVG and GRI under salinity conditions. Nevertheless, sugar content showed better results at 0.05 and 0.1 mM, SVI at 0.1mM, SOD at 0.05 mM, CAT at 0.1 and 0.3 mM and POD at 0.3 mM. In overall, priming with 0.3 mM of L-Trp was a better treatment for the tolerant cultivar (DKC6590) while 0.1 mM L-Trp showed better results in sensitive cultivar (DKC6724).

Keywords: L-tryptophan, priming, salt stress, *Zea mays* L.

INTRODUCTION
High salinity has been reported to be one of the most limiting factor in agricultural plants (Pandolfi et al., 2016; Kamanga et al., 2020; Janda et al., 2016). Salinity is reported to induce delays or decreases seed germination index of most plant species. Lower levels of salinity delay germination, whereas higher levels reduce the final percentage of seed germination (Hozayn et al., 2019). One way to solve this problem is to find a way how to increase the plants' tolerance to salt stress (Demmig Adams et al., 2008). For a long time, efforts have been made to elucidate salinity stress on plants through breeding strategies and approaches. Nowadays, integrative

approach is more significance (Ahmed et al., 2020) by understanding the basic natural mechanisms that occur naturally in plants growing under adverse environmental conditions (Demmig Adams et al., 2008).

Seed germination is considered to be the most critical stage in seedling establishment, determining successful crop production but is also vulnerable stage to adverse environmental conditions (Ren et al., 2020). Salinity has been reported to be a limiting factor on seed germination of several plant species (Aliu et al., 2015) and germination ability of seeds can be different from one species to another and even a significant variation is observed amongst the different cultivars of the same crop (Hakim et al., 2010). High salinity concentrations affect the water absorption by seeds (Kumar et al., 2021), by lowering the osmotic potential outside the seed, thereby inhibiting its absorption of water, or by the toxic effect of Na+ (Aliu et al.2015) causing decreased germination rate and low viability percentage (Kumar et al., 2021).

Auxin is an important plant growth regulator which is present in plants as indole-3-acetic acid (IAA) (Mano and Nemoto, 2012). Because auxin has a high importance for plants and participates in several physiological processes, a disruption in its biosynthesis in plant tissues induces disruption of plant growth (Mustafa et al., 2018). L-Trp has been reported to be a physiological precursor of auxin and melatonin in higher plants (Alfosea-Simon et al., 2020). However, researches have shown that L-Trp is more effective on plant growth and yield than auxins themselves (Mustafa et al., 2018). L-Trp can act as an osmolyte or ion transport regulator, modulate stomatal opening and reduce the harmful effects of heavy metals (Hildebrandt et al., 2015). A number of studies have reported the ameliorative role of L-Trp in improving the physiological processes of plants under different types of environmental stress (Hozayn and Ahmed, 2019; Hanci et al., 2019; Hozayn et al., 2020) by soil application (Muneer et al., 2009; Jamil et al., 2018), foliar spray (Rao et al., 2012; Alfosea -Simon et al., 2020) and seed priming (Abbas et al., 2013; Hanci et al., 2019; Korkmaz et al., 2020).

Moreover, several many studies have reported the positive effects of L-Trp on germination and growth performance of some crops by seed priming: chickpea (Abbas et al., 2013), tomato (Pervez et al., 2000), onion, radish, carrot, leek (Hanci, 2019), wheat and sorghum (Khodary et al., 1992), sugar beet (Hozayn et al., 2020), O. Bassilum L. (Kahveci et al., 2021), barley (Hozayn and Ahmed, 2019), maize (Zahir et al., 2000b), potato (Zahir et al., 2000a) have been reported by different researchers in plants. However, those studies focused on L-Trp on seedling development not on germination.

The aim of this study was to investigate the effect of seed priming with L-tryptophan on germination characteristics under NaCl stress comparing tolerant (DKC6590) and sensitive (DKC6724) maize (*Zea mays* L.) cultivars and determine which L-Trp concentration is more effective to induce salt tolerance in maize (Zea mays L.) crop.

MATERIALS AND METHODS

Plant materials and treatments

Seeds of maize (*Zea mays* L.) culivars to be used were obtained from Dekalb Türkiye (Eastern Regional Directorate, Adana-Türkiye). Seeds were treated before sowing with 0, 0.05, 0.1 and 0.3 mM of L-Trp for 12 hours and then re-dried. This concentrations has been chosen considering previous studies in scientific reviews in the range of 0.0001 and 2 mM L-Trp. The seeds were then germinated in 9 cm petri dishes between two filter paper moistened with 0, 25, 50, 100 and, 150 mM of NaCl solutions and kept in the dark at 25°C for 4 days.

Measurements and analysis

Radicle (RAL) and hypocotyl (HL) lengths were measured manually with a ruler after 4 days and germinated seeds were counted every day for other germination characteristics computing per Taghizadeh *et* al. (2018):

1) Final germination percentage: **FGP=100** $\times\frac{Ng}{Nt}$

Ng: Total number of germinated seeds

Nt: Total number of evaluated seeds

2) Germination rate index (GRI):**GRI=** $\frac{G1}{1}+\frac{G2}{2}+\frac{G3}{3}+\cdots+\frac{Gn}{n}$**;**

Gn: germination percentage in day n

3) Coefficient of velocity of germination (CVG): CVG= $\frac{\Sigma Ni}{\Sigma(NiTi)}\times$ **100;**

Ni: Number of germinated seed on day i

Ti: Number of days from sowing

This parameter gives an indication of the rapidity of germination.

4) Seed vigor index (SVI): **SVI**= GP ×(RAL+HL);

GP: Germination percent

- **Superoxide dismutase (SOD)**

The superoxide dismutase (SOD) activity was measured using the method described by Beyer et al. (1987) as descrıbed by Shankar et al. (2016). SOD activity was assayed spectrophotometrically at 560 nm using modified nitro blue tetrazolium (NBT) method. The activity was expressed as units per milligramme protein. One unit of SOD activity is defined as the amount of enzyme that inhibits reduction of NBT by 50 %.

Peroxidase (POD)

Peroxidase (POD) activity was determined specifically with guaiacol at 470 nm (ε=26.6mM−1 cm−1), following the method of Egley et al. (1983) as described by Boo et al. (2012). The reaction mixture contained 40 mM potassium phosphate buffer (pH 6.9), 1.5 mM guaiacol, and 6.5 mM H2O2 in 1 ml with crude enzyme extract. Control assays in which the enzyme extracts or substrates were replaced by buffer were performed.

Catalase (CAT)

Catalase (CAT) activity was assayed by the method of Mishra et al. (1993) as described Boo et al. (2012). The reaction mixture contained 50 mM potassium phosphate buffer (pH 7.0), 11 mM H2O2, and the crude enzyme extract. The reaction was initiated by addition of H_2O_2 to the mixture, and enzyme activity was determined by monitoring the decline in absorbance at 240 nm (ε=36 M^{-1} cm^{-1}), because of H_2O_2 consumption

Sucrose

Sugar analysis was carried out according to the method described by Kurt et al. (2017). Analysis was done with an Agilent 1100 HPLC (Palo, Alto, CA, USA). The standard calibration curves of all sugars will were calculated for each sugar by comparing it with the retention time of its own standard. HP ChemStation (Hewlett-Packord, Palo, Alto, CA, USA) software was used to calculate the peak areas. The soluble sugar content was expressed as mg/100 g wet weight.

RESULTS

1. Radicle length (RAL)

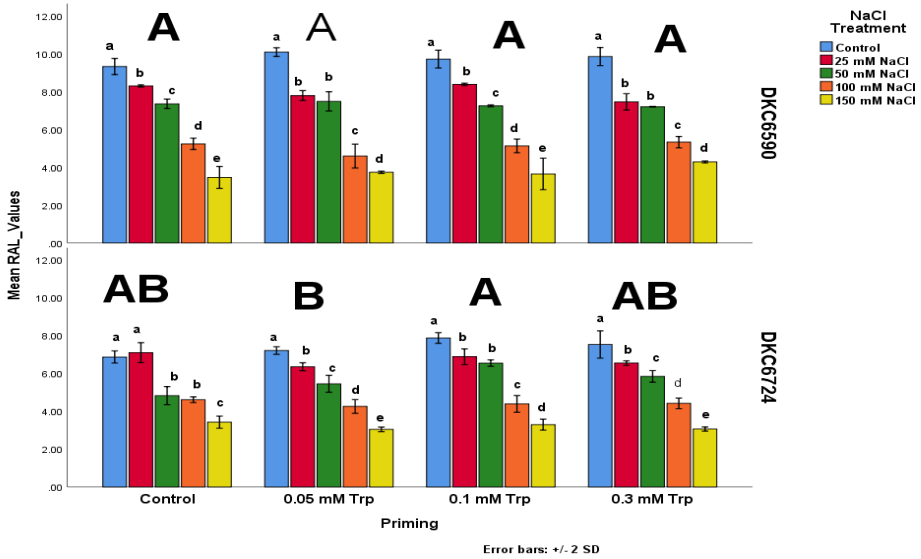

Fig.1. Effects of L-Trp priming on radicle length (RAL) in two maize (*Zea mays* L.) cultivars (DKC6590 and DKC6724) under different NaCl concentrations during germination. Different lowercase letters indicate a significant difference at $p<0.05$ between NaCl concentrations and different uppercases on the columns (or treatment groups) indicate significant difference at $p<0.05$ between L-Trp treatment groups.

The present results showed that radicle lengths (RALs) were significantly ($p<0.05$) reduced by the salt stress and negatively strong correlated with the increasing concentrations of NaCI treatment in a dose dependent manner in sensitive (DKC6724, r = - 0.963) and the tolerant one (DKC6590, r = - 0.979) (Fig. 1). However, seed priming with L-Trp showed no significant ($P > 0.05$) effect on RAL in the tolerant maize cultivar whereas it had a significant effect on RAL in sensitive cultivar in which 0.1 mM Trp showed better results as good treatment.

Hypocotyl length (HL)

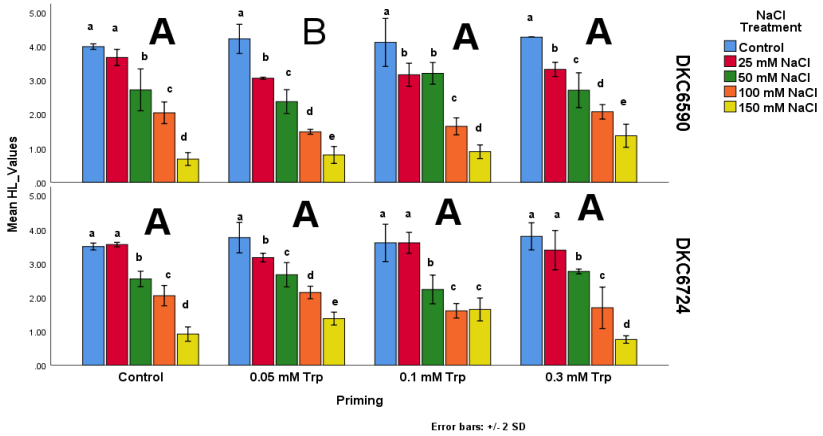

Fig.2. Effects of L-Trp priming on hypocotyl length (HL) in two maize (*Zea mays* L.) cultivars (DKC6590 and DKC6724) under different NaCl concentrations during germination. Different

lowercase letters indicate a significant difference at p<0.05 between NaCl concentrations and different uppercases on the columns (or treatment groups) indicate significant difference at p<0.05 between L-Trp treatment groups.

In similar way, hypocotyl length (HL) was significantly (P < 0.05) affected by the salt stress in the maize cultivars (Fig. 2). The decrease in HLs was negatively strong correlated with salt concentrations in the tolerant (*r* = - 0.968) and sensitive (*r* = - 0.952) maize cultivars. However, seed priming had no significant (p>0.05) effect on the HLs in both maize cultivars, as well as between different L-Trp concentrations.

2. Final germination percentage (FGP)

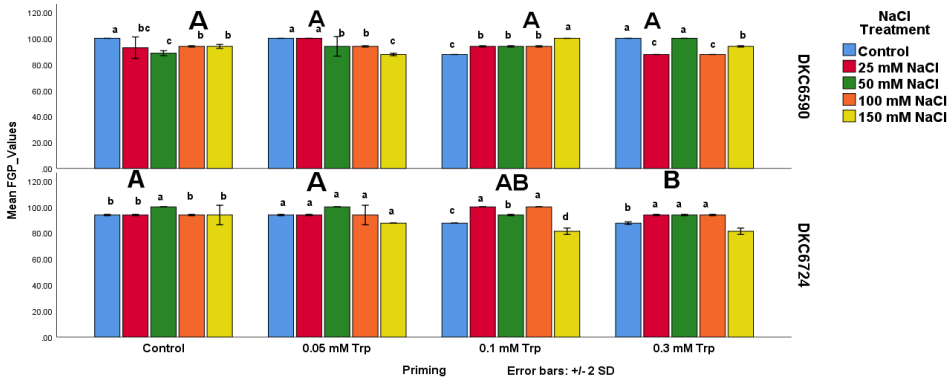

Fig.3. Effects of L-Trp priming on hypocotyl length (HL) in two maize (*Zea mays* L.) cultivars (DKC6590 and DKC6724) under different NaCl concentrations during germination. Different lowercase letters indicate a significant difference at p<0.05 between NaCl concentrations and different uppercases on the columns (or treatment groups) indicate significant difference at p<0.05 between L-Trp treatment groups.

The final germination percentage (FGP) did not show a significant difference between different NaCl doses in both cultivars and showed no strong correlation between the increase of salt stress level and the FGP values (Fig.3) in the tolerant cultivar (*r* = -0.228) and the sensitive one (*r* = -0.244). However, although seed priming with different L-Trp concentrations did not induce a significant difference on FGP in DKC690 cultivar, it showed a significant difference in DKC6724 cultivar in which 0.3 mM showed a reduced germination percentage (Fig.3).

4. Seedling vigor index (SVI)

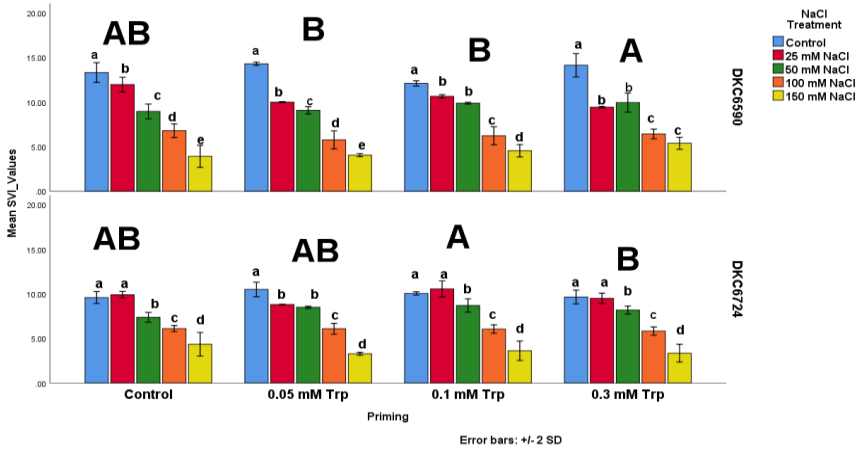

Fig.4. Effects of L-Trp priming on Seedling vigor index (SVI) in two maize (*Zea mays* L.) cultivars (DKC6590 and DKC6724) under different NaCl concentrations during germination.

Different lowercase letters indicate a significant difference at p<0.05 between NaCl concentrations and different uppercases on the columns (or treatment groups) indicate significant difference at p<0.05 between L-Trp treatment groups.

Seedling vigor index (SVI) was significantly (p<0.05) reduced by the salinity stress and negatively strong correlated with the increasing of NaCl concentrations treatment in a dose dependent manner in DKC6590 (*r* = -0.965) and DKC6724 (*r* = -0.945) cultivars (Fig.4). Similarly, different L-Trp concentrations showed significant difference (p<0.05) in inducing a better SVI in both cultivars in which 0.3 mM was the better treatment in DKC6590 whereas 0.1 mM was the better treatment in DKC6724.

5. Coefficient of velocity of germination (CVG)

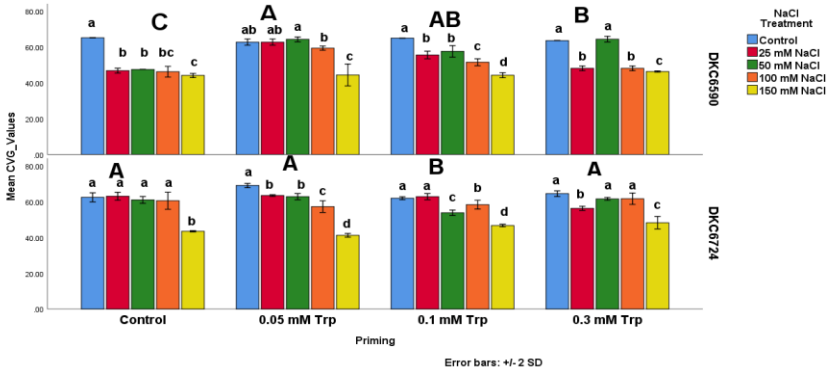

Fig.5. Effects of L-Trp priming on Coefficient of velocity of germination (CVG) in two maize (*Zea mays* L.) cultivars (DKC6590 and DKC6724) under different NaCl concentrations during germination. Different lowercase letters indicate a significant difference at p<0.05 between NaCl concentrations and different uppercases on the columns (or treatment groups) indicate significant difference at p<0.05 between L-Trp treatment groups.

Coefficient of velocity of germination (CVG) results in present study showed that CVG (Fig.5) was significant (p<0.05) reduced by NaCl stress and negatively strong correlated with the increasing concentrations of NaCI in a dose dependent manner in DKC6590 (*r* = -0.707) and DKC6724 (*r* = -0.785) cultivars. Seed priming with L-Trp showed a significant difference (p<0.05) between different L-trp concentrations groups and 0.05 mM was the better treatment in the tolerant cultivar while in the sensitive one 0.1 mM reduced the CVG compared to the control and other groups .

6. Germination rate index (GRI):

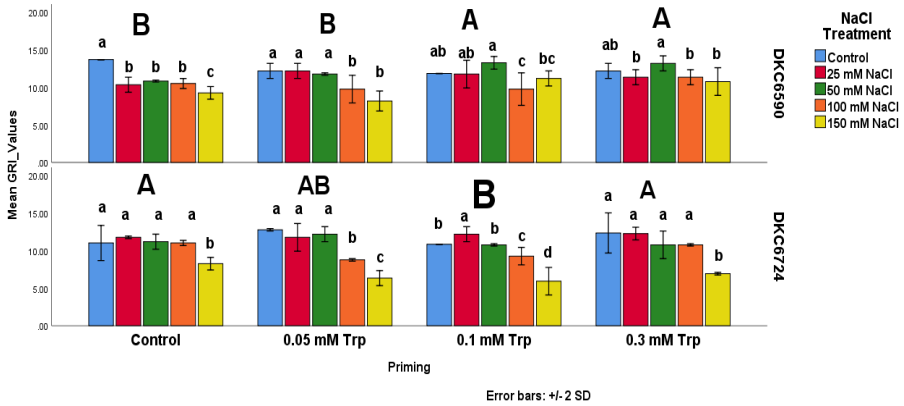

Fig.6. Effects of L-Trp priming on Germination rate index (GRI) in two maize (*Zea mays* L.)

cultivars (DKC6590 and DKC6724) under different NaCl concentrations during germination. Different lowercase letters indicate a significant difference at $p<0.05$ between NaCl concentrations and different uppercases on the columns (or treatment groups) indicate significant difference at $p<0.05$ between L-Trp treatment groups.

Germination rate index (GRI) was reduced significantly by salinity stress and negatively strong correlated with the increasing concentrations of NaCI treatments in a dose dependent manner in sensitive (r = -0.670) and tolerant (r = -0.818). However, The seed priming with L-Trp increased significantly ($p<0.05$) the GRI in both cultivars in which 0.1 and 0.3 mM were better treatments in the tolerant cultivar whereas 0.3 mM showed better results in the sensitive one.

7. Endosperm Sucrose content

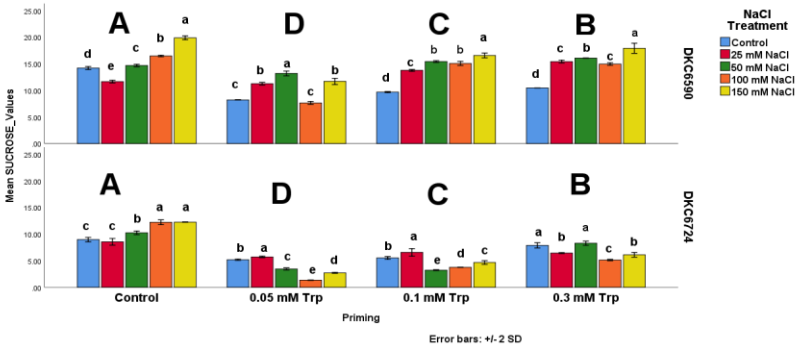

Fig.7. Effects of L-Trp priming on Endosperm Sucrose content in two maize (*Zea mays* L.) cultivars (DKC6590 and DKC6724) under different NaCl concentrations during germination. Different lowercase letters indicate a significant difference at $p<0.05$ between NaCl concentrations and different uppercases on the columns (or treatment groups) indicate significant difference at $p<0.05$ between L-Trp treatment groups.

Endosperm sucrose content (Fig.7) was increased significantly by salinity stress and positively strong correlated with the increasing concentrations of NaCI treatment in a dose dependent manner in DKC6590 (r = +0.838) and DKC6724 (r = +0.921) cultivars. Seed priming with L-Trp induced significantly ($p<0.05$) a decrease in sucrose content in both cultivars in which 0.05 and 0.1 mM showed the lowest values in endosperm sugar content.

8. Superoxide dismutase (SOD) activity

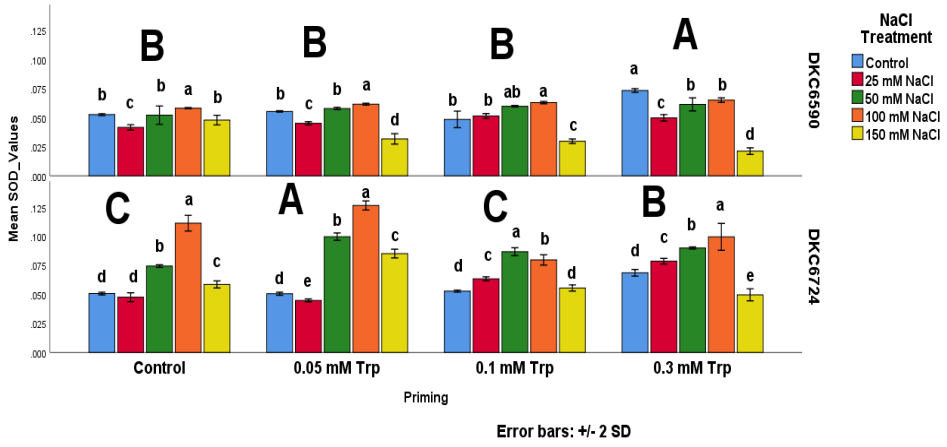

Fig.8. Effects of L-Trp priming on Endosperm Sucrose content in two maize (*Zea mays* L.) cultivars (DKC6590 and DKC6724) under different NaCl concentrations during germination. Different lowercase letters indicate a significant difference at $p<0.05$ between NaCl

concentrations and different uppercases on the columns (or treatment groups) indicate significant difference at p<0.05 between L-Trp treatment groups.
The SOD activity (fig.8) increased with the salinity level compared to control in both cultivars in which the pic was at 100 mM and decreased at 150 mM NaCl. The seed treatment with L-Trp induced an increase in the SOD activity in both cultivars; however, 0.3 and 0.05 mM were better treatments for DKC6590 and DKC6724 respectively.

9. Catalase activity

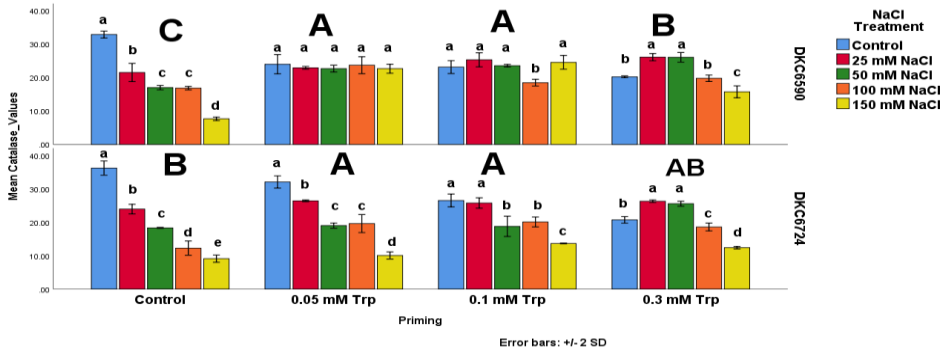

Fig.9. Effects of L-Trp priming on Catalase (CAT) activity in two maize (*Zea mays* L.) cultivars (DKC6590 and DKC6724) under different NaCl concentrations during germination. Different lowercase letters indicate a significant difference at p<0.05 between NaCl concentrations and different uppercases on the columns (or treatment groups) indicate significant difference at p<0.05 between L-Trp treatment groups.
Catalase activity (fig.9) was decreased significantly (P<0.05) by salt stress and and negatively strong correlated with the increasing concentrations of NaCI treatments in a dose dependent manner in sensitive cultivar (r = -0.969) and the tolerant one (r = -0.948). Seed treatment with L-Trp induced a significant difference between different doses effect; however, 0.05 and 0.1 mM induced a high CAT activity in both cultivars.

10. Peroxidase (POD) activity

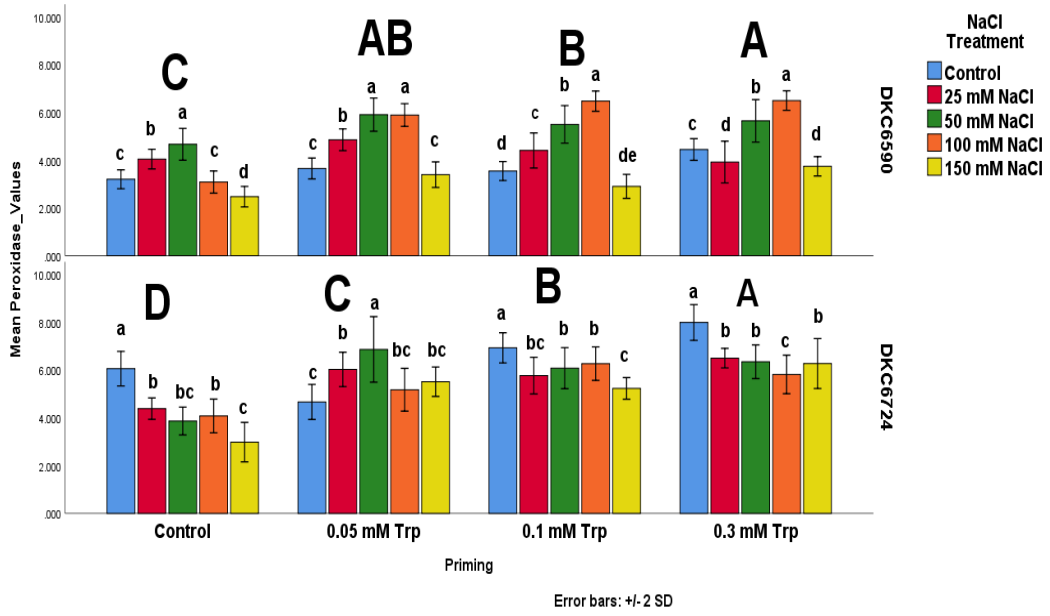

Fig.10. Effects of L-Trp priming on POD activity in two maize (*Zea mays* L.) cultivars (DKC6590 and DKC6724) under different NaCl concentrations during germination. Different lowercase letters indicate a significant difference at $p<0.05$ between NaCl concentrations and different uppercases on the columns (or treatment groups) indicate significant difference at $p<0.05$ between L-Trp treatment groups.

The POD activity (fig.10) was higher in seed treated with 50 mM NaCl and decreased at 100 mM compared to control in DKC6590 cultivar while it decreased significantly ($p<0.05$ and negatively strong correlated with the increasing concentrations of NaCI treatments in a dose dependent manner in DKC6724 (r = -0.876). Seed treatment with L-Trp increased significantly ($p<0.05$) the POD activity in both cultivars; however, 0.3 mM induced a high POD activity in both cultivars.

Discussion

Different salinity levels had a significant negative effect on RAL (fig.1) and HL (fig.2) for the two cultivars. This is in line with the findings of Kamyar et al. (2011) reported that increased NaCl concentration induced a reduction of Radicle length in rice (*Oryza sativa* L.) and Li (2008) who reported a reduction of hypocotyl length in *G.soja, L. sinense* and *S. sudenense*. Salinity stress affects seed germination either by decreasing the rate of water uptake and/or facilitating the intake of toxic ions, which can change certain enzymatic or hormonal activities inside the seed (Chakma et al., 2019). Seed treatment with L-Trp did not have a significant effect on RAL HL in both cultivars. This is confirmed by the findings of Alfosea-Simón et al. (2020) who reported that Trp had no beneficial effect on growth parameters in tomato plants (*S. lycopersicum* L.).

Results showed that there is no significant difference on final germination pourcentage (FGP) (fig.3) between all NaCl and L-Trp treatments. This is in line with the results of Hanci (2019) in which NaCl and L-Trp did not differ significantly for the maximum germination rate for leak (*Allium ampeloprasum* L.). In the same way Aliu et al. (2015) found that there was no significant difference on FGP for maize seed germination under 50, 100 and 200 mM of NaCl. However, the germination rate index (GRI) (fig.6) which expresses the average daily germination rate was affected significantly by NaCl treatments for both cultivars. Hakim et al. (2010) suggested that osmotic stress due to salinity was the main cause that reduced the germination rate. In the same way seed pre-treatment with 0.1 and 0.3 mM L-Trp improved the germination rate compared to control group in DKC6590 cultivars. This is in line with the findings of Hozayn and Ahmed (2019) who reported that L-Trp improved significantly the Germination rate index in barley (*H. vulgare* L.) seed un salt conditions.

The coefficient of velocity of germination (CVG) (fig.5) was reduced significantly by the increasing salinity level for both cultivars. In the same way, Hakim et al. (2010) reported reduction of germination seed by increasing the NaCl concentrations, independently of the varieties of rice (*O. sativa* L.). Seed priming improved significantly the CVG in DKC6590 cultivars in which 0.05 and 0.1 mM whereas in DKC6724 CVG had high values in 0.05 and 0.3 mM. This was confirmed by Hozayn and Ahmed (2019) who reported that a germination speed index was improved by seed priming with L-Trp in barley under salinity.

Seedling vigor index (SVI) (fig.4) was significantly reduced in seed treated by different NaCl concentrations compared to control in both cultivars. Chakma et al. (2019) found that SVI was high in control condition and declined with NaCl increase in solution. However, seed priming

with Trp under salinity improved significantly the SVI in both cultivars. Hozayn and Ahmed reported an improvement of SVI by pretreating barley seed (*H. vulgare* L.) by Trp.

Endosperm sugar content increased as the salinity level increased (fig.7) and high sucrose content was observed in non-Trp condition groups in both cultivars. This is in line with the finding of Gill et al. (2003) who reported that the imposition of NaCl stress resulted in significant increases in sugar contents. They suggested that changes in germination, growth, respiration and other related process can affect other metabolic activities, particularly the carbohydrate metabolism that plays an important role in germination and seedling development. Seed treatment with L-Trp induced the decrease of sucrose content for both cultivars. Gill et al. (2002) proposed that it is possible that more rapid hexose metabolism, supplying compounds involved in water balance may be involved. It had been reported also that under salt or drought stresses there is a conversion of hexoses and other carbohydrates, such as sucrose and starch, into sugar alcohols (polyols) and proline (Perez-Alfocea and Larher 1995).

Antioxidant enzymes activities had been affected by salt stress in both cultivars. Thus, SOD activity (fig.8) results showed that it increased with the NaCl concentration until 100 mM and decrease at 150 mM while POD activity (fig.10) was decreasing at 100 mM. However CAT (fig.9) decreased with the increase of salinity level. Jiang et al. (2016) reported an increase of SOD activity in maize seed germinated und salinity and suggested that maize activates its antioxidant system under salinity stress conditions. In the same way Moghaddam et al (2020) reported an increase of POD activity in germinating seed of a medicinal plant (*Tagetes minuta*). They suggested that the increase of SOD and POD activity under NaCl can be considered as circumstantial evidence for enhanced production of free radicals under NaCl stress. SOD and CAT are very important in scavenging radical oxygen species or ROS. Thus SOD catalyses the dismutation of O_2^- to H_2O_2 and O_2, whereas CAT scavenges H_2O_2 (Jiang et al., 2016).

Seed priming with L-Trp increased significantly in both cultivars the activities of SOD (fig.8), CAT (fig.9) and POD (fig.10). In the same way, Korkmaz et al. (2020) reported under salinity 1µM of Trp increased the activity of CAT while 100 µM improved the activity of POD.

CONCLUSION

All different germination characters evaluated in this study except FGP had been affected by the increase of the NaCl concentration in both cultivars as it was expected. Moreover, seed priming with L-Trp improved the tolerance of the two cultivars towards salt stress in almost the parameters considered. However, different priming concentrations had induced tolerance to NaCl stress differently for the cultivars. Thus, for all parameters, 0.3 mM of L-Trp was more effective in the tolerant cultivar (DKC6590) whereas 0.1 mM showed better results in the sensitive cultivars (DKC6724).

REFERENCES

Abbas S H, Sohail M, Saleem M, Mahmood T, Aziz I, Qamar M, Majeed A, Arif M. 2013. Effect of L-tryptophan on plant weight and pod weight in chickpea under rainfed conditions. Sci Tech Dev. 32: 277–280.

Alfosea-Simón M, Zavala-Gonzalez EA, Camara-Zapata JM, Martínez-Nicolás JJ, Simón I, Simón-Grao S, García-Sánchez F. 2020. Effect of foliar application of amino acids on the salinity tolerance of tomato plants cultivated under hydroponic system. Scientia Horticulturae 272, 109509.

Aliu, S., Rusinovci, I., Fetahu, S., Gashi, B., Simeonovska, E., Rozman, L. (2015). The effect of salt stress on the germination of maize (Zea mays L.) seeds and photosynthetic pigments. Acta agriculturae Slovenica, 105-1:85-94.
Boo H-O., Shin JH., Shin JS., Choung ES., Bang MA., Kyung-Min Choi KM., Song WS. (2012). Assessment on Antioxidant Potential and Enzyme Activity of Some Economic Resource Plants. Korean J. Plant Res. 25(3):349-356.
Chakma, P., Md. Hossain, M., Rabani, M.G. (2019). Effects of salinity stress on seed germination and seedling growth of tomato. J Bangladesh Agril Univ 17(4): 490–499.
Demmig-Adams, B., Dumlao, M., Herzenach, M., Adams III, W., 2008. Acclimation. In: Jørgensen, S.E., Fath, B.D.B.D. (Eds.), Encyclopedia of Ecology. Elsevier, BV Oxford, p. 2008.
Gill P.K, Arun Dev Sharma A.D, Singh P, Bhullar S.S. (2002). Osmotic stress-induced changes in germination, growth and soluble sugar content of sorghum bicolor (l.) Moench seeds. Bulg. J. Plant Physiol. 28(3–4), 12–25.
Gill P.K, Arun Dev Sharma A.D, Singh P, Bhullar S.S. (2003). Changes in germination, growth and soluble sugar contents of Sorghum bicolor (L.) Moench seeds under various abiotic stresses. Plant Growth Regulation 40: 157–162.
Hakim M. A., Juraimi A. S., Begum M., Hanafi M. M., Ismail Mohd R., Selamat A. (2010). Effect of salt stress on germination and early seedling growth of rice (Oryza sativa L.). African Journal of Biotechnology Vol. 9(13):1911-1918.
Hanci F. (2019). The Effect of L-Tryptophan and Melatonin on Seed Germination of Some Cool Season Vegetable Species under Salinity Stress. Düzce Üniversitesi Bilim ve Teknoloji Dergisi, 7: 1879-1891.
Hildebrandt, Tatjana M., Nunes Nesi, A., Araújo, Wagner L., Braun, H.-P., 2015. Amino acid catabolism in plants. Mol. Plant 8, 1563–1579.
Hozayn M., Ahmed AA. (2019). Effect of Magneto-priming by tryptophan and ascorbic acid on germination attributes of barley (Hordeum vulgare L.) under salinity stress. EurAsian Journal of BioSciences 13, 245-251.
Hozayn M , Abd-Elmonem A A, Samaha, G M. 2020. The physiological effect of pre-soaking with tryptophan on sugar beet (Beta vulgaris L.) productivity under different levels of salinity stresses. Bulletin of the National Research Centre 44:65.
Hozayn M, Ahmed AA, El-Saady AA, Abd-Elmonem AA (2019) Enhancement in germination, seedling attributes and yields of alfalfa (Medicago sativa, L.) under salinity stress using static magnetic field treatments. Eur Asian J BioSci 13(1):369–378.
Jamil M, Ahamd M, Anwar F, Zahir ZA, Kharal MA, Nazli F. 2018. INDUCING DROUGHT TOLERANCE IN WHEAT THROUGH COMBINED USE OF L-TRYPTOPHAN AND Pseudomonas fluorescens. Pak. J. Agri. Sci.55(2), 331-337.
Janda, T ; Darko, E ; Shehata, S; Kov, V ; Pal, M ; Szalai, G. 2016. Salt acclimation processes in wheat. Plant Physiology and Biochemistry 101, 68-75.
Jiang X., Li H., SONG X. (2016). Seed prımıng wıth melatonın effects on seed germınatıon and seedlıng growth ın maıze under salınıty stress. Pak. J. Bot., 48(4): 1345-1352.
Kamanga, RM; Echigo, K; Yodoya, K; Ahmad Mohammad M. Mekawy,AM; Ueda, A. 2020. Salinity acclimation ameliorates salt stress in tomato (Solanum lycopersicum L.) seedlings by triggering a cascade of physiological processes in the leaves. Scientia Horticulturae 270 (2020) 109434.

Kazemi K., Eskandari H. (2011). Effects of salt stress on germination and early seedling growth of rice (Oryza sativa) cultivars in Iran. African Journal of Biotechnology Vol. 10(77):17789-17792.
Khodary, S E A. 1992. "Effect of salinity and tryptophan on growth and some metabolic changes in wheat and sorghum plants," Biologica Plantarum, vol. 34, no. 5, pp. 439–443, 1992.
Korkmaz, A., Gerekli, Yakupoğlu, G., Karaca, A., Köklü, Ş. (2020). Seed treatment with tryptophan improves germination and emergence of pepper under salinity stress. Acta Hortic. 1273. ISHS 2020. XXX IHC – Proc. VIII Int. Symp. on Seed, Transplant and Stand Establishment of Horticultural Crops. DOI 10.17660/ActaHortic.2020.1273.57
Kumar A, Rodrigues V, Verma S, Singh M, Hiremath C, Shanker K, Shukla AK, Sundaresan V. (2020). Effect of salt stress on seed germination, morphology, biochemical parameters, genomic template stability, and bioactive constituents of Andrographis paniculata Nees. Acta Physiologiae Plantarum 43:68
Kurt A, Torun H, Colak N, Seiler G, Hayırlıoglu-Ayaz S, Ayaz FA. 2017. Nutrient profiles of the hybrid grape cultivar 'Isabel'during berry maturation and ripening. Journal of the Science of Food and Agriculture 97, 2468-2479.
Li Y. (2008). Effect of salt stress on seed germination and seedling growth of three salinity plants. Pakistan journal of Biological sciences 11 (9): 1268-1272.
Mano Y, Nemoto K. 2012. The pathway of auxin biosynthesis in plants. J Exp Bot. 63: 2853–2872.
Moghaddam M., Farhadi N., Panjtandoust M., Ghanat F. (2020). Seed germination, antioxidant enzymes activity and proline content in medicinal plant Tagetes minuta under salinity stress. Official Journal of the Societa Botanica Italiana Volume 154, 2020 - Issue 6.
Muneer M, Saleem M, Abbas S H, Hussain I, Asim M. 2009. Using L-tryptophan to influence the crop growth of maize at different harvesting stages. Int J Biol Biotechnol. 6: 251–255.
Pandolfi, C; Azzarell, E; Mancuso, S; Shabala, S. 2016. Acclimation improves salt stress tolerance in Zea mays L. Plants. Journal of Plant Physiology 201, 1–8.
Perez-Alfocea, F., F. Larher, 1995. Effects of phlorizin and p chloromercuribenzenesulfonic acid on sucrose and proline accumulation in detached tomato leaves submitted to NaCl and osmotic stresses. J. Plant Physiol., 145, 367–373.
Pervez M A, Muhammad F, Ahmad M. 2000. Effect of auxin precursor (L-tryptophan) on the growth and yield of tomato (Lycopersicon esculentum). Pak J Biol Sci. 3: 1154–1155.
Ren Y, Wang W, He J, Zhang L, Wei Y, Yang M (2020) Nitric oxide alleviates salt stress in seed germination and early seedling growth of pakchoi (Brassica chinensis L.) by enhancing physiological and biochemical parameters. Ecotoxicol Environ Saf 187:109785
Shankar V., Kumar D., Agrawal V. (2016). Assessment of Antioxidant Enzyme Activity and Mineral Nutrients in Response to NaCl Stress and its Amelioration through Glutathione in Chickpea. Appl Biochem Biotechnol 178:267–284.
Taghizadeh M., Solgi M., Karimi M., Sanati M.H., Khoshbin S. (2018).
Heavy Metals Effects on Brassica Oleracea and Elements Accumulation by Salicylic Acid. Archives of Hygiene Sciences 7(1): 1-11.

EVALUATION OF AFLATOXIN M_1 LEVEL IN RAW MILK DURING WINTER 2021 IN KOSOVO

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ABSTRACT

Aflatoxins are a group of mycotoxins produced by certain molds like *Aspergillus flavus and Aspergillus parasiticus*, that contaminate various types of agricultural commodities, food and feedstuff. There are different types of aflatoxins, but most found in feedstuff are aflatoxin B_1, B_2, G_1, G_2. All aflatoxins have negative health effects in animals and human. Aflatoxin B_1 is the most carcinogenic natural substance known. If animals consume aflatoxin B_1 contaminated feed, they will excrete aflatoxin M_1 in their milk. Aflatoxin M_1 is a hydroxilated metabolite of aflatoxin B_1. The aim of this study was to analyze raw cow milk samples for aflatoxin M_1 presence collected during the winter season of year 2021 in one of the biggest regions of Kosovo called Peja, in which region appeared to be a prevalent contamination according to previous studies.

Aflatoxin M_1 was detected using enzyme-linked immunosorbent assay (ELISA) (MaxSignal® Aflatoxin M_1 ELISA Kit, PercinElmer®, catalog #FOOD-1060-05), following the manufacturer`s instructions.

From 40 samples examined, 25 (63%) exceeded the LOD, limit of detection (0.002 μg/L). None of the samples exceeded the maximum tolerable limit for aflatoxin M_1 which is 0.05 μg/L according to the European Union. The concentration range in winter milk samples was 0.004 - 0.010 μg/L. The mean concentration with standard deviation was 0.007 ± 0.003μg/L, and the median was 0.005 μg/L.

It can be concluded that the frequency of AFM_1 contamination of raw milk in the region of Peja in Kosovo during winter season of year 2021 was much lower than the results reported on the previous studies for this region, and most of the samples have been compliant with the European Union regulations for AFM_1.

Keywords: Aflatoxin M_1, Raw Milk, ELISA, Kosovo.

LISTERIA MONOCYTOGENES İLE KONTAMİNE EDİLMİŞ SIĞIR ETİ PREPARATLARINDA NİSİN, LİZOZİM, SİTRİK ASİT VE LAKTİK ASİT' İN ETKİSİ

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ÖZET

Bu çalışmada *Listeria monocytogenes* ile kontamine edilmiş parça sığır eti örneklerine nisin, lizozim, sitrik asit ve laktik asit kullanımının etkisi incelendi. Araştırmada Kars merkezde et satış yapılan yerlerinden toplanan 198 adet *musculus latissimus dorsi* parça eti kullanıldı. Dekontaminasyon etkileri incelenecek olan nisin, lizozim, sitrik asit, laktik asit solüsyonlarına *L.monocytogenes* (10^7 kob/gr) ile kontamine edilmiş et örneklerine daldırılarak et numuneleri 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 ve10. günlerde mikrobiyolojik ve duyusal analize tabi tutuldu. Sonuçlar istatistiksel olarak tek yönlü varyans analizi (ANOVA) ile gruplar arasındaki fark Tukey, post hot testi kullanılarak değerlendirildi. Mikrobiyolojik analizler sonucunda *L.monocytogenes* üzerine FTS 0,1 log, lizozim 1,1 log , nisin 1,5 log, sitrik asit 2,2 log laktik asit 4,9 log düzeyinde azalma şekillendiği gözlendi ($p<0,01$). Duyusal analiz bakımından değerlendirmelerde ise laktik asit ette herhangi bir renk değişikliğine neden olmazken lizozim, nisin ve sitrik asit etin renginde ve kokusunda çok hafif değişikliğe neden oldu. Fakat tüm bu değişikliklerin de kabul edilebilir düzeyde oldukları saptandı. Çalışmadaki bulguların sonucuna göre kullanılan antimikrobiyel maddelerden *L.monocytogenes* üzerine en etkilisinin laktik asit ve sitrik asit olduğu, nisin ve lizozimin de etkili olduğu fakat etkilerinin kısa süreli olduğu tespit edildi.
Bu çalışma ile bir kez daha dekontaminasyon amacıyla kullanılan antimikrobiyel maddeler içerisinde *L.monocytogenes* üzerine en etkilisinin laktik asit olduğu literatür çalışmalarıyla paralellik gösterdiği tespit edildi. Diğer antimikrobiyel maddelerin olumsuz duyusal etkilerinin bertaraf edilebilmesi amacıyla daha düşük konsantrasyonda ve/veya kombine olarak kullanımı üzerine denemeye yönelik araştırmalar yapılmalıdır.

Anahtar kelimeler: *Listeria monocytogenes*, Laktik asit, Sitrik asit, Lizozim, Nisin

ABSTRACT

In this study, antimicrobial effects of nisin, lysozyme, citric acid and lactic acid solutions prepared from recommended doses were investigated on beef pieces contaminated with Listeria monocytogenes.
For the research, 198 pieces of musculus latissimus dorsi meat collected from meat sales places in the center of Kars were used. Meat samples contaminated with L.monocytogenes (107 cfu/gr) were dipped into solutions prepared from nisin, lysozyme, citric acid, lactic acid substances whose antimicrobial effects will be examined, and these meat samples were 0, 1, 2, 3, 4, 5, 6, 7 Microbiological and sensory analyzes were performed on the 8th, 9th and 10th days. The results were statistically evaluated using one-way analysis of variance (ANOVA) and the difference between groups using Tukey's post hot test. As a result of microbiological analyzes, it was

observed that there was a decrease of 0.1 log in FTS (Physiological Salt Water), lysozyme 1.1 log, nisin 1.5 log, citric acid 2.2 log lactic acid 4.9 log on L.monocytogenes ($p<0$,01). In the evaluations in terms of sensory analysis, there was no color change in both color and odor in the samples treated with lactic acid, while a very slight change was observed in both the color and odor of the meats treated with lysozyme, nisin and citric acid. However, these changes were found to be at an acceptable level. According to the results of the findings in the study, it was determined that the most effective antimicrobial agents on L.monocytogenes were lactic acid and citric acid, nisin and lysozyme were also effective, but their effects were short-lived.
In this study, it was determined that lactic acid is the most effective antimicrobial agent used for decontamination, which is in parallel with the literature studies. In order to eliminate the negative sensory effects of the other three substances, it has become necessary to conduct trials with lower concentrations and/or different combinations.

Keywords: Listeria monocytogenes, Lactic acid, Citric acid, Lysozyme, Nisin

GİRİŞ

Beslenme genel anlamda büyüme ve gelişmeyi sağlamak, sağlıklı ve verimli olarak uzun süre yaşamak için vücudun gereksinim duyduğu besin öğelerinin vücuda alınması ve kullanılması olarak tanımlanmaktadır. Bu besin öğeleri gıda maddeleri içinde bulunan karbonhidratlar, yağlar, proteinler, vitaminler, mineraller ve sudan oluşmaktadır. Hayvansal proteinler, büyüme gelişme için gerekli olan ve vücut tarafından sentezlenemeyen esansiyel amino asitleri yeterli ve dengeli bir şekilde içerirler. Et hayvansal gıdalar içerisinde, vitaminler, bazı mineraller ile (özellikle P ve Fe) biyolojik değeri ve sindirilebilirliği yüksek proteinler bakımından zengin olmasından ve bunun yanı sıra iştah artırıcı, lezzetli ve üretimi kolay bir besin maddesi olması açısından tercih edilmektedir (3,4,5,11).

Et ve et ürünlerinin mikrobiyel bozulması, sahip olduğu bakteri türüne ve toplam bakteri sayısına bağlı olarak değişiklik gösterir. Mikroorganizmalar et üzerinde çoğalarak metabolizma ürünlerini ile kokuşma, acılaşma, asitleşme, gaz oluşumu ve renk değişimi gibi bozulmalara neden olurlar. Et ürünleri, üretimlerinin değişik aşamalarında farklı nedenlerle çeşitli kontaminasyonlara maruz kalabilirler (9,10). Mikrobiyel kökenli kontaminasyonlar ise bu noktada çok büyük önem arz eder. Üretimin hijyenik prosedürler çerçevesinde yapılmaması, üretimde kullanılan hammaddenin, baharatların, kılıfların kalitesizliği, personelin hijyen kurallarına gerekli önemi göstermemesi ve üretimde kullanılan alet-ekipmanın bakımsız ve kötü şartlarda olmasına bağlı olarak, *Escherichia coli, Salmonella, Staphylococcus aureus, Campylobacter jejuni, Clostridium* ve yine insan sağlığını ciddi boyutlarda tehdit ettiği bilinen Listeria türlerine et ve et ürünlerinde rastlamak mümkündür (8).

Et ve et ürünlerinin diğer mikroorganizmalar ve *Listeria monocytogenes* ile kontamine olabildiği ve böyle etlerin halk sağlığı açısından tehlike oluşturduğu bilinmektedir. Avrupa birliği bünyesinde yapılan düzenlemelerle gıda mevzuatında et ve et ürünleri için mikrobiyolojik kriterler kapsamına alınan *L.monocytogenes* halk sağlığı açısından oldukça önem verilen bir mikroorganizmadır. *L.monocytogenes*'in çevreye geniş ölçüde yayılabilen buzdolabı ısısında gelişebilen, soğutma, ısıtma, dondurma ve kurutma gibi işlemlerde dahi canlılığını koruyabilen bir patojen olması halk sağlığı açısından taşıdığı riski artırmaktadır (2). Listeria türleri içinde *L.monocytogenes* insan ve hayvanlarda ciddi sporadik enfeksiyonlara yol açarken, *L.ivanovii* sadece hayvanlarda hastalık oluşturmaktadır (18,23).

Et ve et ürünlerinde, bu gibi mikrobiyolojik risk faktörlerini elimine etmek için, bazen de bu

ürünlerin teknolojileri gereği üretimin çeşitli aşamalarında uygulanan tuz, sorbat, nitrit gibi kimyasallar, birtakım gazlar, starter kültür, bakteriyosin ve organik kökenli maddeler günümüzde sıkça kullanım alanı bulmuştur (13,20,24).

ARAŞTIRMA VE BULGULAR

Bu çalışmanın amacı nisin, lizozim, laktik asit ve sitrik asit gibi dekontaminantların *Listeria monocytogenes* ile kontamine edilmiş sığır etleri üzerine antimikrobiyel etkilerinin karşılaştırmalı olarak araştırılmasıdır. Çalışma planlanırken tek ve kombine yapılan çalışmalar derlenerek, kullanılan maddelerin etkinliği belirlenip etkili ve önemli olduğu düşünülen madde ve dozları örnek alınarak farklı solüsyonlar hazırlanmış ve kullanılan metot buna göre düzenlenmiştir.

Materyal

Araştırma da *musculus lotissimus dorsi'* den alınmış 198 adet et preparatı kullanıldı. Et preparatları Kars ilindeki perakende satış yerlerinden alındı.

Metot

Listeria monocytogenes suşu Brain Heart Infusion broth içerisinde aktifleştirildi. Kontaminasyon için *Listeria monocytogenes* solüsyonu hazırlandı ve et preparatları daldırma yöntemi ile kontamine edilmeden önce ve sonra solüsyonların *Listeria monocytogenes* düzeyinin belirlenmesi amacı ile ekimi ve takiben suş sayımı yapıldı. Dekontaminasyon amacıyla lizozim, nisin, laktik asit, sitrik asit ve FTS çözeltileri hazırlandı.

Antimikrobiyel maddelerin hazırlanması

1. Lizozimin hazırlanışı

Distile su içerisinde 250mg/lt oranında hazırlanarak, 0.22 mikrometrelik filtreden süzülüp steril edildi.

2. Nisinin hazırlanışı

0.02N HCl içerisinde 200IU/ml oranında hazırlanarak, otoklavda 121°C'de 15 dk steril edildi.

3. Sitrik asidin hazırlanışı

Distile su içerisinde %2 oranında hazırlanarak, 0.22 mikrometrelik filtreden süzülüp steril edildi.

4. Laktik asidin hazırlanışı

Distile su içerisinde %2 oranında hazırlanarak, 0.22 mikrometrelik filtreden süzülüp steril edildi.

5. Fizyolojik tuzlu suyun hazırlanışı

Kontrol grubu için gerekli olan Fizyolojik Tuzlu Su distile su içerisinde %0.9 oranında NaCl katılarak, otoklavda 121°C'de 15 dk steril edildi.

6. Etlerin dekontaminasyonu

Etler satış yerinden alındığı gibi 1'er parçaları listeria yönünden analiz edildi. Sonuçlar negatif olduğu için etler *Listeria'*ya spesifik free olarak kabul edildi.

Bakteriyel inokülasyon

Et parçaları *Listeria* bulunan broth içerisinde 15 saniye muamele edildikten sonra bakterinin tutunması için 5 dakika bekletildi.

Antimikrobiyellerin uygulanışı

Bakteriyel inokülasyondan sonra etler ayrı ayrı kaplarda hazırlanan solüsyonlar içerisine daldırılarak 15 dk oda ısısında bekletildi. Daha sonra solüsyonlardan alınan etlerin damlaması bitene kadar yaklaşık 5dk beklenip, etler streç filme sarılarak +4°C'de muhafaza edildi. Bir grup

et inokülasyondan ve tutunmadan sonra hiçbir solüsyona batırılmadan paketlendi ve kontrol grubu 1 olarak isimlendirildi.

Mikrobiyolojik Analizler

Muhafazanın 0,1,2,3,4,5,6,7,8,9,10. günlerinde örnekler mikrobiyolojik yönden analiz edildi. Bu amaçla etlerden 25 g tartılarak 225 ml peptonlu su ile sulandırılarak uygun dilüsyonlardan saplamentli *Listeria* Selective Agar besiyerine ekim yapıldı. Ekimi yapılan petriler 30ºC'de 24-48 saat inkübe edildi. Üreme olmayabileceği düşünülerek örneklere zenginleştirme işlemi yapıldı. Bu amaçla etlerden 25 g tartılarak 225 ml saplamentli Listeria Enrichment Broth besiyeri eklendi. Numune 30ºC'de 24-48 saat inkübe edildi. Süre sonunda broth'tan öze dolusu alınarak saplamentli Listeria Selective Agar besiyerine ekim yapıldı. Ekimi yapılan petriler 30ºC'de 24-48 saat inkübe edildi. Üreyen kolonilere doğrulama testleri uygulandı.

***Listeria monocytogenes'* in doğrulanması için identifikasyonda kullanılan testler**

Sayımı yapılan *Listeria monocytogenes* şüpheli kolonilerini doğrulamak amacıyla çeşitli biyokimyasal ve şeker testleri yapıldı. Bu testler Bergey's Manual of Systematic Bacteriology ve Manual of Clinical Microbiology' de belirttildiği üzere yapıldı. Şüpheli kolonilere gram boyama, katalaz, oksidaz, SIM, β-hemoliz, karbonhidrat fermentasyon testleri, MR/VP,indol ve üre testleri yapılmıştır.

Duyusal Analizler

Duyusal analizler Kafkas Üniversitesi, Veteriner Fakültesi, Besin Hijyeni ve Teknolojisi Ananbilim Dalı akademik personeli ve Veteriner Fakültesi öğrencileri tarafından gerçekleştirildi. Örnekler renk ve koku yönünden üç panelist ile puanlama ve sözel hedonik scala testi kullanılarak değerlendirildi.

İstatistiksel Analizler

Elde edilen veriler tek yönlü varyans analizi (ANOVA) ile incelenmiştir. Gruplar arasındaki fark değerlendirilirken Tukey, post hot testi kullanılmıştır. İstatistiksel analizler SPSS 16 paket programı ile yapılmıştır.

Çalışmamızda nisin, lizozim, sitrik asit ve laktik asit gibi dekontaminantların *L. monocytogenes* ile kontamine edilmiş sığır etleri üzerine antimikrobiyel etkileri araştırıldı ve üç ayrı deneme yapıldı. Denemelerdeki mikrobiyolojik analizler değerlendirilmiş ve üç denemenin ortalama değerleri alınmıştır. Üç denemenin 10 günlük analiz sonuçları ortalaması Tablo 1'de (Log_{10} kob/gr) gösterilmiştir.

Tablo 1: Üç denemeye ait on günlük analiz sonuçları ortalaması (Log_{10} kob/gr)

Analiz günlerindeki *Listeria monocytogenes* sayısı (Log_{10} kob/gr)										
Gruplar	**0.gün**	**1.gün**	**2.gün**	**3.gün**	**4.gün**	**5.gün**	**6.gün**	**7.gün**	**8.gün**	**9.gün**	**10.gün**
Kontrol	**7,8**	**8,3**	**8,7**	**9,3**	**9,3**	**9,3**	**9,3**	**9,4**	**9,4**	**9,5**	**9,5**
FTS	**7,8**	**7,8**	**8,0**	**8,6**	**8,8**	**8,9**	**9,1**	**9,3**	**9,3**	**9,4**	**9,5**
Nisin	**7,3**	**7,3**	**6,6**	**6,6**	**6,6**	**6,6**	**7,0**	**7,3**	**7,5**	**7,9**	**7,9**
Lizozim	**7,7**	**7,5**	**7,5**	**8,1**	**8,1**	**8,1**	**8,1**	**8,2**	**8,2**	**8,3**	**8,3**
Sitrik asit	**7,0**	**6,9**	**6,6**	**6,6**	**6,6**	**6,6**	**6,6**	**6,6**	**6,6**	**6,6**	**6,6**
Laktik asit	**7,0**	**6,6**	**6,6**	**6,6**	**6,6**	**6,6**	**0**	**0**	**0**	**0**	**0**

Denemelerde Listeria ile kontamine edilen ve herhangi bir uygulama yapılmayan kontrol grubunda 0. günde *L.monocytogenes* sayısı 7.8 Log_{10} kob/gr, 1. günde 8.3 Log_{10} kob/gr, 2. günde 8.7 Log_{10} kob/gr, 3, 4, 5 ve 6. günlerde 9.3 Log_{10} kob/gr, 7 ve 8.günlerde 9.4 Log_{10} kob/gr ve 9 ve 10. günlerde 9.5 Log_{10} kob/gr olarak belirlendi. İstatistiksel analizlerde kontrol grubunun on günlük ortalama değeri 8,9 log olarak tespit edildi.

Denemelerde Listeria ile kontamine edilen ve Fizyolojik Tuzlu Su (FTS) ile dekontamine edilen FTS grubunda 0 ve 1. günlerde *L.monocytogenes* sayısı 7.8 Log_{10} kob/gr, 2. günde 8.0 Log_{10} kob/gr, 3. günde 8.6 Log_{10} kob/gr, 4. günde 8.8 Log_{10} kob/gr, 5.günde 8.9 Log_{10} kob/gr, 6. günde 9.1 Log_{10} kob/gr, 7 ve 8. günlerde 9.3 Log_{10} kob/gr, 9. günde 9.4 Log_{10} kob/gr ve 10. günde 9.5 Log_{10} kob/gr olarak belirlendi. İstatistiksel analizlerde FTS grubunun on günlük ortalama değeri 8,8 log olarak tespit edildi.

Denemelerde Listeria ile kontamine edilen ve nisin ile dekontamine edilen grupda 0 ve 1. günlerde *L.monocytogenes* sayısı 7.3 Log_{10} kob/gr, 2, 3,4 ve 5.günde 6.6 Log_{10} kob/gr, 6. günde 7.0 Log_{10} kob/gr, 7. gün 7.3 Log_{10} kob/gr, 8. günde 7.5 Log_{10} kob/gr ve 9 ve 10. günlerde 7.9 Log_{10} kob/gr olarak belirlendi. İstatistiksel analizde nisin grubunun on günlük ortalama değeri 7,4 log olarak tespit edildi. *L.monocytogenes* üzerine ortalama 1,5 log düzeyinde azalma oluşturduğu belirlendi.

Denemelerde Listeria ile kontamine edilen ve lizozim ile dekontamine edilen grupda 0. günde *L.monocytogenes* sayısı 7.7 Log_{10} kob/gr, 1 ve 2. günlerde 7.5 Log_{10} kob/gr, 3, 4, 5 ve 6. günde 8.1 Log_{10} kob/gr, 7 ve 8. günlerde 8.2 Log_{10} kob/gr, 9 ve 10. günde 8.3 Log_{10} kob/gr olarak belirlendi. İstatistiksel analiz sonucunda lizozim grubunun on günlük ortalama değeri 7,8 log olarak saptandı ve *L.monocytogenes* düzeyinde ortalama 1,1 log değerinde indirgeme sağladığı belirlendi.

Denemelerde Listeria ile kontamine edilen ve sitrik asit ile dekontamine edilen grupda 0. günde *L.monocytogenes* sayısı 7.0 Log_{10} kob/gr, 1. günde 6.9 Log_{10} kob/gr, 2, 3, 4, 5, 6, 7, 8, 9 ve 10. günlerde 6.6 Log_{10} kob/gr olarak belirlendi. İstatistiksel olarak ortalama değeri 6,7 log olarak tespit edildi. *L.monocytogenes* sayısında ortalama 2,2 log bir indirgenme yarattığı belirlendi.

Denemelerde Listeria ile kontamine edilen ve laktik asit ile dekontamine edilen grupda 0. günde *L.monocytogenes* sayısı 7.0 Log_{10} kob/gr, 1, 2, 3, 4, 5. günlerde 6.6 Log_{10} kob/gr, 6, 7, 8, 9 ve 10. günlerde etken saptanamadı. İstatistiksel analizler sonucunda ortalama değer 4,0 log olarak tespit edildi. *L.monocytogenes* düzeyinde ortalama 4,9 log azalmaya neden olduğu belirlendi.

Duyusal Analiz sonuçları

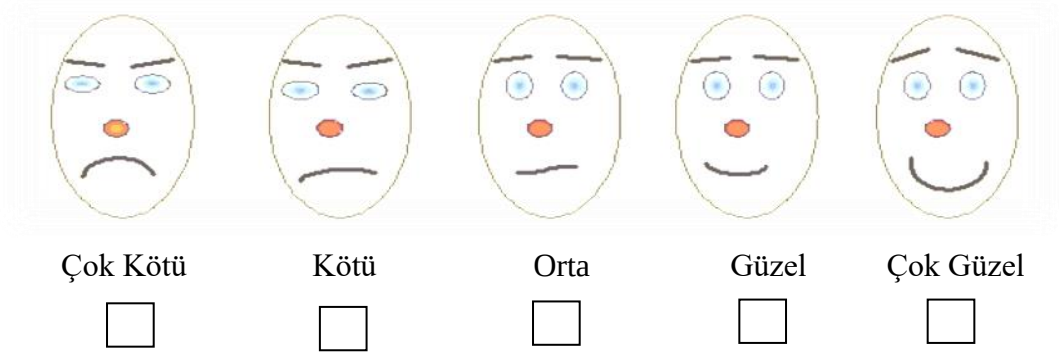
Tüm denemelerdeki mikrobiyolojik üremedeki logaritmik değişikliklerin yanı sıra bir takım duyusal değişiklikler kaydedilmiştir. Bu duyusal değişiklikler renk ve koku olarak değerlendirildi. Renk değişikliğinin belirlenmesinde puanlama testi kullanıldı. Puanlama testinde normal (0), açık (1), koyu (2), fosforlu (3) olarak yapıldı (Tablo 2). Denemelerin 3. gününde laktik asit ette herhangi bir renk değişikliğine neden olmazken lizozim, sitrik asit ve nisin etin renginde çok hafif açılmalara neden oldu. Lizozim, nisin ve sitrik asitte şekillenen değişimlerin kabul edilebilir düzeyde olduğu belirlendi. Dördüncü gün nisin ve lizozim'de renk normal iken sitrik ve laktik asitte etin renginde aşırı bir koyulaşma tespit edildi. Denemenin ilerleyen günlerinde (6, 7, 8, 9 ve 10. günler) sitrik asit etin fosforlu bir renk kazanmasına neden olurken diğer kimyasallarda bu tür bir değişikliğe rastlanmadı. Ayrıca yine denemenin ilerleyen günlerinde lizozim'de hissedilebilir bir koku değişikliği gözlendi (Tablo 3).

Tablo 2: Renk değişimi için puanlama testi sonuçları

	Kontrol	FTS	Nisin	Lizozim	Sitrik Asit	Laktik Asit
0.gün	0	0	0	0	0	0
1.gün	0	0	0	0	0	0
2.gün	0	0	0	0	0	0
3.gün	3	3	1	1	1	0
4.gün	3	3	1	1	2	2
5.gün	3	3	1	1	2	2
6.gün	3	3	1	1	3	2
7.gün	3	3	1	1	3	2
8.gün	3	3	1	1	3	2
9.gün	3	3	1	1	3	2
10.gün	3	3	1	1	3	2

Koku değişimini belirlemek için panelistlere Yüzsel İfade Hedonik Skala Testi uygulandı. Panelistlerden ürün hakkındaki düşüncelerini en iyi anlatan yüz ifadesini seçmeleri istendi. Yüzsel İfade Hedonik Skala Testi Şekil 1' de verilmiştir.

Şekil 1: Yüzsel İfade Hedonik Skala Testi



Yüzsel İfade Hedonik Skala Testi sonuçlarının değerlendirilmesi çok kötü (1), kötü (2), orta (3), güzel (4), çok güzel (5) olarak yapıldı. Değerlendirme sonuçları Tablo 3' de belirtilmiştir.

Tablo 3: Yüzsel İfade Hedonik Skala Testi sonuçları

	Kontrol	FTS	Nisin	Lizozim	Sitrik Asit	Laktik Asit
0.gün	3	4	4	3	4	5
1.gün	3	4	4	3	4	5
2.gün	2	3	4	3	4	5
3.gün	2	3	4	2	4	4
4.gün	1	3	4	2	3	4
5.gün	1	2	3	2	3	4
6.gün	1	2	3	2	3	3
7.gün	1	2	3	1	2	3
8.gün	1	1	2	1	2	3
9.gün	1	1	2	1	2	3
10.gün	1	1	2	1	2	3

SONUÇ

Denemelerde 0. günden itibaren logaritmik değerlerde birtakım (artma + veya azalma -) değişiklikler gözlendi (Tablo 4, Tablo 5). Kontrol grubundaki değişiklik 0,5-1,7 log arasında artma şeklinde belirlendi. FTS grubunda 0. ve 1. gün arasında fark gözlenmezken diğer günlerde ise 0,2-1,7 log arasında artış gözlendi. Nisin grubunda da FTS grubu gibi 0. ve 1. günler arasında değişiklik gözlenmezken 2. günden 6. güne kadar 0,7 log azalma, 6. günden 10. güne kadar 0,2-0,6 log düzeyinde artış saptandı. Lizozim grubunda ilk iki gün 0,2 log azalma, 3. günden itibaren 10. güne kadar 0,4-0,6 log arasında bir artma şekillendi. Sitrik asit grubunda ilk gün 0,1 log, 2. günden itibaren 10. güne kadar 0,4 log oranında azalma saptandı. Laktik asit grubunda 0–5. günlerde 0,4 log azalma gözlenirken, 6. günden sonraki tüm günlerde etken saptanamadı (Tablo 4).

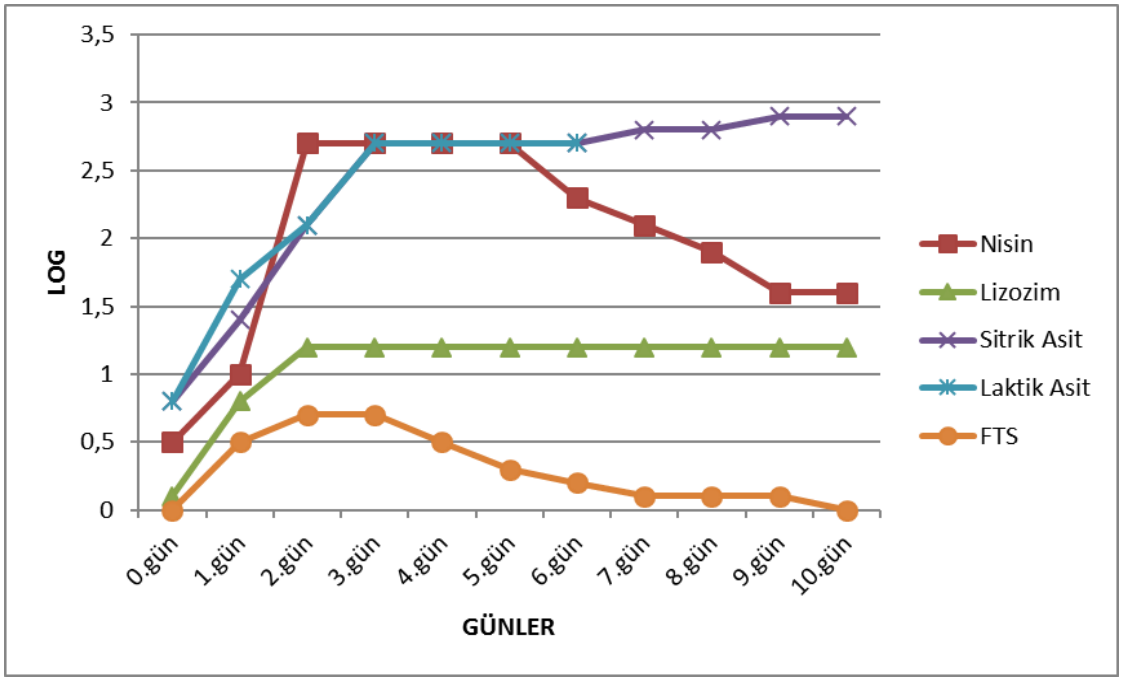
Diğer gruplardaki azalma veya artma değerlerinin kontrol grubuna göre kıyaslamasına bakıldığında (Grafik 1), kontrol ile FTS grubu karşılaştırıldığında FTS grubunda 0 ve 10. günlerde azalma veya artma gözlenmedi. Kontrol grubu ile aynı değer saptandı. Birinci gün 0,5 log, 2. ve 3. günler 0,7 log, 4.gün 0,5 log, 5. gün 0,4 log, 6. gün 0,2 log, 7, 8 ve 9. günlerde 0,1 log azalma sağlandı. Kontrol grubu ile arasında istatistiksel olarak anlamlı bir fark bulunamadı ($p>0,01$). Kontrol ve nisin grupları karşılaştırıldığında 0. gün 0,5 log, 1. gün 1,0 log, 2. gün 2,1 log, 3, 4 ve 5. günler 2,7 log, 6. gün 2,3 log, 7. gün 2,3 log, 8. gün 1,9 log, 9 ve 10. günlerde 1,6 log düzeyinde değişiklik belirlendi. Kontrol grubuna karşılık anlamlı bir fark olduğu saptandı ($p<0,01$). Kontrol ve lizozim grubuna bakıldığında 0. gün 0,1 log, 1. gün 0,8 log, 2 – 10. günlerde 1,2 log azalma gözlendi. Kontrol grubuna karşı anlamlı bir fark olduğu tespit edildi ($p<0,01$). Kontrol ve sitrik asit 0. gün 0,8 log, 1. gün 1,4 log, 2. gün 2,1 log, 3, 4, 5 ve 6. günlerde 2,7 log, 7 ve 8. günlerde 2,7 log, 9 ve 10. Günlerde 2,9 log düzeyinde azalma belirlendi. Kontrol grubuna karşılık anlamlı bir fark oluşturduğu saptandı ($p<0,01$). Kontrol ve laktik asit gruplarının karşılaştırılmasında 0. gün 0,8 log, 1. gün 1,7 log, 2 – 3. günler 2,1 log, 4- 5. günler 2,7 log azalma saptandı. 6. günden itibaren etken saptanamadı. Kontrol grubuna karşılık anlamlı bir fark oluştuğu tespit edildi ($p<0,01$). Günlere göre *L.monocytogenes*' in ilerlemesindeki değişimler Tablo 4' da ve antimikrobiyel maddelerin (FTS – Nisin – Lizozim – Sitrik asit – Laktik asit) kontrol grubuna göre mikrobiyolojik farklılıkları (Log_{10} kob/gr) Tablo 5' da belirtilmiştir.

Tablo 4: Günlere göre *L.monocytogenes*' in ilerlemesindeki değişimler

Gruplar	0.gün	1.gün	***0-1 gün***	2.gün	***0-2 gün***	3.gün	***0-3 gün***	4.gün	***0-4 gün***	5.gün	***0-5 gün***	6.gün	***0-6 gün***	7.gün	***0-7 gün***	8.gün	***0-8 gün***	9.gün	***0-9 gün***	10.gün	***0-10.gün***
Kontrol	7,8	8,3	***+0,5***	8,7	***+0,9***	9,3	***+1,5***	9,3	***+1,5***	9,3	***+1,5***	9,3	***+1,6***	9,4	***+1,6***	9,4	***+1,7***	9,5	***+1,7***	9,5	***+1,7***
FTS	7,8	7,8	-	8,0	***+0,2***	8,6	***+0,8***	8,8	***+1,0***	8,9	***+1,1***	9,1	***+1,3***	9,3	***+1,5***	9,3	***+1,5***	9,4	***+1,6***	9,5	***+1,7***
Nisin	7,3	7,3	-	6,6	***-0,7***	6,6	***-0,7***	6,6	***-0,7***	6,6	***-0,7***	7,0	***-0,3***	7,3	***0***	7,5	***+0,2***	7,9	***+0,6***	7,9	***+0,6***
Lizozim	7,7	7,5	***-0,2***	7,5	***-0,2***	8,1	***+0,4***	8,1	***+0,4***	8,1	***+0,4***	8,1	***+0,4***	8,2	***+0,5***	8,2	***+0,5***	8,3	***+0,6***	8,3	***+0,6***
Sitrik asit	7,0	6,9	***-0,1***	6,6	***-0,4***	6,6	***-0,4***	6,6	***-0,4***	6,6	***-0,4***	6,6	***-0,4***	6,6	***-0,4***	6,6	***-0,4***	6,6	***-0,4***	6,6	***-0,4***
Laktik asit	7,0	6,6	***-0,4***	6,6	***-0,4***	6,6	***-0,4***	6,6	***-0,4***	6,6	***-7,0***	0	***-7,0***	0	***-7,0***	0	***-7,0***	0	***-7,0***	0	***-7,0***

Tablo 5: Antimikrobiyel maddelerin kontrol grubuna göre mikrobiyolojik farklılıkları (Log_{10} kob/gr)

Antimikrobiyel maddelerin kontrol grubuna göre mikrobiyolojik farklılıkları (Log_{10} kob/gr)											
Gruplar	0.gün	1.gün	2.gün	3.gün	4.gün	5.gün	6.gün	7.gün	8.gün	9.gün	10.gün
Kontrol	7,8	8,3	8,7	9,3	9,3	9,3	9,3	9,4	9,4	9,5	9,5
FTS	7,8	7,8	8,0	8,6	8,8	8,9	9,1	9,3	9,3	9,4	9,5
Kontrol-FTS	***-***	***0,5***	***0,7***	***0,7***	***0,5***	***0,4***	***0,2***	***0,1***	***0,1***	***0,1***	***-***
Nisin	7,3	7,3	6,6	6,6	6,6	6,6	7,0	7,3	7,5	7,9	7,9
Kontrol- Nisin	***0,5***	***1,0***	***2,1***	***2,7***	***2,7***	***2,7***	***2,3***	***2,1***	***1,9***	***1,6***	***1,6***
Lizozim	7,7	7,5	7,5	8,1	8,1	8,1	8,1	8,2	8,2	8,3	8,3
Kontrol-Lizozim	***0,1***	***0,8***	***1,2***	***1,2***	***1,2***	***1,2***	***1,2***	***1,2***	***1,2***	***1,2***	***1,2***
Sitrik asit	7,0	6,9	6,6	6,6	6,6	6,6	6,6	6,6	6,6	6,6	6,6
Kontrol-Sitrik Asit	***0,8***	***1,4***	***2,1***	***2,7***	***2,7***	***2,7***	***2,7***	***2,8***	***2,8***	***2,9***	***2,9***
Laktik asit	7,0	6,6	6,6	6,6	6,6	6,6	0	0	0	0	0
Kontrol-Laktik Asit	***0,8***	***1,7***	***2,1***	***2,1***	***2,7***	***2,7***	***9,3***	***9,4***	***9,4***	***9,5***	***9,5***



Grafik 1: *L. monocytogenes*' in günlere göre değişimindeki grafiksel görünümü

Laktik asitle yapılan bir başka dekontaminasyon çalışmasında (94), sığır etlerine 1/9, 1/49 ve 1/99 oranlarında laktik asit ve suyla yıkama işlemi uygulanmış, sonuç olarak 0-14. günler arasında 1/9 ve 1/49'luk solüsyonlarda azalma 1-2 log arasında iken, 1/99 solüsyonundaki azalma ise 2,7-3,4 log arasında değişmiştir. Yapılan bir diğer çalışmada (1), tavuk karkas yüzeyine %0,5, %1, %1,5 ve %2 oranlarında laktik asidin daldırma yöntemi ile dekontaminasyonundan sonra 10, 20 ve 30. dakikalardaki analiz sonuçlarına bakılmış ve *L.monocytogenes* düzeyinde %0,5'lik laktik asit uygulamasının 10, 20 ve 30.dakikalarda sırasıyla 1,24 log, 1,24 log ve 1,30 log, %1'lik laktik asit uygulamasının sırasıyla 1,18 log, 1,23 log ve 0,95 log, %1,5'lik laktik asit uygulamasının sırasıyla 1,53 log, 1,66 log ve 1,77 log ve %2'lik laktik asit uygulamasının ise sırasıyla 1,76 log, 1,70 log ve 1.97 log oranında bir azalma sağladığı gözlemlenmiştir. Yukarıdaki çalışmaların tümünde laktik asitin *L.monocytogenes* üzerine etkili olduğu belirtilmiştir. Çalışmamızda benzer şekilde 0.gün 0,8 log, 1.gün 1,7 log 2-5. günler arası 2,1 log azalma sağlanırken, 6. günden itibaren etken saptanamamış ve laktik asitin dekontaminasyon etkisi bir kez daha kanıtlanmıştır.

Bolder ve ark. (6), laktik asidin %1-2'lik çözeltilerinin kanatlı karkaslarında renk ve tat gibi organoleptik değişikliklere neden olabildiğini, diğer bir çalışmada Pipek ve ark. (21), laktik asit ve buhar uygulamasının kombine olarak kullanılmasının hafif bir renk değişikliğine (koyulaşma), neden olduğu fakat bu değişiklik gözle görülebilir olumsuz bir etkiye neden olmadığını belirtmişlerdir. Çalışmamızda laktik asit anlık etkide gözle görülebilir herhangi bir renk değişikliğine neden olmamış, denemenin 4. gününden itibaren renkte gözle görülebilen bir koyulaşmaya neden olmuştur.

Midgley ve ark. (16), kırmızı etlerde dekontaminasyon amacıyla nisin kullandıkları çalışmalarında nisin ile yıkamada *L.monocytogenes* oranında 2 log bir azalma sağladıklarını belirtmişlerdir. Hampikyan'ın (12), yapmış olduğu bir çalışmada *L.monocytogenes* inoküle edilmiş fermente sucuklarda 100 µg/g nisin kullanımı 15. günde 1,14 log azalma sağlamış, 20. günde ise etkeni tamamen inhibe etmiş, 50 µg/g nisin 20. günde 1,6 log oranında bir azalma sağlarken 25. günde ise etkeni tamamen inhibe etmiştir.

Çalışmamızda nisin uygulanan örneklerde ilk gün *L.monocytogenes* oranında 0,5 log bir azalma 1. ve 2. günlerde sırasıyla 1,0 log, 2,1 log düzeyinde azalma şekillenirken, 3-6. günlerde ise 2,7 log bir azalma gözlenmiştir. Yedinci günden itibaren 1,9 - 2,3 log arasında değişen bir azalma şekillenmiştir. Çalışmalar değerlendirildiğinde nisinin *L.monocytogenes* üzerine olan etkisinin kullanılan doz, gün sayısı ve farklı kimyasallarla kombine olarak kullanımına bağlı olarak değişiklik gösterdiği söylenebilir.

Mangalassary ve ark. (15), hindi salamlarında *L.monocytogenes*'in kontrolü için nisin, lizozim ve kombinasyonlarının kullanımının etkisini araştırmışlardır. Pastörizasyon yapılmadan *L.monocytogenes* üzerine nisin, lizozim ve kombinasyonlarının uygulamasının sonuçları kontrol grubuna benzer bulunmuştur ve *L.monocytogenes* sayısı kontrol grubunda 3,5 log, lizozimde 3,9 log, nisin de 3,8 log ve nisin- lizozim kombinasyonunda 4,2 log olarak saptanmıştır. Araştırmada 65°C'de 32 sn pastörizasyon işlemi sonrası buzdolabı sıcaklığında muhafaza edilen salamlarda 12 hafta sonunda kontrol grubunda sadece 2,4 log düzeyine bir azalma tespit edilirken, pastörizasyon ile birlikte lizozim uygulamasında 8. hafta sonunda 1,9 log azalma gözlenmiş 9. haftadan sonra ise etken izole edilememiştir. Pastörizasyon işlemi ile nisin uygulaması sonucu 0-3. haftalarda 1,7 log oranında azalma meydana gelmiş ve 3. haftadan sonra etken izole edilememiştir. Pastörizasyon işlemi ile nisin ve lizozim kombinasyonunun uygulanması sonucu ilk iki haftada 1,5-2,7 log oranında azalma sağlanırken 3. haftadan itibaren etken izole edilememiştir. Sonuç olarak nisin, lizozim ve kombinasyonlarının salamlarda kullanımının etkisiz olmasına rağmen pastörizasyon işlemi sonucu etkisinin arttığı rapor edilmiştir.

Benzer şekilde, Natress ve ark.(19), lizozimin ticari domuz karkaslarında duyusal özellikler ve mikroflora üzerine etkisini araştırdıkları çalışmalarında ise 6. hafta sonunda lizozimin *L.monocytogenes* üzerine 4,1 log'lık azalma sağladığını bildirmişlerdir.

Çalışmamızda lizozim uygulaması ile 0.gün 0,1 log, 1.gün 0,8 log ve 2.günden itibarende 1,2 log oranında azalma sağlanmıştır. Diğer gruplarla karşılaştırıldığında daha az olmakla beraber çalışmamızda lizozim uygulamasınında belirli ölçüde bakteri sayısında bir düşüşe neden olduğu tespit edilmiştir.

Min ve ark. (17), domuz ve sığır karkaslarlarında mikrobiyel kontrol amacıyla sitrik asit kullanmışlar başlangıç yükü 10^7 log olan numunelerin uygulama sonrası yüklerini 10^3 olarak belirlemişlerdir. Kanatlı etlerinde *L. monocytogenes* gelişimini engellemek amacıyla yapılan bir çalışmada (22), %0,27 ve %0,09 sitrik asit kullanımının *L. monocytogenes*' in gelişme, gerileme ve duraklama dönemlerinde ortalama 1,11 log azalma sağladığı saptanmıştır.

Çalışmamızda sitrik asit ile 0. gün *L.monocytogenes* sayısında 0,8 log, 2. gün 1,4 log, 3.gün 2,1 log oranında bir azalma ve 3.günden itibaren ise 2,7 log düzeyinde bir azalma sağlanmıştır. Özet olarak çalışmamızda kullanılan kimyasallar arasında *L.monocytogenes* üzerine en etkilisi laktik asit ve sitrik asit olarak belirlenmiştir. Yapılan diğer çalışmalarda da en etkili kimyasal maddenin laktik asit olduğu belirtilmiştir. Laktik asit dışında sitrik asit ve asetik asit gibi organik asitlerde dekontaminasyonda önemli yer bulmaktadırlar. Sitrik asit kullanımının gıda maddelerinde renk değişimine neden olması bir dezavantaj olarak belirtilebilir. Nisin ve lizozimin bakteriler üzerine olan dekontaminasyon etkisinin incelendiği bazı çalışmalarda bu maddelerin etkili olduğu bildirilmişken, bazı çalışmalarda ise çalışmamızda belirtildiği gibi *L.monocytogenes* üzerine fazla etkisinin olmadığı rapor edilmiştir. Bu farkın nisin ve lizozimin farklı kimyasallarla veya kendi aralarında kombine olarak kullanımından kaynaklanabileceği düşünülmektedir (13, 15).

Çalışmamızda laktik asit anlık etkide ette herhangi bir renk değişikliğine neden olmazken

lizozim, sitrik asit ve nisin etin renginde çok hafif açılmalara neden olmuştur. Çalışmanın ilerleyen günlerinde bu renk değişimi laktik asitte koyulaşma halini almıştır. Sitrik asit etin fosforlu bir hal almasına neden olmuştur. Ayrıca yine denemenin ilerleyen günlerinde lizozim'de hissedilebilir bir koku değişikliği gözlenmiştir. Yapılan farklı çalışmalarda (7, 14), laktik asitin %2 ve üzerindeki oranlarda ve uzun süreli muamele edilmesi sonucu renk değişimlerine neden olduğu fakat bu renk değişiminin kabul edilebilir düzeyde olduğu bildirilmektedir.

SONUÇ

Sonuç olarak günümüzde tüketici sağlığını tehdit eden patojen mikroorganizmaları inhibe etmek için, özellikle insan sağlığına zarar vermeyen, antimikrobiyel etkili katkı maddelerinin kullanımı yaygınlaşmaktadır. Son yıllarda antimikrobiyel etkileri nedeni ile nisin, laktik asit, sitrik asit ve lizozim, et ve et ürünleri, süt ve süt ürünleri, sebzeler ve çeşitli gıda maddelerinde kullanılan, birçok ülke tarafından onaylanmış güvenilir katkı maddeleri olarak kabul edilen ve gıda sektöründe kullanım alanı giderek artan katkı maddeleri arasında yer almaktadır. *L.monocytogenes* çeşitli gıda maddelerinde bulunabilen ve insan sağlığı açısından risk oluşturabilen bir patojendir. Tüketicinin artan endişelerinden dolayı gıda dekontaminasyonunda özellikle insan sağlığına zarar vermeyen antimikrobiyel maddelerin kullanımın önemi gün geçtikçe artmaktadır. Bu çalışma ile de bir kez daha dekontaminasyon amacıyla kullanılan maddeler içerisinde laktik asitin en etkili organik asit olduğu kanıtlanmış oldu. Kullanılan maddeler etki derecelerine göre laktik asit, sitrik asit, nisin ve lizozim şekilde sıralanabilir,. Kullanılan kimyasalların olumsuz duyusal etkilerinin bertaraf edilebilmesi amacıyla daha düşük konsantrasyonları denemeye yönelik araştırmalar yapılması gerekmektedir.

KAYNAKÇA

1.Anang, D.M., Rusul, G. Jamilah Bakar, Foo H. Ling. (2007). Effects of Lactic And Lauricidin on the Survival of *L.monocytogenes*, *Salmonella Enteritidis* and *Escherichia Coli* O157:H7 in Chicken Breast Stored at 4°C. Food Cont. 18. 961-969.

2.Arda, M. (1997). Listeria ve Listeria Enfeksiyonları. İçinde: Arda M. (Ed.), Özel Mikrobiyoloji. Ankara. Medisan Yayınevi. 147-162.

3.Arslan, A. (2002). Et muayenesi ve Et Ürünleri Teknolojisi. Medisan Yayıncılık. Elazığ.

4.Aymerich, T., Picouet, P.A., Monfort, J.M. (2008). Decontamination technologies for meat products. Meat Sci. 78. 114-129.

5.Berktaş, M., Bozkurt, E.N., Bozkurt, H., Alişarlı, M., Güdücüoğlu, H. (2006). Et ve et ürünlerinde *Listeria monocytogenes*'in izolasyonu. Van Tıp Derg. (2), 36-41.

6.Bolder, N.M. (1997). Decontamination of meat and poultry carcasses. Tren. Food Sci. & Tech.Vol.8. 221-227.

7.Boukhari, E., Al Mazrou, A., Al Zamil, F., Al Kilani, R. (1999). *L.monocytogenes* bacteremia and meningitis in a Saudi newborn. Annals of Saudi Medicine. 19(6). 539-540.

8.Ekici, L.: Telli, R. ve Yetim, H. (2008). Gıda kaynaklı enfeksiyon ve intoksikasyon bakterileri-I. Gıda Tekno. Elekt. Derg. (2) 29-42.

9.Güneş, E. (2000). Bakteriosinler ve Genel özellikleri. Tarım İl Müdürlüğü. Ankara. 2000.

10. Güneş, E., Çıbık, R. (2002). Deneysel olarak kontamine edilmis İnegöl köftelerde Antimikrobiyel bir protein olan nisinin *L.monocytogenes* üzerine inhibe edici etkisi. FEMS Symposium on The Versality of *Listeria* spp. October 10-11, İzmir.

11. Gürbüz, Ü. (2009). Mezbaha Bilgisi ve Pratik Et Muayenesi. Selçuk Üniversitesi Basımevi.
Konya. s.2.
12. Hampikyan, H. (2006). Fermente sucuklarda nisin kullanımının *L.monocytogenes* üzerine etkileri. İ.Ü. Sağ. Bil. Enst. Doktora Tezi, İstanbul.
13. İnal T. (1992).Besin Hijyeni. Hayvansal Gıdaların Saglık Kontrolü. Final Ofset. İstanbul.
14. Ma, L., Zhang, G. and Doyle, M.P., Development of a DNA mıcroarray chıp for ıdentification of *listeria* species, partıal serotypıng and assessment of the vırulence potentıal of *Listeria monocytogenes* ısolates. 2003.
15. Mangalassary, S., Han, I., Rieck, J., Acton, J., Dawson, P. (2008). Effect of combining nisin and/or lysozyme with in-package pasteurization for control of *L. monocytogenes* in ready-to-eat Türkiye bologna during refrigerated storage, Food Mic., 25, 866-870.
16. Midgley, J. and Alison, S. (2006). Review of new and emerging technologies for red meat. Food Sci., Australia Pages:1-73.
17. Min, J.S., Lee, S.O., Jang, A., Jo, C., Lee, M., Irradiation and organic acid treatment for microbial control and the production of biogenic amines in beef and pork, Food Chem., 104, 791-799, 2007.
18. Müller, H.E. (1988). Listeriosis in animals. (Turkısh J. of Infection). 2(4): 505-519.
19. Nattress, M. F., Baker, L.P. (2003). Effects of treatment with lysozyme and nisin on the microflora and sensory properties of commercial pork, Int. J. Food Micro. 85, 259-267.
20. Ova, G., Koruyucular. İçinde Altug, T. (Ed.), Gıda Katkı Maddeleri. İzmir: Meta Basım; 107-142, 2001.
21. Pipek, P., Sikulova, M., Jelenikova, J., Izumimoto, M. (2005). Colour changes after carcasses decontamination by steam and lactic acid, Meat Sci., 69, 673-680.
22. Rio, D.E., Caso, B.G., Prieto, M., Alonso-Calleja, C., Capita, R. (2008). Effect of poultry decontaminants concentration on growth kinetics for pathogenic and spoilage bacteria, Food Mic., 25, 888-894.
23. Seeliger, H. P. R. (1998). “Listeriosis-History and Actual Developments”, Infection 16, Suppl. 2, 80-84
24. Työppönen, S., Markkula, A., Petaja, E., Suihko, M.L., Mattila-Sandholm, T. (2003). Survival of *L. monocytogenes* in North European type dry sausages fermented by bioprotective meat starter cultures. Food Cont., 14, 181-185.

STORAGE CAPABILITY OF A BEVERAGE BASED ON UNCLARIFIED CHEESE WHEY FROM KHAINAK'S MILK

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ABSTRACT
The article presents: characteristics of hainak - a hybrid of a yak with cattle; substantiation of the possibility of using hainak milk living in Kyrgyzstan to create functional dairy products; introduction of non-waste production into the dairy industry. A recipe has been developed and a new functional drink based on non-clarified cheese whey from Khainak milk has been tested. The changes during storage of whey drink in organoleptic and microbiological parameters were studied. The shelf life of the new drink has been set.

Keywords: yaks, hybridization, khainak milk, cheese whey from khainak milk, whey proteins, waste-free technology, whey drinks, beverage storage capacity, microbiological parameters.

Currently, there is a continuous search for the creation of new food products, through the use of resource-saving technology for the processing of dairy raw materials. The consumer seeks to consume healthy, functional foods. This term refers to food products containing ingredients that increase resistance to diseases, can improve many physiological processes in the human body, allowing for a long time to maintain an active lifestyle. These products are intended for a wide range of consumers, have the form of ordinary food and can be consumed, on a regular basis, as part of a balanced diet [1].

Currently, there is a sharp increase in the number of diseases associated with malnutrition in the Kyrgyz Republic: an excess of trans fats, fast carbohydrates and salt, as well as a sedentary lifestyle. For the prevention of diseases, the population needs to use functional products containing various natural supplements of plant origin.

An important factor is the ecological situation in the region. Dairy industry enterprises

in the Kyrgyz Republic are sources of air and hydrosphere pollution by products of their activities: gas and smoke emissions, insufficiently treated wastewater. At a dairy enterprise, whey is practically not processed and is discharged into the sewer, thus polluting the ecosystem [2].

One of the ways to solve these problems is a more complete and rational use of a biologically valuable product - whey through the creation of functional foods on its basis.

The introduction of resource-saving technology for the processing of dairy raw materials is of great social importance, because environmental protection is ensured, all components of milk and dairy products are used for food purposes, which will improve the health of various categories of the population. The quality of food products largely depends on the ecological situation in the region. In recent years, non-traditional types of raw materials have been widely used: milk of yaks and its hybrids (khainak). Of all the productive animals, the yak and hainak occupy the uppermost tier of mountain pastures. In a clean environment, they provide environmentally friendly raw materials and products.

Hybrids of yak and cattle - hainaki - are large, strongly built animals and in appearance combine the features of both parental forms. In their way of life, they are more reminiscent of yaks; with them, they easily graze on mountain pastures, do not require special care from humans. But, unlike yaks, they withstand a warmer climate (30-32 ºC), survive in a wider range of mountain zones from 2000 to 5000 m above sea level, and are not limited to alpine zones. As a result, their distribution area is very wide [3]. Yak hybrid milk is an environmentally friendly raw material, and complete waste-free processing and production of eco-products from such raw materials are relevant [3].



Fig.1 Hainak. Issyk-Kul region (photo by Elemanova R.Sh.)

Today, the task of developing an affordable method for processing cheese whey in order to use its biopotential in the technology of valuable functional products is no less urgent. Cheese whey is a valuable composition of biologically active substances that have passed into it from milk during the production of cheese. More than 200 compounds have been identified in whey, in general, the degree of transition of whole milk solids into whey is about 50%, while milk sugar (96%) and minerals (96%) are almost completely transferred, the average degree of protein transition is 24.3 %, fat - 5.5% [4]. When creating such products, it is promising to use biologically active additives of plant origin, in particular, apricot and sea buckthorn juices.

It seems promising to design whey products, taking into account the biopotential of apricot fruits and sea buckthorn berries, which have a valuable chemical composition and are widely grown in the mountainous regions of the republic. These berries are distinguished by a

high content of vitamins, organic acids, flavonoids and a wide range of macro- and microelements. Sea buckthorn fruits are also characterized by a significant content of carotenoids: beta-carotene (in 100 g - 90.5 mg% of the daily norm) and lycopene (respectively - 80 mg%); xanthophylls: lutein and its isomer zeaxanthin (86 mg%); tocopherols: alpha-tocopherol (33.1 mg%) and gamma-tocopherol (29.3 mg%); ascorbic acid (22 mg%) [5].

Apricot juice contains antioxidants that help the body get rid of toxins and eliminate free radicals, which slows down the aging process. It contains pectin substances that play an important role in the prevention of various diseases. They have jelly-forming and protective properties, promote the excretion of radionuclides and carcinogens from the body [6].

Department of food technology NIHTI KSTU. I. Razzakov, work began on the study of the composition and technological properties of hainak milk in order to organize its complex processing, including whey. There are very few studies on the composition and properties of cheese whey obtained from Khaynak milk, and practically none for Kyrgyz Khaynak milk. We have evaluated cheese whey from khainak milk that lives in the mountainous regions of the Kyrgyz Republic. Whey obtained during the production of cheese "Suluguni" by the thermoacid method in the dairy shop of the UPC "Tekhnolog" at KSTU named after A.I. I. Razzakova, has high sensory performance (table 1).

Таблица 1 – Comparative organoleptic characteristics of various types of cheese whey

№	Name of indicator	Characteristics of cheese whey	
		from cow milk	from Hainak milk
1	Appearance and texture	Homogeneous transparent or translucent liquid, with a slight protein precipitate	Homogeneous transparent liquid
2	Color	Light yellow to pale green	Clear to light yellow
3	Taste and smell	Pronounced whey sweetish aftertaste	Sweetish with a slight nut-whey flavor
		Free from foreign tastes and odors	

The drink obtained by the proposed method from a mixture of nectars and whey has a refreshing effect, imparts the aroma of fillers, has a rich orange color and a pleasant aftertaste.

To obtain 100 liters of drink from collections-measuring tanks, 80 liters of fat-free non-clarified whey, 10 liters of apricot juice and 10 liters of sea buckthorn juice enter the mixer. The resulting mixture is stirred and pasteurized at a temperature of 72 ± 2 °C, with an exposure of 15-20 seconds, cooled to a temperature of 23 ± 27 °C and poured into a container.

The introduction of a new drink was carried out in the dairy shop of the UOC "Tekhnolog" at KSTU. I. Razzakova. As a result of the storageability study, the following quality indicators of experimental and control samples stored at a temperature of 4 ± 2 ° C were determined and are listed in Table 2.

Таблица 2 - The results of determining the storage capacity of microbiological indicators of a drink based on non-clarified cheese whey

№	Defined indicators	Regulations	Permissible levels (Technical regulation of the Customs Union 021/2011)	Analysis results	
				11.08.2021	21.08.2021
1	the number of mesophilic aerobic and facultative anaerobic microorganisms, CFU/g	GOST 10444.15-94	2×10^5	2×10^3	4×10^4
2	coli group bacteria	GOST 31747-2012	0,1	not detected	not detected
3	Pathogenic microflora including salmonella in 25,0 g	GOST 31659-2012	25	not detected	not detected
4	St.aureus в 1,0 g	GOST 31746-2012	0,1	not detected	not detected
5	Listeria monocytogenes в 25,0 g	GOST 32031-2012	-	not detected	not detected
6	Yeast (no more than 100 CFU/g)	GOST 33566-2015	100	36,0	41,0
7	Mold (no more than 50 CFU/g)	GOST 33566-2015	50	22,0	30,0

The resulting drink has fairly high organoleptic characteristics, which did not change during storage for 10 days (Table 3).

Таблица 3 - Organoleptic assessment of the drink within 10 days

Organoleptic indicators	Характеристика сывороточного напитка		
	1 day	5 day	10 day
Appearance and texture	Homogeneous liquid with evenly distributed fruit pulp throughout the drink	Homogeneous liquid with evenly distributed fruit pulp throughout the drink	Homogeneous liquid with evenly distributed fruit pulp throughout the drink, but slight stratification is observed
Taste and smell	Pronounced taste and smell of fruit fillers, light whey aftertaste	Pronounced taste and smell of fruit fillers, light whey aftertaste	Intense taste and smell of fruit fillers, light whey aftertaste
Color	Bright orange, uniform throughout	Intense orange, uniform throughout	Orange, homogeneous throughout the mass

The obtained results indicate that the microbiological parameters are normal. The shelf life of the finished product can be 10 days.

To improve the storage capacity, taste and increase the nutritional and biological value of whole cheese whey, pasteurization and the introduction of fillers - natural juices (nectars) are used.

The effectiveness of the experimental technology has been proven by its positive approbation in the production conditions of the training and production workshop "Technologist" of the Scientific Chemical-Technological Institute at the Kyrgyz State University. I. Razzakova, Normative documentation (drafts) has been developed for a new functional product: Process condition (TP) 10.51.56-001-27730672-2022 and Technological instruction (TI) for the production of a drink based on non-clarified cheese whey from hainak milk [7].

The proposed conditions for obtaining a drink based on non-clarified cheese whey make it possible to increase its shelf life without changing organoleptic characteristics.

The method allows to obtain a functional product with high biological and nutritional value, low cost, good organoleptic qualities. And it can be produced as a tonic, therapeutic and preventive and soft drinks for a wide range of consumers, which allows it to be included in the consumer market segment.

The conducted studies prove that the breeding of hybrids of yaks with cattle, called haynaks in Kyrgyzstan, is of particular interest from the point of view of the economy of mountainous regions and the country as a whole. Hainak breeding can become a promising branch of animal husbandry, capable of providing valuable environmentally friendly food raw materials. The introduction of raw materials processing technology for the production of environmentally friendly and high-quality products seems to be relevant and promising. Integrated processing of non-traditional dairy raw materials will make it possible to fill the protein deficiency, improve the ecological situation in the region and improve the health of the population.

REFERENCE

1. Lapteva, A.P. Production of beverages based on milk whey with fillers // Modern science-intensive technologies. - 2013. - No. 9. - P. 18-19
2. Dyusheeva, N.S. Production of functional products based on the whey of Hainak milk [Text] / N.S. Dyusheeva // Izvestiya KSTU im. I. Razzakova - 2020. - No. 55. - P. 275-280
3. Cai, L. Sichuan Yak [Text] / L. Cai. – Chengdu: Sichuan Ethnic Press, 1989.
4. Batkibekova, M.B., Muslimova M.M., Innovations in the production of dairy products [Text] / M.B. Batkibekova, M. M. Muslimova // Izvestiya KSTU im. I Razzakov - 2017. - No. 43. - P.52-58.
5. Ranjit, A., Sarin Kumar, K., Venugopalan, B.B., Arumughan, C. et al. Fatty acids, tokols and carotenoids in pulp oil of three sea buckthorn species (Hippophae rhamnoides, H. salicifolia and H. tibetana) grown in the Himalayas of India // JAOCS J. Am. Oil Chem. Soc. – 2006. – V. 83. – P. 359-364.
6. Huseynova, B.M., Daudova, T.I. Influence of varietal characteristics and natural factors of apricot growing zones on the biochemical complex of their fruits / B.M. Huseynova, T. I. Daudova [Text] // Bulletin of NGAU - 2018. - No. 3 (48). - P.7-16.
7. TU 10.51.56-001-27730672-2022 Drink based on non-clarified cheese whey from khainak milk

DNA BARCODES FOR INSECTS

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ABSTRACT
The identification and naming of species, that is, the determination of biological diversity, the understanding of parasitoid-host complexes, the definition of ecological problems, and the answers to evolutionary and biogeographic questions constitute the first step of the studies. The traditional identification system, which distinguishes largely with the help of keys based on morphological characters, is still widely used today. Although this system seems to be an advantageous method in terms of cost, time, and labor, it has some serious disadvantages and limitations. These include: (i) phenotypic variability due to local adaptation can lead to misdiagnosis, (ii) cryptic species cannot be identified, (iii) only applicable to a certain life stage (usually adult individuals), (iv) different keys are often used for different sexes. (v) the morphological characteristics of the individual to be diagnosed (such as color, anatomy, and feathers), (vi) the limited power of morphological characters to reflect the evolutionary story of the taxon, and finally (vii) the need for experts for the correct diagnosis of the species. The first step in applying next-generation approaches to empirically delineating species boundaries requires having an informative DNA segment sequence, namely the **'molecular operational taxonomic unit'** (MOTU). In other words, sequence information, which is defined as barcoding today, can be used for this purpose. Barcoding first emerged as microgenomic diagnostic approach and has been used for some groups of microorganisms for which diagnosis based on morphological characteristics is difficult and/or impossible. Later, a similar approach was proposed for the identification of highly organized species and was named the **DNA barcoding** system. Today, DNA barcoding is a fast and reliable tool for researchers, in addition to being able to automate species-level identification using short and standard gene regions. This system also continues to work towards creating reference libraries containing standard DNA sequences of all organisms.

Keywords: DNA barcoding, insects, species delimitation

INTRODUCTION
Insects are the most diverse creatures on earth, evolving in a tremendously diverse range of forms. Insects are the group with the most widespread and the highest number of species among living things, with a history of 400 million years since the Late Silurian in the three billion-year life span on Earth (Grimaldi and Engel, 2005). Insects with the most species in the world are thought to be key to understanding evolutionary relationships and the evolution of life (Trautwein et al., 2012). With approximately one million species known today, insects are distributed in a wide variety of areas from the poles to the equator, from wetlands to mountain peaks. The total number of species is estimated to be between two and a half million and ten million (Grimaldi and Engel, 2005). It took taxonomists almost 200 years to describe only 10% of the species, and there are still many insect species waiting to be described (Jalali et al. 2015). Species identification is an essential part of recognizing and describing biodiversity. Therefore, insects have been the groups that molecular phylogeny has dealt with the most.

'Defining the species category', which is the first step in the studies of detecting the diversity existing in nature, is an important field in systematic biology where there are hot debates. Accurate and reliable identification and delimitation of species remains the most basic requirement for many areas of evolutionary biology, particularly systematics, biogeography and conservation biology. The concept of biodiversity is discussed at species, ecosystem and genetic diversity levels (McNeely et al. 1990).

The systematic, which deals with biological diversity, enables us to recognize and describe the organisms in our environment, to classify them, to compare them with other similar groups and to understand their evolutionary kinship relations with each other. The organization of biological diversity is taxonomy, and the evolutionary history of a taxon forms its phylogeny (Pektas, 2015). The empirical classification system, the foundation of which was laid with Aristotle, has turned into a hierarchical, predictive and modern classification system with Linne's work (Minelli and Contrafatto, 2009). The studies of Fabricius, especially in the 18th century, form the basis of the insect systematics we use today (Tuxen, 1986).

Supporting and discussing taxonomy studies based on morphological comparisons with the development of molecular biology, as well as DNA information, has brought new perspectives for the classification system. With the discovery of DNA structure (Watson and Crick, 1953), and the discovery of mitochondrial DNA (Nass and Nass, 1968), phylogeny inferences supported by molecular biology began to be made and the field we call molecular phylogeny emerged. Today, current systematic problems are tried to be overcome by using DNA-based methods through advances in this field (Avise, 1994).

A "**biological unit**" is defined by **Taxonomic Identification** (morphological characters, breeding, biology, host plants etc.) and **Molecular Identification** (DNA/RNA nucleotide data, protein analysis).

The identification and naming of species, that is, the determination of biological diversity, the understanding of parasitoid-host complexes, the definition of ecological problems, and the answers to evolutionary and biogeographic questions constitute the first step of the studies. The traditional identification system, which distinguishes largely with the help of keys based on morphological characters, is still widely used today. Although this system seems to be an advantageous method in terms of cost, time and labor, it has some serious disadvantages and limitations.

Disadvantages and limitations:

- phenotypic variability due to local adaptation may lead to misdiagnosis,
- inability to identify cryptic species,
- applicable only to a certain life stage (usually adult individuals),
- the necessity of using different keys for different sexes,
- preserving the morphological characteristics of the individual to be diagnosed (such as color, anatomy and feathers),
- limited power of morphological characters to reflect the evolutionary story of the taxon,
- and finally the need for specialists for the correct diagnosis of the species.

Therefore, the method that can be used against all these limitations is molecular markers, which are the basis of molecular identification. Use of DNA/RNA and protein sequence data, sequence comparisons to identify individuals or species, construct phylogenetic trees, and other available tools. Both mtDNA (mitochondrial DNA) and rDNA (ribosomal DNA) are species specific and can be used as molecular markers for species identification.

DNA Barcoding

DNA Barcoding is based on premise that a **short standardized sequence can distinguish individuals** of a specie because genetic variation between specie exceeds that within specie. The premise of DNA barcoding is that a single sequence can be used to uniquely identify an organism with other species, as used by a supermarket scanner, when compared to a reference library of such DNA segments. DNA barcoding is a standardized approach to identifying plants and animals by minimal sequences of DNA, called DNA barcodes. And it is used to compare with traditional taxonomy whenever possible or in an effort to set species boundaries.

The most important advantages of performing a genetically based barcoding study are,

- Deformed/broken samples can be used
- DNA from fossilized specimens can be used
- Identification of immature stages or possible latent stages (egg, nymph, larva,)
- Fast and impartial
- Trustworthy

Different gene regions are used to identify different groups of organisms using barcoding. For animals and some, the most commonly used barcode region is the mitochondrial DNA cytochrome c oxidase I (COI or *cox*-1) gene. They are rRNA genes for prokaryotes and rbcL and matK genes for plants.

Because the mitochondrial genome lacks an intron, exhibits limited haploid recombination and has maternal inheritance, it is more preferred in DNA barcoding studies compared to the nuclear genome. Also, there are several mitochondria in each cell and relatively abundant DNA copies in each mitochondria (1 to 1000 copies). Therefore, even if the tissue sample to be studied is limited, it is possible to obtain sufficient mitochondrial DNA for a successful PCR (Hebert et al. 2003; Blaxter 2004). Among the thirteen protein-coding genes found in the animal mitochondrial genome, the COI gene has been proposed as an ideal barcode marker for two reasons (Hebert et al. 2003). The first is that the universal primers of the COI gene are quite stable, and the second is that the nucleotide substitution rate is high enough to distinguish closely related species and different populations of the same species. The COI gene can be used to identify individuals of the same species as well as to distinguish individuals from different species.

This is because of the rate at which the gene sequence changes within evolution. This rate is slow enough in the same species but fast enough for differentiation between different species. An ideal barcode marker should also be easy to amplify and align. Therefore, the COI gene is also very suitable in this respect.

Methodology

1-Sampling and protection:

Barcoding can be done from tissue from a target sample, a mixture of organisms (bulk sample), or DNA found in environmental samples (eg water or soil). Methods of sampling, preservation or analysis differ between these different types of samples. These can be tissue samples, bulk samples (aquatic macroinvertebrate sample or insect samples collected by pheromone trap) or environmental samples (eDNA samples).

2- DNA extraction, amplification and sequencing

DNA barcoding requires the DNA in the sample to be extracted. Several different DNA extraction methods are available, and factors such as cost, time, sample type and yield influence the selection of the optimum method. Amplification of the extracted DNA is a necessary step

in DNA barcoding. Typically, only a small fraction of the total DNA material is sequenced (typically 400–800 base pairs) to obtain the DNA barcode. For the COI gene region, generally universal, Folmer primers, primers for the cox1 barcode region LCO1490:5'-GGTCAACAAATCATAAAGATATTGG-3', HC02198:5'-TAAACTTCAGGGTGAC-CAAAAAAATCA-3' are used.

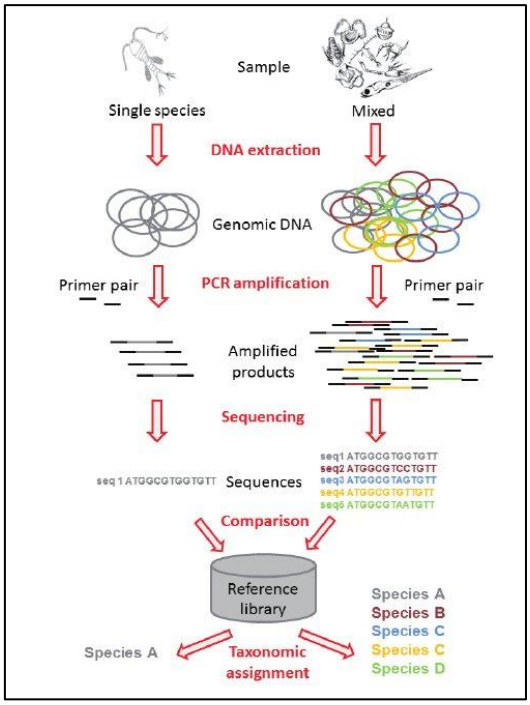

Figure 1 Illustration of DNA barcoding (left) and metabarcoding (right) steps (Corell, 2014)

DNA barcoding also has several disadvantages. The absence of relevant species data in reference barcode libraries or the presence of incorrectly defined data limits the identification of species. In addition, DNA isolation and PCR steps of samples that are not stored under appropriate conditions can be problematic. Finally, nuclear pseudogenes very similar to the barcode sequences found in the mitochondrial genome or 'heteroplasmy', which is defined as the presence of more than one mitochondrial haplotype in a single individual, can be counted as limiting factors for DNA barcoding.

DNA Barcoding in Insects

While morphological data are often time consuming and require specialists, DNA barcoding techniques are a uniform and practical method of identifying insect species and can be used to describe all developmental stages of insects, their food webs and biotypes, which may not be possible with morphology-based taxonomy.

Rapid and accurate identification of invasive species, which are important threats to biodiversity, is very important in terms of biosecurity. Diagnostic studies using DNA barcoding approach have provided better solutions compared to other molecular techniques in terms of identifying new species and monitoring existing harmful species.It is believed that the DNA barcoding technique can reliably resolve ecological and evolutionary links in insect-host plant relationships.

The fact that species close to each other and even different genotypes of the same species differ in terms of insecticide resistance has brought a different perspective to the fight against harmful species complexes. Two cryptic species of Bemicia tabaci, Mediterranean and Middle East-Asia Minor 1 (MEAM 1) populations, differed in sensitivity to insecticides. It has been demonstrated that these two cryptic whitefly species can be easily separated by primers

developed using the COI barcode sequence (Shatters et al. 2009, Yatkın & Guz, 2018).
In addition, DNA barcoding studies with flies are important, especially in determining the vector-disease relationship. Mosquitoes are insects commonly found in tropical and temperate regions. The biodiversity of its species is extensive, often geographically structured, and highly adaptable to environments. About 3600 species have been described. The importance of mosquitoes as vectors of disease-causing pathogens (parasites and viruses) highlights the importance of precise and comparable taxon identification methods across their species. PCR has been used to identify mosquito species since the early 1990s.

CONCLUSION

As a result, in addition to species diversity and biological protection, identification of known species quickly and inexpensively, species identification from plant leaves even when there is no flower or fruit, identification of insect larvae (e.g., there are ten different species of skipper butterfly determined by barcoding), according to stomach content. DNA barcoding can be used in areas such as determining an animal's diet, identifying products in trade (eg herbal supplements, wood or leathers), customs control, forensic events, forestry and education.
It is a fact that DNA barcoding method will accelerate the work of taxonomists and related experts, especially within the scope of species identification. Despite some of its limitations, the success of DNA barcoding in distinguishing studied samples species or other taxa, and especially in the emergence of cryptic species, is significant. It is envisioned that DNA barcoding will become a standard identification protocol for a variety of organisms. Finally, DNA barcoding may be part of agricultural pest management programs, not just taxonomic studies.

REFERENCES

Avise J.C. (1994). Molecular Markers, Natural History and Evolution. Chapman and Hall, New York. 511p.

Blaxter M. L. (2004). The promise of a DNA taxonomy. *Philosophical transactions of the Royal Society of London. Series B, Biological sciences*, *359*(1444), 669–679.

Corell J. (2014). Tuning of protocols and marker selection to evaluate the diversity of zooplankton using metabarcoding. Revista De Investigación Marina.

Grimaldi D. and Engel, M.S. (2005). Evolution of the insects. Cambridge University Press,pp 755p.

Hebert P.D.N., Cywinska, A., Ball, S.L., deWaard, J.R. (2003). Biological identifications through DNA barcodes. Proc R Soc Lond B Biol Sci. 270: 313-321.

Jalali S., Ojha, R., Venkatesan, T. (2015). DNA Barcoding for Identification of Agriculturally Important Insects. In: Chakravarthy, A. (eds) New Horizons in Insect Science: Towards Sustainable Pest Management. Springer, New Delhi.

McNeely J.A., Miller, K.R., Reid, W.V., Mittermeier, Werner, T.B. (1990) Conserving the World's Biological Diversity. IUCN, Gland, Switzerland.

Minelli A., and Contrafatto G. (2009).Biological Science Fundamentals and Systematics, EOLSS Publishers Co Ltd, 472p.

Pektas A. (2015). Using the molecular marker cytochrome oxidase 1 (*cox1*) to identify the taxanomic position of genus Accanthopus Dejean, 1821 (Tenebrionidae; Helopini). MSc. thesis, 27pp.

Shatters, R. G., Jr, Powell, C. A., Boykin, L. M., Liansheng, H., & McKenzie, C. L. (2009).

Improved DNA barcoding method for Bemisia tabaci and related Aleyrodidae: development of universal and Bemisia tabaci biotype-specific mitochondrial cytochrome c oxidase I polymerase chain reaction primers. *Journal of economic entomology*, *102*(2), 750–758.

Trautwein M. D., Wiegmann, B. M., Beutel, R., Kjer, K. M., & Yeates, D. K. (2012). Advances in insect phylogeny at the dawn of the postgenomic era. *Annual review of entomology*, *57*, 449–468.

Tuxen S. L. (1986). Protura (Insecta). Fauna of New Zealand 9, 52 pp.

Yatkın, G. and Güz, N. (2018). The Use of DNA Barcoding in Entomology. (YYU J AGR SCI), 28(1): 126-134.

GENETIC DIVERSITY IN THE MITOGENOME OF ENDANGERED VAQUITA DOLPHIN (*Phocoena sinus*)

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ABSTRACT

Vaquita dolphin (*Phocoena sinus*) is the one of marine mammal species with the conservation status of critically endangered. This species can be found at Mexico's Gulf of California, USA. This study was aimed to observed the genetic diversity in the mitogenome (16,319 bp) of Vaquita based on the GenBank database. Three molecular softwares of BioEdit, MEGA-X and DNAsp were used in this study for the sequence analysis. Research showed that seven-teen (17) mutation sites were detected in the thirteen (13) mitogenome of Vaquitas. These mutation were detected at tRNA (1 mutation), rRNA (3 mutations), ND2 (1 mutation), ATP6 (1 mutation), ND4L (2 mutations), ND4 (2 mutations), ND6 (4 mutations) and D-loop (3 mutations). The haplotype diversity (H_d) in the animal studies was 0.91 (high category). Hence, total nine (9) haploypes (Hap.) were determined in the animal studies with the Pairwise genetic distance between 0.0001 to 0.0006. According to the Neighbor-joining tree, the Vaquita in this study can be clustered into Haplogroup A (Hap.2, Hap.3, Hap.4, Hap.5, Hap.7 & Hap.8) and Haplogroup B (Hap.1, Hap.6 & 9). In addition, the highest haplotype frequency in the animal studies was observed in Hap.9 (4 animals) and followed by Hap.1 (2 animals). Meanwhile, each another haplotype consisted of 1 animal. The Neutrality test of Fu's Fs statistics and Tajima's D value were -2.509 and -1.159, respectively. A negative value in the Neutrality test indicated that low nucleotide variation in the species population was caused by species expansion. It can be concluded that the mutation site in the mitogenome of Vaquita in the present study included of low and may be caused by the inbreeding.

Keywords: GenBank, Haplotype, Mitogenome, Mutation site, Vaquita

GENITO-GENITAL RUBBING AND GROOMING IN RELATION TO ALLOMOTHERING IN A GROUP OF FEMALE CAPTIVE BONOBOS

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ABSTRACT

Bonobos (*Pan paniscus*) live in female dominant groups, composed of more females than males, and with the relationship between mothers as central to the group dynamics. While allomothering (i.e., offspring care by others excluding the mother) has been documented in a variety of species, it has not been well studied in the bonobos. Therefore, the purpose of this study was to explore the relationship between grooming, Genito-Genital (GG) rubbing and allomothering in a group of female captive bonobos at the Milwaukee Zoo. It is proposed that pair-bonding via same sex behaviour in female bonobos is performed as a mechanism for acquiring allomothers who will assist with the raising of one's current and/or future offspring. To explore this prediction, we correlated female grooming behaviour with GG rubbing, as both are thought to be indicators of pair-bond strength. Our data support this finding. We propose that the reason for this correlation is to facilitate an allomothering dynamic.

ANALYSIS OF THE HEPATOPATHOLOGICAL ALTERATIONS INDUCED BY YANGONIN "YA" DIETARY SUPPLEMENTATION BY A SPECIAL SCORING SYSTEM (LIGHT AND TEM) MICROSCOPE AND BIOCHEMICAL TESTS

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ABSTRACT

Yangonin (Ya) is a type of kavalactone that displays many mood-altering qualities. Hence, people have been using this compound as a medicinal and herbal supplement for the past several centuries. People use it generally as a recreational drug, either for pain relief or relaxation. However, regular consumption of any drug can lead to hepatotoxicity. As a majority of the herbal supplements can be metabolised easily in the liver, the liver can be regarded as a target organ for understanding the changes caused by a drug. Currently, Yangonin (Ya) toxicity is regarded as "idiosyncratic". In one earlier study, the researchers determined the alterations that took place in the organelles of the hepatocytes of the Ya-treated cells (either only Ya or when combined with EtOH). All experiments were conducted using rat models, where 30 rats were categorised into 5 groups consisting of 6 animals each. These five groups were as follows - 2 control groups, i.e., Negative Control (NCx) and Positive Control (PCx) along with 3 treatment groups, i.e., Yangonin (Ya), Ethanol (EtOH) and a combined ethanol and Ya, i.e., (EtOH+Ya). These experiments spanned over 14 weeks and were a part of a sub-chronic trial. When the experiments were concluded after 14 weeks, the researchers studied the effect of the above treatments on different organelles, such as rough and smooth endoplasmic reticulum, peroxisome, mitochondria and nuclei of the hepatocytes, with the help of a scoring system. They also compared their results with the histopathological findings. The results indicated that the Ya treatment increased the hepatotoxic scores in comparison to the positive or negative control scores. Ya treatment also showed a significant increase in the organelle damage score, whereas the animals that were subjected to the EtOH+Ya treatment displayed the severest liver lesions, like severe hepatocellular degeneration, hypertrophy and necrosis. Furthermore, the hepatological and ultrastructural scores in the 2 groups showed a good correlation (r = 0.928 for EtOH, r = 0.921 for Ya; and r = 0.903 for EtOH+Ya). Thus, the researchers concluded that ethanol increased the hypnotic and sedative effect of the Ya, along with its toxicity. The researchers examined the organelles using TEM. Their TEM results supported their histological results and the tissue injuries or lesions occurring in hepatocytes, which were attributed to hepatotoxin-based hepatopathy.

Keywords: Yangonin, alcohol, hepatopathy, ultrastructure, mitochondria, sER.

MORTALITY RATE OF EUROPEAN BISON (Bison bonasus bonasus L 1758) IN ROMANIA IN 2004 – 2018

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ABSTRACT
A particular animal of European fauna is conspicuous, it is a heaviest land mammal in Europe – European bison (bison bonasus bonasus L. 1758). The biggest group of bison is living in Belovezhskaya Pushcha nowadays. The larger part of its territory belongs to Belarus (Belovezhskaya Pushcha) and the smaller part to Poland (Białowieża). Besides this area, as well as many other European areas, European bison always lived and still lives now in Caucasus.
A European Bison belongs to a family Bovidae, subfamily Bovinae, genus Bison. One of the European countries where European bison dwells is Romania. The main its habitat there is Transylvania.
The study data were taken from the official books (European Bison Pedigree Book). The official data were received from the appropriate Departments of Romania. The mortality rate for the survey was reviewed for the period of time from 2004 to 2018. The total number of dead animals was observed irrelevantly of the habitat.
It is worth noticing that there were no mortality registered in 2010. In general for the whole period, there are more mortal females in relation to the females alive (8,16% : 7,64%). The female mortality rate (57,76%) is higher than the male rate (42,24%).

Keywords: European Bison, mortality rate, Romania.

INTRODUCTION
A particular animal of European fauna is conspicuous, it is a heaviest land mammal in Europe – European bison (bison bonasus bonasus L. 1758). The biggest group of bison is living in Belovezhskaya Pushcha nowadays. The larger part of its territory belongs to Belarus

(Belovezhskaya Pushcha) and the smaller part to Poland (Białowieża). Besides this area, as well as many other European areas, European bison always lived and still lives now in Caucasus.
A European Bison belongs to a family Bovidae, subfamily Bovinae, genus Bison.
One of the European countries where European bison dwells is Romania. The main its habitat there is Transylvania. As in almost everywhere of Europe, the animals were critically endangered in Romania. The reintroduction was initiated in 1958 by bringing to Romania a male and a female from Poland. Thereafter European bison were brought in from Poland and later from other countries.
A female gives, as a rule, only one calf. According to Volf 1987 (cit. Rezač 2017), it was only once when two calves were born in 1945 in Poland (Psczene). Both twins died the same day.
As for mortality rate, there is no much information on it in the accessible literature. Sipko et al 1999 (Сипко et al. 1999, cit. WWF Москва 2002) state the mortality rate for the one year old calves between 11% to 44%. It makes 25 % in average. The mortality rate for the adult animals is 4,0% (Pucek et al.1996, cit. WWF Москва 2002).
Kartsov (Карцов 1903) also wrote about bison mortality in Belovezhskaya Pushcha. He estimated it as 7, 95%.
Urošević et al. (2020) made a conclusion based on the EPBP data for the period from 1937 to 1954 that the mortality rate for the newly born bison was extremely high. In particular, 43,28% male calves died on the day of birth, and 28,36% died at an age of 2 months. Number of died calves aged up to 1 year was 28,36%. The mortality rate of female calves died on the day of birth was only 15,38% comparatively to 43,28% of male calves rate. The mortality rate of the female calves aged 2 months was 50,77%, and the rate of the 1 year aged females was 33,85%.
Zablotsky (Заблоцкий 1939) while studying the European bison breeding in the Nature Park "Askania Nova" in Ukraine at the period from 1902 – 1938 determined the mortality rate as extremely high – 95,24%. The herd was not at all big, there were at most 6 adult animals. For the surveyed period of 37 years there were 13 calves born and they all died. The adults mortality was unacceptably high.
Malgorzata Krasinska and Zbigniew A.Krasinski reported in 2007 about European bison death on the Polish part of Belovezhskaya Pushcha. At the period of time from 1959 to 1973 there died 62 of 1 913 animals, that makes 3,24% of the total population number. There were 43 males (69,35%) and 19 females (30,65%) among 62 dead animals.
For the second surveyed period from 1974 to 2002 there died 209 European bison of the total 7 570 (2,76%). There were 128 males (61,24%) and 81 females (38,76%) of the dead animals.

MATERIALS AND METHODS

The study data were taken from the official books (European Bison Pedigree Book). The official data were received from the appropriate Departments of Romania. The mortality rate for the survey was reviewed for the period of time from 2004 to 2018. The total number of dead animals was observed irrelevantly of the habitat.

RESULTS AND DISCUSION

The first table shows the dead animals correlation with the total animals' number and with the number by gender.

Tab. 1. Dead animals correlation with the total number of animals in the group with the number by gender

Year	Total number		Died	%	M	%	F	%
2004	6	2 .4	1	16,67	-	-	1	25,00
2005	15	7.8	8	53,33	5	71,43	3	37,50
2006	16	9.7	3	18,75	-	-	3	42,85
2007	59	24.35	4	6,78	-	-	4	11,43
2008	69	29.40	2	2,89	1	3,45	1	2,50
2009	81	34.47	5	6,17	1	2,94	4	8,51
2010	86	37.49	-	-	-	-	-	-
2011	97	41.56	2	2,06	1	2,44	1	1,78
2012	102	45.57	1	0,98	-	-	1	1,75
2013	124	61.63	4	3,22	2	3,28	2	3,17
2014	128	54.74	6	4,68	2	3,70	4	5,40
2015	157	69.88	33	21,02	13	18,84	20	22,73
2016	166	73.93	10	6,02	6	8,22	4	4,30
2017	167	74.93	13	7,78	7	9,46	6	6,45
2018	186	82.104	24	12,90	11	13,41	13	12,50
Total	1.459	641.818	116	7,95	49	7,64	67	8,16

It is worth noticing that there were no mortality registered in 2010. In general for the whole period, there are more mortal females in relation to the females alive (8,16% : 7,64%).

Tab.2. Mortality correlation with the total number of dead by gender

Year	Died	M	%	F	%
2004	1	-	-	1	100
2005	8	5	62,50	3	37,50
2006	3	-	-	3	100
2007	4	-	-	4	100
2008	2	1	50,00	1	50,00
2009	5	1	20,00	4	80,00
2010	-	-	-	-	-
2011	2	1	50,00	1	50,00
2012	1	-	-	1	100
2013	4	2	50,00	2	50,00
2014	6	2	33,33	4	66,67
2015	33	13	39,39	20	60,61
2016	10	6	60,00	4	40,00
2017	13	7	53,85	6	43,85
2018	24	11	45,83	13	54,17
Total	116	49	42,24	67	57,76

It is evident from this table that the female mortality rate (57,76%) is higher than the male rate (42,24%).

The rates by age of males and females at death is also quite noticeable

Tab.3. Males age at death.

No	Age (year)	n	%
1	0,8	2	4,08
2	1	6	12,24
3	1-2	5	10,20
4	2	17	34,69
5	3	6	12,24
6	3-4	4	8,16
7	4	2	4,08
8	4-5	3	6,12
9	5	2	4,08
10	6	1	2,04
11	14	1	2,04

The table shows that the oldest male was 14 years old at the time of his death. Overall, a large percentage of young animals did not die. It is evident from this table that the males died mostly at an age of 2 years (34.69%). It is quite early for European bison. 6 males died at an age of 1 or 3 years. The mortality rate of males under 5 year old – there are 47 of them there – is the highest and that is 95,92% of the total number (49) of dead animals.

Tab.5. Females age at death

No	Age (year)	n	%
1	0,8	1	1,49
2	1	4	5,97
3	1-2	6	8,95
4	2	17	25,37
5	2-3	3	4,48
6	3	20	29,85
7	3-4	1	1,49
8	4	1	1,49
9	5	3	4,48
10	5-6	1	1,49
11	6	2	2,98
12	7	1	1,49
13	8	2	2,98
14	14	2	2,98
15	16,7	1	1,49
16	19	1	1,49
17	20	1	1,43

The maximal female age at death is 20 years, whereas of males it is 14 years. The most females (20) died at an age of 3 years (29,85%). During the surveyed period of time only one female reached the highest age of 20 years before it died. 56 females, that is 83,58% of all 67 died females, died at an age under 5 years. That is 12,34% less than males died at an age under 5 years.

CONCLUSION

The statistics given above on European bison mortality in Romania at the period from 2004 to 2018 correlate with the ones published by Zablotsky 1939, Sipko et al. 1999 г., and later by Urošević et al. 2020. They are much worse than those received by Kartsov in 1903 г. and Malgorzata Krasinska with Zbigniew A. Krasinski in 2007.

There are no reasons of mortality indicated in the EBPB book. So it would be quite interesting to study the reasons of so high European bison mortality in Romania.

REFERENCES

1. European Bison Pedigree Book (EBPB) 2004-2018

2. Milivoje Urošević, Goran Stanišić., Volodomir Pepko, Pance Dameski, Nicola Karabolovski, Delco Kočankov (2020): Mortality estimation of European Bison bonasus L. 1758) in 1937-1955. Биосферное хозяйство: теория и практика, 4 (22), p. 53-68.

3. М. А. Заблоцкий (1939): Тридцать пять лет разведения зубров и их гибридов в зоопарке Аскания-Нова. In book "Кавказскии зубр". СНК РСФСР. p. 37-137, Москва.

4. Карцов Г. П. (1903): Беловежская пуща. С.-Петербург

5. Krasinska Malgorzata, Krasinski Z., 2007. European Bison. The Nature Monograph. Mammal Research Institute Polish Academy of Sciences, Bialowieża.

6. WWF (2002): Стратегия сохранения зубра в России. Российская Академия наук. Москва.

HEMŞIRELIK ÖĞRENCILERININ BIREYSELLEŞTIRILMIŞ BAKIM ALGILARI ILE MERHAMET DÜZEYI ARASINDAKI İLIŞKI

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ÖZET

Amaç: Bu araştırma, hemşirelik öğrencilerinin bireyselleştirilmiş bakım algıları ile merhamet düzeyleri arasındaki ilişkinin incelenmesi amacıyla yapıldı.

Gereç ve Yöntem: Araştırma 2019-2020 eğitim öğretim yılında bir üniversitenin Sağlık Bilimleri Fakültesi Hemşirelik Bölümü'nde eğitim gören 139 öğrenci ile yapılmış tanımlayıcı ilişki arayıcı tipte bir çalışmadır. Verilerin toplanmasında; "Öğrenci Tanıtım Formu", "Bireyselleştirilmiş Bakım Skalası-Hemşire Versiyonu (A ve B) (BBS-Hemşire Versiyonu)" ve "Merhamet Ölçeği (MÖ)" kullanıldı. Veriler Mann Whitney U testi ve Kruskal Wallis testi ile değerlendirilmiş olup, tanımlayıcı özellikler ortalama, yüzdelik olarak verildi. Ölçekler ve alt boyutlar arasındaki ilişkiyi değerlendirmek amacıyla Spearman's Korelasyon Analizi kullanıldı.

Bulgular: Araştırmaya katılan öğrencilerin %51.8'inin 22 yaş ve üzerinde, %76.3'ünün kadın olduğu saptandı. Öğrencilerin hemşirelik mesleğine ve bireyselleştirilmiş bakıma ilişkin düşünceleri incelendiğinde; %68.3'ünün hemşirelik bölümünü isteyerek tercih ettiği, %77.0'ının uygulama alanlarında çalışmayı sevdiği, %58.3'ünün bireyselleştirilmiş bakım verdiğini düşündüğü ve %97.8'inin bireyselleştirilmiş bakım vermenin yararlı olduğunu düşündüğü belirlendi. BBS-A-Hemşire toplam puan ortalamasının 4.09±0.61 olduğu saptandı. BBS-BHemşire toplam puan ortalamasının ise 4.17±0.59 olduğu saptandı. MÖ toplam puan ortalamasının 97.82±11.90 olduğu saptandı. MÖ ile BBS-A-Hemşire ve BBS-B-Hemşire arasında pozitif yönde zayıf ilişki olduğu bulundu ($p<0.001$).

Sonuç: Araştırma sonuçlarına göre, hemşirelik öğrencilerinin merhamet düzeyleri ile hasta bakımını bireyselleştirme ve hastaların bireyselliğini destekleme düzeylerinin yüksek olduğu saptandı.

Anahtar Kelimeler: Bakım, bireyselleştirilmiş bakım, hemşirelik öğrencisi, merhamet.

THE RELATIONSHIP BETWEEN INDIVIDUALIZED CARE PERCEPTIONS AND COMPASSION LEVEL OF NURSING STUDENTS

ABSTRACT

Aim: This research was conducted to examine the relationship between individualized care perceptions and compassion levels of nursing students.

Material and Method: The research is a descriptive-correlational study conducted with 139 students at the Faculty of Health Sciences Nursing Department of a university during the 2019-2020 academic year. For data collection; "Student Identification Form", "Individualized Care

Scale-Nurse Version (A and B) (ICS-Nurse Version)" and "Compassion Scale (CS)" were used. Mann Whitney U test and Kruskal Wallis tests were employed to analyze the data. The descriptive features were given as means and percentages. Spearman's Correlation Analysis was used to evaluate the relationship between scales and sub-dimensions.
Results: It was determined that 51.8% of the participants were 22 years and olde and, 76.3% were female When students' ideas on nursing profession and individualized care are examined; it was determined that 68.3% preferred nursing department voluntarily, 77.0% liked to work in practice areas, 58.3% thought that they gave individualized care and 97.8% thought it was beneficial to provide individualized care. The mean total score of the ICS-A-Nurse was determined to be 4.09±0.61. The mean total score of the ICS-B-Nurse was determined to be 4.17±0.59. The mean total score on the CS was 97.82±11.90. It was found that there was a weak positive correlation between CS and ICS-A-Nurse and ICS-B-Nurse ($p<0.001$).
Conclusion: According to the results of the research, it was found that the levels of compassion, individualization of patient care and supporting the individuality of patients were high among nursing students.

Keywords: Care, individualized care, nursing student, compassion.

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ÜNİVERSİTE ÖĞRENCİLERİNİN AKIL SAĞLIĞININ CİNSİYETE GÖRE KARŞILAŞTIRILMASI

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ÖZET

Günümüzde insanların akıl sağlığı klinik psikologlar, psikiyatristler ve sosyolojistler tarafından ele alınan en önemli konulardan biridir. Dünya Sağlık Örgütüne (DSÖ) göre, toplumdaki bireylerin beden, ruh ve sosyal sağlığının sağlanması için ülke yetkilileri özen gösterirken, bu üç boyuttan hiçbirinin diğerinden üstün olmadığı belirtilmiştir. DSÖ'ye göre, sanayileşmiş ve gelişmekte olan ülkelerde ruhsal bozuklukların yaygınlığı artmaktadır. Ancak, sosyal ve ekonomik kalkınma planlamasında bu bozukluklara çok düşük öncelik verilmiştir. Bu artışın nedeni ise artan nüfus ve kentleşme gibi hızlı toplumsal değişimler, geniş ailelerin dağılması ve ekonomik sorunlar olarak gösterilmiştir. Bu çalışmanın amacı, kadın ve erkek öğrencilerin akıl sağlığını bir değişken olarak ele almaktır. Çalışmadaki istatistiksel evren, Urmiye Azad Üniversitesinin öğrencilerinden oluşmaktadır. Çalışmanın örneklemi ise rastgele örneklem yöntemi ile seçilen 50 kişiden (25 kadın öğrenci ve 25 erkek öğrenci) oluşmaktadır. Araştırmada elde edilen verileri değerlendirmek için çeşitli tablo, ortalama ve tanımlayıcı istatistik göstergeler kullanılmıştır. Bu bağlamda, çalışmanın ölçme aracı olarak "Mental Health Checklist (MHC)" envanteri kullanılmıştır. MHC, bir tanı aracı ile yardıma ihtiyacı olan, psikolojik sağlığı zayıf olan kişileri teşhis etmek için kullanışlı bir araç sağlamak üzere tasarlanmıştır. MHC envanteri 6 psikolojik ve 5 bedensel (fiziksel) olmak üzere toplam 11 sorudan oluşmaktadır. Bir sonraki adımda erkek ve kadın öğrenciler arasındaki bağımsızlık test ve *t*-test uygulanmıştır. Elde edilen sonuçlara göre, seçilen üniversitesindeki erkek ve kız öğrencilerinin akıl sağlığı arasında anlamlı bir fark bulunamamıştır.

Anahtar kelimeler: Genel sağlık, ruh sağlığı, üniversite öğrencileri

COMPARİSON OF UNİVERSİTY STUDENTS' MENTAL HEALTH WİTH RESPECT TO THEİR GENDER

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ABSTRACT

People's mental health is one of the most important issues addressed by the clinical psychologists, psychiatrists, and sociologists. According to the World Health Organization (WHO), while authorities of the countries cares for physical, mental or social health of their citizen, none of these dimensions has superiority over others. According to WHO, the prevalence of mental disorders is increasing in industrialized and developing countries. But, low priority is given to these disorders in social and economic development plans. The reason for this increase is proven to be the rapid social changes such as increasing population and urbanization, the disintegration of extended families and economic problems. The aim of this study is to evaluate the mental health of male and female students as a statistical variable. The population in the study is the students of Urmia Azad University in Iran. The sample of the

study consist of 50 people (25 female students and 25 male students) selected by random sampling method. Various tables, averaging and descriptive statistical indicators are used to evaluate the data obtained in the study. In this context, the "Mental Health Checklist (MHC)" inventory is used as the measurement tool of the study. The MHC is designed to provide a useful tool for diagnosing people with poor mental health who need help with a diagnostic tool. The MHC inventory consists of 11 questions, 6 of which are psychological and 5 of which are physical. In the next step, the independence test and *t*-test are applied between male and female students. According to the results, no significant difference is found between the mental health of male and female students of the selected population.

Keywords: General health, mental health, university students

HEMŞİRELİK ÖĞRENCİLERİNİN KARİYER PLANLARININ İNCELENMESİ

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ÖZET

Kariyer seçimi, statik bir durum olmayıp, gelişim sürecinin değişen önemli bir parçasıdır. Sağlık alanındaki değişimler ve gereksinimler nedeniyle sağlık kuruluşları, nitelikli hemşire ihtiyacını, hemşirelerin bireysel ve mesleki gelişimlerinin sağlanması ile giderilebilir. Bu gereksinimler ise, hemşirelikte kariyer planlama ve geliştirmenin önemini artırmaktadır. Bu çalışma, hemşirelik öğrencilerinin kariyer planlarının gelişim sürecini izlemek amacıyla planlanmıştır.

Araştırma, 2017- 2020 tarihleri arasında Kuzey Kıbrıs Türk Cumhuriyeti'nde özel bir üniversitenin Hemşirelik Fakültesi'nde öğrenim gören ve araştırmaya gönüllü olarak katılmayı kabul eden öğrencilerle yapılmıştır. Çalışma prospektif olarak, öğrencilerin 1. sınıf olduğu yıldan itibaren, 2., 3. ve 4. Sınıf olduğu yıllarda tekrarlı ölçümler ile yapılmıştır. Veri toplama yöntemi olarak tanıtıcı özellikler soru formu ve Kariyer Geliştirme Ölçeği (KARGEL) kullanılmıştır. KARGEL ölçeği, Kalafat (2012) tarafından geçerlik ve güvenilirlik çalışması yapılmış ve Cronbach alfa değeri 0.89 olarak hesaplanmıştır. Ölçek, kariyer uyumluluğu (KU), kariyer iyimserliği (Kİ) ve iş piyasalarına ilişkin algılanan bilgi (AB) adı verilen üç alt boyuttan ve 25 maddeden oluşmaktadır. Elde edilen veriler SPSS ile yüzdelik, ortalama, t testi, tek yönlü varyans analizleri ile değerlendirilmiştir.

Araştırmaya katılan öğrencilerin yaş ortalamasının 23.6±4.1, %62,4'ünün kadın, %81,5'inin mesleği kendi isteği ile tercih ettiği ve %89,5'inin bu seçiminden memnun oldukları saptanmıştır. Öğrencilerin 4 yıl boyunca kariyer gelişimleri incelendiğinde; ölçek puan ortalamaları 2. sınıfta düşme gösterirken, daha sonraki yıllarda iyileşme göstererek puanların anlamlı bir artış gösterdiği saptanmıştır ($p<0.05$). Ölçeğin alt boyut puan ortalamaları da toplam ölçek puan ortalamaları ile paralellik göstermektedir. Öğrencilerin liseyi bitirip üniversiteye başladıklarında kariyer planlama motivasyonunun iyi olduğu fakat zaman içerisinde okula ve derslere uyum gösterdikçe kariyer planlarının tekrar iyileşme gösterdiği saptanmıştır.

Anahtar Kelimeler: Hemşirelik, Hemşirelik Eğitimi, Kariyer Geliştirme,

ÜRINER İNKONTINANSTA DAVRANIŞSAL VE KONSERVATIF TEDAVIYE GÜNCEL YAKLAŞIM

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ÖZET

Üriner inkontinans, kadınların yaşam kalitesini azaltarak, fiziksel, sosyal ve ruhsal açıdan olumsuz etkisi olan yaygın bir sağlık sorunudur. Farmakolojik ve cerrahi tedaviler dışında, tamamlayıcı, konservatif ve davranışsal müdahaleler üriner semptomları hafifletmek için uygulanan tedavi yaklaşımlarıdır. Üriner inkontinans tedavisinde konservatif ve davranışsal tedavi yöntemleri her zaman tedavinin birinci basamağı olmakla birlikte, farmakolojik ve cerrahi tedavi yöntemleri ikinci plandadır. Davranışsal değişikliklerin amacı, hastanın mesane kontrolünü ve kapasitesini arttırmak ve kademeli olarak işemeler arasındaki süreyi uzatmaktır. Bu derlemenin amacı; yaşam biçimi uygulamalarının üriner inkontinans semptomları üzerindeki etkisini güncel çalışmalar doğrultusunda incelemektir. Sağlık personelinin önerilen yaşam biçimi uygulamalarının üriner inkontinans üzerinde etkileri hakkında kanıt temelli bilgiye sahip olmaları kaçınılmazdır. Bu sebeple, önerilen yaşam biçimi uygulamalarının üriner inkontinans üzerinde etkinliğinin güncel çalışmalar üzerinden irdelenmesi amaçlanmıştır. Avrupa Üroloji Birliği'nin yayımlamış olduğu rehberde, yaşam biçimi uygulamalarının üriner inkontinans semptomları üzerine etkisi ve kanıt düzeylerine yer verilmiştir. Bu uygulamalar; üriner inkontinans tanısı olan obez kadınların kilo vermesi (Kanıt Düzeyi 1), günlük kafein kısıtlaması (Kanıt Düzeyi 2), sıvı düzenlemesi (Kanıt Düzeyi 3), sigaranın bırakılması (Kanıt Düzeyi 1), konstipasyonun tedavisi (Kanıt Düzeyi 3), pelvik taban kas egzersizleri (Kanıt Düzeyi 1), vajinal konlar (Kanıt Düzeyi 1), elektriksel stimülasyon (ES) (Kanıt Düzeyi 2), manyetik stimülasyon (kanıt düzeyi: 2a) mesane eğitimi (Kanıt Düzeyi 1) şeklindedir. Sonuç olarak; mevcut çalışmaların çoğu obezite, sigara kullanımı, kabızlık, kafein ve alkol tüketimi, gazlı içecekler ve bazı diyet bileşenlerini aşırı aktif mesane semptomları ve üriner inkontinans ile ilişkilendirmiştir. Ancak tüm yaşam biçimi davranışlarını kapsayan kanıt temelli, prospektif çalışmalara ihtiyaç vardır. Kanıta dayalı öneriler doğrultusunda davranış modifikasyonu sağlanmalı, üriner inkontinans hastalarının yaşam kalitesinin artırılması ve semptomların hafiflemesi hedeflenmelidir.

Anahtar Kelimeler: Üriner inkontinans, davranışsal, konservatif, tedavi

CURRENT APPROACHES TO BEHAVIORAL AND CONSERVATIVE TREATMENT OF URINARY INCONTINENCE

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ABSTRACT

Urinary incontinence is a common health problem that reduces women's quality of life and negatively affects their physical, social and mental condition. Except that pharmacological and surgical treatments, complementary, conservative and behavioral interventions are the treatment approaches applied to alleviate urinary symptoms. In the treatment of urinary incontinence, conservative and behavioral treatment methods are always the first step of treatment, but pharmacological and surgical treatment methods are in the second plan. In behavioral changes, it is aimed to increase the patient's bladder control and capacity and to gradually extend the time between voidings. The purpose of this review; to examine the effects of lifestyle practices on urinary incontinence symptoms in line with current studies. It is inevitable for healthcare professionals to have evidence-based knowledge about the effects of recommended lifestyle practices on urinary incontinence. For this reason, it is aimed to examine the effectiveness of recommended lifestyle practices on urinary incontinence through current studies. In the guide published by the European Urology Association, the effects of lifestyle practices on urinary incontinence symptoms and the level of evidence are included. These applications are; Weight loss (Level of Evidence 1), daily caffeine restriction (Level of Evidence 2), fluid regulation (Level of Evidence 3), cessation of smoking (Level of Evidence 1), treatment of constipation (Level of Evidence 3), pelvic floor muscle exercises (Level of Evidence 1), vaginal cones (Level of Evidence 1), electrical stimulation (ES) (Level of Evidence 2), magnetic stimulation (Level of Evidence: 2a) bladder training (Level of Evidence 1). As a result; Most available studies have associated obesity, smoking, constipation, caffeine and alcohol consumption, carbonated drinks, and some dietary components with symptoms of overactive bladder and urinary incontinence. However, there is a need for evidence-based, prospective studies covering all lifestyle behaviors. Behavior modification should be provided in line with evidence-based recommendations, increasing the quality of life of urinary incontinence patients and alleviating symptoms should be aimed.

Keywords: Urinary incontinence, behavioral, conservative, treatment

THE ABSENCE OF SOCIAL SCIENCES AND THE PERVERSE EFFECTS OF THE LAW TO PREVENT AND COMBAT VIOLENCE IN SPORT IN ULTRA GROUPS

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ABSTRACT
This article intends to demonstrate how the absence of the Social Sciences hampered the fight against the violence provoked by some elements of the Portuguese Ultra groups. By not taking into account the recommendations resulting from social research, the Portuguese legislator had to face the perverse effects of the successive laws that had been implemented to fight against the violence provoked by some elements of the ultra-groups. Consequently, and contrary to what was intended, the legislative measures adopted led to more serious violence and were more difficult to control.

Keywords: Ultra Groups; violence in sport; casual style.

INTRODUCTION
Ultra-groups can be defined as Groups of supporters, with their own names, who are concentrated in the same area of a football stadium with the purpose of supporting their clubs, using chants, flags, banners, etc. (Pereira, 2002).
In Portugal, these groups emerged in the late 1970s, but it was during the 1980s that this phenomenon grew and almost all clubs in the main Portuguese football league were supported by their Ultra groups (Seabra, 2017; Marivoet, 1992; 2002). But the Ultra groups didn't just stand out for the active and militant support they gave to their clubs. Some of their members were responsible for situations of violence, which reached a peak in 1992. The most shocking occurrence took place on May 18, 1996, when a supporter died in the National Stadium, victim of a very light rocket, thrown by an element of an Ultra group.
In view of the increase in violence and the impact that this tragedy had in Portugal, the legislator sought to create a Law with the aim of combating the violence caused by these groups.

RESEARCH
The investigation of 4 Ultra groups in the city of Porto - carried out through participant observation over several years, 100 semi-directive interviews, over 200 questionnaire surveys and also the collection of autobiographical narratives - allowed us to see how these groups would respond to some of the Portuguese legislative measures to combat violence.
The data collected by this research is being largely reinforced by the research that is taking place on the emergence and growth of the casual style in Portugal, whose data this text also includes.

THE LEGAL FRAMEWORK AND THE ESCAPE OF ULTRA GROUPS
The first laws oriented towards the prevention and combat of violence in sport in Portugal are not recent. They take us back to the 80's of last century, when Decree-Law no. 339/80 was published on 30 August. This was later ratified by Law no. 16/81. Later on, Decree-Law No. 61/85 was published on March 12.

It is important to stress that these first legislative interventions aimed at preventing and combating violence in Portuguese sport were mainly directed towards the need to improve the safety conditions of the infrastructures for the practice of sport. As regards spectators at sporting events, the legislation created at the time prohibited them from consuming alcoholic drinks inside the sports grounds where the games were being played.

But it was only in 1989, and through the Decree-Law published on 18 August, that the organised supporter groups - the Ultra groups - were covered by legislation. With this Decree-Law, clubs had the duty to encourage the ethical and sportive spirit of the organised groups of supporters. Clubs were also obliged to take measures and even expel members involved in disorder and/or responsible for encouraging violence.

But it was the Law that followed this one that started to cause the first perverse effects, creating favourable conditions for the emergence and growth of the casual style in Portugal. One of the legislative measures adopted was to identify and control the members of the Ultra groups. For this purpose, Law 38/98, in its article 6, prevented the clubs from providing financial and logistical support to their Ultra groups, if they were not constituted as associations under the general terms of Portuguese law. These groups also had to have a database with the name of their members, as well as their affiliation, marital status, address and occupation. It was also mandatory to register with the Portuguese Football Federation and the Portuguese Professional Football League.

The Law that followed - Law no. 16/2004 - in its article 18, stated that the database should also include the photograph of the members of the groups, the date of birth and the citizen's card number (ID number). This database should then be handed over to the National Council against Violence in Sport. These requirements for Ultra groups were maintained in Law no. 39/2009 and in Law no. 52/2013, changing only the entities in which this database should be registered.

It is not surprising that such legislative measures displeased the Ultra groups. Many were those who refused this legal route and chose not to constitute themselves as associations under the general terms of the law. Others, in compliance with the Law, presented a database of their members that **did not** correspond to the elements that, in reality, were regularly present in the stadiums.

In fact, the number of group members present in the stadiums was incomparably higher than the number of members registered in the database required by law. The aversion of Ultra group members to register in the database was always perceived by the generality of sports agents, as well as by part of public opinion, as an assumption of guilt on the part of someone who knows he commits punishable actions. The refusal to see their names in a database was understood as an evasion of identification and, therefore, as an admission that, in fact, they were committing illegal acts. In fact, and as an old saying in Portugal goes, "Those who should not fear should not fear".

However, when confronted with such a position during fieldwork, the ultra group members interviewed reported several situations in which those who should not have fear, had strong reasons to fear. Ultra group members reported several situations where the possibility of identification was used as a threat by the security forces, even when the group member was not committing any punishable act. Still others reported arbitrary identifications and even situations where members of the ultra groups, mentioned in procedural documents, had not even been present at the places where the events had occurred.

These are, therefore, the justifications presented by several members of the Ultra groups for not constituting themselves as associations under the general terms of the Law, thus formalising a

process of legalisation of the groups as stipulated by the Law.
But this legal framework, associated with a growing police control of the Ultra groups, which was not confined to the stadiums, but also to the trips they made, was the reason that several members of these groups pointed out to justify their transition to the Casual style.

THE EMERGENCE OF THE CASUAL STYLE IN PORTUGAL

This emerged in England in the 70s of the 20th Century, initially associated with Liverpool fans, and should be framed in the social context predisposing the emergence of youth subcultures (Teddy Boys, Mods; Rockers; Skinheads; Hooligans) in the late 60s in the century (Thornton, 2003).
The investigation carried out found an increase in the number of those who started to adopt the casual style. At the moment, more than 500 casuals are identified. They are mainly men aged between 18 and 40, with very heterogeneous professions and who enjoy being involved in acts of violence, associating these with a concept of defending the honour and the territory. Some of them, despite being part of Ultra groups, behaved like Hooligans, as they plann c**onfrontations** with elements of Ultra groups that supported opposing clubs.
With the increase of legal and police control over the Ultra groups, these elements abandoned them and started adhering to the Casual style. Characterized by the use of branded clothes, casuals travel in small groups that do not use identifying props of the clubs they support, which facilitates stealth strategies from police control by those who enjoy the involvement in acts of violence.
Therefore, it was not surprising to see an increase in the number of incidents and, above all, an increase in their severity. In 2013 there were serious incidents near Dragon Stadium in Oporto. [1] In April 2017, the night before a match between Sport Lisboa e Benfica and Sporting Clube de Portugal, and following clashes between hooligans/casuals from the two Lisbon clubs, Marco Ficini, an Italian supporter of Sporting Clube de Portugal, died. In turn, in February 2018, incidents occurred in Guimarães, in which hooligans/casuals from Sporting Clube de Braga and Vitória Sport Clube were involved. Other incidents occurred in several locations, such as Vila do Conde, Braga or Vila das Aves.
Called to comment on these incidents in the Portuguese mass media, the author of this paper vehemently warned of the growth in the number of casuals, one of the reasons for this increase being related to the perverse effects of the published legislation.
This prediction does not result from any divinatory ability. It results from the long fieldwork carried out within the Ultra groups of the city of Porto, through which it was possible to participate in their activities, as well as to observe the behaviour of the most diverse members that compose them.
The interviews also allowed us to understand the values of the groups, as well as the logic of thought and action of those who are part of them. When asked about the reasons that led them to adhere to the casual style, many interviewees point to the increasing control processes imposed by legislation as the main reason for such a change. As a result, police surveillance and repression has been increasing, limiting the freedoms of those who want to go to the stadiums without being the target of control measures that prevent them from going to restaurants, cafes and even to the toilet to satisfy the most basic needs.
In addition to the increasing control, the penalties applied to the members of Ultra groups

[1] 1 https://www.youtube.com/watch?v=NZVQhG-Z0HI

are perceived by them as exaggerated and completely disproportionate to the seriousness of the acts committed, when committed. This is because there are also recurrent statements referring to subjectivities, arbitrariness, exaggerations and falsehoods which are written in the documents drawn up by the security forces and from which the punishments to be applied are determined. Faced with what is perceived as a high risk of being sanctioned for being part of an Ultra group, as well as with the perception of injustice, many adopt the casual style as a way to avoid such dangers.

Social research carried out on Ultra groups has already highlighted such perceptions and their consequences. Despite this, and in view of the increase in the number of incidents and their severity, the Portuguese legislator decided to publish Law no. 113/2019. In the draft law presented, the Portuguese government stated that it had requested the contributions of the Portuguese Youth Institute; the Security Forces; the Portuguese Olympic Committee, the Portuguese Football Federation, the Portuguese Professional Football League, the Professional Football Players' Union, the Portuguese Association of Football Referees, the National Association of Football Coaches and the National Football Information Point.

The proposed bill does not make any reference to the contribution of the Portuguese Association for the Defence of Supporters or any other similar association, so it can be seen that this proposed bill has not taken into account the position, nor the perception of fans, even those presented in the context of social research.

Not surprisingly, this new law again generated serious perverse effects. The legislator decided to create in football stadiums, an exclusive area for members of Ultra. Here only could flags, signs, banners and drums that these groups use to support their clubs enter. Only holders of the fan card would have access to these areas, which is also established by this Law. In addition to requiring clubs to invest heavily in stadium infrastructure in order to create exclusive areas for Ultra groups , this Law obliges all members of these groups to acquire (by paying), before a government entity, a fan card, as only with this can they access such exclusive areas.

These measures caused a significant revolt in the elements of the Ultra groups, who considered such measures discriminatory and stigmatizing. The social investigation carried out on the Ultra groups made it possible to foresee such a revolt and, above all, the reaction that the elements of these groups would have. This was communicated to the Portuguese mass media and the Portuguese legislator became aware, in various ways, of the reaction that could be expected. He was also aware of the ineffectiveness of this measure when applied in other countries.

The refusal of the card was the reaction of members of the Ultra groups. In fact, very few adhered to it. The areas of the stadium created exclusively for the Ultra groups were practically empty, as very few people signed up for the fan card that gives them access. The choice of members of the Ultra groups was another. Some stopped following the games that their clubs played in the stadiums of the opponents. Others opted to break up into small groups, travelling in private cars – whose surveillance by the police forces is more difficult – and buying tickets for other areas of the stadium. As such, they occupied places among the majority of fans, thus increasing the risk of conflicts and confrontations.

Therefore, the Portuguese Government expressed itself very concerned about this fragmentation of supporters, having even appealed to the clubs to help them control their supporters. Faced with the total ineffectiveness of the measure, and given the perverse effects that it generated, the Portuguese legislator published Law No. 92/2022, by which the supporter's card was abolished with those who subscribed having the possibility to ask for a refund of the money they paid for it.

CONCLUSION

By not taking into account the predictive dimension of the results of the social research carried out on Ultra groups, the Portuguese legislator created the predisposing conditions for the growth in the number and severity of violent incidents. The multidisciplinarity would have contributed to avoid a legislative escalation tending to control the Ultra groups, which proved to be perverse in its consequences, as it increased what was intended to contain – violence – and was also conducive to the costs of remodelling football stadiums that later proved to be unnecessary.

REFERENCES

Marivoet, S. (1992). Violência nos espectáculos de futebol. *Sociologia. Problemas e Práticas*, 12, 137-153

Marivoet, S. (2002). Violent disturbances in Portuguese Football. In E. Dunning, P. Murphy, I. Waddington, A. E. Astrinakiz (Eds), *Fighting Fans, Football Hooliganism as a World Phenomenon* (pp. 158-173). University College Dublin Press.

Pereira, L.M. (2002). *Dicionário do Futebol. Manual do adepto.* Prime Books.

Seabra, D. (2017). Ultra-Groups as Social Space for Leisure. *Physical Culture and Sport Studies and Research*, LXXIV, 5-11.

Thornton, P. (2003). *Casuals. Football, Fighting and Fashion. The Story of a Terrace Cult.* Milo Books LTD.

CONSUMERS' AND CUSTOMERS' BEHAVIOR DEPENDING OF X, Y AND Z GENERATION

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OBJECTIVE

The paper presents a theoretical and practical review of consumer behaviour according to generation segments. The focus of the paper is on the development of the theoretical base of consumer behavior according to generation segments. The theoretical part of the paper is based on contemporary literature in the field of consumer behavior, with special emphasis on target groups that are a part of different generations. The key hypothesis of the paper is that companies should use strategies of adaptation in order to fulfill consumers' needs and wishes.

A special focus of the paper is an analysis of a companys' strategies, in the field of services industries, following consumers' needs, according to generation. In the paper, the analysis is focused on services industries, like healthcare, tourism, hospitality, etc. The analysis is based on working of services industries with consumers that are members of generation X, Y and Z. These generations have different needs, wishes, as well as, different lifestyles.

The paper emphasized the importance of experience marketing and emotional marketing on consumers' behavior toward services from a generation's aspect.

In the empirical part of the paper are presented case studies about the implementation of modern marketing strategies, which gives opportunities for better positioning in the global marketplace, according to quality of business and work, based on analysis of needs, wishes, lifestyles and behavior of consumers, members of a different generation. The empirical part of the paper is done an in-depth interview with managers of service companies about marketing approach, marketing strategies, implementation of strategies, and marketing control and marketing analysis.

METHODOLOGY

The methodology of the paper is based on qualitative analysis, analysis of the case studies and in-depth interviews with managers of the services companies about work based on the following needs, wishes and lifestyles of consumers of services, according to their generation segments.

RESULTS

The empirical research's results are clear described in the paper. Particular focus is given to the implementation of the results in the work of service companies, according to the needs, wishes and lifestyles of the generation's target groups. The results emphasized that members of the Z generation have needs for quality of services, time of services implementation, needs for using digital and mobile applications, and online communication using social media. The results present that generation Y combine traditional and digital approach. Special attention is given to generation X, which insists on traditional services without using digital applications.

CONCLUSION

The paper presents a theoretical and practical contribution to the field of consumer behavior analysis, from the aspect of membership to one of the groups: generation groups, X, Y, or Z. The special contribution of the paper is creating the new marketing strategies for consumers of X, Y and Z generations, according to their needs, wishes and lifestyle.

Keywords: Consumers' behavior, services' companies, marketing strategies, generations X, Y and Z.

REFERENCES

[1] Awasthi, A., Kumar, V. (2022). Behavioral consequences of verbally expressed and unexpressed customer rage emotions. *Journal of Consumer Behavior*, ISSN: 0736-3761.

[2] Belch, G., Belch, M. (2012). Advertising and Promotion-An Integrated Marketing Communications Perspective. New York: McGraw-Hill.

[3] Blakeman, R., (2006). Integrated Marketing Communication. Toronto: McMillan.

[4] David, P. (2005). Integrated Marketing Communication. Toronto: Elsevier Inc.

[5] Filipović, V., Janičić, R. (2021). Strateški marketing. Beograd: FON.

[6] Larry, P. (2008). Strategic Integrated Marketing Communication. Toronto: Elsevier Inc.

[7] Kevin, R. (2004). The Future Beyond Brands - Love marks. New York: Power House Books.

[8] Kotler, Ph., Keller, L. (2016). Marketing management. 15th Edition. London: Prentice Hall.

[9] Kumbhojkar, N., Menon, A. (2022). Integrated Predictive Experience Management Framework (IPEMF) for Improving Customer Experience: In the Era of Digital Transformation. International *Journal of Cloud Application and Computing*, Vol.12(1), pp.13. DOI: 10.4018/IJCAC.2022010107

[10] Maričić, B. (2015). Ponašanje potrošača. Beograd: Ekonomski fakultet.

EXAMINING THE EFFECTS OF BRAND LOVE AND CUSTOMER ENGAGEMENT ON VALUE COCREATION: A CONCEPTUAL MODEL PROPOSAL

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ABSTRACT

Value co-creation has gained notable attention among practitioners and researchers in the past decade. Service industries have widely adopted value co-creation strategies to manage customer-brand relationships. Integrating the conceptual framework of brand love allows a better understanding of this concept. However, the association between brand love and value cocreation is relatively scarce. The aim of this study is to investigate the effects of brand love on value cocreation, and to determine whether customer engagement mediates the relationship between these two concepts. İn this paper, we develop a research model by combining previous research, to study how these factors interact with each other, through a review of the literature. This framework can also provide a stage for scholars to undertake future research.

Keywords: Value co-creation, Customer engagement, Brand love, Customer experience.

CONSUMER VALUE CO-CREATION: OVERVIEW, TYPOLOGY AND CONCEPTUALIZATION ATTEMPT

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ABSTRACT
Value co-creation is a very interesting concept in the marketing literature that has aroused the interest of researchers and practitioners. This practice allows businesses to create close links with their customers in a logic of exchange and interaction. Nevertheless, faced with an active, informed, and creative customer, companies are obliged to rethink their interaction process by jointly integrating their resources with those of their customers at different levels of co-creation. Based on a thorough review of previous literature, this research aims to provide a detailed understanding of the concept of value co-creation and to identify its main issues and typologies mostly classified into two levels. However, this study is intended to be an aid in reflection on value co-creation, to provide marketing practitioners with avenues to better manage their relationship with customers, and to effectively involve them in the value co-creation process.

Keywords: Value co-creation, consumer-firm relationship, interaction , participation.

CREATING ZONING ISLANDS WITH THE CONJUGATE APPROACH IN THE REVISION PROCESS OF ZONING PLANS

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ABSTRACT
In Türkiye, zoning plans are the creation of areas that will meet the social and accommodation needs of the people living in a certain region. Sometimes they are areas with certain borders that need to be renewed in a situation that cannot meet the needs. These zoning islands, which are generally formed in the direction of the northern and southern ring roads as the main line on a city or district basis, are placed as an axis, while they are applied diagonally or upside down to form commercial areas at a certain point and residential or social reinforcement areas in some parts. The aim is to ensure the formation of zoning plans by placing the zoning islands within the determined limits. As a method, it is to ensure the settlement of construction islands on certain road and under, various legends, with a square rooted conjugate mathematical approach. In the study, it was aimed to give a planning example in line with the current population and the possible population in the future by locating the zoning islands in this way after the main and intermediate roads were determined. The layout of all areas such as residential, commercial, official institutions, etc. was shown and a proposal was made about how to make a revised or a new zoning plan.

Keywords: Zoning plan, conjugate method, zoning island

İMAR PLANLARININ REVIZE IŞLEMINDE EŞLENIK YAKLAŞIMLA IMAR ADALARININ MEYDANA GETIRILMESI

ÖZET
Türkiye'de imar planları, belli bölgede yaşayan insanların, sosyal ve barınma gibi ihtiyaçlarına cevap verecek alanların meydana getirilmesidir. Kimi zamanda ihtiyaca cevap veremeyecek durumda yenilemesi gereken sınırları belli alanlardır. Genellikle şehir ya da ilçe bazında ana hat olarak kuzey ve güney çevre yolları doğrultusunda meydana getirilen bu imar adaları eksen olarak yerleştirilirken, hat üzerinde belli bir noktası ticari, bazı yerleri konut ya da sosyal donatı alanları meydana getirecek şekilde çapraz ya da alt üst olarak uygulanır. Amaç, imar adalarını belirlenen sınırlar dahilinde yerleştirerek imar planlarının oluşumunu sağlamaktır. Metot olarak karesel köklü eşlenik matematiksel yaklaşımıyla belli yol üzeri ve altı, çeşitli lejantlarda imar adalarının yerleşimini bu şekilde temin etmektir. Çalışmada, ana ve ara yollar belirlendikten sonra bu şekilde imar adalarının yerleşimi yapılarak şu anki nüfus ve ilerleyen zamandaki olası nüfus doğrultusunda bir planlama örneğinin verilmesi hedeflendi. Konut, ticari, resmi kurum vb. tüm alanların yerleşimi gösterilmeye ve revize ya da yeni bir imar planının nasıl yapılacağı hakkında önerme getirildi.

Anahtar Kelimeler: İmar planı, eşlenik yöntemi, imar adası

1. INTRODUCTION
Planning, with a general definition, includes producing the land use decisions made to

determine the usage patterns, capacities and location choices of the functions in the space. Here, planning is defined as the preparation of systematic programs for the future in order to achieve the desired goals (Kiper, 2013; Topal, 2019). In our country, the physical planning has not been completed yet. As there are many unplanned areas, fragmentary, inconsistent plans have been/are being made in some areas deemed necessary by the political authority or where there is pressure on private property. It is extremely important to complete the physical planning by performing the entire planning ritual down to the lower scale, after the entire country is planned, region by region, in terms of preventing both cities and property rights from being on slippery ground, preventing speculation and legal security (Topal, 2019).

In this context, when the zoning legislation is considered as the basis in the evaluation of the issues, it is revealed that all legal documents such as laws, regulations and even circulars related to zoning have emerged, within the scope of the zoning legislation, not only the Zoning Law and related regulations, but also the physical development of settlements and all places outside them. A set of rules including all other functional, sectoral and administrative issues emerge (Duyguluer, 2014; Topal, 2019). For this reason, since the subject of planning and zoning constitutes the zoning legislation as a whole, in our study, within the scope of scale difference within the planning hierarchy, each plan is handled within its own definition and in the context of its own characteristics, although the definition of the zoning plan is within this integrity, the zoning plan within the legal terminology in the context of the word public works. (Topal, 2019). Since the zoning plans are administrative acts, they must first be in accordance with the law in terms of the elements of the administrative act. At the same time, while making the plan, the city planning techniques and principles, which are generally referred to as urban planning principles and planning principles, as well as the principles and principles introduced by the zoning legislation should be respected. Finally, although the zoning plans have to carry the purpose of public benefit as the aim element of the administrative process, it is considered that the science of city planning aims to create a livable and healthy environment and to serve the whole society by providing the planned development of cities in line with economic and social developments. benefit is required. However, since the public interest is flexible and open-ended, it can differ according to the perception interpretation and it is used like a magic formula in urban planning in practice, it was necessary to examine it separately in terms of planning approach (Topal, 2019).

2. Theoretical Framework and Scope

Necessities and limitations related to creating settlements and therefore urbanization have become even more decisive as the human population increases and cities become more crowded. Unlike in previous centuries, a large part of the world's population lives in cities and metropolises, as is the case in Türkiye, where a large part of the country's population lives in cities such as Istanbul, Ankara and Izmir. It is indisputable that this situation creates serious problems in terms of urbanization. First of all, in cities that are getting more and more crowded, it is becoming more and more difficult to provide adequate shelter to the concentrated population. In order to solve this problem, city administrators either build multi-storey houses or have to build houses on even the smallest vacant lands in cities. In both cases, cities have become places where large numbers of people have to live in very narrow spaces, in a way that is contrary to human nature, in a very cramped situation. Another problem caused by urbanization is that rapidly expanding settlements constantly threaten natural areas. The buildings that spread rapidly around the cities narrow the living spaces of all living things.

Finally, it is known that historical and cultural assets are under the threat of rapidly spreading urbanization. It would undoubtedly be an incomplete approach to consider urbanization only in the context of the problems it raises. Because urbanization is not a process in which people are only provided with residential areas where they can live. In other words, cities are no longer just places that meet people's housing needs. Moreover, cities now have to offer people the opportunity to live in a healthy and balanced environment and a well-planned environment that is pleasant to live in. In addition, cities should provide people with quality housing areas, adequate transportation, communication and recreation areas, and provide people with places suitable for carrying out economic, cultural and social activities. In summary, today, cities should be organized in a way that will increase the welfare of the individuals who make up the society (Çiçek, 2016).

3.Material and Method

Let $[A_2]$ be a single point. If $A_2=\{y\}$, there is only one z point, $z \in A1$ and $z \rightarrow y$, for 2 long paths between c and y. In case of more than one z point, $c \rightarrow z_1 \rightarrow y$ and $c \rightarrow z_2 \rightarrow y$ paths are formed. In this case, more than one path of 2 lengths is formed between the point c and y. Contrasted with S being a tournament square root graph. So z is odd. Thus, the $c \rightarrow z \rightarrow y$ path is formed. At the same time, in order to have a 2-long path between the points in A_1 and the point y, there must be β edges such as $B_1 \rightarrow y$ (Özdemir, 2014).

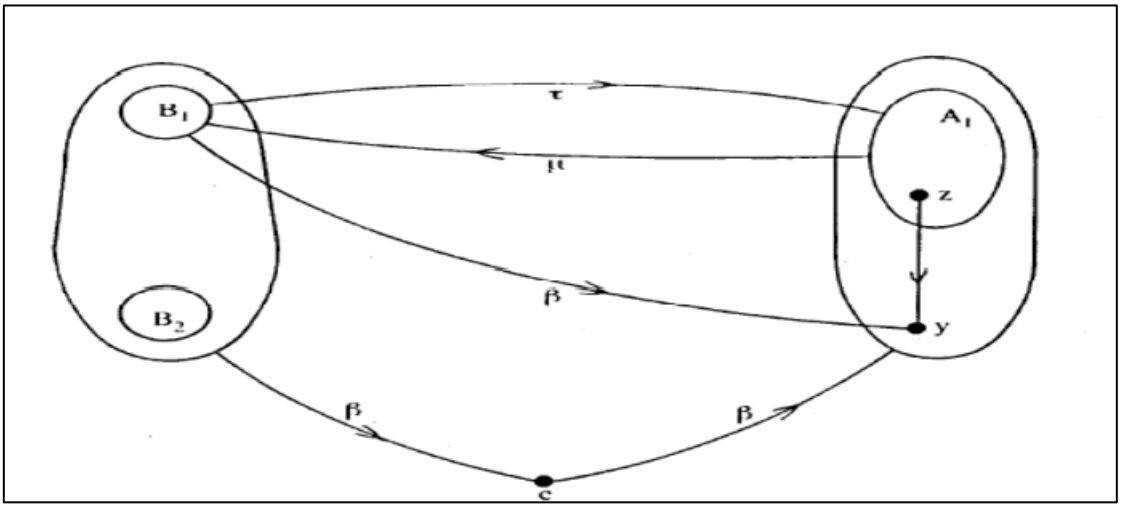

Figure 1. S graph when $[A_2]$ is a single point (Özdemir, 2014).

If $[B_2]$ is a single point, then there can be no sides of 2 lengths between c and $B_2=\{b_2\}$. Because, due to the definition of the set B_2, there is no point $a \in A$ as $c \rightarrow a \rightarrow b_2$. So there is no path of length 2 from point c to point b2. On the other hand, the only alternative for a 2-long path from point b2 to point c is to find the point $b_1 \in B_1$ as $b_2 \rightarrow b_1 \rightarrow c$. But in this case; $B_2 \rightarrow b_1 \rightarrow aj$ and $b_2 \rightarrow c \rightarrow aj$ 2 long paths will be created. This contradicts the fact that S is the tournament square root graph. So from $B_2=\{b_2\}$ there is no edge to any point in B1. Therefore, the set B_2 cannot be a single point. If B_2 is a directional triangle, the only alternative for a path of 2 lengths between B_2 and B_1 is to have a path $B_2 \rightarrow A_1 \rightarrow B_1$. In this case, roads of 2 lengths $B_2 \rightarrow B_2 \rightarrow A_1$ and $B_2 \rightarrow c \rightarrow A_1$ will be formed (Özdemir, 2014). To find the square roots of the 2x2 matrix A, the best-known procedure is to diagonalize the matrix AxA square matrix is called diagonalizable if it looks like a diagonal matrix (Akgül, 2020).

4. Findings and Discussion

One of the most important criteria while creating the zoning plan is to arrange the residential

and commercial zoning islands according to the living population and to make the surface areas within the correct logic framework. From this point of view, it has been tried to show how a zoning plan should be created with the conjugate logic with examples, in the north or south or west-east direction on a certain road, main and intermediate lines route, plus if the zoning islands are the conjugate of a square root, that is, if it is a residence, it will be a trade or a trade if it is a residence.



Figure 2. Conjugation of commercial and only residential islands in the zoning plan

In Figure 2, a zoning plan to be located at a four-armed intersection connection point and the formation of the commercial area in red in the formation of a zoning island, and the residential areas in blue, in diagonal form, according to the amount of people per unit area, are shown.

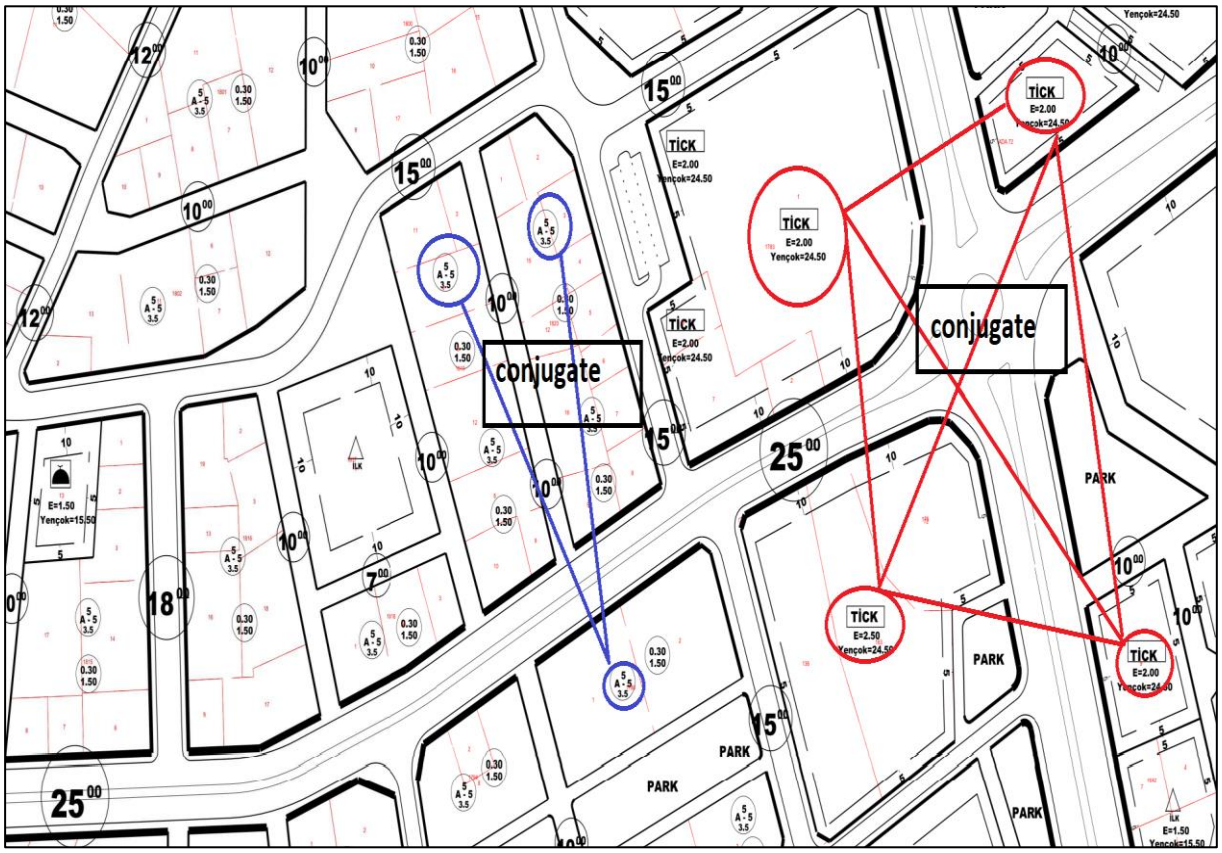

Figure 3. Conjugation of commercial and only residential islands in the zoning plan

In Figure 3, the formation of the 25-meter road in the north and south directions is shown by the residential areas in itself, and the commercial areas in the north and south directions, conjugate in themselves, based on the road line.

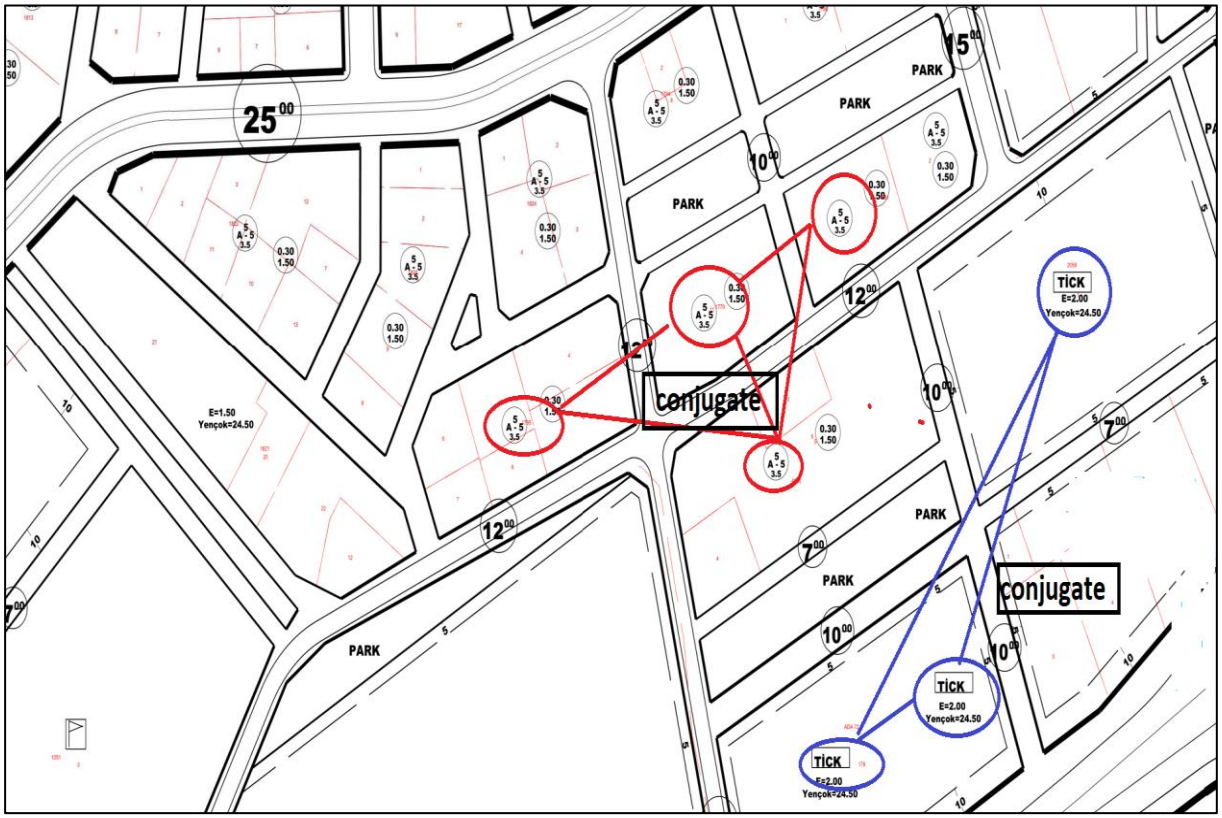

Figure 4. Conjugation of commercial and only residential islands in the zoning plan

In the zoning plan and zoning island display in Figure 4, only the regional and local-based

locations in the discrete order format according to the tendency of the population are formed within themselves, and the commercial zones are created with their own local-based assembly area.

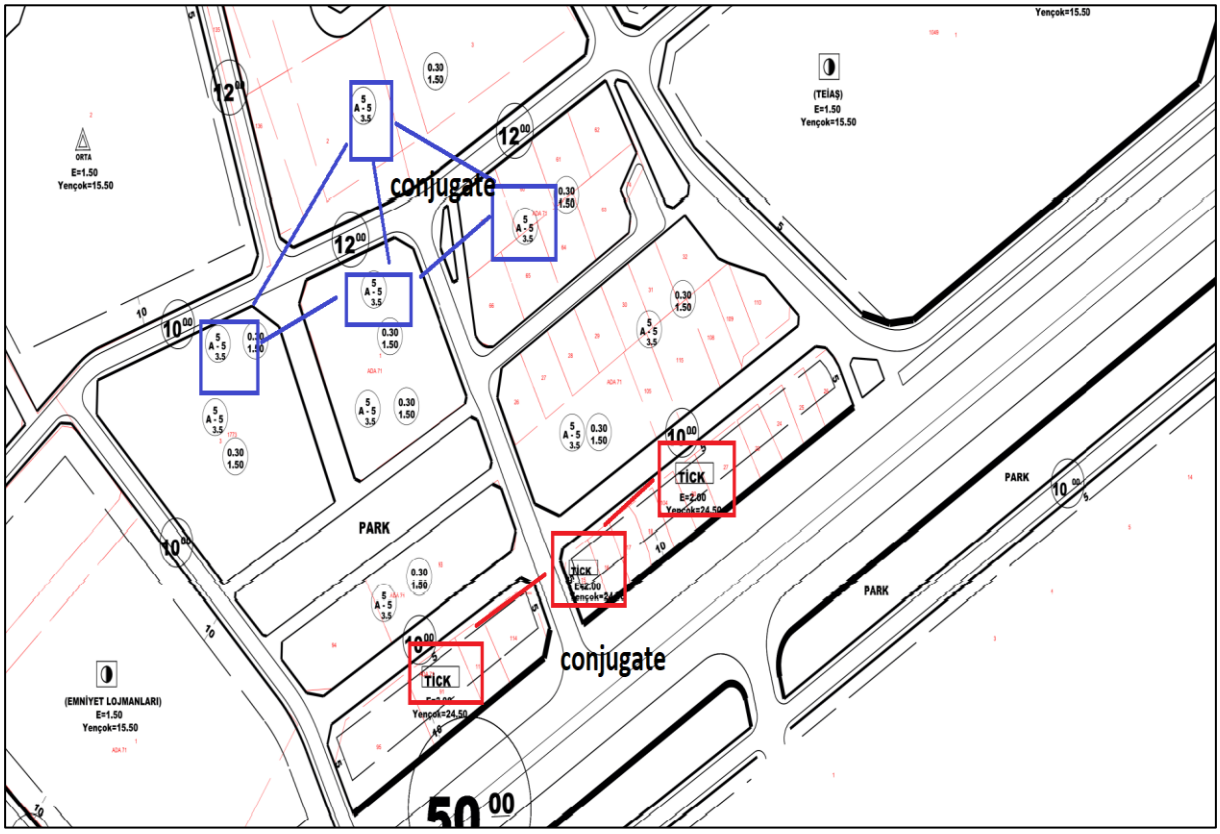

Figure 5. Conjugation of commercial and only residential islands in the zoning plan

In the zoning plan in Figure 5, in the representation of the zoning island formation with the conjugate method, the zoning islands zero to the main 50-meter ring road are shown as trade islands, while the islands with fronts to the narrow 10-meter road inside are created on a local basis.

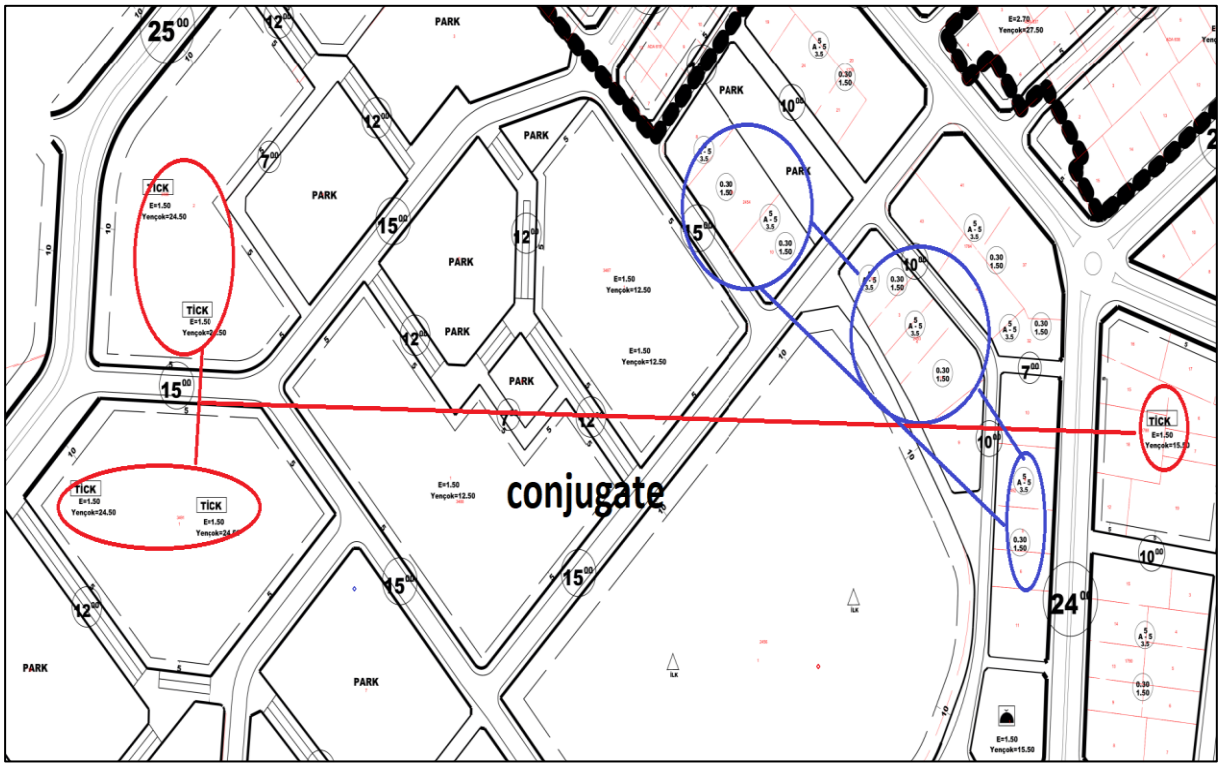

Figure 6. Conjugation of commercial and only residential islands in the zoning plan

In the zoning plan in Figure 6, in the zoning island representation, they are located far from each other and an area-based island is formed between them, symmetrically conjugating with the social cultural zoning island or official institution or school area.

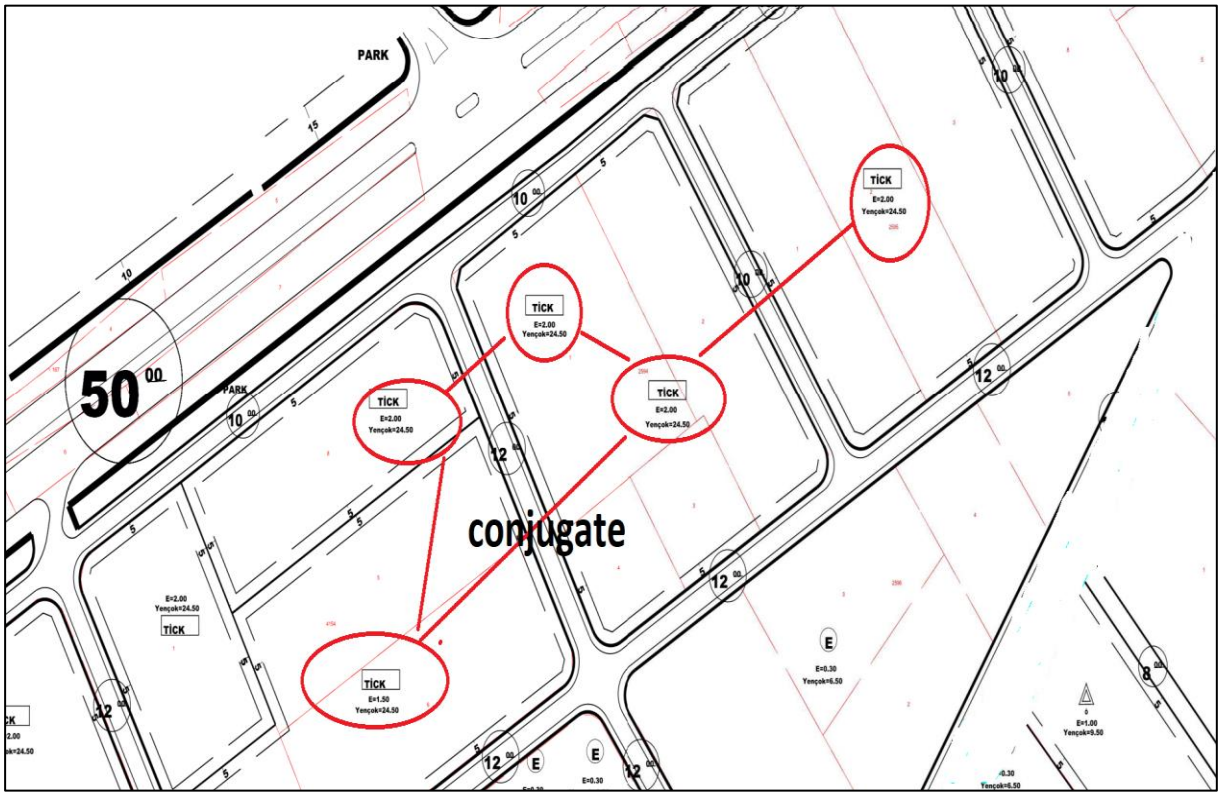

Figure 7. Conjugation of commercial and only residential islands in the zoning plan

At the point located on the line on the main road, which is shown in Figure 7, only commercial zoning islands that are symmetrical to each other or tangent to the unit circle have been created.

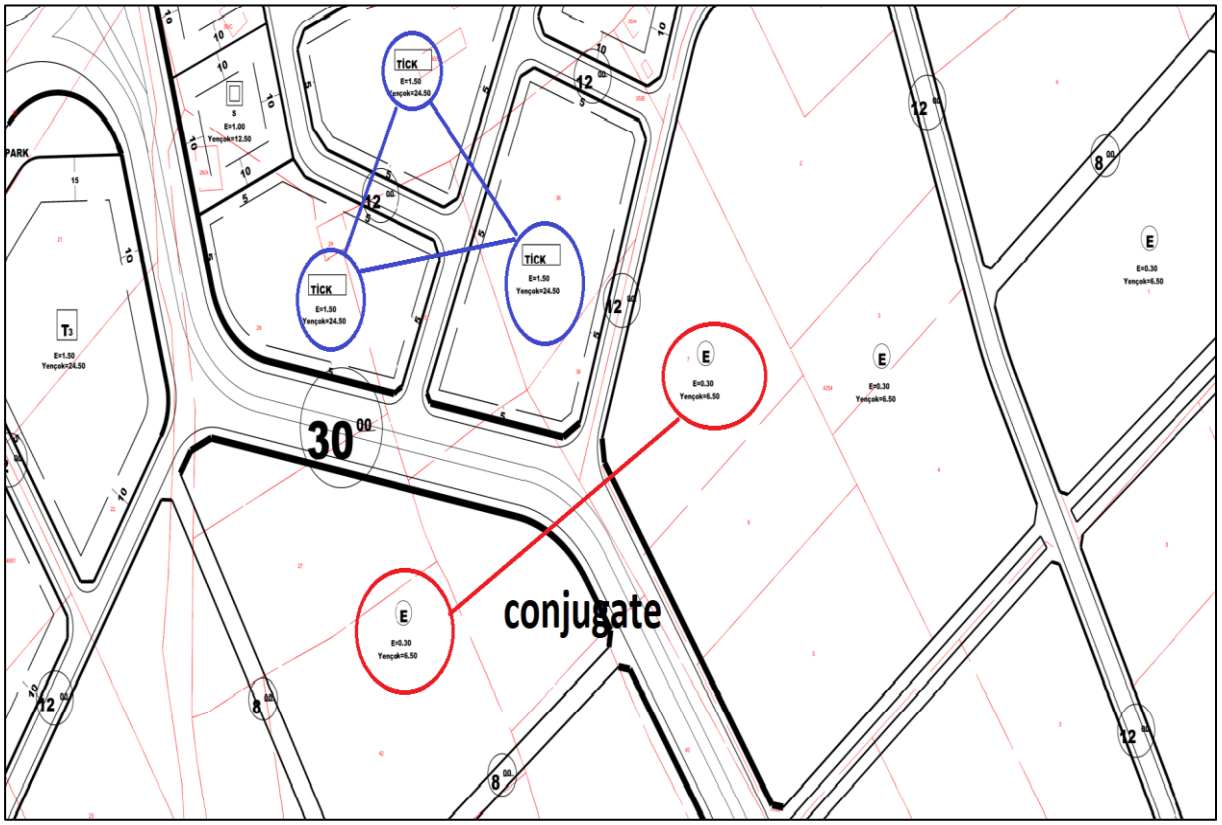

Figure 8. Conjugation of commercial and only residential islands in the zoning plan

In the image shown in Figure 8, the vineyard orchard areas shown with the legend E are formed within themselves, in the middle of the main connection and the 30-meter road network, as conjugate islands for commercial + residential purposes only.

5. Conclusion and Recomendation

Zoning plans are the most important planning art in meeting the needs of people living in a certain region. For this reason, road networks are created in line with the population and topological elements living in the area related to the area closure and using the holistic aspects of these networks to create the conjugate process accordingly. When looking at the examples, the required parcels facing the wide road are generally formed as commercial or commercial + residence, while the zoning islands with the parcels inside and with narrower road fronts are formed as residences. Sometimes, the linear length taken in the symmetrical processes of residential or commercial islands has been social facility areas or official institutions and school areas. Moving from here, in a zoning plan that will respond to the need that will come quickly, topological correlations with the conjugate or in line with the land situation, geological reports, etc. A good planning process can be done together with the factors.

RESOURCES

Akgul, I. 2020. Calculation Methods of Square Root of 2x2 Matrices, Akdeniz University Graduate School of Sciences, Department of Mathematics, Master Thesis, Antalya.

Çiçek, K. 2016. Procedures and Principles of Zoning Plan Changes, Istanbul Commerce University, Institute of Social Sciences, Department of Public Law, Master's Thesis, Istanbul.

Duyguluer, F. 2014. New Tools of the Reconstruction Process, Architecture Journal, issue 375, January-February 2014 (http://www.mimarlikdergisi.com/index.cfm?Sayfa=mimarlik&DergiSayi=389&RecID=3295 Access Date: 17/08/ 2015).

Kiper, T. 2013. The Role of Identity in Planning Urban and Rural Areas, Turkish Journal of Scientific Compilations 6 (2), 2013, pages: 73-77.

Özdemir, S. 2014. Regular Tournament Matrices and Square Roots, Çanakkale Onsekiz Mart University, Institute of Science, Department of Mathematics, Master Thesis, Çanakkale.

Topal, H.K. 2019. Limitation of Property Rights Through Development Plans, Yaşar University Institute of Social Sciences, Department of Private Law, Master's Thesis, İzmir.

USE OF THERMOGRAPHY TO BODY TEMPERATURE MEASURE

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ABSTRACT

Thermography is a versatile tool that can be used in several applications, including map and quantify the surface temperature distribution of bodies. Among the existing thermography methods, the infrared was used in the present work, which does not need contact with the surface where the temperature is to be measured. Infrared technology is based on measuring radiation with a wavelength in the infrared (IR) range that is emitted by the body. According to the Stefan-Boltzmann law, the IR radiation emitted has its intensity proportional to the fourth power of the temperature. This method of analysis covers applications in the most varied areas, such as industrial, military and health. In the present work, experiments were carried out using a low-cost IR camera (Flir One Pro), which was coupled to a cell phone. Samples of polished stainless steel, aluminum, polished titanium, glass, feldspathic ceramics and 3M electrical tape were placed on a metal heating plate between 33°C and 80.7°C. The results obtained showed that the methodology used is extremely sensitive to external factors and there is a need to develop a protocol to control the various variables that influence the results including the position, inclination and distance of the camera in relation to the body at the time of capturing the images. Other variables also influence the measurement results, such as the reflectivity of the sample's surface, the presence of other bodies, the ambient lighting and the device's accuracy.

Keywords: Infrared thermography; Temperature; Radiation; Precision.

AVALIAÇÃO DA DEGRADAÇÃO HIDROTÉRMICA DA ZIRCÔNIA COM RECOBRIMENTO EPÓXI

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RESUMO

Na Odontologia, os materiais cerâmicos são usados há mais de 200 anos para confecção de restaurações indiretas. Uma das mais significativas mudanças neste cenário foi o uso de restaurações monolíticas de alta resistência fabricadas com zircônia. A zircônia é um material de alto desempenho devido à combinação ímpar de resistência mecânica, tenacidade à fratura, resistência à degradação na maioria dos meios, biocompatibilidade, baixa toxicidade e característica quimicamente inerte. No entanto, ela é suscetível à degradação hidrotérmica em ambiente oral, que pode comprometer seu desempenho a longo prazo. A zircônia na presença de água, sofre a transformação de fase de tetragonal para monoclínica, com aumento de volume. A degradação inicia na superfície da cerâmica, aumenta a rugosidade, induz à formação de microtrincas e exposição de grãos superficiais, comprometendo assim as propriedades mecânicas. Além disso, a zircônia tem coloração branca opaca e baixa fluorescência, completamente diferente do dente natural. Para superar os problemas da cor e da fluorescência, foram sugeridos revestimentos cerâmicos das próteses dentárias, mesmo assim, existem limitações no desempenho desta técnica. No presente trabalho, amostras de zircônia policristalina tetragonal estabilizada com 3% mol de Y_2O_3 (3Y-TZP) foram revestidas com tinta epóxi em pó e fez-se a análise da influência do revestimento na degradação hidrotérmica, molhabilidade, rugosidade e cor. Nos ensaios de degradação, as amostras foram imersas em vinho e em solução salina. Os resultados mostraram que a zircônia manteve seu caráter hidrofílico após a pintura. Quanto à rugosidade, esta diminuiu após a pintura, porém não houve mudança significativa após a degradação hidrotérmica. Após a imersão em vinho, com ou sem degradação, não foi observada mudança significativa da cor do revestimento. Concluiu-se que a pintura em pó pode ser um método promissor para revestimento de zircônia para uso odontológico.

Palavras-chave: Zircônia, odontologia, degradação hidrotérmica, molhabilidade.

ABSTRACT
In dentistry, ceramic materials have been used for more than 200 years to make indirect restorations. One of the most significant changes in this scenario was the use of high-strength monolithic restorations made with zirconia. Zirconia is a high performance material due to the unmatched combination of mechanical resistance, fracture tenacity, degradation resistance in most media, biocompatibility, low toxicity and chemically inert characteristic. However, it is susceptible to hydrothermal degradation in oral environment, which can compromise its long-term performance. Zirconia in the presence of water undergoes the transformation from tetragonal to monoclinic phase, with increased volume. The degradation begins on the surface of the ceramic, increases roughness, induces the formation of microcracks and exposure of surface grains, thus compromising the mechanical properties. In addition, zirconia has opaque white coloration and low fluorescence, completely different from the natural tooth. To overcome the problems of color and fluorescence, ceramic coatings of dental prostheses have been suggested, even so, there are limitations in the performance of this technique. In the present work, tetragonal polycrystalline zirconia samples stabilized with 3% mol Y_2O_3 (3Y-TZP) were coated with powder epoxi paint and the influence of the coating on hydrothermal degradation, wettability, roughness and color was analyzed. In the degradation tests, the samples were immersed in wine and saline solution. The results showed that zirconia maintained its hydrophilic character after painting. As for roughness, it decreased after painting, but there was no significant change after hydrothermal degradation. After immersion in wine, with or without degradation, no significant change in coating color was observed. It was concluded that powder painting can be a promising method for zirconia coating for dental use.

Keywords: Zirconia, dentistry, hydrothermal degradation, wettability.

1. INTRODUÇÃO

Os materiais cerâmicos são usados como utensílios domésticos, estruturas, decorações, biomateriais e isolantes elétricos. Na Odontologia, são usados há mais de 200 anos para confecção de restaurações indiretas (ROSENBLUM e SCHULMAN, 1997). O desenvolvimento de sistemas computadorizados para a produção de restaurações dentais, associado ao desenvolvimento de novos materiais cerâmicos, alterou significativamente os procedimentos clínicos e laboratoriais, bem como novas opções de tratamento aos pacientes. Uma das mais significativas mudanças neste cenário foi a introdução de restaurações monolíticas de alta resistência, como a zircônia, com indicação para coroas e pontes na região posterior (SILVA et al, 2017).

A zircônia é um material de alto desempenho que encontra aplicações na indústria biomédica e de energia devido à sua combinação ímpar de resistência, tenacidade à fratura e baixa condutividade iônica. Estas propriedades estão em grande parte associadas com à estabilização das fases tetragonal e cúbica, através de ligações com íons de valências diferentes (CAMERINI, 2013). É o material mais resistente dentre as cerâmicas odontológicas disponíveis. É resistente ao desgaste e à degradação, biocompatível, hipoalergênica, possui baixa toxicidade, é quimicamente inerte e possui algumas propriedades mecânicas semelhantes ao aço (KREVE e REIS, 2021).

A zircônia encontra-se na natureza em três formas cristalinas: monoclínica, tetragonal e cúbica. Cada uma delas tem propriedades mecânicas diferentes e são estáveis em determinadas faixas de temperatura, não havendo alteração de composição química entre elas (RODRIGUES et al,

2021; CARVALHO et al, 2020). Da temperatura ambiente até 1170 °C, a zircônia tem simetria monoclínica. De 1170 °C a 2370 °C, a fase estável é a tetragonal. A partir de 2370 °C até seu ponto de fusão (2680 °C) a fase estável é cúbica.

No início da década de 70, engenheiros descobriram que a adição de óxidos estabilizadores à zircônia tornava possível estabilizar a fase tetragonal à temperatura ambiente. A adição desses óxidos, como o Ce_2O_3, CaO, MgO, Y_2O_3 entre outros, permite a manutenção da fase tetragonal de forma metaestável à temperatura ambiente. A estrutura tetragonal é a responsável pela alta tenacidade da zircônia, pois durante a aplicação de uma carga externa, a fase tetragonal transforma-se em monoclínica, aumentando o volume da região, criando assim tensões de compressão na ponta da trinca, impedindo sua propagação (CARVAHO et al, 2020). O estabilizador mais comum da fase tetragonal da zircônia para aplicações odontológicas é a ítria (Y_2O_3) (DE OLIVEIRA e RABELLO, 2017).

A zircônia estabilizada por ítria sofre transformação de fase da tetragonal para monoclínica na presença de água, sendo tal fenômeno conhecido como degradação hidrotérmica ou degradação a baixa temperatura (Low-Temperature Degradation - LTD) (PEREIRA et al, 2015). A degradação hidrotérmica a baixa temperatura é um fenômeno de envelhecimento lento que inicia na superfície do material quando em contato com a água, e que induz uma alteração na estrutura cristalina metaestável da zircônia. Várias características do ambiente oral como tensões, temperatura e umidade são condições ideais para desenvolver a LTD (KREVE e REIS, 2021).

Apesar de todas as vantagens citadas da zircônia, como alta resistência mecânica e alta tenacidade à fratura, um problema recorrente neste tipo de material pode ser atribuído à sua coloração e aspecto óptico, uma vez que é opaca, e sua cor branca não é adequada para mimetizar os elementos dentários no tom natural deles. Considerando-se as técnicas de recobrimento existentes no mercado, estas não apresentam durabilidade adequada e nem qualidade estética, em especial para uso na região dos dentes anteriores (MENDES et al, 2017; BALICA et al, 2020).

Dados da literatura mostram que não há citotoxicidade da pintura epóxi para uso em estruturas metálicas de próteses parciais removíveis (PPRs) (RAGONHA et al, 2015). Em odontologia, o epóxi, o Teflon® (politetrafluoroetileno – PTFE) e o polietileno têm sido utilizados para recobrimento de fios ortodônticos e bráquetes. Tal procedimento visa a prevenção de reações alérgicas ao metal, além de proporcionar diminuição da rugosidade superficial e redução do atrito. (BANDEIRA, 2004).

2. MATERIAIS E MÉTODOS

No presente trabalho, foi avaliada a influência das cores da tinta em pó na degradação hidrotérmica da zircônia parcialmente estabilizada por ítria. Foram utilizadas 09 (nove) amostras de zircônia tetragonal 3% mol Y_2O_3 sinterizadas, cedidas pela empresa ProtMat Materiais Avançados (Juiz de Fora, MG) nas dimensões médias de 10,8 x 14,8mm (figura 1). As amostras foram divididas em 03 (três) grupos e pintadas conforme a tabela 1.

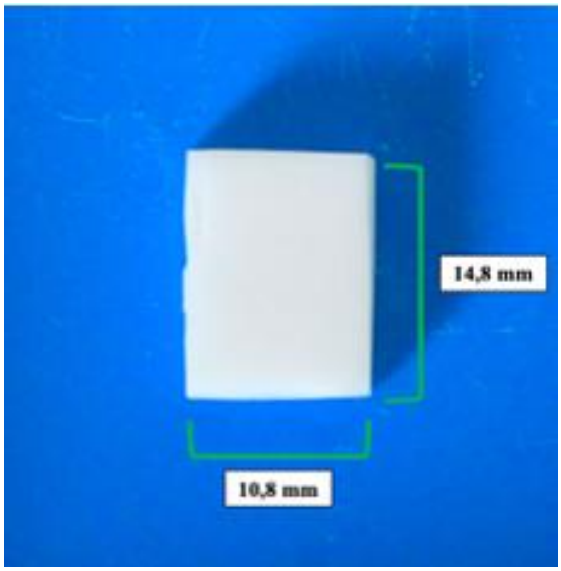

Figura 1 – Amostra utilizada para esse estudo.

GRUPO	AMOSTRAS	COR	ESPECIFICAÇÕES
1	1, 2, 3	A	Politherm 34 NOBAC (branco) / Epóxi
2	4, 5, 6	B	Politherm 30 NOBAC (bege) / Poliéster/Epóxi (70:30)
3	7, 8, 9	C	Mistura das cores A e B na proporção de 4 (800g) :1 (200g)

Tabela 1– Distribuição das amostras e especificações das tintas.

Na figura 2, estão representadas as tintas em pó utilizadas nesse estudo.



Figura 2 – Tintas em pó utilizadas nesse estudo.

Todas as amostras foram caracterizadas quando à sua molhabilidade e rugosidade. Algumas amostras passaram pela degradação hidrotérmica em autoclave, e todas foram imersas em vinho e avaliadas quanto aos parâmetros de cor. As tintas em pó (A e B) foram caracterizadas por meio de fluorescência de Raios X (FRX).

A medida de molhabilidade foi feita com a medida do ângulo de contato. Nos ensaios, foi utilizada a água destilada, com o emprego da técnica da gota séssil, com aproximadamente 2µL cada gota. O equipamento utilizado foi o goniômetro FTA 100 (FirstTen Angstroms, Portsmouth, VA, EUA), disponibilizado no Laboratório de Biomateriais do Instituto Militar de

Engenharia. Foram realizadas três medidas de cada amostra, em locais diferentes, para melhor avaliação do referido parâmetro. As medidas da molhabilidade foram antes e após a pintura.
A análise da rugosidade das amostras foi feita com o uso do Rugosímetro por Interferometria Óptica Zygo NewView 7100 (Zygo Corporation, Middlefield, CT, EUA), disponibilizado no Laboratório de Biomateriais do Instituto Militar de Engenharia. Mediu-se parâmetro o Ra (rugosidade média). Foram realizadas cinco medidas de cada amostra. As rugosidades foram medidas antes e após a pintura, e após a degradação hidrotérmica (apenas amostras 2, 3, 5, 6, 8 e 9).
Para degradação hidrotérmica, as amostras foram aquecidas em autoclave (marca Cristófoli - Vitale Class) até a temperatura de 129 ºC e pressão de 1,7 kg/cm^2, permanecendo nessas condições durante de 05 (cinco) horas. As amostras foram imersas em solução salina 0,5g/L.



Figura 3 – Autoclave utilizada para simular a degradação hidrotérmica da zircônia em ambiente oral
e amostras posicionadas.

As amostras foram imersas em vinho tinto a temperatura ambiente por seis dias. Após esse período, as amostras foram lavadas em água corrente, e em lavadora ultrassônica por 15 min. O objetivo desse procedimento é verificar a alteração de cor das amostras pintadas com a imersão em líquido corante (com ou sem degradação hidrotérmica).
As cores das amostras foram avaliadas com os parâmetros L, C e H (luminosidade, saturação e tonalidade), utilizando-se um espectrofotômetro (Easy Shade – figura 15), cedido pela empresa ProtMat Materiais Avançados. A análise da cor foi feita nas seguintes etapas:

a) antes e após a degradação hidrotérmica (amostras degradadas);
b) antes a após a imersão em vinho (todas as amostras).

3. RESULTADOS

Mostra-se na figura 4 o aspecto das amostras pintadas (após processo de cura). Nota-se a diferença entre as três colorações utilizadas nesse estudo para os diferentes grupos de amostras.

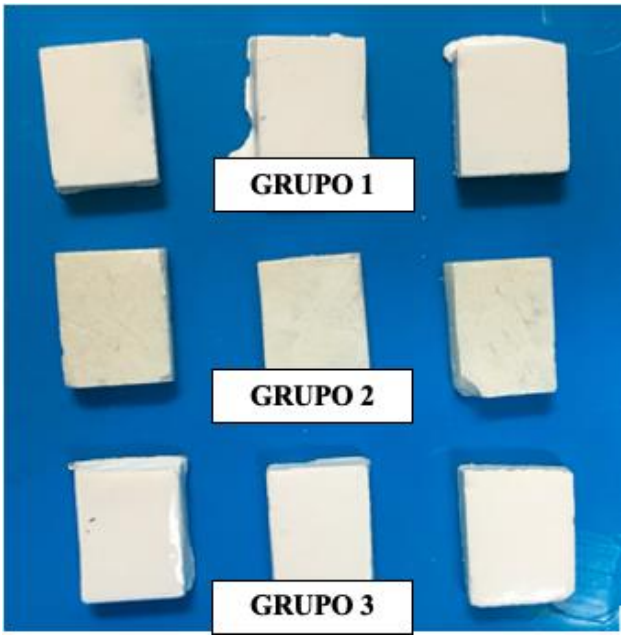

Figura 4 – Aspecto final das amostras pintadas.

A análise de variância quanto à molhabilidade (ANOVA α=0,05) revelou que não houve diferença estatisticamente significativa (P>0,05) entre os grupos pré e pós pintura. A pintura não alterou a molhabilidade da zircônia, sendo mantido seu caráter hidrofílico (ângulo de contato < 90º).

Quanto à rugosidade média (Ra), a análise de variância (ANOVA α=0,05) indicou que houve diferença significativa entre os grupos antes e após a pintura (P<0,05). Houve uma diminuição significativa na rugosidade superficial das amostras após o processo de pintura. Porém, comparando-se os grupos pós pintura e pós degradação hidrotérmica, a ANOVA indicou que não houve variação significativa dos resultados (P>0.05). Na figura 5, está representada a variação do parâmetro de rugosidade Ra das amostras.

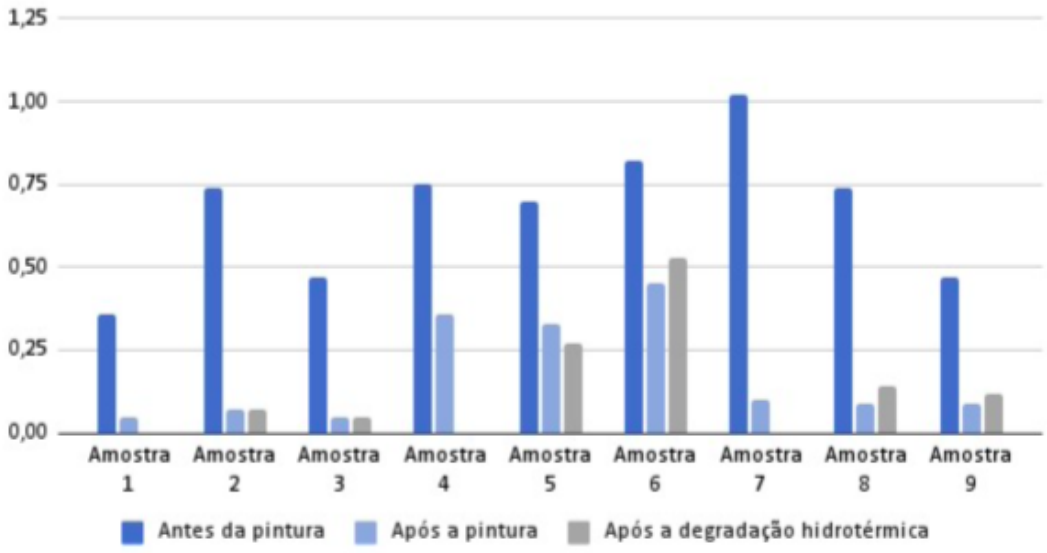

Figura 5 – Variação da rugosidade média (Ra) das amostras.

Nas tabelas 2 e 3, são apresentados os resultados das análises por fluorescência. Nota-se que ambos os pós possuem maior quantidade de Ti (titânio), possivelmente na forma de rutilo,

responsável pela coloração branca final da tinta.

Nr	Ident	Seq	Time	Pos	Norm F	Mg		Al		Si	
						C	Unit	C	Unit	C	Unit
1	ana karine po branco	1/1	06-Jun-2022 17:02:21	1	3.187	601.6	ppm	0.380	%	0.402	%

Nr	P		S		Ca		Ti		Fe		Br		Rb		Sr		Zr
	C	Unit	C	Unit	C	Unit	C	Unit	C	Unit	C	Unit	C	Unit	C	Unit	C
1	0.579	%	1.928	%	0.133	%	77.237	%	204.9	ppm	548.8	ppm	0.0	ppm	771.4	ppm	0.600

Nr	Zr	Nb		Sn		Ba		Pt	
	Unit	C	Unit	C	Unit	C	Unit	C	Unit
1	%	252.5	ppm	324.4	ppm	18.467	%	43.4	ppm

Tabela 2– Resultado da análise do pó branco (COR A).

Application	<Omnian>
Sequence	1 of 1
Position	2
Measurement time	06-Jun-2022 17:18:11

Normalisation factor	2.211
Minimum He Flow (l/min)	0.62

Compound	Mg	Al	Si	P	S	Cl	Ca	Ti	V	Fe	Ni	Zn	Ga
Conc	0.957	0.149	0.388	0.428	0.877	445.7	22.835	59.153	0.411	1.252	0.0	0.119	2.1
Unit	%	%	%	%	%	ppm	%	%	%	%	ppm	%	ppm

Compound	Br	Sr	Zr	Nb	Sn	Ba	Eu	Yb	Ta	Os	Pt
Conc	0.245	1.058	412.2	0.150	828.2	11.518	0.223	116.0	403.5	173.5	0.0
Unit	%	%	ppm	%	ppm	%	%	ppm	ppm	ppm	ppm

Tabela 3 – Resultado da análise do pó bege (COR B).

Mostra-se na tabela 4 os valores obtidos para os três parâmetros de medida de cor para cada amostra, nos diferentes momentos de análise. Foram realizadas três medidas de cada amostra para avaliação dos parâmetros.

AMOSTRA	MEDIDA DE COR INICIAL			MEDIDA APÓS IMERSÃO NO VINHO SEM DEGRADAÇÃO			COM DEGRADAÇÃO HIDROTÉRMICA					
							ANTES DA IMERSÃO EM VINHO			APÓS IMERSÃO EM VINHO		
1	L = 118,3 C = 1,4 H = 90,8º	L = 108,3 C = 2,7 H = 123,9º	L = 103,5 C = 2,8 H = 98,6º	L = 112,5 C = 2,9 H = 72,5º	L = 101,1 C = 2,2 H = 52,1º	L = 98,6 C = 1,3 H = 40,2º						
2	L = 103,5 C = 3,5 H = 106,8º	L = 105,1 C = 3,1 H = 110,2º	L = 108,8 C = 2,4 H = 112º				L = 107,7 C = 7,1 H = 86,8º	L = 106,4 C = 6,7 H = 88,6º	L = 112,8 C = 6,8 H = 90,2º	L = 103,5 C = 8,0 H = 81,1º	L = 100,2 C = 7,9 H = 76,7º	L = 93,5 C = 6,9 H = 66,5º
3	L = 107,7 C = 2,4 H = 101,9º	L = 114,8 C = 2,5 H = 107,7º	L = 107,1 C = 2,5 H = 109,2º				L = 115,2 C = 8,1 H = 84,4º	L = 107,3 C = 7,2 H = 88,7º	L = 108,9 C = 8,0 H = 94,7º	L = 97,2 C = 7,4 H = 71,1º	L = 95,3 C = 7,6 H = 71,6º	L = 96,0 C = 7,5 H = 72,0º
4	L = 95,1 C = 5,1 H = 110,3º	L = 96,9 C = 4,9 H = 102,4º	L = 106,5 C = 5,1 H = 108,1º	L = 100,5 C = 6,0 H = 84,3º	L = 99,9 C = 6,1 H = 77,6º	L = 97,1 C = 5,7 H = 78,3º						
5	L = 96,2 C = 4,2 H = 115,2º	L = 99,4 C = 3,3 H = 121,8º	L = 102,8 C = 3,5 H = 133,8º				L = 99,3 C = 5,1 H = 105,6º	L = 104,5 C = 5,0 H = 107,3º	L = 98,6 C = 3,6 H = 121,7º	L = 89,1 C = 3,2 H = 76,8º	L = 98,4 C = 4,6 H = 76,0º	L = 98,4 C = 5,6 H = 71,0º
6	L = 108,6 C = 3,9 H = 112,9º	L = 100,6 C = 3,5 H = 110,9º	L = 100,6 C = 3,5 H = 116,6º				L = 100,8 C = 4,5 H = 117,0º	L = 93,1 C = 3,7 H = 111,5º	L = 101,5 C = 4,3 H = 110,0º	L = 89,6 C = 3,4 H = 73,0º	L = 94,3 C = 4,3 H = 77,3º	L = 91,1 C = 3,8 H = 77,7º
7	L = 112,9 C = 1,9 H = 83,2º	L = 109,5 C = 2,1 H = 72,9º	L = 113,4 C = 2,3 H = 81,6º	L = 107,7 C = 3,2 H = 54,5º	L = 107,1 C = 3,6 H = 57,3º	L = 89,9 C = 3,1 H = 35,4º						
8	L = 115,4 C = 2,2 H = 81,0º	L = 118,0 C = 2,0 H = 84,6º	L = 118,2 C = 2,1 H = 78,9º				L = 109,0 C = 7,1 H = 89,5º	L = 112,2 C = 8,2 H = 90,8º	L = 102,7 C = 6,4 H = 85,8º	L = 102,3 C = 6,4 H = 70,2º	L = 99,6 C = 6,5 H = 72,6º	L = 95,3 C = 6,1 H = 67,3º
9	L = 119,7 C = 2,6 H = 77,2º	L = 105,4 C = 2,1 H = 62,1º	L = 107,2 C = 2,5 H = 67,9º				L = 113,8 C = 5,6 H = 76,9º	L = 113,2 C = 5,7 H = 77,8º	L = 108,6 C = 5,1 H = 74,2º	L = 95,1 C = 5,0 H = 67,3º	L = 99,9 C = 5,4 H = 73,0º	L = 98,6 C = 5,6 H = 70,6º

LEGENDA:
L = luminosidade
C = saturação
H = tonalidade

Tabela 4 – Resultado da análise de cor das amostras pintadas.

4. CONCLUSÃO

Com base nos resultados obtidos pode-se concluir que:

a) a molhabilidade da zircônia não foi alterada com a pintura, mantendo-se seu caráter hidrofílico;

b) A rugosidade diminuiu após o revestimento, havendo diferença entes as cores, porém não estatisticamente significativa;

c) Após a imersão em vinho, com ou sem degradação hidrotérmica, alguns parâmetros de cor foram alterados, porém sem diferença estatisticamente significativa;

d) Há necessidade de maiores estudos sobre o revestimento com tinta epóxi em zircônia para uso odontológico para melhor entendimento do mecanismo de união tinta/substrato.

5. REFERÊNCIAS

BALICA, N. M. P.; CAMPELO, T. S.; SILVA FILHO, E. C.; SANTOS, M. R. M. C.; SANTOS, R. L. P. **Zircônia pigmentada obtida pelo método Pechini para aplicações odontológicas.** Revista Matéria, v. 25, n. 4, 2020.

BANDEIRA, A. M. B. **Avaliação da força de atrito de fio ortodônticos recobertos com resina epoxídica.** Tese - Universidade Federal do Rio de Janeiro, COPPE, 2004. 103 p.

CAMERINI, R. V. **Desenvolvimento De Compósitos Cerâmicos Laminares À Base De Alumina E Zircônia.** Tese de Doutorado apresentada ao Programa de Pós- Graduação em Ciência dos Materiais tda Universidade Federal do Rio Grande do Sul. 2013. 95p.

CARVALHO, R. F. de; RODRIGUES, M. R.; MARINHO, C. C.; SAAVEDRA, G. S. F. A.; PAES-JÚNIOR, T. J. de ARRUDA; KIMPARA, E. T. **Zircônia: desafio do processo de tratamento de superfície.** HU Rev. 2020; 46: 1-8.

DE OLIVEIRA, P. F. G.; RABELLO, T. B. **Tratamento de superfície para a cimentação adesiva de cerâmicas à base de zircônia: revisão de literatura.** Ver. Bras. Odontol., Rio de

Janeiro, v. 74, n.1, p. 36-9, jan./mar. 2017.

KREVE, S; REIS, A. C. **Zircônia da Odontologia: mini-revisão.** Revista da Faculdade de Odontologia de Porto Alegre, 62 (1): 82-89 (2021).

MENDES, P. F. C.; ELIAS, C. N.; DOS SANTOS, H. E. S. **Efeito da adição de Fe_2O_3 nas propriedades da zircônia estabilizada com ítria.** Revista Matéria, v. 22, n. 2, Jun. 2017.

PEREIRA, G. K. R.; VENTURINI, A. B.; DAPIEVE, K. S.; MONTAGNER, A. F. **Low-temperature degradation of Y-TZP ceramics: a systematic review and meta-analysis.** Journal of Mechanical Behavior of Medical Materials. Elsevier. V. 55 (2015), 151-163.

RAGONHA, E. W.; MARTINEZ, E. F.; MUZILLI, C. A.; MIRANDA, M. E.; OLIVEIRA, K.A.N. **Citotoxicity analysis of eletrostatically applied epoxy coating onto CO-CR alloy.** Revista Gaúcha de Odontologia, Porto Alegre, v. 63, n. 3, p. 257-262, ju./set. 2015.

RODRIGUES, A. C. C.; MARCHRY, R. V.; PEREIRA, G. K. R.; VALANDRO, L. F.; **Zircônia como alternativa para restaurações monolíticas.** Revista ImplantNews, 5 (6): 1-7 (2021).

ROSENBLUM, M. A.; SCHULMAN, A. **A review of all-ceramics reataurations.** J Am Dent Assoc. 1997 Mar, 128 (3): 297-307.

SILVA, L. H.; LIMA, E.; MIRANDA, R. B. P.; FAVERO, S.S.; LOHBAUER, U.; CESAR, P.F. **Dental Ceramics: a review of new materiais and processing methods.** Braz. Oral Res. 31, 2017: 133 – 145.

COMPORTAMENTO GALVÂNICO ENTRE LIGAS BIOMÉDICAS

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RESUMO
Diferentes ligas metálicas são utilizadas como biomateriais, entre elas o aço inoxidável, titânio, níquel-titânio e cobalto-cromo-molibdênio. Estes materiais possuem elevada resistência à corrosão e biocompatibilidade para diversas aplicações nas áreas médicas e odontológica. A alta resistência à corrosão destas ligas está diretamente associada com a capacidade de formarem uma camada passiva de óxido em sua superfície. No entanto, a exposição destes materiais ao contato com líquidos corporais, em especial no meio bucal, reduz sua resistência à degradação. A degradação aumenta devido à corrosão galvânica quando duas ou mais destas ligas são colocadas na cavidade oral ou em outra parte do corpo. O caso mais comum da corrosão galvânica no ambiente oral é o contato entre próteses dentárias fabricadas com diferentes ligas. Alguns casos de mudança da cor da gengiva foiram observadas na região próxima ao implante dentário. Este comportamento pode ser associado ao contato do implante dentário de titânio puro com os componentes protéticos que fixam a prótese ao implante que liberam diferentes íons. Além da alteração da cor, a corrente gerada próxima aos tecidos moles (gengiva) pode acarretar na morte celular, efeitos sistêmicos (efeito em local distante do biomaterial) e induzir outros efeitos deletérios para o paciente. No presente trabalho foram realizadas análises eletroquímicas de três ligas (aço inoxidável 303 ASTM F889, titânio comercialmente puro (TiG4 ASTM F67) e liga Ti-6Al-4V ASTM F136) usadas como biomaterial. Fez-se a medida de potencial de circuito aberto e amperometria de resistência zero. Como eletrólito foi utilizada a solução NaCl 0,9%. Os resultados obtidos mostraram que o contato do TiG4 F67 com o aço inoxidável 303 F889 apresentou um menor corrente galvânica, maior resistência à corrosão e maior potencial galvânico que o par Ti-6Al-4V F136/aço inoxidável 303 F889.

Keywords: Corrosão galvânica; Ligas de titânio; Aço inoxidável 303 F889; Biomateriais.

ABSTRACT
Metallic alloys are used as biomaterials, including stainless steel, titanium, nickel-titanium, and cobalt-chromium-molybdenum. These materials have high corrosion resistance and biocompatibility for medical and dental applications. These alloys' high corrosion resistance is due to their ability to form a passive oxide layer on their surface. However, the exposure of these materials to body fluids, especially in the oral environment, reduces their resistance to

degradation. Degradation increases due to galvanic corrosion when different alloys are placed in the oral cavity or elsewhere in the body. The most common cause of galvanic corrosion in the oral environment is when dental prostheses are made with different alloys. Some soft tissue color changes were observed in the region close to the dental implant. This behavior can be associated with the contact of the pure titanium dental implant with the prosthetic components that fix the prosthesis. The implant releases ions. In addition to the color change, the current generated close to the soft tissues can lead to cell death, systemic effects (effect in a distant location of the biomaterial), and induce other deleterious effects for the patient. In the present work, electrochemical analyzes of three alloys (303 ASTM F889 stainless steel, commercially pure titanium (TiG4 ASTM F67) and Ti-6Al-4V alloy ASTM F136) used as biomaterials were performed. Open circuit potential and zero resistance amperometry were measured. The 0.9% NaCl solution was used as electrolyte. The result showed that the contact of TiG4 with stainless steel 303 F889 presented a lower galvanic current, greater corrosion resistance, and greater galvanic potential than the pair Ti-6Al-4V F136/303 stainless steel F889.

INTRODUÇÃO

Algumas ligas metálicas são utilizadas como biomateriais, entre elas o aço inoxidável, o titânio comercialmente puro e suas ligas, cobalto-cromo e cobalto-cromo-molibdênio. Estes materiais possuem elevada resistência à corrosão e biocompatibilidade. A alta resistência à corrosão destes materiais está diretamente associada com a capacidade de formarem uma camada passiva de óxido em sua superfície [1, 2, 3, 4].

No entanto, a exposição destes materiais ao contato com líquidos corporais, em especial com a saliva, reduz sua resistência à corrosão devido a presença de íons agressivos na saliva, como os íons de cloreto e fluoreto. Outros fatores como a variação de pH, variações térmicas, esforços mecânicos, faz com que a resistência corrosão destes materiais reduza consideravelmente [4, 5].

A corrosão dos biomateriais provoca efeitos indesejáveis no organismo, pois ocorre o aumento da liberação de íons metálicos prejudiciais a saúde, além de comprometer a durabilidade dos materiais e causar falhas no implante [8].

Diferentes tipos de corrosão ocorrem na superfície dos biomateriais, e os principais tipos são a corrosão por pite, em fresta, corrosão biológica e galvânica. A corrosão galvânica ocorre quando ligas diferentes são colocadas em contato direto ou indireto na cavidade oral ou em outra parte do corpo. A liga que sofre corrosão é a liga menos nobre [9, 10]. O caso mais comum da corrosão galvânica no ambiente oral é o contato entre próteses dentárias fabricadas com diferentes ligas [11].

Recentemente, observou-se alguns casos de mudança da cor da gengiva na região próxima ao implante dentário. Possívelmente, o contato do implante dentário com os componentes protéticos que fixam a prótese ao implante liberam diferentes íons que alteram a cor da gengiva. Além da alteração da cor, a corrente elétrica gerada próxima aos tecidos moles pode acarretar na morte das células, aumento da liberação de íons para o organismo e induzir efeitos deletérios sistêmicos (distante do local do implante) para o paciente [12].

Valero e colaboradores avaliaram a resistência à corrosão de cinco ligas utilizadas como componentes protéticos (NiCrTi, duas ligas de CoCr, Au e Ti6Al4V) acopladas aos implantes de TiG2. As análises eletroquímicas foram realizadas variando o pH da saliva artificial em condições ácidas, com e sem fluoretos. Os autores concluíram que ocorreu corrosão galvânica das ligas de CoCr e de Ti-6Al-4V acopladas a TiG2 para o pH da saliva artificial menor que 3

e o teor de flúor de 1000 ppm [10].
Além do uso dos implantes de ligas diferentes, a corrosão galvânica também pode ocorrer em suportes ortodônticos e amálgamas. Bakhtari e colaboradores analisaram a corrosão galvânica entre fios ortodônticos e braquetes, com materiais diferentes, utilizando a saliva artificial como eletrólito. Os fios de aço inoxidável, níquel-titânio e titânio beta foram acoplados aos braquetes de aço inoxidável e titânio. A corrente galvânica de cada par foram monitoradas com um amperímetro de resistência zero por 10 horas. Os pesquisadores concluíram que as ligas que apresentaram potenciais de corrosão mais próximos foram a liga de NiTi acoplada a liga de Ti e exibem menor corrente de corrosão galvânica. As ligas que possuem diferenças de potenciais maiores, como a liga de Ti-Beta acoplada ao braquete de aço inoxidável, apresentaram maior corrente de corrosão galvânica [13].
O objetivo deste trabalho foi investigar a resistência à corrosão galvânica do titânio comercialmente puro (TiG4 ASTM F67) usado em implantes dentários em contato com as ligas (aço inoxidável 303 ASTM F889 e a liga Ti-6Al-4V ASTM F136) usadas como componentes protéticos das próteses implantossuportadas.

MATERIAIS E MÉTODOS

No presente trabalho foram utilizadas as ligas comerciais de aço inoxidável 303 ASTM F889, TiG4 ASTM F67 e a liga Ti-6Al-4V ASTM F136. As ligas foram fornecidas pela empresa Conexão Sistema de Próteses (Arujá, SP).
Os ensaios eletroquímicos realizados foram a medida de potencial de circuito aberto (OCP) e amperometria de resistência zero (ZRA). O equipamento utilizado para os ensaios foi um potenciostato/galvanostato da marca AUTOLAB, modelo PGSTAT 204N.
A célula eletroquímica utilizada foi a convencional contendo três eletrodos. O eletrodo de referência foi o calomelano, o contra eletrodo a platina e os eletrodos de trabalho as amostras estudadas.
A montagem da célula galvânica foi realizada de acordo com a norma ABNT NBR15613-5. O material considerado como anodo foi utilizado como eletrodo de trabalho e o catodo foi o contra-eletrodo. As análises foram realizadas por um período de tempo de 24 h e em triplicatas. A análises eletroquímicas realizadas foram realizadas em um eletrólito com uma solução de NaCl 0,9% para simular a saliva artificial em temperatura ambiente.

RESULTADOS

Medida de Potencial de Circuito Aberto (OCP – Opend circuit potencial)

A medida de potencial de circuito aberto mede o potencial de equilíbrio entre a superfície metálica e a solução. Os valores dos potenciais de circuito aberto das amostras metálicas imersas em solução de NaCl 0,9% após 3600 s são mostrados na Tabela 1.
Tabela 1. Medida de potencial de circuito aberto (OCP) em solução de NaCl após 3600s.

Liga metálica	OCP (V)
Aço inoxidável 303 F889	-0,14813
Ti-6Al-4V F136	-0,23019
TiG4 F67	-0,11008

A liga Ti-6Al-4V F136 apresenta potencial de circuito aberto mais negativo indicando que possui menor resistência à corrosão no eletrólito analisado. O titânio TiG4 F67 apresenta potencial de circuito aberto mais próximo de zero, indicando que possui uma maior resistência à corrosão.

Medidas galvânicas

A técnica de amperometria de resistência zero (ZRA) é utilizada para medir a corrente e o potencial galvânico que flui entre dois materiais. As medidas galvânicas foram realizadas com objetivo de avaliar se as ligas analisadas quando acopladas geram corrente galvânica. Foram analisados dois pares galvânicos, o aço inoxidável 303 F889 acoplado ao TiG4 F67 e o aço inoxidável 303 F889 acoplado a liga Ti-6Al-4V F136. A Figura 1 apresenta a evolução do potencial dos pares galvânicos imersos em solução de NaCl 0,9% durante 865 s, 43200 s (12 h) e 86400 s (24 h).

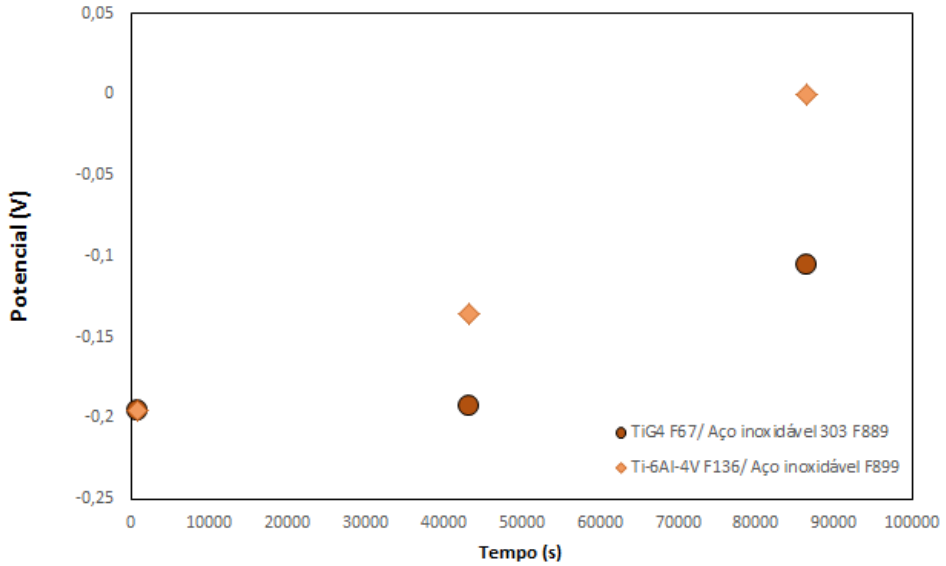

Figura 1. Potencial dos pares galvânicos imersos em solução de NaCl 0,9% durante 865 s, 43200 s (12 h) e 86400 s (24 h). Pares galvânicos: TiG4 F67/aço inoxidável 303 F889 e o Ti-6Al-4V F136/aço inoxidável 303 F889.

Na figura 1 observa-se a evolução do potencial dos pares galvânicos. Nota -se que o potencial dos pares galvânicos o TiG4 F67 com o aço inoxidável 303 F889 apresenta evolução para valores mais próximos de zero, indicando menor possibilidade de ocorrência de corrosão galvânica entre os pares. O potencial do par galvânico Ti-6Al-4V F136 com o aço inoxidável 303 F889 apresentou valores mais negativos, indicando uma maior possibilidade de ocorrência de corrosão galvânica.

Na figura 2 são mostrados os valores das correntes galvânicas dos pares TiG4 F67/aço inoxidável 303 F889 e Ti-6Al-4V F136/aço inoxidável 303 F889 imersos em solução de NaCl 0,9% durante 865 s, 43200 s e 86400 s. Observa-se que o par TiG4 F67/ aço inoxidável 303 F889 apresentou menor corrente galvânica, corroborando com o observado no gráfico da figura 1, que mostra o potencial em relação ao tempo. O par galvânico Ti-6Al-4V F136/ aço inoxidável 303 F889 apresentou valor corrente galvânica inicial maior. Contudo, observa-se que a corrente após 24 horas foi próxima do valor do par TiG4 F67/ aço inoxidável 303 F889, indicando que ao longo do tempo a corrente galvânica gerada tende a diminuir. Este comportamento ocorre devido a formação do filme passivo que se forma em ambos materiais que funciona como uma barreira e assim diminui a troca de elétrons.

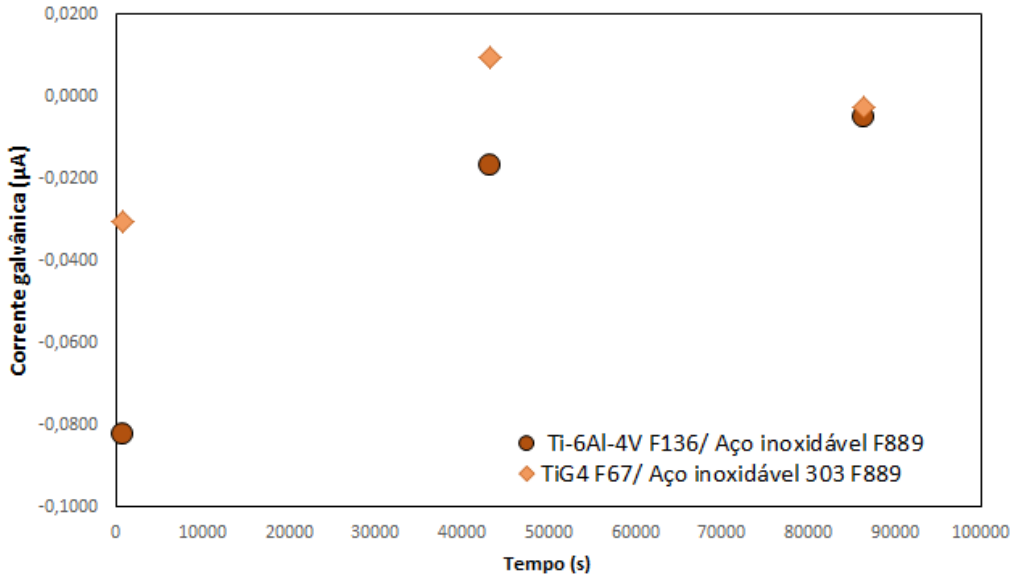

Figura 2. Medidas de corrente galvânica dos pares imersos em solução de NaCl 0,9% durante 865 s, 43200 s e 86400 s. Pares galvânicos: TiG4 F67/aço inoxidável 303 F889 e o Ti-6Al-4V F136/aço inoxidável 303 F889.

CONCLUSÃO

Os resultados obtidos no presente trabalho mostraram que:

a) as ligas analisadas apresentam alta resistência à corrosão devido à formação de um filme passivo;

b) o par galvânico TiG4 F67/aço inoxidável 303 F889 apresentou maior resistência à corrosão, menor corrente galvânica e maior potencial galvânico em relação ao par Ti-6Al-4V F136/aço inoxidável 303 F889.

REFERÊNCIAS

[1] Pires, A. L. R., Bierhaltz, A. C. K., & Moraes, A. M. (2015). Biomateriais: Tipos, aplicações e Mercado. Química Nova, v. 38, p. 957-971.

[2] El-Bediwia, A., Saada, M., El-Fallalb A. A., & El-Helalya, T. (2009) Electrochemical corrosion behavior, Vickers microhardness, and microstructure of Co–Cr and Ni–Cr dental alloys. Radiation Effects & Defects in Solids, v. 164, p. 712–718.

[3] Ramires, I. & Guastaldi, A. C. (2002). Estudo do biomaterial Ti-6Al-4V empregando-se técnicas eletroquímicas e XPS. Quim. Nova, Vol. 25, 1, 10-14.

[4] Shah, F. A.; Trobos, M.; Thomsen, P.; Palmquist, A. (2016). Commercially pure titanium (cp-ti) versus titanium alloy (ti6al4v) materials as bone anchored implants—isone truly better than the other? Materials Science and Engineering: C, Elsevier, v. 62, p. 960–966,

[5] Hanawa, T. (2004). Metal ion release from metal implants, Materials Science Engineering C, v. 24, p. 745- 752.

[6] Gentil, V. (2011). Corrosão, 6ª Edição, Rio de Janeiro.

[7] Soares, F. M. d. S.; Santana, A. I. d. C.; Santos, L. B. F. d.; Gomes, P. A. M. C.; Monteiro, E. d. S.; Coimbra, M. E. R.; Elias, C. N. (2019). Influence of oral ph environment in the corrosion resistance of cr-co-mo alloy used for dentistry prosthetic components. Materials Research, SciELO Brasil, v. 22

[8] Hanawa, T. (2004). Metal ion release from metal implants, Materials Science Engineering C, v. 24, p. 745- 752.

[9] Shreır, L. L. (2013) Corrosion: corrosion control. [S.l.]: Newnes.
[10] Valero, A. M., Munõz, A. I., Pina, V. G., Ruiz, M. F. S. (2018). Electrochemical Behaviour and Galvanic Effects of Titanium Implants Coupled to Metallic Suprastructures in Artificial Saliva, Materials, v.171 , p. 1-19.
[11] Karov, J., Hinberg, I. (2001). Galvanic corrosion of selected dental alloys, Journal of Oral Rehabilitation, v. 28, p. 212 – 219.
[12] Morais, L.S., Serra, G.G., Palermo, E.F.A., Andrade, L.R., Müller, C.A., Meyers, M.A., Elias, C.N. (2009). Systemic levels of metallic ions released from orthodontic mini-implants. American Journal of Orthodontics and Dentofacial Orthopedics 135 (4), 522-529.
[13] Bakhtari, A., Bradley, T., Lobb, W., Berzins, D. (2011). Galvanic corrosion between various combinations of orthodontic brackets and archwires. American Journal of Orthodontics and Dentofacial Orthopedics, v. 140, p. 26-31.

INFLUENCE OF TOOTH PROFILE MODIFICATIONS ON GEAR TRANSMISSION ERROR

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ABSTRACT
Due to their unique advantages such as their compact design, load sharing capacities between multiple planetary gears, and their ability to achieve higher speed ratios in smaller volumes, planetary gear trains (PGTs) have a wide range of applications in aerospace, wind energy, automotive industry and etc. With the increased performance requirements and their complex design, a variety of studies have been conducted by the researchers, mostly on the dynamic behaviors of PGTs in order to reduce the vibration levels, dynamic forces, and noise, increasing their efficiency, extending their service lifetime by minimizing the contact pressures and tooth root bending stress, and examining the failure mechanisms such as pitting and wear. Tooth profile modifications which is a change of tooth shape, are common practice and an effective tool to improve the aforementioned effects. Since the static transmission error is one of the main interior excitations which causes noise and vibration, and is influenced by the tooth profile modifications, it should be taken into account in the designing process of the gear systems. In this study, the influence of different amounts of tip relief modifications on the gear transmission error and the dynamic behavior of planetary gear trains are investigated by utilizing the fast and accurate simulations of ROMAX Software in order to deliver design ideas in the early stages of product development.

Keywords: Planetary Gear Trains, Gear transmission error, Tooth profile modifications, Gear dynamics.

1. INTRODUCTION
With the generally accepted definition, gear transmission error is defined as the driven gear being in a different position along the line of action than the ideal position. The main causes for the occurrence of this error can be listed as manufacturing errors which result in deviation from the perfect involute profile of gear teeth, misalignment, and elastic deflections of the teeth under the transmitted load. In gear dynamics, the noise and vibration generated by the gear pairs are

strongly related to the static transmission since it is the main internal excitation of the gear dynamic behavior. The common practice for minimizing this error is the application of proper tooth profile modifications. By applying these small profile corrections, the elastic deflection of the gear teeth can be compensated so that static transmission error is minimized. (Kahraman and Blankenship, 1999 & Palmer and Fish 2012). Thus, many studies have been conducted on this subject.

Tavakoli and Houser (1986), conducted an optimization study on tooth profile modification based on the transmission error and its harmonics since they can also be the source of the noise. Modifications were applied to either pinion and gear teeth or one of them as linear/parabolic tip and root relief. Along with other results, they stated "The combined tip and root relief on both the gear and the pinion teeth gave the best results.". Yildirim and Munro (1999), presented a systematic approach to calculating the required amount and extent of tip relief for both low and high contact ratio spur gears to minimize transmission error. Their approach was based on the sum of adjacent pitch error and combined deflection of the gear teeth, with respect to load per unit face width and the tooth pair stiffness. Their study has a place in the literature since they consider both manufacturing errors and the deflection of teeth for the calculation and validated experimentally. In another study, Öztürk et al. (2014), seek the optimum amount of tip relief with the objective of minimum peak-to-peak transmission error in spur gear pairs. They analyzed five different cases with different ranges of torque, speed, and the amount of tip relief by utilizing the minimization of the loaded static transmission-based model and single/multi-degrees of freedom dynamic models of spur gear that the optimization is achieved through minimization of dynamic transmission error. They observed the optimum point in terms of the transmission error at different amounts of tip relief between these models. They concluded that the results of the multi-degree of freedom model better represent the best tip relief modification since it includes the effects of flexible shafts and bearings. Hu et al. (2016), studied the relation between tooth profile modifications and the mesh stiffness and dynamic responses of the gear system. They used an equation similar to Munro's (1990,1999) to determine the limits of modifications and applied different amounts of short and long modifications. According to their results, short profile modifications have better performance than long modifications in reducing the dynamic responses with respect to the amplitude of dynamic factor, vibration, and dynamic transmission error. However, they also stated that with an excessive modification amount, results may tend to increase. Another study on the effects of linear tip relief modification on dynamic tooth loads in ordinary spur gear and wind turbine gearbox was conducted by Doğan et al. (2021), In their case studies which included different amounts of linear tip reliefs and speed intervals, they concluded that the until a certain amount of modification, the dynamic loads continuously decrease and then begin to increase again. Therefore, with the graphical optimization method, they obtained optimum linear tip relief modification concerning dynamic loads.

The planetary gear system is a unique gear drive design that is composed of sun gear, multiple planet gears, ring gear, and the planet carrier. With the benefit of its design, the transmitted load is shared between the multiple-planet gear meshes so that the gear system is able to carry and transmit higher loads. Similarly higher speed ratios can be achieved in a smaller volume with this design. In their study, Öztürk and al. (2021), stated "vibration-induced dynamic loads are one of the major sources of failures of these components". By using a purely torsional dynamic model and loaded static transmission error-based calculated time-varying mesh stiffness, they conducted a parametric study to find ideal tooth profile modification in terms of the dynamic

behavior of the planetary gear system. They applied different amounts of linear and parabolic profile modification to the tip and root section of one of the gear pairs and analyzed their effect at various loading conditions. They concluded that by applying proper linear and parabolic tooth modification, dynamic mesh forces can be reduced and for the maximum reduction, the proper combination of profile modification for both sun-planet and ring-planet gear pairs is needed since the mesh forces are coupled for both gear pairs. Their results also show that the sensitivity of the parabolic modification to its amount is smaller than the linear counterparts in terms of the dynamic mesh force. This is also an important result when manufacturing tolerances are considered for the applicability of proper profile modification.

In this study, an example planetary gear system is modeled in Romax software which is an effective and reliable software package for the design and analysis of powertrain systems. Next, by applying different amounts of linear and parabolic tip relief to the respective teeth flanks of gear components of the system in the microgeometry analysis of Romax, the effect of tooth profile modification on the static transmission error and the dynamic behavior of the planetary gear system is investigated. Finally, static transmission error and dynamic contact load results for both the unmodified and the modified system are compared.

2. RESEARCH and FINDINGS

In this section, an example planetary system which is modeled in Romax in order to investigate the influence of tip relief modifications, is introduced. Figure 1 gives the 3D view of the example Planetary gear train with respect to its design parameters given in Table 1.

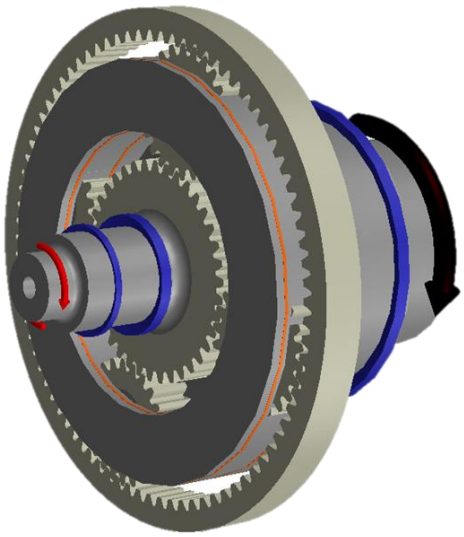


Figure 1. 3D view of the example planetary gear train.

The planetary gear system is composed of a sun gear, which is connected to the input shaft, fixed ring gear, 4 equally spaced planet gears, and the planet carrier. In this configuration, planet gears can rotate both on their own axis and the sun gear axis and the carrier shaft is the output of the power flow. This planetary gear configuration is the common application in the main gearbox of helicopters.

	SUN GEAR	PLANET GEARS	RING GEAR
Number of Planets	4		
Number of Teeth	38	22	82
Module (mm)	4		
Tip Diameter (mm)	158	94	323
Root Diameter (mm)	142	78	338
Face width (mm)	30	30	30
Transverse tooth thickness (mm)	6,283	6,283	6,283
Design Torque (Nm)	2400		

Table 1. Design parameters of the example planetary gear set

As tooth profile modification linear and parabolic tip relief are applied to the respective tooth flanks of both sun-planet and ring-planet gear pairs. Tip relief modification is the material removal from one side and the top of the gear tooth. It is generally defined by its amount and extent as it can be seen in Figure 2. Based on where it is applied, tip relief modification can be defined as short and long tip relief modification. In this study, different amounts of (5 to 25 μm) linear modification are applied at the highest point of the single tooth contact point of both flanks of planet gears since they make contact with sun and ring gear, and the right and left flank of sun and ring gear respectively. The same application is made for parabolic tip relief modification, except it is applied 1° before the highest point of the single tooth contact. Generally, modifications that are applied closer to this point are called short tip relief modifications.

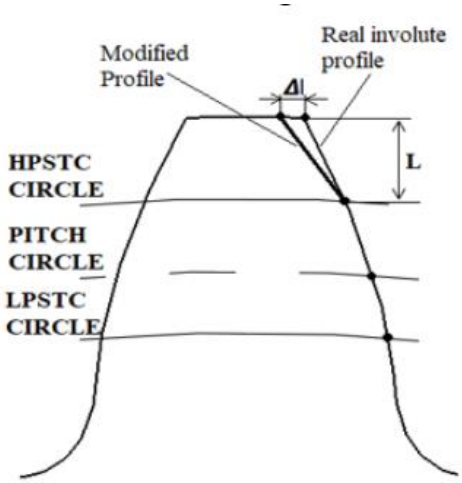


Figure 3. Linear tip relief modification (Dogan et al., 2021)

After the application of profile modifications, gear displacement along the line of action, respective peak to peak static transmission error, and dynamic contact load results are compared for different amounts of modifications.

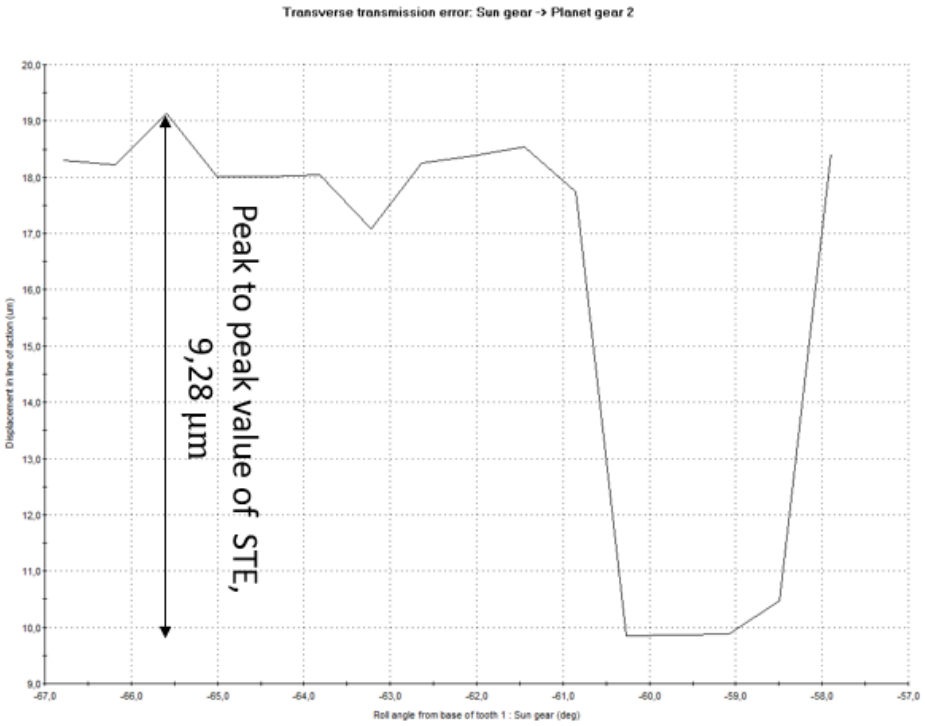


Figure 4. Displacement of the sun gar along the line of action

Figure 4 gives the sun gear displacement along the line of action with respect to its roll angle in sun-planet 2 meshes. The maximum difference between these points yields the peak-to-peak value of static transmission error as 9,28 µm for this gear pair. As abovementioned, one of the reasons for static transmission error, is the deflection of the teeth under the transmitted load. Therefore, it is expected that it gets higher values with the increased load. Figure 5 shows this load dependency of the static transmission error under the different percentages of design load which is 2400 Nm.

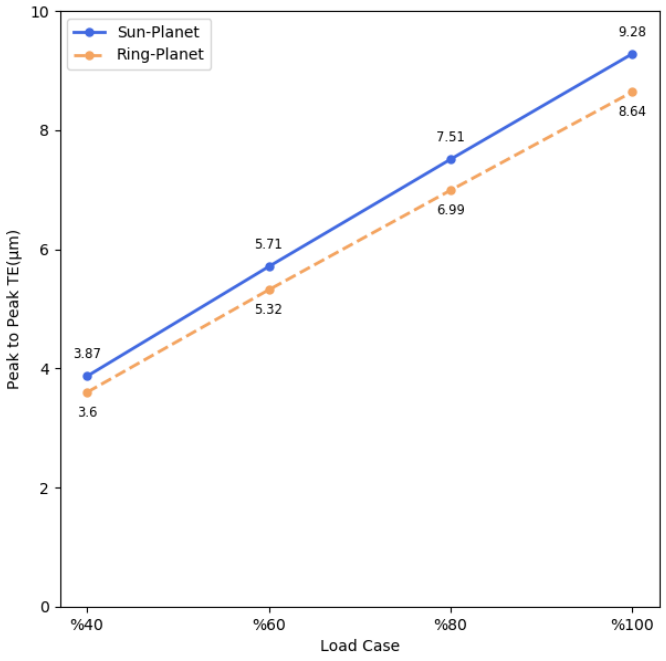
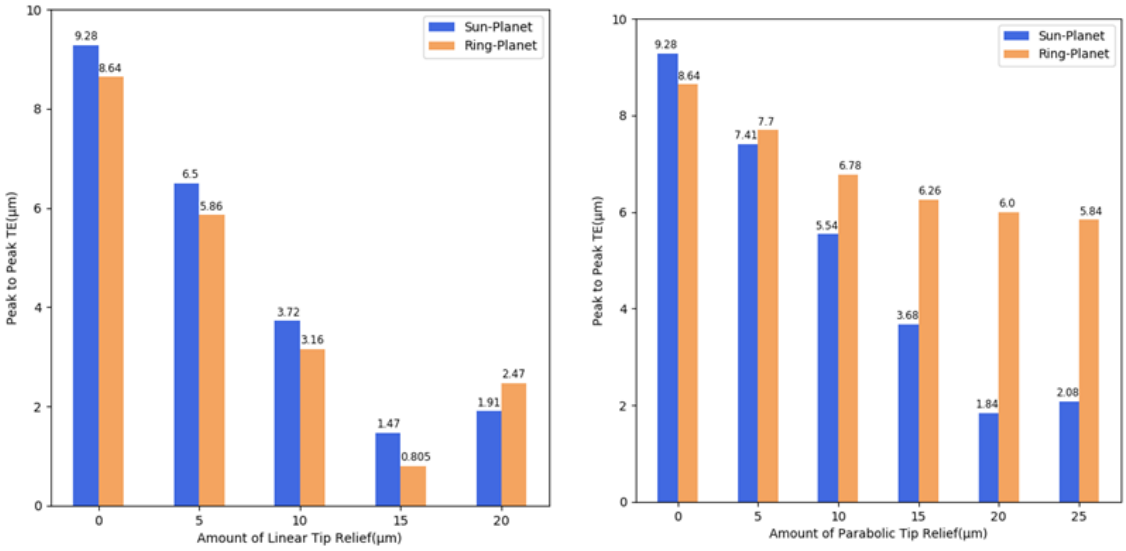


Figure 5. Load dependency of static transmission error

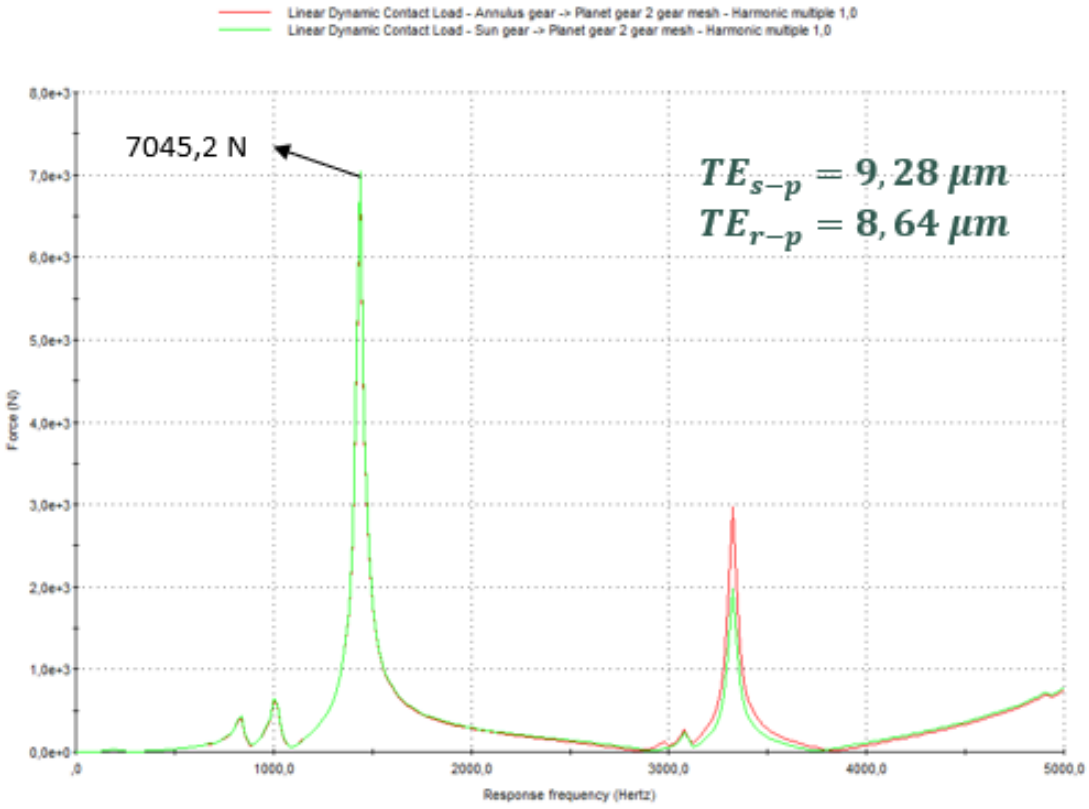
Figure 6 gives the change in the static transmission error with respect to the amount of linear and parabolic tip relief. Results indicate that until certain amounts of tip relief modification which are 15 µm and 20 µm for linear and parabolic respectively, the static transmission keeps decreasing, after these amounts it starts increasing again. These results show that there is an optimum amount of tip relief modification that minimizes the transmission error. Therefore, an optimization study should be made to decide the amount of tip relief for a specific design case. These results also agree well with the above-mentioned studies in the literature review.



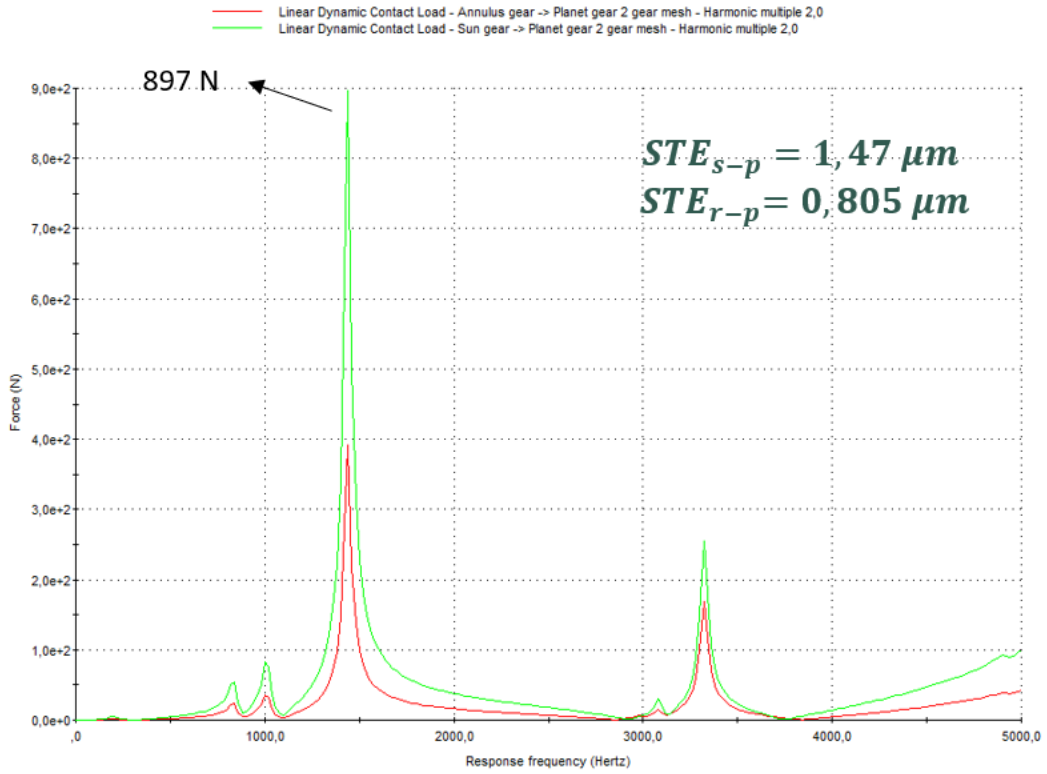
a) Linear tip relief modification b) Parabolic tip relief modification

Figure 6. Effect of tip relief modification on static transmission error

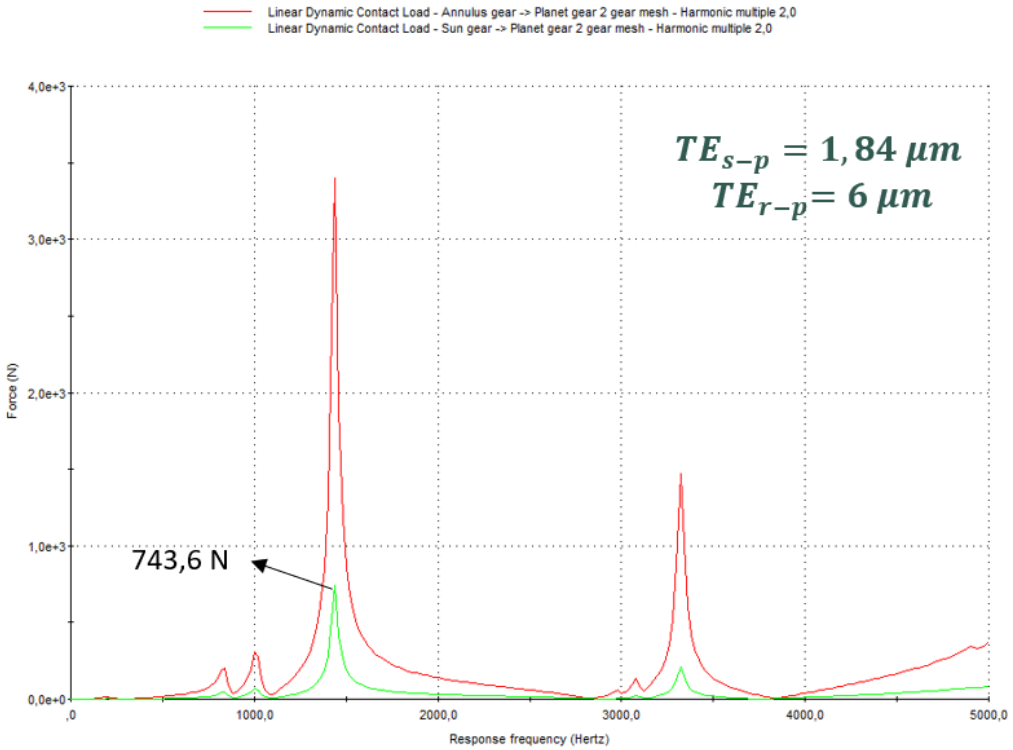
As mentioned before, static transmission error is one of the main internal excitations of the dynamic behavior of the gear system. Thus, dynamic contact load is taken into account to present the influence of the tip relief modification in the example planetary gear system. Figure 7 shows the dynamic contact load at the frequency response of the system with respect to zero profile modification and the 15-micrometer linear tip relief that cause maximum and minimum static transmission error in this study respectively. In no profile modification case, peak to peak value of static transmission error for sun-planet 2 meshes is 9,28 µm and at 1440 Hz frequency response, the dynamic contact load is obtained 7045,2 N. This frequency is chosen to see the effects clearly since it has the maximum response in the given frequency range. By applying 15 µm linear tip relief to both sun and planet tooth flanks, static transmission error is reduced to 1,47 µm and consequently, dynamic contact load at the same frequency response also dropped down to 897 N. Similar conclusions are also valid for the ring planet 2 gear pair for linear tip relief modification. The same figure also gives the same dynamic contact load results for 20 µm parabolic tip relief modification. This amount of parabolic modification also gives the minimum static transmission error for the parabolic tip relief case. For sun-planet 2 meshes transmission error is reduced to 1,84 µm. This reduction in transmission error also provides the dynamic load to decrease to 743,6 N at the same frequency. Also, it can be seen in the same figure that static transmission error for the ring-planet pair is higher than for the sun-planet pair in the parabolic tip relief case. Therefore, at the same frequency, the dynamic contact load is much higher compared to the sun planet gear pair. For the linear tip relief, it was quite the opposite.



a) No profile modification



b) 15 µm linear tip relief modification



c) 20 µm parabolic tip relief modification

Figure 7. Influence of profile modifications on the dynamic contact load

3. CONCLUSION

In this study, the influence of both linear and parabolic tip relief modifications on the static transmission error and the dynamic behavior of the example planetary gear train are evaluated. Static transmission error is one of the main excitations of the gear systems. It directly affects the dynamic behavior such as dynamic contact load and dynamic displacement which cause noise and vibration in a gear system. According to the results of this study, with the proper tooth profile modifications, these excitations can be reduced. For instance, with the application of linear tip relief, static transmission error is reduced by nearly %87 and %90 until the 15 µm linear tip relief for sun-planet and ring-planet gear pairs respectively and the dynamic contact load is decreased from 7045,2 to 897 N for sun-planet 2 meshes. However, after this amount of profile modification, static transmission error values started increasing again. A similar trend is also observed for parabolic tip relief modification. After the reduction of static transmission error by nearly %80 and %30 at 20 µm modification for sun-planet 2 and ring-planet 2 gear pairs respectively, static transmission error started increasing again. Also, with this amount of parabolic modification, the dynamic contact load is decreased to 743,6 N for the sun-planet gear pair. Therefore, an optimization study should be conducted at certain design parameters for a gear system in order to determine the proper amount of tip relief modification with the objective of reduction in static transmission error.

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5. REFERENCES

Kahraman, A., & Blankenship, G. W. (1999). Effect of involute tip relief on dynamic response of spur gear pairs.

Palmer, D., & Fish, M. (2012). Evaluation of methods for calculating effects of tip relief on transmission error, noise and stress in loaded spur gears. Gear Technology, 1(1), 56-67.

Tavakoli, M. S., & Houser, D. R. (1986). Optimum profile modifications for the minimization of static transmission errors of spur gears.

Yildirim, N., & Munro, R. G. (1999). A systematic approach to profile relief design of low and high contact ratio spur gears. Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science, 213(6), 551-562.

Munro, R. G., Yildirim, N., & Hall, D. L. (1990). Optimum profile relief and transmission error in spur gears. Gearbox noise and vibration, 35-42.

ÖZTÜRK, V. Y., Ciğeroğlu, E., & Özgüven, H. N. (2014). Optimum profile modifications for the minimization of dynamic transmission error.

Hu, Z., Tang, J., Zhong, J., Chen, S., & Yan, H. (2016). Effects of tooth profile modification on dynamic responses of a high speed gear-rotor-bearing system. Mechanical Systems and Signal Processing, 76, 294-318.

Doğan, O., Kalay, O., & Karpat, F. (2021). Influence of linear profile modifications on the dynamic loading of a spur gear. Uludağ Üniversitesi Mühendislik Fakültesi Dergisi, 26(2), 707-722.

Öztürk, V. Y., Cigeroglu, E., & Özgüven, H. N. (2021). Ideal tooth profile modifications for improving nonlinear dynamic response of planetary gear trains. Journal of Sound and Vibration, 500, 116007.

BICHECTOMY: A LONGITUDINAL STUDY ON THE ELECTROMYOGRAPHIC ACTIVITY OF THE MASSETER AND TEMPORALIS MUSCLES.

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ABSTRACT

Bichectomy is a surgical procedure that aims the removal of the spherical fat mass located in an anatomical structure called the Bichat adipose body. The aim of this study was to evaluate the electromyographic activity of the masseter and temporalis muscles during mandibular tasks before, 30 and 60 days after bichectomy in 10 healthy subjects with normoocclusion and without temporomandibular disorder. This study was approved by the Ethics Committee of the Faculty of Dentistry of Ribeirão Preto, University of São Paulo, Brazil (process # 10589419.0.0000.5419) with financial support from FAPESP. Electromyographic signals from the masseter and temporais muscles were measured by the wireless system (Trigno, Delsys Inc., Boston, MA, USA) during rest, right laterality, left laterality, protrusion and dental clenching in maximum voluntary contraction. Data were tabulated and submitted to statistical analysis using the repeated-measure test ($p<0.05$). Significant differences were observed for the right temporalis muscle at rest between the 3 periods ($p=0.003$). It was observed that after 30 days of bichectomy there was a decrease in electromyographic activity in almost 100% of the muscles evaluated for mandibular tasks. After 60 days, an increase in electromyographic activity was observed in almost all muscles, reaching values close to the values before bichectomy. This study suggests that there is a functional recovery of the masticatory muscles

after 60 days of bichectomy.

Keywords: Bichectomy, electromyography, masseter muscle, temporal muscle.

DENIPLANT NUTRACEUTICALS - A SUPPORTIVE THERAPY AND ADJUVANT FOR THE FEMALE REPRODUCTIVE SYSTEM DYSBIOSIS

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ABSTRACT

Background Most research has focussed on the oral, skin, and gut microbiomes, whereas relatively little is known about the reproductive microbiome. Infertility incidence has so increased in the last years that it is currently recognized as a worldwide health issue

Objective The use of nutraceuticals among other approaches, could improve the dysbiosis of female reproductive system microbiome. The effects of nutraceuticals from Deniplant on dysbiosis of reproductive microbiome and fertility were reviewed.

Materials and methods Female reproductive microbiota has also been suggested to affect infertility, and it may play a key role in the success of assisted reproductive technologies, such as embryo implantation and pregnancy care. The use of Deniplant nutraceuticals could be interesting in the management of dysbiosis on human reproduction.

Results We review the state of the art regarding the role of the female reproductive system microbiota in women's health and human reproduction, highlighting its contribution to infertility. Dysbiosis has been related to several diseases, including chronic endometritis, endometriosis, pelvic inflammatory disease, and gynecological cancers. Understanding the composition, dynamics, and stability of a patient's microbiota in different areas of the body and identifying changes that occur during disease onset or progression can aid in the development of personalized microbiota-based therapies.

Conclusion We have reported a positive correlation between the presence of specific bacteria in the uterus and the onset of pelvic inflammatory disease, an inflammation of the upper genital tract that can lead to infertility. Gestational infections and inflammations reduce fertility and increase the risk of preterm birth

Keywords: reproductive immunity, pelvic inflammatory disease, gut microbiota, Deniplant nutraceuticals

A NUTRACEUTICAL STRATEGY FOR PSORIATIC DISEASE: WHAT DOES THE FUTURE HOLD?

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ABSTRACT

Background A growing body of evidence highlights that intestinal dysbiosis is associated with the development of psoriasis. The gut-skin axis is the novel concept of the interaction between skin diseases and microbiome through inflammatory mediators, metabolites and the intestinal barrier. The gut microbiome affects skin homeostasis through its influence on the signaling pathways that coordinate epidermal differentiation.

The objective of this study was to synthesize current data on the Deniplant nutraceutical strategy of the gut microbiome in patients with psoriasis.

Materials and methods All studies confirmed the association of psoriasis and gut microbiota dysbiosis. We describe the recent advances regarding the interplay between gut microbiota and the skin. Thus, the microbiome can be considered an effective therapeutical target for treating this disorder.

Results This presentation provides a detailed and comprehensive systematic study regarding gut microbiome in patients with psoriasis. These results are supported by clinical observations based on a case serie showing improvement in psoriatic skin lesions after Deniplant nutraceutical strategy. It is still not clear whether psoriasis is an effect or a cause of the observed disbalance between beneficial and pathogenic microbes. In this context, the study provides very interesting results, showing significantly greater changes in the gut microbiome of patients with psoriasis after Deniplant nutraceutical strategy.

Conclusion There is a significant association between alterations in gut microbial composition and psoriasis. Gut dysbiosis is a state of imbalanced gut microbiome that eventually has a negative impact on skin function and integrity. Deniplant nutraceuticals is a potential therapeutic strategy in psoriatic disease.

Keywords: dysbiosis, microbiome, psoriasis, gut-skin axis, Deniplant nutraceutical strategy

AVRUPA BİRLİĞİ'NİN GEÇİCİ KORUMA REJİMİ: RUSYA – UKRAYNA SAVAŞI ÖZELİNDE BİR DEĞERLENDİRME

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ÖZET

Rusya, 24 Şubat 2022 tarihinde, uluslararası hukuk bakımından birçoğu açıkça "hukuksuz" olarak değerlendirilen birtakım gerekçelerle, Ukrayna'ya karşı bir askeri operasyon başlattığını duyurmuştur. Rusya'nın Ukrayna'ya yönelik bu saldırısı, şaşırtıcı olmayan bir biçimde, her yaş, grup ve cinsiyetten insanın hayatını etkilemiş ve geriye dönüşü olmayan bir biçimde değiştirmiştir.

Rusya'nın saldırısı ile başlayan savaştan, gerek Rus, gerekse Ukrayna vatandaşları etkilenmiş ve her iki devletin vatandaşları da büyük kayıplara uğramış ise de; bu etkiler, saldırının hedefi olan Ukrayna'nın vatandaşları üzerinde çok daha sert bir şekilde hissedilmiştir. Pek çok Ukrayna vatandaşının hava saldırıları veya yürütülen askeri operasyonlar sebebiyle hayatını kaybettiği ya da ciddi insan hakkı ihlallerine maruz kaldığı, uluslararası basına yansıyan haberlerde de görülmüştür.

Savaşın insanlar üzerindeki bir diğer etkisi de, onları yer değiştirmek zorunda bırakması olmuştur. 24 Şubat'tan itibaren, Ukrayna'nın dışına ve özellikle Avrupa Birliği (AB) bölgesine doğru yoğun bir göç dalgası başlamıştır. UNHCR verilerine göre, 16 Haziran 2022 itibariyle, Ukrayna dışına doğru sınır geçişleri 7,703,857 olarak kayıt altına alınmıştır.

Söz konusu kitlesel göç akınının büyük oranda Avrupa'ya doğru yönelmesi, AB'yi bu konuda harekete geçmeye itmiştir. Avrupa Komisyonu, 21 yıl sonra 2001 tarihli Geçici Koruma Direktifi'nin uygulanmasını teklif etmiş, Konsey de 3 Mart 2022 tarihinde oybirliği ile aldığı kararla bunu kabul etmiştir. Böylece, eski Yugoslavya'da yaşananlardan sonra hazırlanan, ancak bugüne kadar AB tarafından hiç uygulanmamış olan Geçici Koruma Direktifi'nin ilk defa uygulanması söz konusu olmuştur.

Geçici Koruma Direktifi'nin, Rusya-Ukrayna savaşı vesilesiyle 21 yıl sonra ilk defa uygulanması, Direktif'in ve AB'nin geçici koruma rejiminin daha yakından incelenmesi ihtiyacını doğurmuştur. Bu çerçevede, Rusya-Ukrayna savaşının neden olduğu göç dalgasına ilişkin verilerle birlikte, Geçici Koruma Direktifi'nin öngördüğü geçici koruma rejimi hakkında bilgi verilmesi ve olumlu ve olumsuz tüm yönlerine değinilerek genel bir değerlendirme yapılması önem arz etmektedir.

Anahtar Kelimeler: Rusya-Ukrayna Savaşı, Toplu Göç Dalgası, Avrupa Birliği Geçici Koruma Direktifi

THE TEMPORARY PROTECTION REGIME OF THE EUROPEAN UNION: AN EVALUATION SPECIFIC TO THE RUSSIA-UKRAINE WAR

ABSTRACT

On February 24, 2022, Russia announced that it had launched a military operation against Ukraine based on several reasons, many of which were clearly considered "unlawful" in terms of international law. Not surprisingly, Russian attack on Ukraine has affected and irreversibly changed the lives of people of all ages, groups and genders.

Because of the war, which started with the attack of Russia, both Russian and Ukrainian citizens were affected and although the citizens of both states suffered great losses, these effects were felt much more heavily on the citizens of Ukraine, which was the main target of the attack. It was followed from the news on the international press that, many Ukrainian citizens lost their lives or suffered serious human rights violations as a result of air strikes or military operations. Another effect of the war on people was that it forced them to move. As of February 24, a mass influx has started out of Ukraine and especially towards the European Union region. According to data which is provided by UNHCR, as of June 16, 2022, border crossings from Ukraine were recorded as 7,703,857.

The mentioned mass influx which is mostly directed towards Europe has pushed the European Union to take action in this regard. The European Commission proposed activating the Temporary Protection Directive dated 2001 after 21 years, and the Council adoped it unanimously on 3 March 2022. Thus, it was the first time that the Temporary Protection Directive, which was enacted after the conflicts in the former Yugoslavia, but which has never been implemented by the EU, has been implemented for the first time.

The implementation of the Temporary Protection Directive for the first time after 21 years, because of the Russia-Ukraine war, necessitates a closer evaluation of the Directive and the EU's temporary protection regime. In this context, it is important to provide information about the temporary protection regime envisaged by the Temporary Protection Directive, together with the data on the mass influx caused by the Russia-Ukraine war, and to make a general evaluation by addressing all its positive and negative aspects.

Keywords: Russia-Ukraine War, Mass Influx, European Union Temporary Protection Directive

YENI İLETIŞIM TEKNOLOJILERININ GAZETECILIK ETIĞINE ETKISI: YURTTAŞ GAZETECILIĞI

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ÖZET

Yeni iletişim teknolojileri hayatın birçok alanında dönüştürücü bir güç olurken özellikle medya alanında iletişim teknolojilerinin değiştirme gücü çok daha fazla hissedilmektedir. İletişim teknolojileri gelişimi ile bireylerin hayatına yeni uygulama alanları ve platformlar girmiştir ve söz konusu gelişim ile medyada enformasyonun küreselleşmesi çağı başlamıştır. Yeni iletişim teknolojilerinin medya alanlarında ivme kazanması ile enformasyon akışı ve hızı büyük ölçüde değişime uğrarken, medya alanında hissedilen bu değişim haber yapısı ve aktarımında bazı farklılıklara yol açmıştır. Tüm bu değişimler çerçevesinde, geleneksel medyada mevcut olan haber üretimi ve içeriğinin tek bir elden oluşturulup, dağıtılması durumunun artık birden fazla haber üreticisinin rol oynadığı bir duruma evrilmesinden bahsedilebilmektedir. Akıllı telefonu olan herkesin bir medya patronu olduğu günümüzde haberciliğin en önemli ilkesi olan 'gerçeği anlatma' kişinin kültürüne, yaşam şekline, maruz kaldığı normlara, demografik yapılarına göre şekillenerek neredeyse geçerliliğini kaybetmiştir.

Günümüzde sosyal medya platformları ile kendi perspektifinden haber yansıtma fırsatı bulan bireyler, ideolojileri doğrultusunda yurttaş gazeteciliği normlarında da büyük çapta değişikliğe sebep olmuşlardır. Yurttaş gazeteciliğindeki dönüşümlerle beraber birçok avantaj ve dezavantajdan bahsetmek mümkündür. Bireyler yurttaş gazeteciliği ile hak, adalet ve eşitlik arama imkânı bulurken aynı zamanda enformasyon değerindeki yanlışlık oranı artmış, bilgideki güvenirlik azalmaya başlamıştır. Dolayısıyla gazetecilik mesleğini icra eden kişilere karşı halkın güveninde de bazı sarsılmalar yaşanmaya başlamıştır. Bu bilgiler ışığında, mesleki sorumlulukları ve etik değerleri olan gazeteciliğin itibarının korunması için, sosyal medya platformlarında karşılaşılan bilgilere itibar edilmemeli, güvenirliliği test edilerek belirli haber kaynaklarından haber alımı gerçekleştirilmelidir.

Anahtar Kelimeler: Yeni iletişim teknolojileri, yurttaş gazeteciliği, etik.

THE EFFECT OF NEW COMMUNICATION TECHNOLOGIES ON JOURNALISM ETHICS: CITIZEN JOURNALISM

ABSTRACT

While new communication technologies are a transformative power in many aspects of today's life, the changing power of communication technologies is felt much more especially in the field of media. By the development of technologies in communication, new platforms and applications have placed in the individuals lives, and the globalization of information in media has begun with this development. The flow and speed of information has changed greatly with the acceleration of new communication technologies in media. This change felt in the media has led to some differences in news structure and transmission. Within the framework of all these changes, it can be mentioned that the existing news production and news content in

traditional media from a single source has evolved into a situation where more than one news producer plays a role.Today, when everyone with a smartphone is a media leader, the most important principle of news reporting, 'telling the truth', has almost lost its validity by being shaped by the culture, lifestyle, norms and demographic structures of the person.
Nowadays, individuals who have the opportunity to reflect news from their own perspective with social media platforms have also caused major changes in the norms of citizen journalism in line with their ideologies. With the transformations in citizen journalism, it is possible to talk about many advantages and disadvantages. While individuals have the opportunity to ask for rights, equality and justice through citizen journalism, the rate of falsity in information value has increased and the reliability of information has begun to decrease at the same time. Therefore, there has been some deterioration in the public's trust towards people who practice the profession of journalism. Accordingly, in order to preserve reputation of journalism, which has professional responsibilities and ethical values, the information encountered on social media platforms should not be trusted, and news from certain sources should be obtained by testing its reliability.

Keywords: New communication technologies, citizen journalism, ethics.

NEW WORLD ORDER AFTER COVİD 19

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ABSTRACT

1789 The French Revolution brought the concept of nation to the agenda, and as a result of the Second World War, instead of 5-6 empires in the 20th century, many states and international organizations were formed to regulate this multiple structure. In the new world order established after the Second World War, the number of countries governed by 12 democracy in the 1945s increased to 87 in the two thousand years.

The free market conception gathered under the definition of westernization was the main body in these liberal democracies, the principles of the system are of the rule of law, human rights, democracy and individuality. Globalization in the free market order was the main factor as planned. The world GNP was $ 12 trillion in the 1980s, while it rose to 33 trillion dollars in 1999. This figure is 84 trillion dollars for today, after the Second World War, customs duties were reduced by the GATT order to pave the way for world foreign trade, and instead of protectionism made through customs duties, the gold standard, and the free movement of knowledge and communication increased as a result of transparency.

At first everything went as planned, but over time, underdeveloped countries went beyond the roles given to them with the help of technology and internet network, and those who established the order began to have difficulty in providing the benefits they expected from the order they established. Today, nation-states live difficulties because production is going to the cheapest and relatively quality workforce. The capital is available and has mobility. The average life expectancy, which was 38 years even in the USA in the 1900s, has exceeded 75s. Great improvements in health and hygiene have been achieved. Diseases such as smallpox ended. At first glance it may seem wrong, but peace came to the world. Leading countries are no longer fighting there are guardianship wars in the World. Statistical records are kept more careful and the figures show us that there is a half a reduction in crimes. The average world welfare increase has a great impact on this. There are great developments in human rights. While child abuse and death penalty figures are falling, women's rights are developing rapidly.

Communism pushed the United States to regulate the international market through isolation policy. In the 1930s, the US wanted to change the imperialism, which was dominated by the world and applied by each of the United Kingdom, France and Germany, after the Second World War, and through the rich old-fashioned imperialist countries against communism and the poor countries that were assisted, it was constantly kept on the agenda that the path of development was not communism but capitalism. In addition, the United States established its own order through international organizations such as the United Nations, the World Bank, the IMF and GATT. A reference money was created to sustain the system. With the Bretton Woods System and later, the US dollar became a means of dominating the world system as a reference money. In the 1960s, 50 percent of the world GNP was created by the US, while today the rate has fallen to 25 percent, the US has a large foreign trade deficit, the supply is increasing with the dollar printing method. The depreciation of the dollar is traumatic of being a reserve money. The inevitable consequence of the United States will either share its sovereignty in the world with other countries or will be closed. The United Nations, established with the aim of

producing political solutions to the world order, could not become a solution due to its institutional structure. Power focused among the few countries. G20 covers 80% of international trade and 90% of the world economy. The United Nations Security Council 25% of the area of the world GDP; 50% of the world's population; 50% of the world's scientific publications; 45% of the world's R & D increments; 97% of the world's computer operating systems 60% of the world military satellites; 90% of the world's military satellites; 99% of the world's nuclear weapons. Religious pluralism, secularism (secularism) sexual openness, renewal in art and culture, advanced individual rights, social rights, opening in architecture, freedom of travel (surplus of mobility) urbanization, respect for the environment (climate, erosion, water, pollution, consumption of resources) such as economic world integration (competition, measure economy, creativity). In the 1870s, the world's foreign trade was 10% of the total GDP, while today it is 25%. In the 1970s, 2/3 of the world GDP was produced by the Western world, which represented 15% of the world's population. If today's world order continues, this ratio is expected to be 33% in 2030. The world order after WW2 and between today actually made great progress. -The world GDP has doubled in the last 30 years-

It was told that democracy distributed the political power equally. However, since the values of capitalism were inevitably above the values of human beings, it was aimed to balance the inevitable equality brought by capitalism with social policies (retirement, health insurance, education by the public) and interim arrangements were needed to move from national economies to the global economy. First, bilateral agreements were made and then regional alliances were established to accelerate globalization. The most powerful and even transnational example of these alliances is the European Union. Although the European Union has survived various crises during its 60-year life (September 11, 2001, the Constitution in 2001, the 2008 Financial Crisis, the 2011 Migration Crisis, the Ukrainian Crisis, the 2016 Brexit, 2018 Yellow Vests Crisis), it has always been successful in living in Europe. Apart from its own internal integration, the European Union is successful in terms of integration with the world. There are 40 free trade agreements with 72 countries. In the new world order that is likely to be established in the future, we can see the European Union-like structures as the main actor. Despite its generally accepted achievements, the European Union cannot fully recover from the nation-state understanding even today new generation agreements have created safe zones to enable capital to act internationally, where national rules often strangles capital. Common Competition Rules Developments in the blending of standards, similarity and follow-up of state aids, protection of intellectual rights, and the development of disputes played an important role in the effectiveness of globalization.

The populist way of thinking had the chance to penetrate the larger masses through simple solutions. The natural consequence of this situation was the loss of blood by democracies. Mediocre new elites that reach all kinds of information by using the internet! They cannot produce solutions as before, because their capacity is not enough. However, they can make decisions through a referendum (forty-six referendums were held until the Brexit after the first referendum in the European Union in 1972)

In the near future, the extreme right in Europe is expected to be saturated and ultimately fall after a little more up.) Europe is not on the agenda, not the change of values in the future. The generally accepted opinion meets at the point that the average citizen who votes to the extreme right cannot fully absorb the democratic culture, institutions, practices and values. At this point, the impact of social media is great because the free flow of knowledge has reduced the influence of the elites (intellectuals, munish) who advocated democratic values rather than increasing

democracy, as he thought at first glance. The masses were reached more quickly and with larger numbers through Face Book, You Tube, Tweets. However, these channels also transfer dirty information.

Those who approach the populist movements with tolerance and those involved are not only affected by the dirty information, the 2011 Arab Spring, the beginning of the 2013 Gezi events, the 2018 Yellow Vests When we look at the old medicine “losing“ weighted protesters, we see precarious employees, well-educated young people, civil servants, and retirees.

Globalization has produced different results in different parts of the world. Conceptually, when the concept of the middle class is mentioned, the lawyer, who can be shown as a classical example, was replaced by a carpenter due to the rise of welfare. The main demands of this new middle class are their demands for respect and recognition. Globalization has brought gains to this former middle sub-class. Another winning class (especially in India and China) is 1% at the top of the welfare scale (especially in the west) The old classical middle class in the West is the loser in this environment The concept of migration came to the agenda when the members of the new middle class met the world better with the help of the internet. There is a concept of migration in history. Between 16 and 19 centuries, 20 million people migrated through slave trade. Between 1880 and 1910, 17 million people migrated from Europe to the USA. In 1947, with the distinction of India Pakistan, 15 million people were forced to migrate. It is also estimated that 20 million people migrated from Europe after World War II. To these figures, the Ottoman Empire faced immigration from the Balkans between 1880-1910. The figure is 5 million people. Today's migration should be evaluated differently. Because the cause and effect relationship is different. The point reached made the West obliged to create a new enemy. Islam and China are defined as the new enemies of the West. While the effect is the reaction and supports the new middle class populism in the east, it emerges as Western values as enemies. How does this understanding of hostility come to life? In the decision-making process, the average citizen is surprised by the information bombardment, he gets tired and has difficulty in making decisions. When making decisions, he prefers the result, which is usually easy and simple. Deciding by analyzing information, it is replaced by the culture of allegiance and ultimately autocracy. Xenophobia and racism are increasing through politics, and the success of populist leaders has an impact on the current situation of globalization.

Because the concept of national sovereignty was eroded as a result of globalization. The nation-state became unable to rule the national economy. In the new economic world order, every country is in need of other states, regardless of the size of the economy. In this case, populist leaders take refuge behind the concept of cultural sovereignty to manage the national economy and use nationalism. Thus, national leaders can move to authoritarian governments instead of governing the people with the more difficult liberal democracy. For example, under the motto of American President Trump (making America big again), he uset social media effectively and creates allies, friends and friends instead of supporters. Even if Trump's open message is to make America big again, the secret message is perceived as the superiority of white (Muslims should be recorded, Hispanics are perverted, Negroes are alcoholic) Putin, similarly says “We Russians are not castrated like Europeans”. On the other hand, while Trump is creating friends, he degenerates the basic concepts that have been established as a result of democracy and uses the concept of immigrants in a negative sense, revealing that he does not believe in the rule of law. He does not define himself as a classical rightist or leftist. He defined his values as instruments of the establishment in the eyes of the people. He describes the United States as a losing country in the globalizing world by pretending that the US did not establish and rule the

post-World War II order.

Managing information and knowledge in the new state understanding will be as important as these resources. When we look at the definition of the state, we encounter the concepts of state taxes, laws, army, relations with other international states. In the 21st century state, we will encounter the last of these concepts more. Knowledge-based relationships will determine the position of states against other states. The approach of young people to politics is generally not to want to camp and they call politics as the main factor of campification. Young people do not believe in democracy. They think the right and left parties are increasingly similar. They are becoming increasingly similar to themselves in the same environment, because the system supports the communication of those who are similar. Their truth is the only valid truth. They ignore others.

Cases are losing their importance. The abuse of the cases serves populists, transmits the information that comes to their work and repeats them constantly. Young people believe in creative destructiveness. So the new system that demolishes the existing system and operates with new rules (Über instead of Taxi, R&B instead of the classic hotel, social media to block the chance)

INFLUENCE OF BROADCASTING IN THE PROMOTION OF EBIRA CULTURE: A STUDY OF "AANI YEYE" PROGRAMME ON *JATO FM*

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ABSTRACT
The broadcast media, with its audio-visual effects has been adjudged as the most powerful medium of communication. The effect and potent socio-cultural and political influence of radio is said to be obvious. This is more so, given its affordability and reach. In a developing country like Nigeria, radio has been pointed out as a factor in cultural imperialism, through constant presentation of foreign ideologies at the expense of indigenous programmes. This study was conducted to examine the influence of broadcasting in the promotion of the culture of Ebira people – a tribe in the Okene Local Government, northcentral of Nigeria, using "Aani Yeye" cultural radio programme on *Jato FM* as a case study. The study was based on Cultural Imperialism and Cultural Norms Theories. Methodologically, the study adopted survey research design; and using two-stage cluster and simple random techniques, a total of 220 close-ended questionnaires were administered with a return rate of 88%. Data collected were analysed using manual coding techniques and results presented using frequency tables and percentages. Findings reveal that the people of Okene Local Government listened to the radio programme and understood the Ebira culture. They also affirmed that the radio programme promoted and facilitated their knowledge of the Ebira culture. The study concluded that the "Aani Yeye" radio programme is a factor in the preservation of Ebira cultural values. It recommends that efforts should be intensified in the production and spread of indigenous radio programmes in Nigeria, so as to reverse the current trend of foreign cultures that are eroding the cultural values of Nigeria.

Keywords: Influence, Broadcasting, Ebiral Culture, Aani Yeeye, Radio Programme

INTRODUCTION AND STATEMENT OF PROBLEM
Culture can be described as a way of life of a particular group of people bound by common interests. Every society is governed by certain rules and regulations enshrined and inspired by their respective cultural values and norms. Culture is "a way of life fashioned by a people in their collective endeavour to live and come to terms with their total environment" (Acholonu 2016, p.3). The Nigerian society for instance, is home to peoples from diverse socio-cultural groups. It is estimated that "Nigeria has as much as 350 ethnic groups based on lingual classification" (Felicia & Akuva 2013, p.178), with each having their distinct peculiarities that have been passed down from generations through certain media of communication. These media have evolved over a long period of time from the traditional African medium of gongs, wooden drums, bells, horns, signs, and symbols to the modern forms of communication such as the radio, television, cable, magazines, newspapers, the new media etc.
Research studies have revealed the differences in the level of cultural appreciation between the era of the traditional media system and the modern media system, hence it is noted that:

the era of the African communication system was organised to protect the established norms and values of the society, such that the kind of information which is capable of upsetting established social structures is suppressed while that which edifies or promotes norms and values is given prominence" (Ibagere 2020, p.4).

This is in contrast with the modern communication channels in the technological era. Alimi (2012) bemoaned that the communication channels operating in Nigeria today are imposed with alien values, faith and psychology which are detrimental to the Nigerian culture.

Radio particularly has been described by many scholars as being more instrumental in the promotion of a people's culture. Okunna (2003) opined that the ease in accessing the radio by members of the public makes it an influential medium for cultural propagation. Over the years, the radio medium has become an indispensable channel in information diffusion in both the urban and rural areas. Neil (2018) emphasised that the radio medium when compared to other communication channels is affordable, has a wider reach, reaches its target audience more specifically and delivers its messages timely. In the same vein, Odo (2008) noted that radio as a means of communication has become one of the most effective means of communication in the third world since its discovery because of its reach. It transcends geographical, linguistic and traditional barriers. Rashimi (2019) stated that "radio broadcasting was an innovation of its time and was often referred to as a cultural barometer which acts as a medium that can track the changing times" (p. 2).

However, research studies have suggested that this very important medium (radio) for cultural preservation and propagation is filled with foreign rather than indigenous content. The natural and inherent lifestyles of the western world have found its way into the heart of the various media of communication that operate in Africa generally and in the Nigerian society especially. Mensah, Nyakor and Amoh (2018) opined that the mass media have become channels for foreign countries to successfully impose their culture on these media consuming audiences of the developing nations. Although, the preference for the adoption of foreign programmes can be traced to the long period of colonialism and its resulting psychological slavery which scholars have termed "cultural imperialism" (Ndlovu-Gatsheni 2018, Sparks 2012, Roach 1997).

The Ebira people, although a minority tribe in the northcentral of Nigeria are not excluded from this wave of globalisation. The indigenous media no longer has as much effect as it used to especially in the highly technological world. This has resulted in a paradigm shift from what used to be cultural homogeneity to cultural pluralism leading to a depletion of the Ebira culture and values. Films, music, drama and documentaries that are imported do not contain content that represent the Nigerian culture and values, hence the Ebira people are faced with the challenge of preserving their cultural heritage from the claws of this globalization debacle.

Various literary works exist to explain this phenomenon as well as provide useful background information on why the phenomenon exists. The cultural imperialism theory was amplified by Herbert Schiller in 1975. Although other scholars such as John Tomilson in 1960 have used the term cultural imperialism interchangeably to also mean media imperialism, cultural synchronisation, economic imperialism, cultural dependency, and domination. Kimberly (2022) defined imperialism as the policy or act of extending a country's power into other territories or gaining control over another country's political or economic sphere. Cultural imperialism therefore is the imposition of the value systems of a developed country on the already established cultural systems of a developing country. Cultural imperialism theory used in this research states that western nations dominate the media around the world which in return

has powerful effects on the third world countries by imposing on them western views and therefore destroying their native cultural beliefs and value systems. Western civilisation produces most media contents consumed because they have the means, and the rest of the world imports these contents because it is cheaper than having to produce locally

Also, the cultural norms theory holds that a person's behaviour is normally guided by the individual's perception of culture. According to Folarin (2005), the theory proposed that through selective presentation and emphasis on certain themes, the mass media created the impression among their audiences that such themes were part of the structure or clearly defined cultural norms of the society. In essence, the media selects and presents foreign themes, ideas and programmes and create the impression that those ideas are part of the culture. As long as the media continues to transmit those ideas through its programming, the audience will pattern their lives according to what is obtainable in the media. Brown (2012) stated that this theory postulates that selective presentation of and tendentious emphasis on specific issues by the mass media succeed in creating the impression on the audience that such matters are necessary parts of the cultural norms of the society. Scholarly research conducted in order to evaluate the effects of indigenous programming in the propagation of culture abound.

Using a survey method that employed a total of 400 questionnaires distributed among the three senatorial districts of Delta state, Patrick and Emmanuel (2022) conducted a study on the audiences' perception on the contributions of local language broadcasts in 27 communities in the state. It was established that 141 (52.4%) consumed the programmes once or a few times a week while 125 (47.6%) tuned in less frequently. This compelled the conclusion that the consumption of local language programmes in Delta state is moderate even though they are significantly available. The researchers further stated that many members of the broadcast audience in Delta state cannot recall titles of mother tongue programmes that are transmitted to them via radio or television. The study concluded that indigenous programmes are significantly available on radio and television stations in Delta State, but the consumption of these programmes were not significant.

Also, in a study by Nwankwo (2015) on the impact of Radio Nigeria Unity FM and Ebonyi Broadcasting Corporation Abakaliki, on the promotion of Igbo language, findings revealed the possibility of the gradual fading of the Igbo language and culture. The survey research method was employed for this study with a sample size of 400 and study findings revealed that majority of the Igbo community knew about the Igbo programmes but didn't find them interesting. Hence, they weren't inclined to tune into these Igbo cultural programmes and this does not look good for the Igbo community.

Chinweobo, Ngene, Akata and Ezenwa (2021) carried out a study to examine the influence of indigenous cultural orientation of Igbos in three states in the Southeast Nigeria. The survey research method was adopted for this study. The residents of nine selected Local Government areas of Anambra, Enugu and Imo states constituted the population of the study. Findings revealed that improper scheduling affects the listenership of the indigenous programmes however, improvement can be seen in the knowledge of the Igbo culture by the people of the region. It was concluded that indigenous radio programmes have helped in propagating the Igbo cultural values among the residents.

Another research was conducted by Adamkolo, Dorcas and Abubakar (2020) on the radio and its promotion of indigenous language in Nigeria with particular reference to Jere Local Government area of Borno state. The study employed a semi structured qualitative survey approach, specifically the in-depth interview approach. Using an 8 and 12 item question guide,

interviews were conducted on 2 and 12 individuals respectively from BRTV Kanuri Broadcast at Khaddamari and the Khaddamari community. Thus, it was established that BRTV has been instrumental in promoting the Kanuri culture and tradition. This is true considering the number of programmes being aired in Kanuri and the distance covered by the transmissions. However, many listeners still preferred to listen to programmes in other languages like Salamma, Kanem gai etc. This also proves that apart from western influence, stronger indigenous neighbouring languages might contribute to the extinction of weaker ones.

As the aforementioned empirical studies can reveal, the influence of foreign programmes on the socio-cultural values of the indigenous people are prominent. Thus, this study focused on evaluating what effect the "Aani Yeye" cultural radio programme has on the Ebira people of Okene Local Government.

RESEARCH QUESTIONS:

1) Are residents of Okene Local Government aware of the "Aani Yeye" radio programme on *Jato FM?*
2) Does the "Aani Yeye" programme promote the knowledge of the Ebira culture amongst the residents of Okene Local Government?
3) To what extent do the residents of Okene Local Government assimilate the Ebira culture?

Research Objectives

The objective of this study was to ascertain if the residents of Okene Local Government were aware of the "Aani Yeye" programme on *Jato FM* and the effects of the programme in cultural propagation. The study also sought to establish the extent to which the residents understand and assimilate the Ebira culture through the programme.

Methodology

The research design adopted for this study was the descriptive survey method. The descriptive type of research is the most used instrument among scientists (Gbolagunte and Popoola 2003, p.37). Questionnaires were used as the survey instrument. This approach involves drawing up specific questions which are aimed at providing answers to the established research questions in the study.

The population for this study comprised the Ebira people in Okene Local Government which includes both indigenes and non-indigenes. The National population Commission (2006) estimated the population of Okene Local Government at 325,623 inhabitants with a projection of 439,500 inhabitants in 2016. The sampling technique used in this study was the two-stage cluster and simple random sampling technique. Kothari (2004) defined two-stage cluster sampling as "a process which involves grouping the population and then selecting a handful of individuals from the clusters created" (p.16). First the population was clustered into 11 political wards and then 20 respondents chosen from each of these wards using the simple random sampling technique (lottery method).

Presentation and Discussion of Findings

Here, the data collected is analysed and presented using simple frequency tables. A total of 220 questionnaires were administered to the chosen sample size. Out of 220 copies of questionnaire, 195 were filled and returned for analysis.

Table 1 Gender Distribution of Respondents

sex	Frequency	Percentage
Male	109	55.9
Female	86	44.1
Total	**195**	**100**

Table 1 shows the demographic distribution of respondents by sex; 109 (55.9%) responses are males and 86 (44.1%) females. This indicates a higher response from the male gender.

Table 2 Age Distribution of Respondents

Age	**Frequency**	**Percentage**
18-25	41	21.0
26-35	43	22.0
36-45	56	28.7
46 and above	55	28.2
Total	**195**	**99.9**

Table 2 reveals the age distribution of the respondents with ages 36-45 being the highest with a percentage of (28.7%) of the sample size and ages 46 and above following closely with 28.2%. Ages 18-25 and 26-35 were 21.0% and 22.0% respectively.

Table 3 Educational Qualification Distribution of Respondents

Qualification	**Frequency**	**Percentage**
Secondary	38	19.5
Tertiary	146	74.9
Others	11	5.6
Total	**195**	**100**

Table 3 reveals that 146 (74.9%) of the responses are tertiary institution certificate holders or students, 38 (19.5%) of the responses are from secondary school students or certificate holders while 11 (5.6%) of the respondents had other qualifications.

Research question 1: Are the residents of Okene Local Government aware of the "Aani Yeye" programme on *Jato FM?*

Table 4, Item 1: Are you aware of the "Aani Yeye radio programme?

Response	**Frequency**	**Percentage**
Yes	145	74.4
No	50	25.6
Total	**195**	**100**

Table 4 shows that 145 (74.4%) of the sample are aware of the "Aani Yeye" radio programme and may have listened to it at one point or the other, the 50 (25.6%) of respondents who have never heard of the programme were disqualified from further participation in the study. This is because the prerequisite for continued participation as outlined in item 1 of the questionnaire is the awareness of the "Aani Yeye" programme on *Jato FM* which the (50) respondents answered in the negative. The implication of this result is that a greater number of the respondents are aware of the existence of the "Aani Yeye" cultural programme on *Jato FM*.

Table 5, Item 2: Do you listen to the radio programme?

Response	**Frequency**	**Percentage**
Yes	134	92.41
No	11	7.6
Total	**145**	**100**

Table 5 shows that 134 (68.7%) of the respondents listen and monitor the programme and 11 (7.6%) do not. The implication of this result is that although 145 (74.4%) of the sample size are aware of the programme as seen in table 4, only 134 (92.41%) of them listen and monitor the programme. Consequently, 11 (7.6%) of the responses who did not listen to the programme were disqualified from further participation. This is because the requirement for continued participation in the study as outlined in Item 2, section B is listenership and monitoring of the "Aani Yeye" cultural programme on *Jato FM* which 11 respondents answered in the negative.

Research question 2: Does the "Aani Yeye" programme promote the knowledge of the Ebira culture amongst the residents of Okene Local government?

Table 6, Items 1, 2 & 3

S/N	**Variables**	**Strongly agreed**	**Agreed**	**Strongly disagreed**	**Disagreed**	**Total**
1	The programme promotes knowledge of the Ebira culture	101 (75.37%)	32 (23.88%)	-	1 (.75%)	**134 (100%)**
2	If sustained, the programme will preserve Ebira culture	71 (52.99%)	61 (45.52%)	-	2 (1.5%)	**134 (100%)**
3	The programme has improved perception about the Ebira people	75 (56%)	57 (42.54%)	-	2 (1.5%)	**134 (100%)**

Item 1 of table 6 reveals that 101 (75.37%) of the respondents strongly agree that the programme promotes the knowledge of the Ebira culture and supportively, 32 (23.88%) of the

respondents agree on the same note. On the contrary, 1(0.75%) of the respondents disagree on the effectiveness of the programme in promoting knowledge of the Ebira culture.
Item 2 reveals that 71 (52.99%) of the respondents strongly agree that if the programme is sustained, it will preserve the Ebira culture and 61 (45.52%) of the respondents agree as well. On the contrary, 2 (1.5%) of the respondents do not think the programme will preserve the Ebira culture.
Item 3 shows that 75 (56%) strongly agree that the programme has improved their perception of the Ebira people and in support, 57 (42.542%) of responses agree. 2 (1.5%) however disagree

Research question 3: To what extent do the residents of Okene Local Government assimilate the Ebira culture?

Table 7, items 1, 2 & 3

S/N	Variables	Strongly agreed	Agreed	Strongly disagreed	Disagreed	Total
1	Understand the Ebira culture through the programme	48 (35.82%)	78 (58.20%)	3 (2.24%)	5 (3.73%)	**134 (100%)**
2	The programme has debunked misconceptions in the Ebira culture	59 (44.03%)	58 (43.28%)	11 (8.21)	6 (4.48%)	**134 (100%)**
3	Understand and can speak the Ebira Language	88 (65.67%)	46 (33.58%)	-	-	**134 (100)**

Item 1 in Table 7 reveals that 48 (35.82%) of the responses strongly agree that the programme has improved their understanding of the Ebira culture. In support, 78 (58.20%) agree to the statement as well. 3 (2.24%) strongly disagree and 5 (3.73%) disagree as well.
Item 2 shows that 59 (44.03%) of the response strongly agree that the programme has debunked misconceptions and corrected misunderstandings in the Ebira culture, with 58 (43.28%) reinforcing the response as well. However, 11 (8.21%) strongly disagree and 6 (4.48%) disagree.
Item 3 reveals that 88 (65.67%) of the respondents strongly agree to understanding and speaking the Ebira language. In support, 46 (33.58%) agree as well.

Discussion of Findings

Findings showed that 145 (74.4%) the respondents were aware of the radio programme, 134(68.7%) listened and monitored it, and 115 (59%) confirmed that it was interesting. This shows that a majority of the responses are aware of the program and tune in to it. This result finds support in Hassan (2014) and Dishu (2013) where the participants were well exposed to the indigenous programme due to the popularity of the programme in the Northern regions where the study was conducted.
Findings revealed that 101 (75.37%) and 32 (23.88%) of respondents agreed that the programme promotes their knowledge of the Ebira culture. The implication is that the

programme is serving as an educational tool and is instrumental in inculcating Ebira cultural values on the inhabitants. This contrasts with Kalu's (2014) study where it was found that indigenous programmes have not significantly added to the knowledge of the people in the South-South geopolitical zone where it was conducted. Also, results showed that 71 representing 52.99% and 34 representing 23.88% of the respondents believed in the potency of the programme in promoting the Ebira culture if continued.

Findings also revealed that 48 and 78 responses representing 35.82% and 58.24% of the sample respectively understand and assimilate the Ebira culture through the programme and could speak the Ebira language as well. This finding, therefore, upholds the tenet of the cultural norm theory that television and radio can promote the speaking of indigenous languages among members of the audience through selective presentations of broadcast contents in mother tongues (Hasan, 2010).

Conclusion

Distilled from the findings of this study, it can be said that the residents of Okene Local Government are aware of their cultural heritage and have assimilated its values through the help of the indigenous programme under study. This programme provides the necessary information through well packaged content that not only educates but also entertains, hence the Ebira people still appreciate their cultural values and hope that the programme continues. In order to foster cultural appreciation and to accelerate the salvaging of the Nigerian society from the claws of cultural imperialism, governments at all levels, media regulatory bodies and media houses should intensify efforts in the production and dissemination of indigenous programmes in the country.

REFERENCES

Acholonu, R. (2016*)* Mass Media and Cultural Imperialism: The African Experience. *www.researchgate.net/publication/31124564.*

Adamkolo M, Dorcas R, Abubakar S, Ahmed L, Mohammed N (2021): *Contributions of the Radio service of BRTV Maiduguri towards the promotion of Kanuri language. International Knowledge Sharing Platform*

Alimi, T. (2005) Cultural Journalism in Nigeria In *Yusuff J. B. (Ed.) Culture and the Media in Nigeria.* National Institute for Cultural orientation

Chinweobo, O. B., Ngene, A. H., Akata, U. C., & Ezenwa, C. E. (2021) Influence of indigenous radio programmes on cultural orientation of Igbos in three selected stated in South East Nigeria. *International Journal of Communication*

Colin, S. (2012): Media and cultural imperialism considered. Chinese Journa of Communication, 5:3, 281-299.

Roach, C. (1997) Cultural imperialism and resistance in media theory and literary theory. Sage Journals, Vol. 19 issue 1, pp. 47-66

Dishu (2013): An evaluation of media promotion of indigenous language in Jigawa state, Nigeria experience. Enugu Caritas University.

Felicia H.A, Akuva I.I (2013): The origin and development of ethnic politics and its impacts on post-colonial governance in Nigeria. *European Scientific Journal, Vol. 9, No 17*

Folarin, B. (2005) Theories of mass communication. Sterling-Horden Publishers Ltd

Hassan (2014): Mass media and the promotion of Hausa language in Northern Nigeria

Ibagere, E (2010) Introduction to African Traditional Communication System. University Printing Press, Delta State.

Kalu (2014) Perception of broadcast media indigenous programmes in South-South Nigeria

Kimberly, A (2022) What is imperialism? www.thebalance.com-imperialism-definition-and-impacts-on-us-history-4773. Retrieved June 14, 2022.

Mensah, E. O, Owusu-Amoh, S. and Nyarko, J. (2018) The global imperialism project: lessons from television, movies and radio. *African Research Review, Vol. 12, No 4 (2018).*

Neil, K. (2018) Advantages and disadvantages of radio advertising. *www.bizfluent.com/facts-52. Retrieved June 10, 2022.*

Nwankwo, S. U. , Ojo, L. I. and Apeh, A. C. (2015) Impact assessment of radio Nigeria – Unity FM and Ebon Broadcasting Corporation, Abakalikis Igbo language promotion programmes. *Ebonyi State University Journal of Mass Communication, Vol. 2, Issue 1, pp. 160-173, October, 2015.*

Okunna, S. (2003) Ethics of mass communication. Enugu, New Generation Books.

Patrick, I. N. & Emmanuel, U. B (2022) Audience perception on the contributions of local language broadcasts to the development of indigenous languages in Delta State, Nigeria. *Linguistic and Culture Review 6(S1), 212-228.*

Donge, R. and Nehulkar, R (2019) Paradigm shift in radio and TV broadcasting in the digital age. Proceedings of International Conference on Media Ethics, 9th – 10th January, 2019. http://ssrn.com/link/2019-int-Conf-MediaEthics.html

Sabelo J, Ndlovu-Gatsheni (2018) *Metaphysical empire, linguicides and cultural imperialism*. English Academy Review, 35:2, 96-115.

REASON AND REASONING IN LAW AND JURISPRUDENCE

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ABSTRACT

The emergence of *Ash'arites* and *'Adlites* (justice-orienteds) in the context of Islamic doctrines goes back to differences of views on the essential and a priori goodness and badness (the beautiful and the ugly) of deeds and things, and the capacity of the reason in recognizing it. In contrast, while *Ash'arites,* like legal positivists, deny any a priori norms that concern Divine rules, the justice-orienteds, e.g., *the Imamites (Twelver Shiites)* and *Mu'tazilites*, emphasize the existence of such norms. In the *fiqh*–oriented and *Shi'i* legal thought, too, the emergence of the *akhbārī* and *uṢūlī* schools of thought traces back to the capacity of the reason in discovering the religious rules. Although none of them believe in the prefect capacity of the human reason in this realm, the *akhbārītes* regard the realm of the reason much more limited, the *uṢūlītes* hold that the capacity of the human reasoning is greater by far. The effects of these two approaches can well be discerned in the *fiqh*–oriented sources of either group. The main problem to be tackled in the present paper is to find the manner of how reasoning interferer in legal and *fiqh*–oriented reasoning based on *uṢūlī* approach. Therefore, the present paper attempts to delineate types of effects of the reason in legal and *fiqh*–oriented argumentation based on an *uṢūlī* approach and within the broader framework of the essential and rational goodness and badness. It is evident that the scope of the present paper barely makes enough room for dealing with all versions of this theoretical background. In consequence, it is mainly a descriptive- cum- deductive study, with evaluations within the same framework. Briefly, the main achievements of the roles of reason in *fiqh*–cum-legal reasoning from an *uṢūlī* perspective can be summarized thus: (1) The overall construct of reasoning based on general rules of logic, (2) understanding the effects and non-linguistic evidence and interpreting texts based on them, (3) discovering the relations between concepts and rule(s) of law, (4) discovering the full and sole (entire) cause of the rules of law, delineating their scopes based on the presence and/or absence of the cause, (5) discovering the rational consequences of legal and religious data and limiting or extending the statement based on them, (6) discovering the requirements of the wise practice of the legislator and determining its effects in interpreting the act, (7) discovering the data for pure rational reasoning's that can serve as the basis for a legal or *fiqh*–based rule, (8) proving the sameness of the pure rational rule and the religious (Islamic) rule, (9) proving the facts and subjects of legal and *fiqh*–based rule, (10) validation of the evidence of proving the rules and facts, (11) solving the conflicts between the evidence of rules and facts, (12) intervention (i.e., determining the assignment) in deciding the duties of people when the rule and/or subject (fact) sound dubious, (13) intervention in solving the conflict (i.e., interference) between duties and rights at the time of implementation, and (14) explicating the relations of rules of law with their inner elements and their external preliminaries.

Keywords: Reason, Legal Reasoning, Interpretation of Act, Islamic Jurisprudence (Fiqh), Conflict of Evidence, Conflict (Interference) of Duties

EXECUTIVE ORDERS IN NIGERIA AS TOOLS OF GOVERNANCE: PROSPECTS AND CHALLENGES

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ABSTRACT
Nigerian constitutional democracy provides for separation of power, where constitutional powers are devolved among the three arms of government; the legislature, judiciary and executive. However, it has been held by various scholars that it is extremely, if not near impossible to carry on this practice in its entirety, devoid of incursion on one arm or the other. A water tight division of governmental power can lead to a deadlock, which may not only paralyse the machinery of government, but ultimately defeat its aim. To this extent, law making is not an exclusive duty of the legislature as the judiciary make law, through decisions of court, known as case law, while the executive enacts law though delegated legislation and executive order. This work deals with the use of executive order as an instrument of government under the Nigerian presidential system of government. These orders often set out government policies, issue directives or expertise action relating to functions of the executive arm. Adopting the doctrinal methodology, this paper looks at the constitutionality of executive, identifies the nature and definition, questions of the practice and the procedure as provided for in the grundnorm and the recent controversy surrounding the introduction in the Nigerian political landscape. The paper also appraises the law on modifying and challenging executive orders. It then ends with a conclusion that executive orders though a law-making instrument must be subject to the proper procedure as provided by law and should not offend the provisions of the constitution or any legislature of the National Assembly. Finally, recommendations are made for transparency, due process and accountability in the use of executive orders.

Keywords: Legislature, executive orders, constitution, administrative

ROLE OF PARIS AGREEMENT IN MITIGATING CLIMATE CHANGE

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ABSTRACT

Climate change threatens people with food and water scarcity, increased flooding, extreme heat, more disease, and economic loss. Human migration and conflict can be a result. The World Health Organization (WHO) calls climate change the greatest threat to global health in the 21st century.

The momentum of global warming is going up day by day which is a serious concern for globe. Every decade is warmer than its prior. The statistics shows that last five years (2015-2020) were the warmest on record. Natural disasters are more common which indicates that natural system of earth is disturbed. The rising sea levels indicates that the world is moving closer to face irreversible changes which may be beyond imagination.

The rapid increase in global warming is attributed to Green House Gas emissions particularly to Carbon dioxide. The increasing temperature of earth is making an alarming situation and so intellect individuals and scientist and organizations all over the globe are looking for it seriously. In this link, an aggressive goal to keep global warming below 2 degrees Celsius – specifically 1.5 degree Celsius has been accepted by policymakers from all over the world in Paris in 2015. The pledge to reduce greenhouse gas emissions and to focus on net zero carbon emission is an important initiative in this direction.

The present research paper is focused to elaborate the present and future prospect of Paris Agreement to the community so that the major issues and concerns should be understand easily, and should be considered when aiming to enhance Green House Gas inventories. The paper will analyze the role of the Paris agreement in mitigating climate change and will discuss the impacts of global warming on climate. In this link, the efforts of Indian government at national level will also be comprised further.

Keywords: Climate Change, Global Warming, Green House Gas Emission, Net Zero Carbon Emission, Paris Agreement

CULTURAL IMPACT OF TRIBAL MIGRATION: A CASE STUDY OF PANGWALA TRIBE OF HIMACHAL PRADESH

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ABSTRACT

Purpose: Culture is the beliefs, practices and artifacts of a group. In anthropology, tribe is a notion form of human social organization base on a set of smaller groups, having temporary or permanent political integration and defined by traditions of common descent, language, culture and ideology. Tribal people in India have their own customs, traditions, beliefs, etc. Tribal societies are rich in terms of cultural traditions. Tribal people are getting migrating due to several reasons. This has made in impact on different aspects of society including culture. The purpose of this study is to analyze the cultural impact of tribal migration.

Methodology: The study was empirical in nature. Pangwala tribe of Himachal Pradesh was taken for the study purpose. Pangwala tribe founds in Pangi block of Chamba district of Himachal Pradesh. Only permanent migrants who have constructed their houses at destination places were included in the study as samples with the help of snowball sampling.

Results: The results of the study will be helpful to government and policymakers to pay special attention to these vulnerable groups.

Conclusion: The problems of tribal people are different than other people of the country. Tribal communities are getting migrated because of land snatching, construction of power projects and other developmental activities tribal people are losing their agricultural lands, which causes threat to their survival.

Keywords: Cultural Impact, Tribal Migration, Pangi, Pangwala Tribe, India, Himachal Pradesh

INTRODUCTION

"Culture is the sum of all the forms of art, of love, and of thought, which, in the course of centuries, have enabled man to be less enslaved."

-Andre Malraux

Culture is the beliefs, practices and artifacts of a group. In anthropology, tribe is a notion form of human social organization base on a set of smaller groups, having temporary or permanent political integration and defined by traditions of common descent, language, culture and ideology. Culture refers to the cumulative deposit of know-how, experience, ideals, values, attitudes, meanings, hierarchies, religion, notions of time, roles, spatial members of the family, ideas of the universe, and fabric gadgets and possessions obtained with the aid of a group of humans within the direction of generations via person and institution striving. Culture is communication. Culture in its broadest experience is cultivated behavior; this is the totality of

a person's found out, amassed experience that's socially transmitted, or greater in short, conduct via social getting to know. Culture consists of patterns, explicit and implicit, of and for conduct obtained and transmitted through symbols, constituting the one-of-a-kind achievement of human groups, which include their embodiments in artifacts; the essential middle of culture includes conventional thoughts and mainly their attached values; lifestyle structures may additionally, on the one hand, be taken into consideration as merchandise of action, alternatively, as conditioning affects upon in addition action.

Migration has become a matter of political debate all over the word as it is the continuous process. Managing human mobility is one of the biggest challenges for destination places. Most of the people want to migrate to the cities where they try to spend good quality of life. Due to the lack of knowledge of the aspects, structure and features of international flow of migration the governance of migration has become difficult. There is lack of exact and quality of data at governance level. No accurate data of migrants is available with the government. To overcome the challenges of migration, it is very important to maintain a proper record of the migrants and collect quality of statistics. Tribal people in India have their own customs, traditions, beliefs, etc. Tribal societies are rich in terms of cultural traditions. Tribal people are getting migrating due to several reasons. This has made in impact on different aspects of society including culture. The purpose of this study is to analyze the cultural impact of tribal migration.

IMPORTANCE OF CULTURE

Culture is a composite of several elements. A community shares a prime tradition, and there may be sub-cultures inside the predominant culture. The important culture is what makes a group of diverse sub-cultures cohesive. It can be compared to religions that consider in God, but have extraordinary doctrines and ideals approximately God; however the overall commonality is the notion in God. Culture is a reflection of a network or country. This makes culture important and vital figuring out aspect of ways the network reacts, responds, and grows. Culture performs a primary role in the lives of all of us inside the society. Culture offers an experience of belonging, in particular whilst all people speak the same language. Language evolves with the tradition as an intimate fabricated from the way those within the society talk. Culture provides stability that, in turn, offers us a feeling of security and safety. In the proper type of tradition, people feel nurtured and even loved. They share the identical history and ideologies as the ones inside their community, and this gives the entirety cohesion. It ties them to their ancestry and gives a sensation of longevity which gives them a feeling of truth and dwelling actual life. It's simple that our tradition influences who we are, our perspective approximately life and the arena at large, and your values. Even our experience of humanity and the way we relate to other people are have an effect on by using our tradition. This type of affect can bring about what is normally called a cultural hole.

BRIDGING CULTURAL GAPS

It is through intentional understanding and popularity of various cultures that cultural gaps can be bridged. It takes a willingness and preference to recognize distinct cultures. Communities that make such efforts display an appreciation for diversity and view cultural variations as a gateway for building and growing their personal network. When a society values cultures exceptional from their own, they allow themselves to develop and recognise there are different methods of doing things. They are capable of grow as people and reach past their own protection nets to experience new thoughts, cuisines and numerous expression of individuality and cultures

via religions, music, fashion, and art. A healthy subculture learns to evolve to changes. It can extend and develop without feeling its very own centre values are threatened. The healthful network may additionally even undertake some components of a new way of life. These new cultural elements can toughen the existing ethos and add to its personal richness and variety. This form of growing and advancing subculture can better assist its members. It can provide a more stable and nurturing framework for the community, but more importantly, the individuals in the tradition. The tradition is the riding force at the back of a network's economic system. The culture provides individuals with precise goals, which includes creation and constructing. The greater numerous a traditions is, the greater monetary possibilities and wealth it may have. That is because the pool of talents and know-how are widened and end up deeper and more complicated. There is a more wellspring of creativity that monetary opportunities observe.

IMPORTANCE OF THE STUDY

A wholesome wealthy subculture is a high quality mirrored image of a diverse community. Culture is critical to the growth and monetary progress of society. Our behavioral styles, notion structures, principles, and methods of dwelling are the derivatives of our culture. Culture is the invisible bond which ties humans collectively. It refers to the pattern of human interest. The art, literature, language, and faith of a network represent its culture. Cultural values and beliefs appear themselves through its culture. Our ethical values represent our tradition. Differences in cultures have led to diversity in the people from different components of the world. How we understand matters is largely affected by our judgment competencies, preconceived notions, mind-set and emotions. These elements are carefully connected with our way of life. In perceiving something as correct or terrible, our biases play a role and so does our manner of questioning. In judging something as easy or hard, our mind-set and our motivation levels play a key function. Our culture determines the structure of our questioning, which influences our perceptions. People who belong to cultures that promote individualism generally tend to take a look at only the principle factors of a state of affairs, whilst the ones of a tradition that promotes collectivism generally tend to consider even the minor information. Culture impacts perception and perceptions power conduct. Thus, the subculture we belong to has an instantaneous impact on our conduct. Moreover, our environment, which has cultural affects, shapes our conduct. Our faith and moral which might be part of our way of life, affect how we behave. Our moral influence our feelings consisting of shame and pleasure and our faith defines what we understand as right or incorrect. Group culture determines the behavioral norms for a set. To be familiar as part of the group, we tend to comply with what the group makes a decision for us. Influenced by using the norms or regulations laid out by our tradition, we act according with them. Our subculture defines people’s expectations from us. In the try to fulfill them, we shape our conduct and personality to healthy our tradition. Our religion, traditions, customs, all part of our subculture and performs a prime role in shaping our personalities.

IDENTIFICATION OF RESEARCH GAP

To conduct this research, previous studies were consulted. Many studies have been conducted related to migration throughout the world. Very less studies have been conducted on tribal migration especially in Himachal Pradesh. Studies related to tribal migration in Himachal Pradesh are negligible. The existing studies on tribal migration have been conducted with references to forced migration, displaced migration, labour migration, migration in search of livelihood, and temporary migration. Permanent migration and its impact on different aspects

of life have been unexplored in research point of view. During literature review the researchers did not find any study close to the present study. In this study the researcher shall explore the areas of cultural impact and permanent migration.

RESEARCH METHODOLOGY

In present study Pangwala tribe was taken for the study. Chamba, and Kullu districts (destination places of the migrants) of Himachal Pradesh were covered as study area, because most of the permanent Pangwal migrants are settled in these two areas. There were total 374 samples and were selected with the help of snow ball sampling technique. To complete the present study both primary as well as secondary data were used. Primary data was collected with the help of questionnaire and direct face to face interactions were made with the respondents.

RESULTS AND DISCUSSION

Agriculture and animal husbandry are main occupations of the Pangwala tribe. They treated it as culture. The results of the study reveal that the migrants Pangwala tribe have no ownership of livestock at destination place. As for as agriculture is concern, only 3.21 per cent migrant respondents do agriculture at their destination place, whereas 96.79 per cent migrants do not perform agricultural activities at destination palace. A question was asked from the migrant respondents that whether their children speak Pangwali dialect or not. It was found that 74.60 per cent respondents opined that their children speak Pangwali dialect, while 25.40 per cent respondents opined that their children do not speak Pangwali dialect. It was also asked from the migrant respondents during the survey that whether they speak in Pangwali dialect with their children or not. The study reveals that 80.48 per cent respondents speak in Pangwali dialect with their children and 19.52 per cent respondents do not speak in Pangwali dialect with their children.

It is evident from the results that 94.39 per cent migrant respondents got married from Pangi, whereas only 5.61 per cent migrant respondents got married out of Pangi. As for as the marriage of their children is concern, the data depicted that 73.80 per cent respondents opined that their children got married from Pangi, 18.18 per cent responded that their children got married outside the Pangi while 8.02 per cent respondents opined that their children were unmarried. As we know that fair and festivals are important part of culture of any society. Tribal people also celebrate their fair and festivals with eagerly. The study shows that 78.07 per cent Pangwala migrant tribe always celebrate their local festivals at their destination place. 12.57 per cent Pangwala migrant tribe sometimes celebrate their local festivals at their destination place and 9.36 per cent Pangwala migrant tribe never celebrate their local festivals at their destination place. Pangwala tribe have their own dressing style. The question regarding wearing of Pangwali dress was also asked from the migrants. It is revealed that 13.43 per cent respondents sometimes wear their local dresses at destination place whereas 89.57 per cent never wear their local dresses at their destination place.

CONCLUSION

Due to migration of people across countries or from one place to another, what we have got now-a-days is a multicultural society. People who live around us, those we socialize with, and the ones we paintings with, come from exclusive components of the arena and have extraordinary cultures. Their methods of wondering and dwelling, and their values and ideals

are one of a kind from ours. The understanding of our personal and different cultures enables us be given those differences. Our tradition gives us an identity, and allows construct our character. The cultural values shared throughout our network or social organization, deliver us experience of belonging towards society. Our subculture unites us and offers us experience of protection. The language we communicate, the artwork, literature, and the heritage we are proud of, our meals, our festivals, and our customs and traditions together shape our culture. They come to be a part of our day by day residing and influence us in lots of approaches. The significance of culture cannot be burdened sufficient, as it is something that lies inside us, around us, and is a vital part of our being. It defines the manner we treat others and ourselves.

Tribal people in India have rich cultural heritage. Their different cultures differentiate them from rest of the society. Due to advancement in all spheres of life and the community as well, tribal people are getting migrate either in search of employment according to their status or to avail the modern facilities. Besides these some other reasons of migration are also there. When people leave their origin place and choose another place to live then they get in to contact with the new community and culture. Slowly they try to adopt that new culture it made adverse effect on their original culture. Same is with the tribal communities. They are choosing new places to live and their original cultural heritage is getting affected due to the influence of new culture. There will be a time when this distinct cultural heritage will get destroyed. There is a need to preserve such a beautiful cultural heritage. There should be serious efforts in this regard. The government must come forward with a strong plan to preserve the culture of tribal communities. Cultural museums should be established at local level and outside as well. This will expose the beautiful cultural of tribal communities outside the locality. Various competitions, fairs, shows, etc. should be organized among the tribal communities based on the theme of traditional culture, beliefs, customs, etc. Innovative ideas should be called from the people to preserve the culture of the tribal communities. Best ideas should be rewarded, so that the people can generate more and more good ideas in this field.

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REFERENCES

1. Annual Administrative Report (2019-2020), Ministry of Tribal Affaires, Government of India.
2. Bharti, K. R. (2001), Pangi and Pangwals, P. L. Printers Ludhiana.
3. Census of India (2011), Himachal Pradesh, Series-03, Part-XII-B, District Handbook, Chamba.
4. Devi, S. (2018), A Study of Primary Health Services in Tribal Areas in Himachal Pradesh, A Ph. D. thesis submitted to the Department of Public Administration, Faculty of Social Sciences, Himachal Pradesh University, Shimla-171005.
5. Hussain, H., (2021), Society and Culture, international Journal of Recent Scientific Research, Vol. 12, Issue, 01 (C), ISSN: 0976-3031, pp. 40608-40613, DOI: http//dx.doi.org/10.24327/ijrsr.2021.1201.5729
6. Lebron, A. (2013), What is Culture?, Merit Research Journal of Education and Review Vol. 1(6), . pp. 126-132.

7. Negi, S. (2017), Understanding Educational Out-Migration: A Case Study of Himachal Pradesh, Global Research Forum on Diaspora and Transnationalism, Research Monograph Series 25, Vol. 3, No. 1, ISSN: 2454-3675.
8. Negi, T. S. (1976), Scheduled Tribes of Himachal Pradesh: A Profile, Raj Printers Meerut.
9. Vidyarthi, L. P. and Rai, B. K., (1985), The Tribal Culture of India, Concept Publishing Company, Pvt. Ltd.

MODERN ROMANDA TARİHİ ANLAMA SORUNLARI

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ÖZET

Tarihi geçmişe ilişkin romanlar iki türe ayrılır: tarihi romanlar ve tarihi geçmişle ilgili romanlar. Tarihi bir romanın konusu tarihi geçmişdir (bazı araştırmacılar bunu metnin yazılmasından en az 75 yıl önce kronolojik bir çerçeve olarak alırlar). Tarihi romanda yazarın amacı sadece bilinen bir tarihi şahsiyetin karakterini incelemek değil, aynı zamanda kişilik ve dönem arasındaki bağlantıyı göstermektir. Burada tarihsel, sosyal ve hümanist yaklaşımlar örtüşmeli ve tarihsel gerçeklerin ve olayların tasvirinde sanatsal düşünce, tarihsel kişiliklerin karakteristik nitelikleri tarihsel gerçekliğe zarar vermemelidir.

Tarihi geçmişle ilgili romanın ana karakteri, kapsamlı tarihsel olaylar, tarihsel bir kişilik değildir. Romanın olay örgüsü belirli bir tarihsel aşamaya aittir ve insan kaderine dayanmaktadır. Bu varyantta, karakterler sanatsal koşulluluk kazanır. Bu durumda yazar, tarihi kaynaklara dayanmadan olayları dilediği gibi yorumlayabilir. Tarihi geçmişle ilgili romanın temel amacı, sıradan insan sorununu abartmaktır. Bu tür romanda sanatsal nesne, kronolojik olarak tarihin herhangi bir aşaması, hatta yakın geçmiş olabilir.

Son zamanlarda, romancılar genellikle tarihi olay örgülerini sentezler. Retro görüntülere ilgi, tarih, onun algısı, sanatsal arkeoloji modern romanda bir deney haline geldi. Kural olarak, yazarlar birkaç dönemin tarihinin bir resmini oluştururlar, bu durumda tarihi roman yerine sosyal roman türünü tercih ederler. Bu tür romanlarda ideolojik tarihsel bellekten çok kişisel bellek, ıstırap, acı, utanç ve günah gibi duygular ön plana çıkmıştır. Tarihi ve askeri olaylar, kahramanın kişisel deneyiminden anlatılır.

Çağdaş Azerbaycan romanlarında Karabağ sorunu ve savaşı ile ilgili eserlerin çoğunda tarih arka planda kalmış gibi görünmektedir, daha çok insan kaderini ve acılarını görüyoruz. İçimizdeki düşmanı arama fikri bu işlerin merkezinde yer alıyor. “Dolu”, “Karagovağ çölleri”, “Mucize”, “Üzeyir Hacıbeyov çadırda doğmaz”, “Evvel, axır”, “Ağrı”, “Çat” ve diğer romanlar bu çizgidedir.

Üç bağımsız olay örgüsü olan "Evvel ve axır” (M.Abdulla) romanının her bir öyküsü farklı yerlerde, farklı tarihsel zamanlarda geçmektedir. Fikir ve içerik bakımından sesleşen "Narkoman” (uyuşturucu bağımlısı), "Ağdere'den yüzü beri", "Agah" eserlerinin her birinde öncelikle insanların trajik kaderi, trajedileri ve sarsıntıları ön plana çıkarılmaktadır. Vatanın iç ihanet sonucu teslim olması, yakın tarihimizin acı bir gerçeğidir ve talihsiz bir durumdur.

“Ağrı” (A.Quliyev) romanında da tarihi gerçeklerin anlamı önemlidir. Yazar, tarihi gerçekleri, belirli dönemlerdeki siyasi süreçleri, topraklarımızın ermeniler tarafından işgal edilmesinin neden olduğu acı olayları ve ayrıca geçmiş tarihi süreçleri, Arnavutların geçmişini, Rusların Azerbaycan topraklarını işgalini, dini ve manevi baskılarını ele alıyor. Metinde okunan ve görülen acı, roman boyunca çeşitli toplumsal sorunlarda, tarihsel ve ruhsal deneyimlerde, aile ve insan ilişkilerinde izleniyor.

A.Abbas'ın “Dolu” veya Alabas'ın “Garagovag Çölleri” romanları de tarixi Karabağ savaşını kapsar. Her iki romanın ana yükü, ermenilerin Azerbaycan köylerini yağmalaması, Azerbaycanlı yetkililerin buna izin vermesi, silah toplaması ve halkı çaresiz bırakması ve topraklarımızı satmasıdır. "Yaşlılık ve hastalıktan öte, söyleyemediği sözlerin acısı insanı

öldürür". Eserden alınan bu örnekte yazar söylemek isteyip de söyleyemediği konuların varlığından söz ediyor ve aslında çok şey söylediği gibi görünmektedir ve hatta söylenenin acı bir gerçek olması bile okuyucuyu çileden çıkarmaktadır.

Sonuc olaraq görüldüğü gibi, tarih konulu çağdaş romanlarda tarihe atıfta bulunmak insanı, dönemi, zamanı, gerçekleri ve olayları, sosyal, manevi ve felsefi sorunları anlamanın bir aracıdır. Bir tür olarak, tarihi romanlardan ziyade tarihi olayları yansıtan sosyal yüklü romanlar daha aktualdır. Aynı zamanda, bu tür romanlar daha öğretici ve daha fazla manevi degere sahiptir.

Anahtar kelimeler: modern roman, tarih, Karabağ, savaş, Rus işgali

PROBLEMS OF UNDERSTANDING HISTORY IN MODERN NOVEL

ABSTRACT

Novels related to the historical past are divided into two types: historical novels and novels related to the historical past. The subject of a historical novel is historical (some researchers take it as a chronological framework at least 75 years before the text was written). In a historical novel, the author's goal is not only to examine the character of a known historical figure, but also to show the connection between personality and the period. Here, historical, social and humanistic approaches should overlap, and artistic thinking in the depiction of historical facts and events, the characteristic qualities of historical personalities should not harm the historical reality.

The main character of the novel about the historical past, comprehensive historical events, is not a historical personality. The plot of the novel belongs to a certain historical stage and is based on human destiny. In this variant, the characters gain artistic conditionality. In this case, the author can interpret the events as he wishes, without relying on historical sources. The main purpose of the novel about the historical past is to exaggerate the ordinary human problem. In this type of novel, the artistic object, chronologically, can be any stage of history, even the recent past.

In recent times, novelists have often synthesized historical events. Attention to retro images, history, its perception, art archeology has become an experiment in modern novels. As a rule, writers create a picture of the history of several periods, in which case they prefer the social novel type instead of the historical novel. In these types of novels, emotions such as passion, pain, shame and guilt have come to the fore, rather than ideological historical fiction. Historical and military events are told from the personal experience of the hero.

In contemporary Azerbaijani novels, the Karabakh issue and most of the works related to the war seem to be left in the background, we see more human destiny and pain. The idea of searching for the enemy within us is at the center of this work. "Hail", "Garagovag Deserts", "Miracle", "Uzeyir Hajibeyov is not born in a tent", "First, last", "Pain", "Crack" and other novels are in this line.

Each story of the novel "Before and After" (M.Abdulla), which is a network of three independent events, takes place in different places, at different historical times. Since ", in each of the" Agah "works, the tragic fate, tragedies and upheavals of the people are brought to the fore. The surrender of the homeland as a result of internal betrayal is a bitter fact of our recent history and an unfortunate situation.

The meaning of historical facts is also important in the novel "Pain" (A. Guliyev). The author deals with historical facts, political processes in certain periods, the painful events that led to the occupation of our lands by Armenians, as well as past historical processes, the past of the Arnavuts, the occupation of Azerbaijani lands by the Russians, religious and moral pressures. The pain read and seen in the text is followed throughout the novel in various social issues, historical and spiritual experiments, and family and human relations.

Agil Abbas's "Hail" or Alabas's "Garagovag Deserts" novels also cover the historic Karabakh war. The main burden of both novels is that the Armenians plundered the Azerbaijani villages, that the Azerbaijani authorities allowed it, that they collected weapons and left the people helpless and sold our lands. "Beyond old age and illness, the pain of words he can't say kills." In this example from the work, the author speaks about the existence of topics that he does not want to say, and in fact, it seems as if he says a lot, and even if what is said is a bitter truth, it bothers the reader.

As a result, in contemporary novels on history, history is a tool for understanding man, the period, time, facts and events, social, spiritual and philosophical issues. As a genre, socially loaded novels that reflect historical events are more relevant than historical novels. At the same time, these types of novels have a more educational and more spiritual value.

Keywords: modern novel, history, Karabakh, war, Russian occupation

MAGJAN JUMABAY VE AHMAD JAVAD'IN KADERİ VE ÇALIŞMALARINDAKI BENZERLİKLER

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ÖZET

Azerbaycan'ın "Cumhuriyet şairi" Ahmed Cevad ile Kazakların milli şairi Magjan Jumabay'ın kaderi ve yaratıcılığı çok benzer. Her ikisi de 45 yaşında uydurma ve yalan kurbanı olarak vuruldular.Ahmed Cevad 1892-1937'de ve Magjan Jumabay 1893-1938'de yaşadı. 45 yılda yazdıkları tek bir milletin değil, bütün Türk dünyasının manevi zenginliğidir. Her ikisi de baskı kurbanı oldukları için Azerbaycan ve Kazak halklarının eserlerini okumaları ve yayınlamaları uzun yıllar yasaklandı. Ancak hiç bir yasak her iki şairi de halkın hafızasından silememiştir, tüm Türk halkları onları her zaman sevmiş ve eserlerine milli bir hazine gibi değer vermiştir.

Sanat hayatına küçük yaşta başlayan A.Javad ve M.Cumabay, aynı zamanda ilmî, gazetecilik ve siyasi faaliyetlerde bulunmuş, halklarının hür olmasını dilemişler ve bu istikamette mücadele etmişlerdir. Fikirleri, düşünceleri ve yazıları Sovyet imparatorluğunun ideolojisine uygun değildi ve bu tür entelektüellerin varlığı ve yaratılması iktidardakileri endişelendirdi. Böyle entelektüeller çoktu. 1937-1938 yıllarında Azerbaycan'dan Hüseyin Cavid, Ahmed Cevad, Mikayil Mushfig, Kazaklardan Saken Seyfullin, Ahmed Baytursun, Mağcan Cumabay, Özbekistan'dan Fikret, Çolpan ve yüzlerce aydının baskıya maruz kalması tesadüf değildir. Kanlı imparatorluk, türkçe konuşan halkların aydınlarını ve milli ideologlarını yok ediyor, köleliğini genişletiyordu. Vurulmayan ve ya idam edilmeyen sürgüne gönderildi ve ağır işkence gördü. Sürgün yerleri tesadüfen seçilmedi. Orta Asya'nın kurak çölleri milyonlarca insanın mezarı oldu. Yıllar sonra, Oljas Süleymenov o zamanın dehşetini hatırladı ve olanlardan ülkesi ve milleti sorumlu olmasa da diğer milletlerden özür diledi.

Kazakistan!....
o sadece sende
Bütün dünyada
Başkentlerin hapishaneleri.
Sen sonsuz sürgü yerisin
Küçük bir haritada .....

Magjan'ın "Ural", "Türkistan", "Uzaktaki kardeşim", "Turan'ın bir bahçesinde" şiirleri ve A.Javad'ın "Göy göl", "Dilimiz", "Türk ordusuna", "Kür" şiirleri fikir ve düşünceler açısından kulağa hoş gelen eserler.

Her iki şair de halkına hür ve mutlu bir hayat dilemiş, milli ve manevi değerlerine bağlı kalmış, gerçek milletleri olan Türk topraklarını sevmiştir. Türk olmaktan gurur duyan Magcan şunları yazdı:

Dünyada Turan gibi bir yer var mı?
Türk eline karşı çıkan bir el var mı?
Derin zeka, geniş hayal gücü, cesaret,
Turan kocalarına yeteri kadar koca var mı?

A.Javad da aynı ruha sahip bir şiirinde şöyle yazar:

Bu yalchin kayalarını sev,
Bunlar şahin yuvaları...

Bu yalnız ormanları sev,
Bunlar kocalar köyü.

Hem Magjan Jumabay hem de Ahmad Javad'ın sanatsal ve politik fikirler, doğa ve aşk sözleri dünyası çeşitli ve zengindir. Her iki şair de halklarını bekleyen tehlikeleri önceden görmüş ve bu endişelerini şiirlerinde açıkça dile getirmekten çekinmemiştir. Bu nedenle zulme uğradılar, defalarca "halk düşmanları" adına tutuklandılar ve sonunda imparatorluk tarafından kurşuna dizildiler. Bugün her iki ulus da bağımsızdır ve en sevdikleri şairlerin eserleri bu halkları daha militan ve gururlu olmaya çağırmaktadır.

Anahtar Kelimeler: Ahmed Cevad, Magjan Jumabay, sürgün, Turan

SIMILARITIES IN THE LIFE AND ACTIVITIES OF MAGJAN JUMABAY ANDAHMAD JAVAD

ABSTRACT

The life and activities of the "poet of the Republic" of Azerbaijan Ahmad Javad and the national poet of the Kazakhs Magjan Jumabay are very similar. Ahmad Javad lived in 1892-1937 and Magjan Jumabay in 1893-1938 each of them was shot at the age of 45 as victims of fabrications and lies. 45 years is the spiritual wealth of the whole Turkish world, not only just one nation they have lived and created. Because both were victims of repression, the Azerbaijani and Kazakh peoples were banned from reading and publishing their works for many years. However, no ban could erase both poets from the memory of the people. All Turkish peoples have always loved them and valued their works as a national treasure.

A.Javad and M.Jumabay, who started their artistic career at an early age, were also engaged in scientific, journalistic and political activities, wished their people to be independent, and fought in this direction. Their ideas, thoughts, and writings were not in line with the ideology of the Soviet empire, and the existence and creation of such intellectuals worried those in power. There were many such intellectuals. It would not be a coincidence that Huseyn Javid, Ahmad Javad, Mikayil Mushfig from Azerbaijan, Saken Seyfullin, Ahmad Baytursun, Magjan Jumabay from Kazakhs, Fikret, Cholpan from Uzbekistan and hundreds of intellectuals were victims of repression in 1937-1938. The bloody empire was destroying the intellectuals and national ideologues of the Turkish-speaking peoples, especially the captives, and was expanding its slavery. He was exiled without being shot or executed, and was severely tortured. The places of exile were not chosen by chance. The arid deserts of Central Asia have become the graves of millions of people. Years later, Oljas Suleymenov remembered the horrors of that time and apologized to other nations, although his land and nation were not to blame for what happened.

Qazaxıstan!....
Təkcə səndə yerləşir
Bütün yer üzündəki
Paytaxtların türməsi.
Sən ucsuz-bucaqsız sürgün yerisən
Kiçik bir xəritədə.....

(in this poem Kazakhstan described as prisons of capitals)

Poems by Magjan "Ural", "Turkestan", “Ural”, “Türküstan”, “Uzaqdakı qardaşıma”, “Turanın bir bağında” with poems A.Javad s “Göy göl”, “Dilimiz”, “Türk ordusuna”, “Kür”

poems idea are works that sound in terms of ideas and thoughts. Both poets wished their people a free and happy life, were loyal to their national and moral values, and loved their true nation, the Turkic lands. Proud to be Turkish, Magcan wrote:

Yer üzündə Turan kimi yer varmı?
Türk elinə qarşı çıxan el varmı?
Dərin zəka, geniş xəyal,cəsarət,
Turanlı ərlərə yetən ər varmı?

A.Javad also writes in one of his poems with the same spirit:

Sev bu yalçın qayaları,
Bunlar şahin yuvası...
Sev bu ıssız ormanları,
Bunlar ərlər obası.

(In this poem Turan is described as paradise)

Both Magjan Jumabay and Ahmad Javad's world of artistic and political ideas, nature and love lyrics are diverse and rich. Both poets foresaw the dangers that awaited their people, and did not hesitate to express these concerns openly in their poems. For this reason, they were persecuted, repeatedly arrested in the name of "enemies of the people", and finally shot by the empire. Today, both nations are independent, and the works of their favorite poets call on these peoples to be more militant and proud.

Keywords: Ahmad Javad, Magjan Jumabay, exile, Turan

THE BRAIN-BASED SCIENCE LEARNING STRATEGY AMONG PRE-SERVICE TEACHERS: AN EMPIRICAL STUDY

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ABSTRACT

The study investigated empirical evidence of brain-based strategy's ability to enhance students' learning in science in Nigeria. Studies show that students in Nigerian schools' academic performance in science are abysmally poor for many reasons, among which teachers' paradigm of teaching is critical. Research suggests that most conventional teaching strategies employed by teachers, like lectures, could not help students understand science. Previous research opined that a brain-based instruction strategy could enhance science learning, motivate students, and foster high retention. The study adopted a quasi-experimental design of a pre-test - post-test approach. Sixty pre-service science teachers of a College of Education were sampled for the research. A research instrument, the Brain-based Instructional Test (BbIT), was used to obtain data for the study. One null hypothesis was formulated and tested using the t-test statistical tool. The finding shows a marginal mean difference between students taught with the brain-based strategy and those acquainted with the lecture method. It was indicated that the difference was not statistically significant, and the null hypothesis was sustained. The author concluded that the mean difference is not substantial to accept the literature that brain-based enhances learning. A suggestion for further study was recommended.

Keywords: brain-based learning, brain, teaching method, science, motivation, retention

PROBLEMS OF MODERN SOCIETY IN SERGEY MINAEV'S NOVEL "SPIRITLESS"

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ABSTRACT

Sergey Minaev's novel "Spiritless. The Tale of a Fake Man" (2006) is often called an office novel. This novel is relevant because it covers sometimes invisible problems. It is not without attention that the author accompanies each chapter of the novel with an epigraph characterizing the main idea. In the novel, the author raises the problem of a person in society, and especially at work, often comparing workers with soulless mechanisms. Describing young people killing their time in bars, he draws attention to the mental state of his characters. So, in one of the paragraphs of the novel, he draws attention to the fact that in a bar "a dude sits with an absent face and ruffles his neck." The author raises global issues of his time, where young people have no moral values, they are not interested in internal development.

The writer describes the working environment in the office well. In addition to secretaries, he shows office directors and their role in the office. Speaking in the novel as a director, Sergey Minaev reveals all the processes taking place at work. Giving in the novel a description of society and the aimless direction of the youth's strength to nowhere, the author does not give a solution to this question. He just raises it: "stupid way of speaking with words – advertising slogans. Why do smart people diligently, day after day, make idiots of themselves?". The author in the novel tried to cover many issues of modern society.

Keywords: office novel, problems of society, modern novel

ROLE OF CONTACT TIES WITHIN THE CONTEXT OF CULTURAL INTERACTION BETWEEN EAST AND WEST

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ABSTRACT

The problem of cultural interaction between East and West holds a special place in modern literature. Here, the point is more of typological ties between two branches of human spiritual dimension rather than mere influence.

Prominent figures of art and science from West have discoveredpermanent ideal – aesthetic value of the cultural heritage of the Eastern nations and linked it to the progressive cultural achievements of the West throughout all historic epochs and our contemporary time in particular. A vital methodological key for accurate understanding of afairly complex, contradi ctory process of cultural interaction between East and West is to identify conflicting tendencies, which transpire in the process of cultural interaction between East and West. Unlike the European cultural areal that originates on the base of(antique and partially B yzantine) a unified tradition, the cultureof East, while presenting a certain systemic unity, has severaldifferent sources such as Indian, Chinese, and Ancient Iraniancivilizations (Arabic-Muslim cultural region joined it in X century). Regional historic –cultural unities, characterized by similarity of cultural traditions, proximity of religious – philosophic, ethic and aesthetic ideas, sustainability and systemic nature of genetic, contact and typological cultural ties as well as relative unity of cultural process, have emerged and developed based on such civilizations. Interaction and mutual enrichment of the culture of East and West is a key driving force for the progress of the world culture.

Keywords: cultural interaction, East, West, contact ties, the world culture.

COVID-19'S IMPACT AND ALTERNATIVE METHODS OF TEACHING AND LEARNING SCIENCE, TECHNICAL AND VOCATIONAL EDUCATION IN NIGERIA

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ABSTRACT

In Nigeria, like in some other parts of the world, the impact of COVID-19 worsened education situation, as seen in the teaching and learning of science, technical and vocational education (STVE). The government responded to the crisis by providing financial assistance to businesses and through prompt payment of monthly salaries to government's teachers all through the coronavirus outbreak. Yet, alternative methods of teaching and learning STVE were not put in place by various governments across the country. To this extent, this paper assessed COVID-19's impacts on education, and the teaching and learning of STVE. This impact ranges from interruption of academic activities to cancellation of academic conferences to job losses. It further unraveled novel (alternative) methods that could enhance the teaching and learning of STVE during health crisis as witnessed during the coronavirus outbreak. In this regards, this present article mentioned and discussed flipped classroom model, learning management systems, blended learning, social media platforms among others as innovative means of teaching and learning STVE during pandemic outbreak. The paper concluded by emphasising on proper monitoring in order to ensure the effectiveness of these methods and quality (re)trainings of teachers.

Keywords: COVID-19, Impact, Innovatives, Science, Technical and Vocational Education

TEACHING METHODOLOGY OF THE SUBJECT "REVIVAL OF THE TRADITIONS OF INDEPENDENT STATEHOOD IN AZERBAIJAN IN IX-XI CENTURIES IN SECONDARY SCHOOLS"

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ABSTRACT

The emergence, development, rise and decline of the traditions of Independent Statehood in Azerbaijan, the education of secondary school students, their understanding of these features and their consideration in future activities are of great importance in terms of shaping worldviews. While teaching this topic, first of all, information is given about the fact that Azerbaijan is one of the first countries in the world, the existence and decline of the states of Manna, Atropatena, Albania. The influence of internal and external factors in these processes is emphasized. As a result of the weakening of the Arab caliphate, fertile conditions have been created in Azerbaijan for the revival of the traditions of independent statehood. It is noted that in the IX-XI centuries Azerbaijan experienced a Renaissance in terms of statehood. Information is given about Shirvanshahs, Sajis, Salaris, Ravvadis, Shaddadis. Along with the importance of the existence of these states, the mistakes they made are the result of feudal fragmentation and the fact that none of them paid attention to the creation of the Navy and the fact that part of the borders remained unprotected led to subsequent occupations. Students form an opinion that the state independence of each nation is its national dignity and national pride. It is reported that the existence of the Independent States in Azerbaijan in the IX-XI centuries led to economic and cultural growth in the country, as well as the beginning of the Renaissance in other areas.

Teaching this topic in this form is valuable in terms of strengthening the National Statehood in modern times, increasing the sense of patriotism in students, the importance of constantly increasing defense capabilities, taking into account the existing international realities.

Keywords: Azerbaijan, State, Feudal, Century, Tradition

THE ROLE OF MULTİCULTURALİSM İN AZERBAİJANİ EDUCATİON

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ABSTRACT

Programs and textbooks, teaching and methodological aids, recommendations, etc. for the effective organization of the teaching of languages of minorities and ethnic groups. preparation and publication are in constant focus. Multiculturalism means "many cultures" in English. Azerbaijan has been known for centuries as a place where different civilizations meet, where the environment of national and cultural diversity is formed, where people of different nations and religions live in peace, tranquility, mutual understanding and dialogue. Multiculturalism and tolerance have historically been a way of life for Azerbaijanis, and today they have become a way of life for every citizen of the Azerbaijani state, regardless of their national identity, language or religion. The rich multicultural past of the Azerbaijani people lives not only in the tolerant way of life of our people today, but also in the literary-artistic, scientific-philosophical, political-legal sources and documents created by them.

In modern times, it is important to study the real situation in order to manage the quality of education, monitor and forecast the dynamics of development. In this case, assessment is considered an important pedagogical tool. Assessment creates objective conditions to improve the educational process, to increase the effectiveness of the learning process, to determine what students have mastered, what skills they have and what qualitative changes have taken place in them. The activities carried out in this direction in our country are aimed at preserving, developing and harmonizing the cultural diversity of representatives of different religions and nations around the world.

Undoubtedly, Azerbaijan, as a country that has been contributing to the development of multicultural values for more than a century, will spare no effort to maintain peace, stability and sustainable development, not only in the South Caucasus but in the world as a whole. Today, there are new realities in the culture of Azerbaijan, in the education system of Azerbaijan. The post-war period is especially important for the restoration of socio-political, cultural, educational and economic ties in the region, and this process today requires a more multicultural approach.

Keywords: multikulturalism, education, multikultural education

REFLECTING THE OF UNDERSTANDING AND INTERPRETATION THE LINK BETWEEN THE PHILOSOPHICAL HERMENEUTICS OF DAZIN "BEING WEIGHT" MARTIN HEIDEGGER IS A DIFFERENT STEP THAN "METHODOLOGICAL HERMENEUTICS"

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ABSTRACT

In Iran, some have identified *Martin Heidegger* as the world's most important and advanced philosopher of the next century, and even said that the world remains, will remain. We have strongly sanctified *Heidegger* in Iran, but in a philosophical country like England they are not good with his thinking. There is a rumor that he wrote some of *Hitler's* speeches. The first book published by *Heidegger* in Persian was the translation of *Ahmad Fardid*. From What is Philosophy? From March 1953, for the first time an article entitled "From Kant to Heidegger" by *Ahmad Fardid* in the Magazine of Speech until 1988, the book "What is Philosophy?" Martin Heidegger was translated into Persian and made available to Persian -speaking audiences, the name of *Heidegger* repeatedly in Iranian philosophical circles and caused controversy. In other words, at 78 years since Heidegger's introduction to Iranians until the first translation of his work, Heidegger's name was the quotation of Iranian philosophical and intellectual circles without a book published. *Heidegger* is usually considered to be existentialists. This is both true and incorrect. Because, despite the ambiguity of his philosophy and sometimes two -part, it seems that we are faced with a philosopher and a philosophy who makes every effort to protect the ontological or " Budology " position. What is the subject of the who and what his difference with the existentialist philosopher is what we will explain below? This article seeks to present philosophical hermeneutics from *Heidegger's* view, and it has been shown that hermeneutics has entered a different phase of "methodological hermeneutics" with the book "The Being of the Website". To do this, we have dealt with one of the important books of the book "Being and Time", " exist ". "Dazin" as a being thrown into life and has the abilities to reach the future that is original and original, which requires *Heidegger* to understand and interpret. *Heidegger* is sometimes written by Dasein, sometimes separate and with the Da-Sein distance line. In the first case, Dasein is man because it is open and open to existence. And in the second use, the meaning is still human, but because it is the embodiment of existence. *Heidegger*, when he speaks of Dazin, is the same human being. The literal meaning of the word is: "Being - there", meaning that man is "there - there" is paying attention to his body

Keywords: Martin Heidegger, methodological hermeneutics, existentialist, phenomenology, ontology, Dazine, throwing, interpretation.

EVALUATION OF THE EFFECT OF SPERM MORPHOLOGY ON EMBRYO DEVELOPMENT

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ABSRACT
The number of couples who want to have children has increased significantly. This situation leads to an increase in the number of couples seeking infertility treatment, and especially patients receiving treatment at an advanced age. When we look at the increase in infertility today, it is seen that it is increasing worldwide and it affects 10-15% of couples of reproductive age. Studies show that the main source of infertility originates from men. There are two technologies commonly used in ART, called in vitro fertilization [IVF] and intracytoplasmic sperm injection [ICSI], and are the most important treatment option for achieving a pregnancy by bypassing the natural conception process. Many studies have been conducted on the factors affecting embryo quality, and it has been suggested that many of the "embryo quality" parameters result from paternal factors. It is especially important to determine the paternal factors, which are among the factors affecting the embryo quality. Because with the ICSI method, which has been successful in IVF treatment, it has allowed infertile men with severe male factor to become fathers, thus increasing the risk of vertical transmission of paternal genetic defects. Significantly lower division rates and blastocyst formation rates have been noted when frozen or morphologically abnormal sperm are used to fertilize oocytes in IVF. In addition to negatively affecting embryo development, it has also been found to significantly affect pregnancy rate.

Keywords: IVF, Implantation success, embryo development, sperm morphology

INTRODUCTION
The length of human sperm is about 60 μm. It consists of two main parts, the head and the tail. While the head part contains the thin cytoplasmic part and the nucleus containing the acroma, the tail part; neck, middle piece, main piece, and last piece (Ross and Pawlina, 2014). The sperm head is flat and pointed. The sperm head is 4-5 μm long, 3 μm wide, and 1μm thick. The sperm head contains a flattened shaped nucleus. The acrosomal cap covers 2/3 of the apical part of

this nucleus. This region contains hyaluronidase, neurominidase, acid phosphatase, and trypsin-like proteases known as acrosin. The remaining 1/3 is called the postacrosomal region. Acrosomal enzymes dissolve the zona pellucida, allowing the genetic material of the sperm to enter the ovum. The tail is about 55 μm long. It consists of four parts as neck, middle piece, main piece and end piece. The neck is a narrow piece that connects the head to the tail and includes the proximal and distal centriole. The proximal (anterior) centriole is found attached to the nucleus. The distal centriole is the source of the axoneme, the central part of the tail of the sperm. The middle part of the tail is 7 μm long, 1 μm in diameter. It lies between the neck and the main piece (Ross and Pawlina, 2014; Kierszenbaum, 2006). The middle piece has large mitochondria arranged in a spiral fashion, in addition to the axoneme and 9 outer dense fibrils. There are 9 outer dense fibers around the axoneme, surrounded by spirally arranged mitochondria that provide energy to the tail. Towards the end of the tail, the outer dense fibers become thinner and disappear. Mitochondria located here provide the energy necessary for the movement of the tail. The main part is the longest part of the tail and is about 40 μm long.

1. Semen analysis

While investigating the cause of male infertility, the first procedure to be done after anamnesis and physical examination is semen analysis. Semen analysis is the most basic test in the evaluation of male infertility and alone is effective in shaping the treatment. 2 or 3 semen analysis performed with the ejaculate sample that the patient will give at least 15 days apart has an important place in the evaluation of infertility. For semen analysis, the ejaculate sample given by masturbation after 2-7 days of sexual abstinence should be evaluated within 1 hour at the latest (Burrows et al., 2002).

Macroscopically: Appearance, viscosity, liquefaction time, color and volume are evaluated (WHO, 2010).

Microscopic examination: In the microscopic examination, firstly, evaluations such as concentration, motility, agglutination, aggregation, and presence of leukocytes are made. If the semen sample is not mixed well, differences in motility, viability, concentration and morphology are observed between two separate examinations. High speed mixers should not be used as they will damage the sperm. A Makler slide (20 μm in depth) is used when examining. Thus, spermatozoa are allowed to move and counted more easily (Gökçe, 2011).

2. Sperm Morphology

It is the visual evaluation of the physical properties of the sperm with a microscope. Anomalies in the head and tail of the sperm have a negative effect on the motility and fertilization capacity of the sperm (Gardner, 2010).

Evaluation of sperm morphology is made using different staining techniques at light microscopic and electron microscopic levels. Staining techniques used while evaluating morphology are listed as Papanicolaou, Hematoxylin dye, Toluidine blue-pyronin, Giemza and Nigrosine-eosin. Papanicolaou, Shorr and DiffQuick staining are recommended methods. Papanicolaou reveals the acrosomal and postacrosomal space, residual cytoplasm, midpiece and tail in sperm. Papanicolaou staining provides good staining of sperm and other cells. It is dyed pink or red with Papanicolaou dye. However, since the examination of sperm with this method takes a long time, staining methods such as Spermac and Diff-Quik, which are performed in a shorter time and provide detailed information about sperm morphology, are used. With these dyes, the head is stained pale blue in the acrosomal region and dark blue in the post-acrosomal

region. The middle part may show some red staining. The tail is painted blue or reddish (Gökçe, 2011; et al., 2011).

The study of sperm morphology goes back to 1951. Morphology was started to be evaluated with strict criteria by Kruger et al. After the determination of these parameters, it has gained increasing importance. Parameters revised by Menkveld et al. in 1990 were accepted. According to Kruger, it is divided into 3 classes: the group with normal morphology (more than 14% normal form), the group with good prognosis (between 4% and 14% normal form), and the group with poor prognosis (less than 4% normal form). are separated. When the normal morphology is less than 4%, the fertilization rate per oocyte with IVF is 7.6%, while this rate increases to 63.9% at rates greater than 14%. Many definitions of sperm morphology have been made by the WHO from 1980 to 2010. In the WHO 2010 booklet, 4% is taken as a criterion (Hassa, 2003).

Sperm viability: It is based on the evaluation of the integrity of the cell membrane. The damaged plasma membrane in dead cells engulfs the dye. It can be made using eosin-nigrosin or just eosin dyes. In hypoosmotic swelling, only cells with intact membranes swell in hypotonic solutions. Viability should be evaluated within 30 minutes after liquefaction. Temperature change and dehydration have a negative effect on sperm viability. The number of viable cells should be greater than the number of motile sperm. It is clinically important whether the immotile sperm are viable or not. The results of the viability assessment should be evaluated together with the motility results of the same semen sample. A large proportion of viable but quiescent cells may be indicative of structural defects in the tail. The lowest reference value for sperm viability is 58% (Çolgar, 2006; Gökçe, 2011).

The rate of DNA damage has also increased in those with impaired sperm morphology (Esterhuizen et al., 2000). When DNA damage is high, pregnancy success decreases, whether naturally or with IVF. However, even if the sperm morphology is normal, DNA damage can be found. In other words, we cannot say whether there is sperm DNA damage or not based on the sperm morphology result (Trisini et al., 2004). This also needs to be investigated. This is very important; Even if the normal morphology is low, pregnancy can be seen if there is no DNA damage. The centrosome is the starting part of the sperm tail. In its disorder, sperm movement is also affected. But the main task of the centrosome is the division of the egg and the development of the embryo (Yang et al., 2015). Because while the sperm unites with the egg, the centrosome of the egg melts, only the centrosome from the sperm remains. If the centrosome is defective, the embryo cannot develop either. This situation is said as the egg is not divided in in vitro fertilization. Here, one reason why there is no division in IVF failures is the centrosome diseases of the sperm. We understand this with the deformity of the neck part in the sperm morphology examination. Such sperm can enter the egg naturally, but the embryo cannot develop (Barroso et al., 2009). Mitochondrial diseases can affect all functions of sperm. But it is especially responsible for movement disorders and DNA damage. In recent years, it has been revealed that mitochondrial diseases play a role in sperm premature aging, apoptosis and necrosis (Aitken et al., 2011). In the morphology examination, the middle part of the sperm is thin or short, and its shape is deformed, indicating a mitochondrial disorder.

We said that the low normal sperm morphology alone does not make sense. But it is necessary to pay attention to 2 situations: Presence of other disorders accompanying low morphology: Cases where a single deformity holds all the sperm. There are three main disorders here: Globozoospermia, point head or pinhead condition, large head anomaly. However, these conditions are very rare and are important if all sperm are involved, but not important if only a

few sperm are affected (Franken 2015).

Here, when looking at the morphology result, it is necessary to evaluate the above situations well. If there is one of these, just trying to fix the morphology will not work. Even if the morphology does not improve, pregnancy can be achieved if we correct the accompanying disorder. For this, it is necessary to evaluate each disorder well. However, evaluating sperm morphology requires a long experience. It is also important to have this type of analysis done in experienced centers.

Conclusion

As a result, sperm morphology should be routinely evaluated in couples who could not have children. Thus, it is understood where or which function of the sperm is damaged and the treatment plan is arranged accordingly. However, it is not enough to consider sperm morphology alone when deciding whether to have children naturally or to have IVF. It is not correct to hold sperm morphology alone responsible for not having children naturally or for IVF failures.

REFERENCES

Aitken RJ, Koppers AJ. Apoptosis and DNA damage in human spermatozoa. Asian J Androl. 2011;13(1):36-42.

Barroso G, Valdespin C, Vega E, Kershenovich R, Avila R, Avendaño C, Oehninger S. Developmental sperm contributions: fertilization and beyond. Fertil Steril. 2009;92(3):835-48.

Burrows PJ, Schepterman CG, Lipshultz LI (2002). Comprehensive office evaluation in the newmillennium. Urol Clin North Am, 29:873-894.

Çolgar U (2006). Reprodüktif Endokrinoloji ve İnfertilite. İstanbul medikal yayıncılık. S.1-7.

Erdemir F, Fırat F, Gençten Y. Sperm Morfolojisinin Değerlendirilmesi ve Klinik Önemi. Turk Urol Sem 2011;2:11-7.

Esterhuizen AD, Franken DR, Lourens JG, Van Zyl C, Muller II, Van Rooyen LH. Chromatin packaging as an indicator of human sperm dysfunction. J Assist Reprod Genet 2000;17:508-514.

Franken DR. How accurate is sperm morphology as an indicator of sperm function? Andrologia 2015;47:720-723.

Gardner DK, Weissman A, Howles CM, Shoham Z (2010). Yardımla üreme teknikleri temel kitabı.Nobel tıp kitbevleri. Sayı 65-92, s.625-638.

Gökçe A. Dünya Sağlık Örgütü Kriterlerine Göre Standart Semen Analizi, Turk Urol Sem 2011;2:1-7.

Hassa H (2003). İnfertil Olgularda Klinik Yaklaşım ve IVF Laboratuvar Uygulamaları. Eskişehir, Osmangazi Üniversitesi Yayınları. S.100-114.

Kierszenbaum AL (2006). Histoloji ve Hücre Biyolojisi-Patolojiye Giriş, çeviri editörü: R.Demir, Palme yayıncılık, s.532-605.

Ross MH and Pawlina W (2014). Histoloji konu anlatımı ve atlas. Palme yayıncılık, s.784-882.

Trisini AT, Singh NP, Duty SM, Hauser R. Relationship between human semen parameters and deoxyribonucleic acid damage assessed by the neutral comet assay. Fertil Steril 2004;82:1623-1632.

World Health Organization. Geneva; World Health Organization; 2010. WHO Laboratory Manual for the Examination and Processing of Human Semen. 5th ed.

Yang KT, Tang CJ, Tang TK. Possible Role of Aurora-C in Meiosis. Front Oncol. 2015;5:178.

EVALUATION OF THE EFFECT OF ENDOMETRIAL INJURY ON IMPLANTATION SUCCESS IN IVF

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ABSRACT
About half of the embryo implantations transferred to the patient in IVF result in unsuccessful pregnancy. It provides support for implantation failure, including many abnormalities of the embryo, such as genetic, physiological or metabolic. However, it is seen that the endometrial injury application affects the chance of getting pregnant in patients with implantation failure. In addition, although many disorders that cause infertility can be overcome by using various assisted reproductive techniques, the success of implantation significantly affects the success of in vitro treatment. Fertilization (IVF) treatments. endometrial biopsies performed spontaneously, during the previous cycle, or during the IVF cycle itself have been shown to significantly contribute to implantation rate, clinical pregnancies, and live births. It is seen that the piece taken from the endometrium tissue or the mechanical immune system created increases the receptivity of the uterus and the chance of attachment of the embryo by stimulating an inflammatory reaction by significantly affecting it. In this study, we found that injury-induced inflammation in patients treated with endometrial biopsy creates a focus for the accumulation of uterine DCs, resulting in implantation of the embryo that will attach to the endometrium and increasing pregnancy.

Keywords: IVF, Implantation success, Pregnancy, endometrial biopsy

INTRODUCTION

1. Endometrium

The endometrium undertakes tasks such as creating a favorable environment for the implantation of the embryo, forming the maternal placenta, hosting the embryo until birth, and protecting and nourishing the embryo. It undergoes changes according to the developments in the ovary with regular monthly cycles from puberty to menopause. The endometrium first proliferates, its thickness increases, the number of glands and secretions increase, stromal cells begin to store glycogen. If fertilization does not occur as a result of these changes, since it

cannot return to its former state, it is shed with a little blood and thrown out. This is called menstruation or menstruation. After this event, changes begin again. Ovarian hormones control and regulate the menstrual cycle (Ross and Pawlina 2014).

2. Implantation

Implantation is a set of events that allow the zygote at the blastocyst stage to enter the mother's endometrium and initiate pregnancy. It has been reported that many molecular and cellular mechanisms originating from both the endometrium and the blastocyst play an active role in this complex process (Guzeloglu-Kayisli et al. 2007). The failure of implantation during pregnancies to be achieved with both normal pregnancy and in vitro fertilization (IVF) brings with it an important problem. Therefore, implantation failures are one of the important infertility problems and failures play a role in almost 50% of these problems. Although it is known that any damage or molecular deficiencies in both the endometrium and the embryo during the implantation stages cause implantation failure and thus miscarriage, studies for its treatment continue rapidly (Guzeloglu-Kayisli et al. 2007). Implantation is a process specific to human endometrial tissue and the endometrium accepts the embryo within the so-called 'implantation window' (Staun-Ram and Shalev 2005). The implantation window is the programmed effect of estrogen and progesterone on the endometrium. In humans, the implantation window begins 6 days after the LH surge and is completed on the 10th day (Ross and Pawlina 2014). Successful implantation is the beginning of a healthy pregnancy. During this period, implantation occurs as a result of some genetic and non-genetic changes that occur separately in the blastocyst and endometrium and communication with each other. Embryo cells communicate with each other, endometrial gland and stromal cells, and embryo-endometrium cells with each other through endocrine, paracrine and autocrine products. Some of these products are steroid hormones, human chorionic gonadotropin (hCG), growth factors, cytokines, adhesion molecules, extracellular matrix proteins and prostaglandins (Dey et al. 2004).

In the endometrium, various structural, cellular and molecular events are controlled by the implantation window, and as a result of this, the necessary elements that provide endometrial receptivity may emerge. Blastocysts can interact with the endometrial epithelium only during the window of implantation. What determines this is the effects of progesterone secreted from the corpus luteum on the endometrium, followed by a small estrogen peak on the 4th day of pregnancy (Sunder and Lenton, 2000). During the implantation window, the plasma membrane of endometrial epithelial cells undergoes a series of changes (Murphy and Shaw, 1994). In many mammalian species, large round, projection-like structures are present on the apical surface of epithelial cells. Progesterone is essential for the endometrium to reach the receptive phase and for pregnancy to occur (Salmani et al., 2005; Rashid et al., 2011). In the receptivity phase; At the same time, stromal changes that lead to decidualization occur in the endometrium, which allows the approach, attachment and penetration of the embryo. Implantation failure is one of the important factors limiting the success of IVF. A blastocyst requires interaction with a receptive endometrium to initiate implantation. The success of IVF depends on their harmonious development. It is suggested that there are problems related to the embryo and endometrium that underlie Recurrent Implantation Failure (Defrere et al., 2005; Tan et al., 2005). Professionals interested in Assisted Reproductive Techniques tend to attribute the underlying cause of IVF failures to poor embryo quality. However, in addition to embryological factors, many factors such as poor endometrial receptivity that cause implantation problems can

affect IVF success (Bahar and Baykal, 2008). Inadequate endometrial receptivity is responsible for approximately two-thirds of implantation failure. Recurrent implantation failure in IVF is a complex issue and is not yet fully understood.

3. Effect of Endometrial Damage on IVF

Before assisted reproductive techniques, diagnostic and therapeutic hysteroscopy is the gold standard, especially in the presence of suspected pathology of the uterine cavity (Pundir and El Toukhy, 2010). With direct observation of the uterine cavity, it is possible to treat pathologies such as submucous fibroids, polyps and adhesions, which may have a negative effect on implantation, at the same time. For cases with recurrent implantation failure, reevaluation of the uterine cavity with hysteroscopy before a new transfer cycle is a common approach in clinical practice. Recent meta-analyses have been published on the effectiveness of routine hysteroscopy and/or endometrial damage induction methods on reproductive outcomes before the first in vitro fertilization (IVF) cycle or in the group with recurrent failed implants (Di Spiezio Sardo et al., 2016; Pundir et al. ., 2014; Cao et al., 2018; Kamath et al., 2019; Nastri et al., 2015; Van Hoogenhuijze et al., 2019; Sar-Shalom Nahshon et al., 2019; Nahshon et al., 2020) . It has been hypothesized that endometrial damage may be effective in the recruitment of immune cells involved in tissue healing and implantation via associated cytokines, growth factors, macrophages, and dendritic cells (Siristatidis et al., 2014). Today, opinions about the contribution of endometrial damage on reproductive outcomes are still controversial. There is no standard approach regarding the applied technique and its degree. There is also insufficient data on the optimal time between procedures and embryo transfer.

REFERENCES

Bahar L, Baykal T. İmplantasyon Sürecinde Endometriyum. Mersin Üniversitesi Sağlık Bilimleri Dergisi 2008;1(2):1-7.

Cao H, You D, Yuan M, Xi M. Hysteroscopy after repeated implantation failure of assisted reproductive technology: A meta-analysis. J Obstet Gynaecol Res. 2018 Mar; 44 (3): 365-73.

Defrere S, Langendonck A, Moulin P, et al. Human endometrial epithelial cells (EEC) contitutively express more intercellular adhezion molecule (ICAM)-1 than endometrial stromal cells (ESC) in culture. Am J Reprod Immunol 2005;54(1):5-12.

Dey SK, Lim H, Das SK, Reese J, Paria BC, Daikoku T, Wang H. Molecular cues to implantation. Endocrine Reviews. 2004; 25: 341-373.

Di Spiezio Sardo A, Di Carlo C, Minozzi S, et al. Efficacy of hysteroscopy in improving reproductive outcomes of infertile couples: a systematic review and meta-analysis. Hum Reprod Update. 2016 Jun; 22 (4): 479-96.

Guzeloglu-Kayisli O, Basar M, Arici A. Basic aspects of implantation. Reprod Biomed Online. 2007;15(6):728-39.

Kamath MS, Bosteels J, D'Hooghe TM, et al. Screening hysteroscopy in subfertile women and women undergoing assisted reproduction. Cochrane Database Syst Rev. 2019 Apr 16; 4: CD012856.

Murphy CR, Shaw TJ. Plasma membrane transformation: a common response of uterine epithelial cells during the periimplantation period. Cell Biol Int 1994;18(12):1115-28.

Nahshon C, Sagi-Dain L, Dirnfeld M. The impact of endometrial injury on reproductive outcomes: results of an updated meta-analysis. Reprod Med Biol. 2020 Sep 17; 19 (4): 334-49.

Nastri CO, Lensen SF, Gibreel A, et al. Endometrial injury in women undergoing assisted

reproductive techniques. Cochrane Database Syst Rev. 2015 Mar 22; (3): CD009517.
Pundir J, El Toukhy T. Uterine cavity assessment prior to IVF. Womens Health (Lond). 2010 Nov; 6 (6): 841-7
Pundir J, Pundir V, Omanwa K, Khalaf Y, El-Toukhy T. Hysteroscopy prior to the first IVF cycle: a systematic review and meta-analysis. Reprod Biomed Online. 2014 Feb; 28 (2): 151-61.
Rashid NA, Lalitkumar S, Lalitkumar PG, Gemzell-Danielsson K. Endometrial Receptivity and Human Embryo Implantation. Am J Reprod Immunol 2011;66(1):23-30.
Ross MH, Pawlina W. Histology A Text and Atlas. Çeviren: Barış BAYKAL. Histoloji Konu Anlatımı ve Atlas. 6. Basım, Palme Yayıncılık Ltd. Şti. Ankara; 2014, s:830-870.
Salmani MK, Nikzad H, Shiokawa S, Akimoto Y, Iwashita M. Secretory role for human uterodomes (pinopods): secretion of LIF. Mol Hum Reprod 2005;11(8):553-9.
Sar-Shalom Nahshon C, Sagi-Dain L, Wiener-Megnazi Z, Dirnfeld M. The impact of intentional endometrial injury on reproductive outcomes: a systematic review and meta-analysis. Hum Reprod Update. 2019 Jan 1; 25 (1): 95-113.
Siristatidis C, Vrachnis N, Vogiatzi P, et al. Potential pathophysiological mechanisms of the beneficial role of endometrial injury in in vitro fertilization outcome. Reprod Sci. 2014 Aug; 21 (8):955-65.
Sunder S, Lenton E. Endocrinology of the Peri- Implantation Period. Clin Obstet Gynaecol 2000;14(5):789-800.
Tan BK, Vandekerckhove P, Kennedy R, Keay SD. Investigation and current management of recurrent IVF treatment failure in the UK. BJOG 2005;112(6):773-80.
Van Hoogenhuijze NE, Kasius JC, Broekmans FJM, Bosteels J, Torrance HL . Endometrial scratching prior to IVF; does it help and for whom? A systematic review and meta-analysis. Hum Reprod Open. 2019 Jan 29;2019 (1): hoy025.

NÖROLOJİK SEMPTOMLARA YÖNELİK İNTERNET ARAMALARINA COVID-19 PANDEMİSİNİN ETKİSİ

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GİRİŞ: Bu çalışmada COVID-19 pandemi döneminde Türkiye'de internet üzerinden yapılan nörolojik semptomların sorgulanmasına yönelik değişimlerin belirlenmesi amaçlandı.

METOD: Bu çalışmada nörolojik semptomlara yönelik literatür bilgisinden belirlenen 16 semptomun Google Trends üzerinden Türkiye'de yapılan arama hacimleri değerlendirildi. Araştırma hacmi değerlendirmesinde 2018 ve 2021 tarihleri arasında ki 208 hafta değerlendirmeye alındı.
BULGULAR: Nörolojik semptomlara yönelik terimlerin arama hacminin 17 defa zirve (100 puan) yaptığı, tüm terimlerin 1 defa, 'görme bulanıklığı' teriminin ise 2 defa zirve yaptığı belirlendi. Bu terimlerin 3'ünün 2018 yılında, 2'sinin 2019 yılında, 6'sının 2020 yılında ve 6'sının 2021 yılında meydana geldiği tespit edildi. 208 haftalık dönemde arama hacmi en yüksek olan terimler baş dönmesi (78.67), uyuşma (77.30), bel ağrısı (71.17) ve bulantı (68.77) olarak belirlendi. COVID-19 pandemi öncesi döneme göre, COVID-19 pandemi döneminde 13 arama teriminin arama hacminin arttığı, 3'ünün ise azaldığı tespit edildi. COVİD-19 pandemi döneminde ortalama arama hacmi en yüksek olan terimler sırasıyla; baş dönmesi (82.06), uyuşma (78.87), bel ağrısı (75.98) ve kas ağrısı (75.60) olarak saptandı.
SONUÇ: Bu çalışmada nörolojik semptomlara yönelik Türkiye'de insanların Google Trends üzerinden yaptığı arama terimlerinin, arama hacminin ciddi oranda arttığı belirlendi. COVİD-19 pandemi döneminde nörolojik semptomlar içerisinde özellikle baş dönmesi, uyuşma, bel ve kas ağrısı terimlerinin yoğun olarak arandığı tespit edildi. Bu semptomların COVİD-19 semptomları içerisinde yer alamsı ve pandemi dönemde artmış olması önemli bir bulgudur.

Anahtar Kelimeler: Nörolojik semptom, COVİD-19, baş dönmesi

ANTIBIOTIC SUSCEPTIBILITY PATTERN IN INFECTED CUTANEOUS ULCERS IN A TERTIARY CARE FACILITY IN KARACHI, PAKISTAN

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ABSTRACT

Antimicrobial resistance is a physicians dilemma in treating resistant cutaneous wounds especially in diabetic patients . With the origin of newer antibiotics with each passing year the infection control has improved , but is it at the cost of Multi drug resistant strains of lethal microorganisms is yet to be identified . We have conducted this study in a tertiary care hospital to identify the culture and sensitivity of commonly isolated species of pathogens in cutaneous wounds .The most frequently isolated species are S. aureus 28/71 (39.4%), followed by E. coli 22/71 (31%), P. aeruginosa 15/71(21%) and Klebsiella pneumoniae 8/71(11%) , few strains of proteus , serratia , enterobacter , streptococci and morgenella identified .15/70 (21%)isolates showed polymicrobial infection. Almost all the first line antibiotics including beta lactam amoxicillin / clauvulinic acid , Trimethoprim /sulfamethoxazole ,cephradine , cefixime has shown 90% resistace to gram-ve aerobes and anaerobes and 50% resistance to gram +ve cocci. Although floxacin family has shown 40- 60% sensitivity ,the most effective antibiotics proved to be Imipenem/cilastin having 100%sensitivity against staphylococcus and klebsiella. To conclude , the alarming increase in multidrug resistant pathogens has not only increased mortality and morbidity but also economically burdened the population and health care system of our country, to manage the currrent situation new regulatory policies are needed to ensure the controlled availability of antibiotic medication only with prescription . Furthermore, public awareness to avoid inadverent use of antibiotics and adherence to the dose and duration of treatment should be encouraged on large scale . Randamised controlled trials and regular surveillence of antibiotic sensitivity pattern in different settings are needed to update our regional management guidlines accordingly .

Keywords: Antimicrobial resistance, staphylococcus , Multi drug resistant.

STRUCTURAL AND FUNCTIONAL STATE OF THE HEART AT THE INITIAL STAGES OF PROGRAM HEMODIALYSIS

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ABSTRACT

According to the US Renal Disease Registry, the five-year survival rate in the general population of patients receiving hemodialysis (HD) as renal replacement therapy (RRT) is 29.4%. In 47.2% of these patients, the cause of death is cardiovascular pathology, including thrombohemorrhagic complications. There is evidence in the literature that many changes in the heart and blood vessels develop in patients with CRF also at the pre-dialysis stage. 40% of patients at the beginning of dialysis therapy were diagnosed with coronary heart disease (CHD) and 40% with chronic heart failure (CHF).

In this study, we aimed to investigate the features of remodeling, the state of systolic and diastolic function of the left ventricle in patients with end-stage chronic renal disease (ESRD) at the initial stage of RRT.

Material and methods: To achieve the goal, the data of 192 patients with ESRD who received HD up to 3 months (initial stage of RRT) were studied. Patients with severe cardiac arrhythmias, acute disorders of cerebral circulation were excluded from the study. All patients were examined using a complex of non-invasive instrumental methods: echocardiography (Echo) and color Doppler ultrasonography (CDUG).

Results and discussion: In 192 patients with ESRD, echocardiographic studies were performed on i-RRT. LV hypertrophy was diagnosed in 163 (84.9%) HD patients, only 29 had a normal echocardiographic picture. Normal LV geometry was observed in 15 (8.0%) patients on HD. Concentric remodeling (CLVH), characterized by an increase in the relative thickness of the LV walls with normal myocardial mass, was detected in 35 (18.0%) patients. Eccentric hypertrophy (ELVH) because of adaptation that occurs during volume overload was diagnosed in 31 patients 16.0%. A mixed variant of the geometric model of LVH (MLVH), characterized by a significant thickening of the LV walls in combination with an increase in its cavity, was detected at the initial stage in 39 patients (20.0%) treated with HD.

Conclusions: Thus, the highest percentage of occurrence of changes was in CLVH. In second place in terms of frequency of occurrence, a mixed version of the geometric model of LVH was revealed. ELVH was diagnosed in an even smaller percentage of patients on HD. Finally, the

lowest percentage of occurrence was found in the development of ALVH. It has been established that a predictor of a high risk of cardiovascular disorders and an unfavorable prognosis in dialysis patients is not only an increase in the mass of the left ventricular myocardium (LV), but also a change in the geometric model of the heart. Further research is needed to make the data more informative.

Keywords: renal replacement therapy, ventricular hypertrophy, hemodialysis

THE ROLE OF SERUM BETA 2 MICROGLOBULIN IN PREDICTING KIDNEY FUNCTION

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ABSTRACT

Biomarkers for predicting outcomes in chronic kidney disease (CKD) are very limited. Beta 2 microglobulin (β2M) - is a molecule that is constantly synthesized by cells. It is freely filtered from the glomerulus and resorbed from the proximal tubule. With this feature, there are changes in serum β2M levels in patients with kidney diseases.

This study aimed to determine the serum beta 2 macroglobulin (β2M) level and to reveal whether it may play a decisive role in the follow-up of kidney diseases.

Methods and Results: A total of 82 patients (mean age was 64±8 years) were included in the study. β2M levels of patients' coefficients were created by proportioning the upper limit of the normal value. β2M was strongly positively correlated with serum cystatin C and Cr. Serum β2M was negatively correlated with GFR. In addition, no relationship was found between patient age and β 2M level. 53.6% of patients were end-stage renal disease patients, who were on hemodialysis. The average β 2M level in these patients was 8 times higher. Multiple myeloma was revealed in 7 patients, lymphoma in 3 patients, and 6 patients were diagnosed with leukemia. In this patient group, β B2M levels were at least 5 times higher than normal. In addition, it was shown that the length of hospital stay was prolonged.

Conclusions: The B2M level may be a guide in deciding when to start dialysis in patients with end-stage chronic kidney disease. Beta 2-microglobulin is a parameter that can help guide clinical decisions in the follow-up of kidney disease. It can also provide information about the risk of developing malignancies and cardiovascular disease.

2D DNA NANOPOROUS SCAFFOLD PROMOTES OSTEOGENIC DIFFERENTIATION OF PRE-OSTEOBLASTS
SHORT TITLE: DNA NANOTECHNOLOGY FOR REGENERATIVE THERAPEUTICS

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ABSTRACT
Biofunctional materials with nanomechanical parameters similar to bone tissue may promote the adherence, migration, proliferation, and differentiation of pre-osteoblasts. In this study, deoxyribonucleic acid (DNA) nanoporous scaffold (DNA-NPS) was synthesized by the polymerization of rectangular and double-crossover (DX) DNA tiles. The diagonally precise polymerization of nanometer-sized DNA tiles (A + B) through sticky end cohesion gave rise to a micrometer-sized porous giant-sheet material. The synthesized DNA-NPS exhibited a uniformly distributed porosity with a size of 25 ± 20 nm. The morphology, dimensions, sectional profiles, 2-dimensional (2D) layer height, texture, topology, pore size, and mechanical parameters of DNA-NPS have been characterized by atomic force microscopy (AFM). The size and zeta potential of DNA-NPS have been characterized by the zeta sizer. Cell biocompatibility, proliferation, and apoptosis have been evaluated by flow cytometry. The AFM results confirmed that the fabricated DNA-NPS was interconnected and uniformly porous, with a surface roughness of 0.125 ± 0.08035 nm. The elastic modulus of the DNA-NPS was 22.45 ± 8.65 GPa, which was comparable to that of native bone tissue. DNA-NPS facilitated pre-osteoblast adhesion, proliferation, and osteogenic differentiation. These findings indicated the potential of 2D DNA-NPS in promoting bone tissue regeneration.

Keywords: 2D DNA nanoporous scaffolds (DNA-NPSs); Bone tissue regeneration; Pre-osteoblasts; Rectangular and double-crossover (DX) DNA-tiles

TREATMENT OF WILMS' NEPHROBLASTOMA CANCER CELLS VIA EGFR TARGETING OF DACTINOMYCIN LOADED DNA-NANOWIRES
SHORT TITLE: DNA NANOTECHNOLOGY FOR ANTICANCER THERAPEUTICS

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ABSTRACT

Purpose

Dactinomycin (DCTM) is a highly cytotoxic hydrophobic drug requiring robust nanomaterials for uniformed water dispersion and safe delivery to tumor site avoiding exposure to healthy cells.

Methods

DNA triangulation produces sturdier two-dimensional nanostructures through the polymerization of DNA-triangles by sticky ends cohesion in the form of DNA-nanosheets. The curvature of the B-form (right twisted) DNA causes the coiling of the DNA-nanosheets into DNA-nanowires (D-NWs) structures. DNA-triangles scaffolded by the short circular templates (84-NT) are stiffer in topology giving rise to compact D-NWs for DCTM loading, and cellular delivery. The PAGE gel analysis was performed to assess the polymerization of the DNA-triangles to observe restricted electrophoretic mobility, and attainment of a single sharp band. The morphology and compactness of the D-NWs were confirmed by the AFM analysis and confocal imaging. Epidermal growth factor (EGF) functionalization of the D-NWs was performed through amide chemistry using amino-modified DNA strands reacting with the carboxylic group of EGF for EGFR targeting. EGFR is highly expressed on NB-OK-1 Wilms' tumor nephroblastoma cancer cells. DCTM loading onto D-NWs was carried out through intercalation between the base pairs of GC rich DNA duplex by physical mixing/incubation, and was confirmed through the UV peak shift analysis and confocal imaging. Cell internalizations and the cytotoxic effects were monitored via confocal imaging, MTT assay, and flow cytometry.

Results

AFM images of the synthesized D-NWs showed that polymerization of DNA-triangles was successful with the length ranging from 4 to 6 μm, and width ranging from 80 to 120 nm. EGF functionalization was confirmed through the confocal microscopy after labeling EGF with the FITC hook conjugating dye. The slight UV shift (> 15 nm) confirmed DCTM loading onto D-NWs. Blank D-NWs showed biocompatibility to the cells at different (low to high) concentrations (10 μM to 640 μM). MTT assay revealed that DCTM loaded D-NWs showed a dose-dependent (0.25–128 nM) decrease in cell viability.

Conclusion

EGF functionalized D-NWs effectively targeted the EGFR rich NB-OK-1 cancer cells compared to the control HEK293/D75 cells lacking EGFR (receptors). By these results, we can expect similar site-specific targeted treatment if administered systemically.

Keywords: Dactinomycin (DCTM); DNA triangular tiles; DNA-nanosheets; DNA-nanowires (D-NWs)

METAHEURISTIC APPROACHES FOR THE UNCAPACITATED FACILITY LOCATION PROBLEMS

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ABSTRACT
Uncapacitated Facility Layout Problems (UFLP's) aims to determine the optimal location for the desired facility, given the problem constraints. Today, the wide variety of plant types has become too complex for manual selection of the site management task and the corresponding demand allocation. Many approaches to solving this different UFLP have been presented to the literature. In this study, metaheuristic-based approaches for UFLP were examined. The benefits and drawbacks of the most widely used artificial intelligence algorithms used in the literature are examined.

Keywords: UFLP, Optimization, Metaheuristic, Swarm

1. INTRODUCTION

The facility location problem is concerned with the selection of geographical coordinates for facilities in a geographic area of interest, as well as the allocation of demand for these facilities while adhering to a set of restrictions [1]. Location difficulties differ from other types of location problems in that the size of the facilities to be constructed are tiny in comparison to the search space [2].

The formulation and resolution of an FLP is heavily influenced by the type of facility in issue as well as the context of the use case. When opposed to municipal structures or transportation hubs, working with an FLP that incorporates emergency facilities such as disaster relief and health clinics has a reduced acceptable margin of error [3]. When compared to emergency facilities, competitive trade and energy facilities prioritize start-up and operational expenses [4]. Meanwhile, logistics and transportation hubs must adhere to greater time limitations than power plants [5]. Furthermore, the amount, variety, accuracy, and speed (if the use case is stochastic) of datasets accessible to the developer constrain the formulation of the challenge.

Distance or demand-driven constraints can exist [1]. The initial attempts to reduce the time and distance traveled by the populace to access the facility. Second, it localizes infrastructure to satisfy the population's geographically scattered need.

In this study, all articles that adopt the artificial intelligence approach, whether evolutionary or not, were examined.

2. THE DEFINITION OF UNCAPACITATED FACILITY LOCATION PROBLEMS (UFLP)

UFLP is an example of an NP-hard issue. UFLP includes a set of (I) possible facilities in basic UFLP formulation. Each facility has the option of being open or closed. Each dimension in the search space selects a '1' value if the facility is open and a '0' value if it is closed. These facilities cater to a certain group of (J) clients. The goal of this problem is to minimize the sum of the

transportation expenses between I and J as well as the facility opening costs [6]. The UFLP's mathematical structure is seen below.

$$f(UFLP) = min\{\sum_{i\in I}\sum_{j\in J} c_{ij}x_{ij} + \sum_{i\in I} f_i y_i\} \quad (1)$$

where $I = \{1,2,\ldots,k\}$ is the set of possible facility locations, $J = \{1,2,\ldots,g\}$ is the set of customer demand points, f_i is the fixed cost of opening a facility in $i \in I$, c_{ij} is the shipment cost between ith facility location and jth customer point. The decision variable x_{ij} is the demand of customer j corresponded ith facility and y_i is the binary variable: $y_i = 1$ if a facility is located in $i \in I$, $y_i = 0$ otherwise.

Subject to:

$$\sum_{i\in I} x_{ij} = 1 \quad j \in J \quad (2)$$

$$x_{ij} \leq y_{i,\ i\in I, j\in J} \quad (3)$$

$$x_{ij} \in \{0,1\}, i \in I,\ j \in J \quad (4)$$

$$y_i \in \{0,1\}, i \in I \quad (5)$$

3. LITERATURE REVIEW

Specialized studies include those carried out at huge facilities that are too enormous to be regarded a one-dimensional point in relation to their surroundings [7]. Banking, catering, and gas stations are some of the service facilities investigated by Türkolu et al. [8]. Higashikawa et al. [9] explored FLP as dynamic flow networks as a result of evacuation planning.

This work varies from the previous literature in that we conduct a systematic evaluation of the literature on Metaheuristic Approaches to FLP and focus on other publications concentrating on a specific component of FLP. We also discuss the many sorts of FLPs that are being addressed in various businesses.

Caunhye et al. reviewed the logistics part of the emergency rescue [3]. Bas and Ulker solved the UFLP test functions with the Social Spider Algorithm, which is a heuristic algorithm. They have achieved remarkable results [6].

Shariff and colleagues A Maximal Cover Location Problem (MCLP) was utilized to investigate the healthcare facilities of one of Malaysia's districts. They examined the facilities' limited capacity and framed the problem as Capacity MCLP (CMCLP). They developed a new genetic algorithm-based solution strategy to investigate the percentage of coverage of current facilities within the Malaysian government's authorized distance. Today, as one of the cornerstones to

establishing a high quality in healthcare, the desire for more systematic and efficient planning has become increasingly significant [10].

Rural Kiosks are an essential infrastructural pillar in rural communities throughout the world for internet and basic technological facilities. They are also known as Tele-centers or Joint Service Centers, and the government primarily uses them to promote Electronic Governance. The most essential aspect of the Remote Kiosk's establishment is its accessible location, which allows individuals from rural areas to benefit from the services with minimal travel costs and on time. In the past, researchers employed a variety of conventional approaches for site allocation. To optimize the position of the rural kiosk, Gupta et al. recommended using Fuzzy C-Means clustering and the BAT method. The investigation was conducted on a random sample of 72 villages in India. and Clusters of settlements were formed. It has been discovered that utilizing simply Fuzzy C-Means clustering and the BAT method to distribute the center delivers up to 25% more efficient outcomes [11].

Based on the elastic demand problem and the conventional p-median problem, Levanova and Gnusarev, revisited their prior competitive p-median plant layout and design challenge with elastic demand. The problem that develops in a new firm that intends to enter the existing market of products and services is considered. The company wishes to position its business at p-points in order to profit as much as possible from its competition. The problem is represented mathematically by a nonlinear objective function. It is tough to find the best answer to the problem that has been created. Even in small quantities, the CPU time of commercial software is important. They suggested an artificial ant algorithm and created an ant colony algorithm. The algorithm's parameters are changed to accommodate for the features of the problem. They considered the predicament that would develop in a new firm attempting to enter the existing market for goods and services [12].

Crawford et al. used the meta-optimization technique to address the Set Coverage Problem. The Bund Covering Problem is one of the most common among facility layout concepts. Meta-level metaheuristics are used to solve problems that reflect other metaheuristic parameters. This method was used to tackle a non-single cost cluster coverage problem using an Artificial Bee Colony metaheuristic. The Artificial Bee Colony algorithm is a novel collection of metaheuristic approaches based on honey bees' intelligent foraging behavior. This meta-heuristic has a number of characteristics that have a significant impact on the search's performance. A Genetic Algorithm fine-tunes these parameters by training the Artificial Bee Colony meta-heuristic on a portfolio of coating issues [13].

Kocakaya and Türkakin discovered the best storage site for natural stone mining using the fuzzy c-means approach. The plant layout difficulty is one of the most typical issues when deciding on plant sites such as factories and warehouses. Various solutions have been developed to overcome facility layout challenges. One of the most effective strategies is the fuzzy c-means method [14].

The hierarchical facility layout problem (HFLP) is described as the placement of facilities so that higher-level facilities can service lower-level facilities efficiently. Ou-Yang and Ansari presented a mixed integer programming paradigm for HFLP with a limit on streaming capacity. To address HFLP, they suggested a hybrid PSO and Tabu search (TS) (HPSO-TS) technique. The main purpose is to reduce demand-weighted distance travel, facility running expenses, and flow assignment costs. This technique translates PSO snippets representing different attribute dimensions into a Tabu priority list and subsequently generates assignment meshes [4].

Jouzdani et al. investigated dynamic dairy location and supply chain planning under demand unpredictability, with the goal of minimizing the cost of facility layout, traffic congestion, and raw/processed milk and dairy product transportation. The suggested model incorporates dynamic changes in the transportation network, facility investment costs, the monetary value of time, and changes in the manufacturing process. Furthermore, it considers temporal variation and demand uncertainty for dairy products throughout the planning horizon to estimate optimal plant location and optimal production volumes [5].

Location concerns with substantial facilities constitute a difficult field of study. A facility is called comprehensive if it is too large in terms of location to be regarded a point in relation to its surroundings, according to specialized literature. Puerto et al. investigated the role of dimensional facilities in networks. Given the middle and center objective functions, which are the most commonly used in the location literature, they primarily focus on the position of roads and trees. They do, however, take into account certain other alternative criteria that extend them as ordinal median objective functions or in terms of equity, dependability, and robustness. They have incorporated the fundamental tools and strategies for designing algorithms for such issues [7].

4. CONCLUSION

The core notion of the facility layout problem is discussed in this work, as are other significant associated terms. Furthermore, some of the most typical core problem formulations are noted, and additional location concerns are reviewed briefly. Several metaheuristic algorithms have been proposed. The benefits of these algorithms are discussed. This research provided readers with a summary of all the algorithms employed for the UFLP they were working on. Many relevant papers from the literature are offered for readers to evaluate and discover how related research approach issue solutions.

REFERENCES

[1] Y. N. Photis and G. Grekousis, “Locational planning for emergency management and response: An artificial intelligence approach,” Int. J. Sustain. Dev. Plan., vol. 7, no. 3, pp. 372–384, Sep. 2012, doi: 10.2495/SDP-V7-N3-372-384.

[2] R. Zanjirani Farahani and M. Hekmatfar, Eds., Facility Location: Concepts, Models, Algorithms and Case Studies. Heidelberg: Physica, Verlag HD, 2009.

[3] A. M. Caunhye, X. Nie, and S. Pokharel, “Optimization models in emergency logistics: A literature review,” Socio-Economic Planning Sciences, vol. 46, no. 1. Pergamon, pp. 4–13, Mar-2012, doi: 10.1016/j.seps.2011.04.004.

[4] C. Ou-Yang and R. Ansari, “Applying a hybrid particle swarm optimization_Tabu search algorithm to a facility location case in Jakarta,” J. Ind. Prod. Eng., vol. 34, no. 3, pp. 199–212, Apr. 2017, doi: 10.1080/21681015.2016.1243167.

[5] J. Jouzdani, S. J. Sadjadi, and M. Fathian, “Dynamic dairy facility location and supply chain planning under traffic congestion and demand uncertainty: A case study of Tehran,” Appl. Math. Model., vol. 37, no. 18–19, pp. 8467–8483, Oct. 2013, doi: 10.1016/j.apm.2013.03.059.

[6] E. Baş and E. Ülker, “A binary social spider algorithm for uncapacitated facility location problem,” Expert Syst. Appl., vol. 161, p. 113618, Dec. 2020, doi: 10.1016/j.eswa.2020.113618.

[7] J. Puerto, F. Ricca, and A. Scozzari, “Extensive facility location problems on networks: an updated review,” TOP, vol. 26, no. 2, pp. 187–226, Jul. 2018, doi: 10.1007/s11750-018-0476-5.

[8] D. Celik Turkoglu and M. Erol Genevois, “A comparative survey of service facility location problems,” Ann. Oper. Res., vol. 292, no. 1, pp. 399–468, Sep. 2020, doi: 10.1007/s10479-019-03385-x.

[9] Y. Higashikawa and N. Katoh, “A Survey on Facility Location Problems in Dynamic Flow Networks,” Rev. Socionetwork Strateg., vol. 13, no. 2, pp. 163–208, Oct. 2019, doi: 10.1007/s12626-019- 00047-z.

[10] S. S. R. Shariff, N. H. Moin, and M. Omar, “Location allocation modeling for healthcare facility planning in Malaysia,” Comput. Ind. Eng., vol. 62, no. 4, pp. 1000–1010, May 2012, doi: 10.1016/j.cie.2011.12.026.

[11] R. Gupta, S. K. Muttoo, and S. K. Pal, “BAT Algorithm for Improving Fuzzy C-Means Clustering for Location Allocation of Rural Kiosks in Developing Countries under E-Governance.”

[12] T. Levanova and A. Gnusarev, “Development of Ant Colony Optimization Algorithm for Competitive p-Median Facility Location Problem with Elastic Demand,” in Communications in Computer and Information Science, 2019, vol. 1090 CCIS, pp. 68–78, doi: 10.1007/978-3-030-33394-2_6.

[13] B. Crawford, R. Soto, E. Monfroy, G. Astorga, J. García, and E. Cortes, “A meta-optimization approach for covering problems in facility location,” in Communications in Computer and Information Science, 2017, vol. 742, pp. 565–578, doi: 10.1007/978-3-319-66963-2_50.

[14] M. N. Kocakaya and O. H. Türkakin, “Solution of facility location problem in Turkey by using fuzzy C-means method,” in AIP Conference Proceedings, 2013, vol. 1558, no. 1, pp. 433–436, doi: 10.1063/1.4825518.

BATTLE ROYALE OPTIMIZATION ALGORITHM

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ABSTRACT
Recently, various metaheuristic optimization approaches have been developed for solving many complex problems in various fields. In this paper, a new metaheuristic optimization algorithm named BRO (battle royale optimization) is introduced. The proposed method is inspired by a type of digital game known as "battle royale". BRO is a population-based algorithm where each individual is represented by a soldier/player who wants to move towards the safest (best) place. BRO's success has been demonstrated in various dimensions in various benchmark functions. Experimental results show that BRO gives promising and competitive results.

Keywords: Battle, Optimization, Metaheuristic

1. INTRODUCTION
The process of determining the best potential solution for a given problem from a group of candidate solutions is known as optimization. Optimization algorithms are important in a wide range of practical issues in both scientific and industry applications. Metaheuristic algorithms have been widely employed to tackle optimization issues throughout the last two decades [1].
For the last few decades, researchers have been fascinated by the sophisticated collective behavior of numerous types of living beings, such as animals and insects. Some optimization techniques, for example, are based on Swarm Intelligence, which is inspired by the collective behavior of both animals and people [2].
To carry out the notions of exploration and exploitation, each optimization algorithm has its unique strategy. The balance between exploration and exploitation should be preserved since it is useful in producing good outcomes in optimization algorithms. Exploration is the process of looking for novel solutions in a large search space. In other words, unvisited locations are examined to see if they may be used as a safe haven from bad local optima [3].
BRO, like other previous swarm-based techniques, is population-based; it employs a population of potential solutions to find the optimal one. Each solution is referred to as a soldier, and it is attempting to defeat its nearest neighbor. As a result, a soldier in a stronger position can beat others. As a result, everyone tries to get into a better position in order to have a greater chance of surviving. Finally, the best soldier will be declared the winner at the end of the iteration [3].
In this study, the BRO algorithm was examined. BRO's success has been demonstrated in various benchmarks and dimensions (d={10, 20, 30}).

2. BATTLE ROYALE OPTIMIZER
Battle royal video games are based on the Japanese film Battle Royal and include competitive, last man standing action. The playing field frequently shrinks, forcing players to explore and utilize their surroundings in order to live. The challenge in these games is not simply beating other players, but also the game itself, since the playing space ("safe area") shrinks during the

game. Players that suddenly leave the safe zone receive damage or risk being booted out of the game. These weaker players must now compete in a smaller field while also dealing with ailments. Most battle royale games begin with players of similar power and resources; participants are generally placed on the playing field at random and nothing in the way of resources or equipment is provided. Instead, exploration is an important component of the game, as players must search for tools to aid in survival. Another component of battle royale games used in the algorithm is the possibility of respawning [3].

In some versions of Battle Royale games, players begin as they jump from a plane and parachute onto the map. This situation is simulated in the BRO with a random population evenly distributed throughout the problem area. Then, each person (soldier/player) tries to hurt the nearest soldier by firing their weapon. Therefore, better-positioned soldiers hurt their nearest neighbors. When one soldier is injured by another, the damage level is increased by one. These interactions are mathematically calculated per xi. damage = xi. damage + 1, where xi: damage is the damage level of the ith soldier among the population. Also, soldiers want to change their position immediately after being damaged and therefore attack their opponents from another side. So, to focus on exploitation, the damaged solder moves to a point between the previous position and the best position found so far (elite player). These interactions are calculated mathematically as [3]:

$$x_{dam,d} = x_{dam,d} + r\left(x_{best,d} - x_{dam,d}\right) \quad (1)$$

where r is a randomly generated number uniformly distributed in the range [0,1] and $x_{dam,d}$ is the position of the damaged soldier in dimension d [3].

Furthermore, x_i: damage will be reset to zero if damaged soldiers can harm their opponent in the next iteration. To emphasize exploration, if a soldier's damage level exceeds a specified threshold number, the soldier dies and respawns at random from the viable problem space, and x_i: damage is reset to zero. A threshold value was appropriated through trial and error as 3. This step prevents early convergence and allows for more exploration. The soldier that returns to problem space after being slain looks like this [3]:

$$x_{dam,d} = r(ub_d - lb_d) + lb_d \quad (2)$$

where lb_d and ub_d is the lower and upper bounds of dimension d in problem space, respectively.

Furthermore, with each Δ iteration, the problem's viable search space shrinks toward the optimal solution. The initial value was $\Delta = log_{10}(\text{Max}Circle)$ but then $\Delta = \Delta + round\left(\frac{\Delta}{2}\right)$ [3].

This contact helps with exploration as well as exploitation. As a result, the lower and upper boundaries will be changed in the following manner [3]:

$$lb_d = x_{best,d} - SD(\overline{x_d})$$
$$ub_d = x_{best,d} + SD(\overline{x_d})$$
(3)

Here $SD(\overline{x_d})$ is the standard deviation of the whole population in dimension d and $x_{best,d}$ is the position of the best solution found so far [3]. Figure 2 shows a flowchart of the BRO [3].

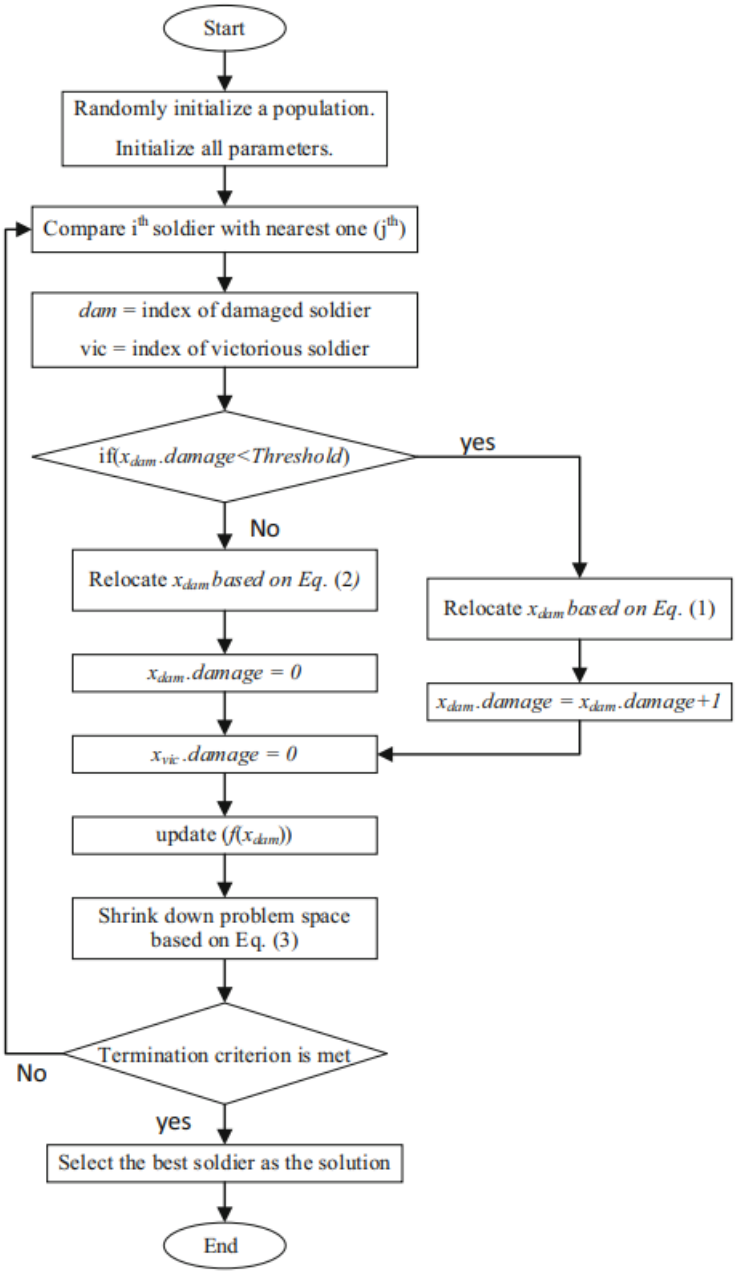

Figure 2. The flowchart of the BRO [3]

3. EXPERIMENTAL RESULTS

The maximum number of iterations was set to 100 and the population size to be 30. BRO was implemented in MATLAB and performed on a Core i5-1035G1 1.19GHz processor with 12 GB of RAM. Table 1 shows the benchmark functions and Table 2 shows the mean and SD results of the BRO.

Table 1. Benchmark test functions

Function	Name	Range
$f_1(x) = \sum_{i=1}^{d} x_i^2$	here	00,100]
$f_2(x) = \sum_{i=1}^{d} \lvert x_i \rvert + \prod_{i=1}^{d} \lvert x_i \rvert$	hwefel 2.20	0,10]
$f_3(x) = \sum_{i=1}^{d} \left(\sum_{j=1}^{n} x_j \right)^2$	tated hyper-ellipsoids	00,100]
$f_4(x) = Max_{i=1,\dots d} \lvert x_i \rvert$	hwefel 2.21	00,100]
$f_5(x) = \sum_{i=1}^{d-1} [100(x_{i+1} - x_i^2) + (x_i - 1)^2]$	senbrock	0,30]
$f_6(x) = \sum_{i=1}^{d} (\lvert x_i + 0.05 \rvert)^2$	ep	00,100]
$f_7(x) = \sum_{i=1}^{d} i x_i^4 + rand[0,1)$	iartic	.28,1.28]

Table 2. The mean and SD results of the BRO (d={10, 20, 30})

Function	Dimension=10		Dimension=20		Dimension=30	
	mean	**SD**	**mean**	**SD**	**mean**	**SD**
1	0.5888	1.4494	36.0626	23.0971	213.8820	69.7076
2	0.2682	0.2416	3.2835	1.4651	7.3920	1.4155
3	117.5199	98.1377	1.5880e+03	456.5133	5.1778e+03	1.0089e+03
4	3.8106	1.3364	10.6184	2.9855	15.5975	3.4640
5	157.5143	252.7912	1.8165e+03	2.3198e+03	1.4358e+04	1.1048e+04
6	0.7881	1.7006	33.3169	27.3839	215.0715	96.3704
7	0.0252	0.0179	0.0803	0.0384	0.1711	0.0449

4. CONCLUSION

In this study, the performance of BRO was tested in 7 benchmark functions in three different dimensions. Unlike other heuristic algorithms, it is created by imitating a game, not herd intelligence. BRO has been presented to the literature by participating in exploitation and exploration capabilities. According to the results, the BRO has an acceptable success.

REFERENCES

[1] Lazar A (2002) Heuristic knowledge discovery for archaeological data using genetic algorithms and rough sets. In: Sarker R, Abbass H, Newton C (eds) Heuristic and optimization for knowledge discovery. IGI Global, Hershey, pp 263–278.

[2] Tang D, Dong S, Jiang Y, Li H, Huang Y (2015) ITGO: invasive tumor growth optimization algorithm. Appl Soft Comput 36:670–698. https://doi.org/10.1016/j.asoc.2015.07.045.

[3] Farshi, T.R. (2021). Battle royale optimization algorithm, Neural Computing, and Applications (2021) 33:1139–1157.

ACOUSTOELECTRIC CURRENT IN A QUANTUM WELL

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ABSTRACT

When a sound wave propagates through a material containing free elements, its momentum, as well as energy is attenuated. The momentum attenuation acts as a dc force, causing the electrons to drift in the direction of the force. When then us a closed circuit in this direction a direct current is produced, called acoustoelectric current which is proportional to the sound intensity, as the momentum attenuation itself is. The acoustoelectric effect was first described by R. H. Parameter The resistance of the material is generally changed due to the acoustic stress Parameter in 1954 found that Acoustoelectric effect is the appearance of a dc electric current. When an acoustic wave passes through a conducting medium. The acoustoelectric effect can be thought of as a drag by the wave on the particles and depends on the relative velocity between the wave and those particles. The aim of this paper is to present the concept of Acoustoelectric effect in Solid State Devices and substances based on Quantum Mechanical outcomes, Quantum Wells and Quantum Dots. Effect of ultrasonic stress, known as acoustoelectric effect, deals with the proliferation of an electric current by a travelling longitudinal acoustic wave. Ultrasonic Wave is a coherent wave.

Keywords: Quantum Well, Quantum Acoustoelectric current, radiation pressure, carrier mobility, deformation potential coupling.

1. Introduction

Quantum dots (Nano elements of semiconductors) were hypothesized in 1970s. If semiconductor elements are made small enough, Quantum outcomes come into play, which restricts the energies at which electrons and holes (the absence of an electron) can exist in the element. The energy is related to wave length or colour, this means that the optical characteristics of the elements can be finally tuned depending on its size.

In nano structured materials, the electrons are bounded quantum mechanically in a very small region of space and the corresponding effects exercise control over by making the continuous energy bands to collapse into isolated energy levels.

The Quantum size effects can be observed in a confined state. The quantum size effects can be known for semi conductor size elements. Mobility, magnetic moment, band gaps, chemical bonds, ionization potential, melting point etc. are all dependent on the element size. This happens when substance dimensions are comparable to the characteristic size associated with electrons such as the exciton radius de Broglie wave length, absorption length. Substances in such size are called mesoscopic regime or quantum confinement.

2. Quantum Mechanical effects in semiconductor

Quantum elements can be well understood from the basic quantum physics based on the quantum mechanical wave function, used to describe an energy state in which an electron can

occur. The allowed energy state and the wave functions are explained by Schrodinger's equation. A well known case is that of the solutions of the Schrodinger's equation for an electron bound by the attractive potential of a proton, describing the bound states (ground states plus excited states) of the hydrogen atom. This classical paradigm of quantum physics is often differentiated to the element in a box problem, which describes the characteristics of electrons bound in a square well potential.

3. Quantum Well

A quantum well may be viewed as a sandwich consisting of an ultra-thin layer of a substance with smaller band gap embedded between two thin layers of substance with a larger band gap. Such a double hetero structure confines electrons and holes into the small band gap substance, realizing the concept "element in a box" in the actual growth direction. Quantum effects can begin to influence the properties of matter as size is moderated to the nanoscale.

4. Description

When a sound wave spreads through a substance containing free electrons, its momentum, as well as energy, is assuaged. The momentum minimization operates as a dc force, causing the electrons to float in the direction of the force.

The acoustoelectric effect can be deliberated of as a drag by the wave on the elements, and depends on the relative velocity between the wave and those elements [1].

The acoustoelectric effect may be measured by concluding the electric potential difference between the two ends of a rod. This potential difference is comparable to the thermoelectric effect, when the two ends of a metal rod are retained at different temperatures. The net flow of phonons along a temperature gradient may be considered as a net flow of navigating acoustic waves along the gradient.

The acoustoelectric current is an outcome of electron - external acoustic wave interaction and also the electron internal phonons scattering in the sample. Considering a simple model for a quantum well in which an electron gas is confined by an infinite potential. The energy spectrum of the electron is quantized. The motion of an electron is confined in a quantum well and its energy spectrum is separated into defined energy levels. Peripheral or external acoustic wave of frequency ω_q is circulating along the quantum well.

$$\frac{\omega_q}{\eta} = \frac{C_s q}{\eta} \ll 1 \; and \; ql \gg 1 \text{ ----------} \qquad (1)$$

η is the frequency of the electron collisions, q is the modulus of external acoustic – wave vector and l is the electrons mean free path. The acoustic wave is deliberated in the field $ql \gg 1$.

Under such circumstances the external acoustic wave can be construed as monochromatic phonons having the 3D phonon distribution function $N(\vec{K})$ and the acoustic flux can be expounded as a δ - function distribution in $\vec{K}$- space.

$$N(\vec{K}) = \frac{(2\pi)^3}{\omega_{\vec{q}} C_s} \phi \delta(\vec{K} - \vec{q})$$

With frequency $\omega_{\vec{q}}$, ϕ is the flux density of the external acoustic wave (external phonon).

In the aura of an external acoustic wave with frequency $\omega_{\vec{q}}$, the Hamiltonian of the electron – external phonon and electron – internal phonon structure in a quantum well second quantization representation (assuming $\hbar$=1)

$H = H_0 + H_{e-ph}$; $H_o = \sum_{n,\vec{p}_\perp} \varepsilon_n(\vec{p}_\perp) a^+_{n,\vec{p}_\perp} a_{n,\vec{p}_\perp} + \sum_{\vec{K}} \omega_{\vec{K}} b^\pm_{\vec{K}} b_{\vec{K}}$ .....(2)

$H_{e-ph} = \sum_{n,\vec{p}_\perp,n',\vec{q}} C_{\vec{q}} U_{n,n'}(\vec{q}) a^+_{n,\vec{p}_\perp+\vec{q}_\perp} a_{n',\vec{p}_\perp} c_{\vec{q}} \exp(-i\omega_{\vec{q}} t) + \sum_{n,\vec{p}_\perp,n',\vec{k}} D_{\vec{k}} I_{n,n'}(\vec{k}_z) a^+_{n,\vec{p}_\perp+\vec{k}_\perp} a_{n',\vec{p}_\perp} (b_{\vec{k}} + b^+_{-\vec{k}})$

..... (3)

H_o is unperturbed Hamiltonian

H_{e-ph} is perturbed Hamiltonian

In equation (3), the first term is the electron acoustic wave external interaction and the second term is the contribution of electron phonon internal interaction.

n symbolizes the quantization of the energy spectrum, $n = 1,2, \ldots\ldots, a^+_{n,\vec{p}_\perp}$ and $a^+_{n,\vec{p}_\perp}$ $(b^\pm_{\vec{k}} and\ b_{\vec{k}})$ are the conception and the extinction operator of the electron (Internal phonon), respectively, $\overrightarrow{c_q}$ is the extinction operator of the external phonon.

$|n, \vec{p}_\perp > and\ |n', \vec{p}_\perp + \overrightarrow{k_\perp} >$ are electron forms before and after scattering.

The electron energy perceives the simple form

$$\varepsilon_n, \overrightarrow{p_\perp} = \frac{\vec{p}^2_\perp}{2m} + \frac{\eta^2\pi^2}{2\pi m L^2} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

$\overrightarrow{p_\perp}$ is the transverse component of the quasi-momentum in the (x-y) plane, m is the effective mass of the electron, L is the width of the quantum well.

$u_{n,n'}(\vec{q})$ is the matrix element of the operator $u = \exp(iqy - \lambda_\iota Z)$

$u_{n,n'}(\vec{q}) = \frac{(-1)^{n+n'}.\exp(-\lambda_l L)-1}{\lambda_l L + \frac{(n+n')^2\pi^2}{\lambda_l L}} - \frac{(-1)^{n-n'}.\exp(-\lambda_l L)-1}{\lambda_l L + \frac{(n-n')^2\pi^2}{\lambda_l L}}$ .....(5)

$\lambda_l = \left(q^2 - \frac{\omega^2_{\vec{q}}}{{c_l}^2}\right)^{1/2}$ is the spatial attenuation factor of the potential component of the displacement field.

$C_{\vec{q}}$ and $D_{\vec{K}}$ are the electron external phonon and the electron internal phonon interaction factors respectively.

$C_{\vec{q}} = i\Lambda c_l^2 \left(\frac{\omega^3_{\vec{q}}}{2\rho_0 \Xi s}\right)^{1/2}$

$\Xi = q\left[\frac{1+\sigma_l^2}{2\sigma_l} + \left(\frac{\sigma_l}{\sigma_t} - 2\right)\frac{1+\sigma_t^2}{2\sigma_t}\right]$

$\sigma_l = \left(1 - c_s^2/c_l^2\right)^{1/2}; \sigma_t = (1 - c_s^2/c_t^2)^{1/2}$

$\left|D_{\vec{K}}\right|^2 = \frac{\Lambda^2 \vec{k}}{2\rho_0 c_s}$ ..... (6)

Λ is the deformation potential constant, c_s is the velocity of the acoustic wave, c_l and c_t are the velocities of the longitudinal and the transverse bulk acoustic waves respectively, ρ_0 is the mass density of the medium, $s = L_x L_y$ is the surface area and

$I_{n',n}(k_z) = \frac{2}{L}\int_0^L dz \sin\left(\frac{n'\pi}{L} z\right) \sin\left(\frac{n\pi}{L} z\right) \exp(ik_z z)$ ..... (7)

5. Concluding Remarks:

An attempt has been made to study the acousto electric effect quantitatively [1 – 9].

REFERENCES

[1]. V. R. Singh, Awadhesh Prasad, NPL, New Delhi – 110012, Effect of Ultrasonic Stress on Amplification of an operational Amplifier Device, Applied Acoustics, UK, Vol. 27, pp 69 – 73, 1989.

[2]. V. R. Singh, Awadhesh Prasad, NPL, New Delhi – 110012, Acoustoelectric Effect in Semiconductor Substances and Devices, Chinese Journal of Acoustics, Vol. 9, No. 3, pp 275 – 279, 1990.

[3]. V. R. Singh, Awadhesh Prasad, NPL, New Delhi – 110012, Effect of Ultrasonic Stress on offset voltage of operational amplifier Devices, Noise control Engineering Journal, USA, Vol. 35, No. 2, pp – 65 – 67, 1990.
[4]. Nguyen Quang BAu, Nguyen Van HIEU and Nguyen Vu NHAN, "Calculations of the Acoustoelectric Current in a Quantum Well by using a Quantum Kinetic Equation" Journal of the Korean Physical Society, Vol. 61, No. 12, December 2012, pp 2026 – 2031.
[5]. Bau Quang Nguyen, Hung ManH Do and Ngoc Bich Nguyen, The nonlinear Absorption coefficient of a Strong Electromagnetic Wave Caused by Confined Electrons in Quantum Wells, Journal of the Korean Physical Scoeity, Vol. 54, No. 2, February, 2009, pp 765 – 773.
[6]. Nguyen Quang BAu and Hoang Dinh TRIEN, The Nonlinear Absorption Coefficient of Strong Electromagnetic Waves Caused by Electrons confined in Quantum Wires, Journal of the Korean Physical Society, Vol. 56, No. 1, January, 2010, pp – 120 – 127.
[7]. R. H. Parameter, The AcoustoElectric Effect, Physical Review, Volume 89, No. 5, March 1953, pp 990 – 998.
[8]. V. R. Singh, Awadhesh Prasad and Sanjay Yadav, NPL, New Delhi – 110012, Ultrasonic Stress Effect on a Germanium based junction transistor, Acustica, Germany, 1990, 71, pp 79 – 80.
[9]. V. R. Singh, Awadhesh Prasad, NPL, New Delhi – 110012, Effect of Ultrasonic Stress on offset voltage of operational amplifier devices, noise control engineering journal, USA, 1990, Vol. 35, No.2, pp 65 – 67.

ADVANCES IN BIODEGRADABLE CONDUCTING POLYMERIC MATERIALS FOR BIOMEDICAL APPLICATION: A REVIEW

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ABSTRACT

The biodegradable conducting polymers have attracted considerable attention for the past two decades as a unique class of biomaterials that combine electrical conductivity and biocompatibility. These new biomaterials have enormous potential for biomedical applications. In this review article, we discuss recent developments in biodegradable conducting polymers and their applications in biomedical fields. In our first section, we describe biomaterials and their biocompatibility, followed by a brief discussion of conducting polymers and their new hybrid biodegradable conducting polymers, along with their application in biomedical fields such as tissue engineering, drug delivery, biosensors, and antibacterial activity. In conclusion, this review concludes with some highlights and future perspectives.

Keywords: Conducting polymer; Biomaterials; Biomedicine

ON TOPOLOGICAL AND METRIC SPACES

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ABSTRACT

While determining the types of geometry, properties that do not change under transformations were used. When geometries are classified according to their invariant properties under transformations, it can be said that topology is the largest geometry. Topology includes Euclidean geometry and other popular geometry types, affine geometry and projective geometry (Kidder, 1976). Due to its topology structure, it requires using spatial and spatial awareness, geometric intuition and imagination. Topology can be defined as a branch of mathematics that studies the properties of spaces that do not change under continuous deformation. The metric is related to distance. A metric space is a set of closeness between its elements. In other words, it is a set on which a distance function is defined. The concept that we will call the metric is nothing but a generalization of the concept of distance, which everyone knows intuitively. Theoretically, the metric space is a vector space on which a distance function is defined. Most of the topological spaces that we encounter in practice also fall into the metric space class. As it is known, each metric space determines one and only one topological space, and this determined topological space is called metric topology. In this study, a detailed research will be made on topological spaces and metric spaces; The similarities and differences between these spaces will be given.

Keywords: Mathematics, Topology, Metric, Topological Spaces, Metric Spaces.

1. Introduction

The problem that gave birth to topology was a problem posed in the old Prussian city of Königsberg (now called Kaliningrad in Russia). The Pregel river, which runs through Königsberg, forms an island and a peninsula in the city, continuing as two branches on one side of the island and a single branch on the other. There are seven bridges over the river. [8]

The question that the people of Königsberg wonder is:

Is it possible to return to the starting point by moving from one point and crossing each bridge once and only once? The people of the city tried to return to the point where they started by crossing the seven bridges once, departing from different points. No one has succeeded in this trip. Finally, this problem was solved by the famous mathematician of the time, Leonhard.

Euler was intrigued. Euler presented his mathematical proof in 1735 proving the impossibility of traversing all seven bridges only once. In 1741, this proof was published in the journal of the academy under the title "Solutio problematis ad geometryam situs pertinentis (Solution of a problem with position geometry)" . As can be understood from the title of the article, Euler was talking about a new geometry that did not have the concept of distance and measure, but was concerned with positions.

After this general information, let's present a more detailed study on Topological and Metric Spaces and make use of reference number [8] mostly with all references throughout this study. Source [8] will be our main source throughout this study. For this reason, the source number [8] can be examined by researchers for a detailed study.

2. On Topological Spaces

The word topology was first used by the German mathematician Listing in 1847.

In 1851, German mathematician Bernhard Riemann applied topological ideas to Analysis in his doctoral thesis.

Gauss was Riemann's PhD thesis advisor. In 1858, German mathematician AF Möbius introduced one-sided surfaces (known as Möbius stripes). In 1872, the German mathematician Felix Klein discussed topology among geometries. In addition, Klein gave the example of a one-sided closed surface. Today this surface is known as the Klein bottle. In 1882, the French mathematician Camille Jordan put forward what is known as the Jordan Egri Theorem. In 1895, French mathematician Henri Poincare is known as the father of modern topology. He was also the first mathematician to make applications to various fields of topology.

As you can see, topology, which started to be developed in the middle of the 19th century, has become one of the main branches of mathematics. It is derived from the Greek words topos meaning surface or ground and logos meaning science. The main purpose of topology is to examine topological spaces and to classify these spaces by determining which properties of these spaces are preserved under continuous deformations, namely homeomorphisms (topologically equivalent). If we want to give an example where we can easily see the concept of homeomorphism geometrically, we can give the example that a tea cup made of rubber is homeomorphic to a tea saucer made of rubber.

Because we can turn a tea cup made of rubber into a tea plate without cutting, tearing or tearing it by simply bending it. However, it is not always possible to obtain such easy samples. Therefore, starting from the fact that two topological spaces do not have the same topological properties, we can say that these two spaces are not homeomorphic. Also, it is not always easy to construct homeomorphism between two spaces. For this reason, many sub-branches have emerged to study spaces in topology.

Geometry studies the geometric properties of objects (line, plane, ellipse, circle, square, surfaces (cylinder, tor, Klein bottle, Möbius strip, projective plane), etc.). geometric features; length, area, volume, curvature, etc. is in the form. However, properties such as color, smell, melting point of objects are not taken into account in Geometry. The set that is accompanied by a certain structure is called a geometric object. Therefore, Geometric objects are a subset of Euclidean space. If there is a bijective function from A Geometric object to another B Geometric object, keeping the distance, A and B objects are said to be isometric and the function is called isometry. So the features protected by isometry are called geometric features. [8]

Features that are preserved under homeomorphism are called topological features. Topological Properties; Compactness, Connectivity, separation axioms, etc. Topology studies the topological properties of objects.These properties are the ones that do not change as a result of twisting, shrinking and stretching. Concrete Mathematics: Examination is made on very specific clusters. Abstract Mathematics: Addition on the set to be considered structures are added and examined.

The topology types are:

1) General Topology (examines the properties of topological spaces)

2) Geometric Topology is a branch that studies manifolds and their embeddings. low dimensional topology
Also known as Knot theory and Braid groups are the most prominent topics.35
3) Algebraic Topology is the field whose solution is reached by transforming the topological problem into an algebraic problem.
The connection of homotopy, homology, cohomology (they are invariant under homeomorphism) and space
feature is investigated.
4) Differential Topology is the branch that studies differentiable functions and manifolds. Differential Topology studies topological invariants of Differentiable Manifolds.
5) Combinatoric Topology, problems in Algebraic Topology using combinatorial methods solves it. The most obvious of these is the simplex complex. With the triangulation method, some three It allows us to create dimensional shapes. It is especially important in computer images.
6) The term Digital Topology was first used by Azriel Rosenfeld in 1979. Digital
Topology is a field that allows us to analyze digital images using topological features.
Kong, Kopperman, Kovalavsky, Boxer and Han have done studies in this area. Topological methods In addition, algebraic topology methods have been used. Especially homotopy
is one.
7) Network Topology examines the transformations between connections in a network. local network, It is the best example of physical and logical topology. Network Topology is part of Graph theory.
8) Mereotopology is formal theory combined with mereology and topology. This theory, logician and computer developed by the scientist.
9) Computational Topology, Topological properties (compactness, connectivity, etc.)
is to define given objects. [8]

3. On Metric Spaces

The extension of topological thinking beyond Euclidean space was first introduced by Maurice Frechet. has not been done. Frechet (1906) found that the dots are not just real numbers or n-sets of real numbers, but also abstract
He defined metric spaces in a very general way that allows the thought of being objects.
C[a; b] and C(X;R) are also attributed to Frechet, although the supremum metric for the functions is already 1885. It was used in a study by Weierstrass on uniform convergence in .
Henry Poincare used the idea of homeomorphism in 1895. Then again, the Frechet continuous functions and initiated the systematic study of homeomorphisms. Hilbert space David Hilbert (1862-1943) in 1906. Cauchy created the Cauchy-Schwarz inequality used for metric spaces. Minkowsky's inequality in Hermann Minkowsky (1864-1909) 1909 proved in.
The idea of the completeness of a metric space was introduced in 1821 by Cauchy's irrational numbers. It can be based on the fact that it produces a complement for the space of rational numbers by defining it as the limit of sequences.
But Cauchy's method relies heavily on intuition. Charles Meray introduced this concept in 1869. reorganized it by putting logical foundations on it. For the set of rational numbers in Cantor defines a similar noun. In general, Frechet defined the concept of full metric space. and the general noun structure was introduced by Hausdorff in 1914.
Stefan Banach (1892-1945) invented the Shrinkage Lamma. Normed spaces Banach, Hans

It was discovered by Hahn (1879-1934), Eduard Helly (1884-1943), and Norbert Wiener (1894-1964). Banach spaces were also defined by Banach in 1923.
Baire Category Theorem for the real truth French mathematician Rene Baire (1874-1932) in 1889 proven by. The general theorem for complete metric spaces was first seen in Grundzüge der Mengenlehre and attributed to Hausdorff.
I wanted to investigate the reasons for the existence of these spaces, not the definitions and theorems that can be found easily in textbooks. Because I think that knowing for what reason topological and metric spaces are found and put forward will make it easier to learn. Here, research [8] has been our main resource.

4. Why Does the Metric Exist?

Mathematics is both a branch of science and the language of sciences. Metric spaces and topological spaces are also the most important keys to solving this language.
Every space encountered in the mathematical journey that started with Euclidean spaces; It allows us to understand mathematics a little more, to produce new ones from existing ones, to make abstractions from concrete concepts, and to reinterpret many features we know in Euclidean spaces with the help of these abstractions.
The metric says that the positions of points in space must be related to each other. However, for a metric to work, the concept of distance must be defined.
There are mathematical formulas that give the distance between two points. These formulas give us the distance between two points as a result of arithmetic operations with the positions of the points. That is, a defined |AB| between points A and B. We should have a distance formula. This formula can be any formula. However, a random formula may not create space as we know it. However, a formula that satisfies some conditions will give the space we know. These conditions are:
a) Positivity (The distance of A to B cannot be negative.)
b) Identity (A and B are the same point if the distance of A from B is zero.)
c) Symmetry (A's distance from B is equal to B's distance from A.)
d) Triangle inequality (A's distance from C is less than or equal to the sum of A's distance from B and B's distance from C.).
If we have a distance formula that satisfies these conditions, then we know how far the points are from each other.
A metric space is a vector space with a distance function defined on it. (X, d) is a binary consisting of the metric space, a non-empty X statement, and a distance function d.
d(x,y); ∀ x is a single-valued real function with four properties defined for y ∈ X: If it has these four properties, d is called a metric on X.
If d is a metric on X, the pair (X, d) is called a metric space, and the real number d(x, y) is called the distance between x and y.
According to conditions 2 and 4, since $0 = d(x, x) \leq d(x, y) + d(y, x) = 2d(x, y)$ for ∀ x, y ∈ X for $d(x, y)) \geq 0$ (d is a non-negative function).

5. Conclusion

Since topology mathematics allows generalization to all sets, mathematical topics are covered. looking from a wider perspective (Narlı, 2010) and many provides a better understanding of the field (Wallrabenstein, 1973). Topology in the framework of geometry

When considered, other geometries such as projective geometry, affine geometry, and Euclidean geometry also occurs as a result of the privatization of the topology (Kaya, 2005, p. 16). More strikingly than By emphasizing that knowing topology will also illuminate Euclidean geometry, it has been emphasized that topology topics will be made simple. plane geometry such as closed curves, interior and exterior, points separating lines, lines separating plane(Yates, 1971). To summarize [12], the topology
It will enable to see the relations between different geometries and give a different perspective to the geometric relations.
It is stated that it will enable to see with eyes.

References

1) Kidder, FR (1976). Elementary and middle school children's comprehension of euclidean transformations. Journal for Research in Mathematics Education, 7(1), 40-52.
2) Nesin, A., "Topological Space", World of Mathematics. 2009:49-52.
3) Ercan, Z., Topology, Ankara: METU Publishing, 2020.
4) Ergezen, F., Introduction to Topology, ITU Department of Mathematics, ITU, https://web.itu.edu.tr/ergezen/topoloji.html , 18.04.2022
5) Rahimov, A. (2006). Topological spaces. Ankara: Seçkin Publishing.
6) Sue E. Goodman, Beginning Topology, American Mathematical Society, 2009.
7) John McCleary, A First Course in Topology, American Mathematical Society, 2006.
8) prof. Dr. Ismet Karaca, Topology Lecture Notes, 2018.
9) Osman Mucuk, Category and Topology, Springer-Verlag, New York, 2009.
10) James R. Munkres, Elements of Algebraic Topology, Springer-Verlag, New York, 1984.
11) James R. Munkres, Topology, Springer-Verlag, New York, 1984.
12) Ali DELİCE, K. Gizem KARAASLANMarmara University Atatürk Faculty of Education Journal of Educational Sciences / Journal of Educational Sciences Year: January 2016 • Volume-Issue: 43 • ISSN: 1300-8889 • pp. 43-66

LOGIC EXERCISES

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ABSTRACT
As in the rest of the world, getting away from rote learning and non-life-oriented information is one of the main goals in Turkey. It is tried to adopt an education model that aims to raise students who can solve problems, prioritize logic in every course area, criticize, question and research. However, this model is not widespread in practice. As we know, logic is accepted as "the way, method, art and science of correct thinking". According to Galileo, logic is a tool of criticism and mathematics is a tool of invention. According to Albert Einstein , logic will get you from point A to point B. Imagination takes it everywhere. Logic is often associated with the numerical sciences. However, the importance of verbal logic is unavoidable. Verbal logic is used to reveal our abilities such as making a connection between verbal information, solving problems by using the information given, developing methods or classifying information by thinking correctly. In this study, logic questions will be examined and the concept of logic will be examined and questioned with various examples.

Keywords : Logic , Mathematics , Science , Numerical talent .

1.Introduction

Do you think it is important to know the exact date of a war in terms of day, month and year; Or is it to know why and how it is done, what kind of results it has? Undoubtedly, it is the second approach that pushes us to think, comment, research, problem solving and questioning. If we exemplify this question within ourselves, we will know the efforts of generations to live a more civilized life, rather than the date of birth of our grandfather.

In this study, some of the questions given and solved in [10] will be included. [10] can be examined for more detailed questions and solutions.

2. Logic Questions and Solutions

Let's question and examine the logic question with four different examples:

Soaps of K, L, M, N, P, R, S, T brands are sold in a market. The soaps are placed on 5 shelves in a row, with the 1st being the bottom one. The following is known about the shelves where the soaps are located:

- There are soaps of at most 2 different brands on each shelf.
- 3. Only P brand soaps are on the shelf.
- N and L brand soaps are on the top shelf of S brand soaps.
- K Brand soaps are on a different shelf with T brand soaps and on 1 lower shelf of M brand soaps .
- R brand soaps are not on the same shelf as S and M brand soaps.

1. Which of the following is definitely true?
A) R branded soaps are on the 1st shelf.
B) R and K brand soaps are on the same shelf.
C) L brand soaps are on the fifth shelf.
D) M and T brand soaps are on the fourth shelf.
E) K brand soaps are on the fourth shelf.
2. Which of the following is absolutely false?
A) T brand soaps are on the 1st shelf.
B) S brand soaps are on the 4th shelf.
C) N brand soaps are on a lower shelf of T brand soaps.
D) R brand soaps are on a lower shelf of M brand soaps.
E) L brand soaps are on the upper shelf of T brand soaps.
3. Which of the following soap brands cannot be on the 2nd shelf?
A) M B) N C) L D) K E) T
4. Which of the following is definitely wrong in the case of "T brand soaps are on the 5th shelf"?
A) S brand soaps are on the 1st shelf.
B) N brand soaps are on the 4th shelf.
C) K brand soaps are on one of the shelves above the S brand soaps.
D) R brand soaps are on one of the shelves above the L brand soaps.
E) P brand soaps are on one of the shelves below the R brand soaps.
In the question, we first take a brief look at the premises, and then the root of the question and its options. After we understand what the information requested from us is, we interpret the clues in the given premises one by one. Here, I write down what we have deduced from the information given in the premises, you should partially form them in your mind and note some of them in the blank next to the question:

- We imagine a 5-story supermarket shelf that grows upwards, with number 1 at the bottom.
- We have 8 brands of soap in total and we will place them on each shelf with a maximum of two.
- It is not possible to have 2 brands on each shelf; because we would need 10 soap brands. This means that there will be one soap brand on some shelves.
- There were only 'P' branded soaps on the 3rd shelf. There are 4 shelves left. Two soap brands cannot fit on these shelves; because we should have had 9 brands in total. This means that there are two brands on each of the 3 shelves, and there is one brand on each of the 2 shelves.

After the comments we made above about the premises, crucial clues begin to emerge. Information is given about which soap brand they are under, above or next to which one. Having the 'P' brand soap right in the middle of the shelves makes our job easier. Now we continue with the hint:

- It is said that 'N' and 'L' branded soaps are on the upper shelf of 'S branded soaps'.

Now we arrive at the following conclusion. 'N' and 'L' brand soaps must be either on the second shelf or on the fifth shelf and must be strictly next to each other. Because there are two spaces where 'S' branded soaps can be placed, one on top of the other, to be just above them. Right now we need to consider two possibilities.

- 'K' brand soaps would not be on the same shelf with 'T' brand soaps and would be on a lower shelf of 'M' brand soaps. The fact that 'K' soaps can be just below 'M' soaps creates two possibilities just as above. Because there are two different spaces in our table where they can be placed one on top of the other. So 'K' soaps should be either on the first shelf or on the fourth shelf so that they can be one below the 'M' soaps.
- In our last premise, it is written that 'R' branded soaps are definitely not next to 'S' and 'M' branded soaps. There were three places we could put this soap on the table. These were the "S, M, K" soaps. Since there can be no 'S' and 'M' soaps, one possibility remains. It's next to the 'K' soaps. So 'R' branded soaps and 'K' branded soaps have to be side by side.
- To briefly formulate what we understand from the last three premises:

N=L (N and L soaps are on the same shelf)
K×T (K and T soaps are on different shelves)
K=R (K and R soaps are on the same shelf)
Now let's look at the simple table where we process the inferences we make using the clues. As we said above, there are two different possibilities where "N" and "L" soap brands can be placed one on top of the other. It is normally possible to show them on a single table. But for clarity, we will try to show two different possibilities on two different tables:

FIRST POSSIBILITY		
5. RAF	N - L	
4. RAF	S	T
3. RAF	P	
2. RAF	M	T
1. RAF	K - R	

Our first table above will be based on the probability that the 'N' and 'L' soaps are on the 5th shelf. As you can see, there is a fixed 'P' brand on the 3rd shelf. The 'N' and 'L' brands are located just above the 'S' brand. According to this table, we have confirmed the first three premises. Now if we look at the fourth premise, it is desired that the 'K' soaps are just below the 'M' soaps. In this case, 'K' soaps will come on the first shelf and 'M' soaps will come on the second shelf. Since 'K' and 'R' soaps will be on the same shelf, 'R' soaps will also be on the first shelf. According to our first possibility, we determined the location of 7 soap brands. Now there is only one brand left and that is 'T' soaps. There are two places they can fit in our chart: next to the 'M' and 'S' brands . But it is impossible according to the given premises to know for certain which one is on his side. For this, we show the two possibilities where the 'T' brand will be placed in the margin of our table and we will try to solve the question in this way.

THE SECOND POSSIBILITY		
5. RAF	M	T
4. RAF	K - R	
3. RAF	P	
2. RAF	N - L	
1. RAF	S	T

The second table above is based on the probability that 'N' and 'L' soaps are on the second

shelf. Again, there is a fixed and only 'P' brand on our 3rd shelf. In order for the 'N' and 'L' brands to be just above the 'S' brand, the 'S' branded soaps are on the first shelf; 'N' and 'L' branded soaps are on the second shelf; must be. We have now again confirmed the first three premises. If we try to adapt the fourth premise according to this table, we write the 'K' soaps on the 4th shelf so that the 'K' soaps are just below the 'M' soaps. Naturally, 'M' soaps are also placed on the 5th shelf. Since 'R' soaps and 'K' soaps will be on the same shelf, we write them on the fourth shelf. Now that we have verified all the premises, we have determined which shelves the 7 brands will be on according to our second probability. Again, there is only one brand whose location is unknown, 'T' soaps. We attach them next to the 'M' and 'S' brands in the margins of our table, and we start to read the questions excitedly, thinking that we should be able to solve the questions according to this information.
We need to look at the two tables we created while reading the questions. Because it is necessary to consider the situations in which both possibilities are valid. Also, after creating the tables, it's a piece of cake! You just have to be careful and look at the tables we have created with such effort, and select the correct one among the options.

1. option A in the question fits the table we created according to the first possibility; but it doesn't fit the second table. So 'R' soaps can be found on the first shelf as well as on the fourth shelf. So option A is false. Option B refers to the formula we created. The 'K' and 'R' marks are next to each other in both tables and must be so. So the correct option is option "B". It is possible to eliminate other options by reading the tables.

2. It is said that the problem may be on the first shelf with 'T' branded soaps in option A. In the table we made according to the second possibility, we can see that the 'T' brand is really on the first shelf. So it certainly can't be wrong. In option B, the 'S' brand is said to be on the fourth shelf, which is seen in the table we made according to the first possibility. This cannot be wrong at all. In option C, it is said that the 'N' soaps are just below the 'T' soaps, which is not possible. There is no possibility that 'N' soaps can be found just below the 'T' brand in either table. So the correct answer is option "C".

3. I think it will not take even 10 seconds to solve the question. Because he asks about the soap brand that will not be on the second shelf. We look at both of our charts and see from here that four brands (N, L, M, T) may be on the second shelf. The 'K' brand is unlikely to be on the second shelf. So the answer is option 'D'.

4. The question asks us to solve it by considering the possibility that 'T' brand soaps are on the top shelf. So we're going to solve this question just by looking at our second probability table. Except for option B, the information given in all the options exactly matches our second probability table. In option B, the 'N' brand is said to be on the 4th shelf, which is not possible. 'N' branded soaps are on the 2nd shelf. Therefore, the correct answer is option "B".

As a result of the solutions, we got the following answer key:

1) B - 2) C - 3) D - 4) B

As seen above, logic questions lead us through a process that requires us to really think about it, produce practical solutions, embody a problem with tables and figures, and produce creative solutions by combining our verbal intelligence and numerical intelligence. Before you can develop a technique on solving logic problems, you need to solve a large number of questions. If you pay attention to the steps and tips listed above, logic questions are actually questions that can be answered with certainty.

Let us now try to solve another and more difficult question, which is stated to belong to Einstein (1879-1955).

3. Difficult Question Examples

➢ Five houses stand side by side. They are home to people of five different nationalities who drink five different drinks, smoke five different brands of cigarettes, and have five different pets.

1. The Englishman lives in the red house.
2. The Spaniard has a dog.
3. The Ukrainian likes to drink tea.
4. The green house is (directly) to the left of the white house.
5. Coffee is drunk in the green house.
6. The person who drinks old gold has a snail.
7. The inhabitants of the middle house drink milk.
8. The resident of the yellow house drinks Kools .
9. Norway lives in the first house
10. Chesterfields smoker drinks orange juice.
11. The Horseman lives next to the person drinking Kools .
12. Lucky Strike smoker drinks orange juice.
13. Norway lives next to the blue house.
14. Japanese smoke parliamentarians.
15. Chesterfields smoker has a neighbor who drinks water.

Find out who has the zebra!

Notes: “Left” and “Right” must be understood by a spectator standing in front of the houses. In this aspect, the first house is the house on the left. Let's prepare our study template to help [10].

NUMBER	**one**	**2**	**3**	**4**	**5**

Then let's put the given information into this template step by step.

Step 1:

7. The inhabitants of the middle house drink milk.

NUMBER	**one**	**2**	**3**	**4**	**5**
COLOUR					
NATIONALITY					
DRINK			MILK		
CIGARET					
ANIMAL					

Other words pending; blue, yellow, green, red, white, British, Japanese, Norwegian, Spanish, Ukrainian, coffee, orange juice, tea, water, Chesterfields , Kools , Lucky -Strike, Old -Gold , Parliamentarians, fox, dog, horse, snail , zebra.

Step 2:

9. The Norwegian lives in the first house.

NUMBER	**one**	**2**	**3**	**4**	**5**
COLOUR					
NATIONALITY	NORWAY				
DRINK			MILK		
CIGARET					
ANIMAL					

Other words pending; blue, yellow, green, red, white, British, Japanese, Spanish, Ukrainian, coffee, orange juice, tea, water, Chesterfields , Kools , Lucky -Strike, Old -Gold , Parliamentarians, fox, dog, horse, snail, zebra .

Step 3:

13. The Norwegian lives next to the blue house.

NUMBER	**one**	**2**	**3**	**4**	**5**
COLOUR		BLUE			
NATIONALITY	NORWAY				
DRINK			MILK		
CIGARET					
ANIMAL					

Other words pending; yellow, green, red, white, British, Japanese, Spanish, Ukrainian, coffee, orange juice, tea, water, Chesterfields , Kools , Lucky -Strike, Old -Gold , Parliamentarians, fox, dog, horse, snail, zebra.

Step 4:

4. The green house is (directly) to the left of the white house.

5. Coffee is drunk in the green house.

If the green house is directly to the left of the white house, the green house should be No.3 or No.4. Therefore, white would be house number 4 or house number 5. Since coffee is drunk in the green house, the number 4 must be in the green house, because in the number 3 house milk is drunk.

NUMBER	**one**	**2**	**3**	**4**	**5**

COLOUR		BLUE		GREEN	WHITE
NATIONALITY	NORWAY				
DRINK			MILK		
CIGARET					
ANIMAL					

Other words pending; yellow, red, British, Japanese, Spanish, Ukrainian, coffee, orange juice, tea, water, Chesterfiedls , Kools , Lucky -Strike, Old -Gold , Parliamentarians, fox, dog, horse, snail, zebra.

Step 5:

1. The Englishman lives in the red house.

Since the Englishman lives in the red house, this house must be number 3, because Norway lives in the number 1. As a result, only yellow remains for house number 1.

NUMBER	**one**	**2**	**3**	**4**	**5**
COLOUR	YELLOW	BLUE	RED	GREEN	WHITE
NATIONALITY	NORWAY		BRITISH		
DRINK			MILK	COFFEE	
CIGARET					
ANIMAL					

Other words pending; Japanese, Spanish, Ukrainian, orange juice, tea, water, Chesterfields , Kools , Lucky -Strike, Old -Gold , Parliamentarians, fox, dog, horse, snail, zebra.

Step 6:

8. The resident of the yellow house drinks Kools .

NUMBER	**one**	**2**	**3**	**4**	**5**
COLOUR	YELLOW	BLUE	RED	GREEN	WHITE
NATIONALITY	NORWAY		BRITISH		
DRINK			MILK	COFFEE	
CIGARET	KOOLS				
ANIMAL					

Other words pending; Japanese, Spanish, Ukrainian, orange juice, tea, water, Chesterfiedls , Lucky -Strike, Old -Gold , Parliamentarians, fox, dog, horse, snail, zebra.

Step 7:

11. The Horseman lives next to the person drinking Kools .

NUMBER	**one**	**2**	**3**	**4**	**5**
COLOUR	YELLOW	BLUE	RED	GREEN	WHITE
NATIONALITY	NORWAY		BRITISH		
DRINK			MILK	COFFEE	
CIGARET	KOOLS				
ANIMAL		HORSE			

Other words pending; Japanese, Spanish, Ukrainian, orange juice, tea, water, Chesterfiedls ,

Lucky -Strike, Old -Gold , Parliamentarians, fox, dog, snail, zebra.

Step 8:

3. The Ukrainian likes to drink tea.

14. Lucky -Strike smoker drinks orange juice.

The Ukrainian neither lives in house number 1 nor the person in question smokes Lucky -Strike. As a result, only water remains for them.

NUMBER	**one**	**2**	**3**	**4**	**5**
COLOUR	YELLOW	BLUE	RED	GREEN	WHITE
NATIONALITY	NORWAY		BRITISH		
DRINK	THIS		MILK	COFFEE	
CIGARET	KOOLS				
ANIMAL		HORSE			

Other words pending; Japanese, Spanish, Ukrainian, orange juice, tea, Chesterfiedls , Lucky -Strike, Old -Gold , Parliamentarians, fox, dog, snail, zebra.

Step 9:

15. Chesterfields smoker has a neighbor who drinks water.

NUMBER	**one**	**2**	**3**	**4**	**5**
COLOUR	YELLOW	BLUE	RED	GREEN	WHITE
NATIONALITY	NORWAY		BRITISH		
DRINK	THIS		MILK	COFFEE	
CIGARET	KOOLS	Chesterfields			
ANIMAL		HORSE			

Other words pending; Japanese, Spanish, Ukrainian, orange juice, tea, Lucky -Strike, Old -Gold , Parliamentarians, fox, dog, snail, zebra.

Step 10:

12. Lucky -Strike smoker drinks orange juice.

Both together are possible only in house number 5.

NUMBER	**one**	**2**	**3**	**4**	**5**
COLOUR	YELLOW	BLUE	RED	GREEN	WHITE
NATIONALITY	NORWAY		BRITISH		
DRINK	THIS		MILK	COFFEE	Orange juice
CIGARET	KOOLS	Chesterfields			L.STRIKE
ANIMAL		HORSE			

Other words pending; Japanese, Spanish, Ukrainian, tea, Old -Gold, Parliamentarians, fox, dog, snail, zebra.

Step 11:

3. The Ukrainian likes to drink tea.

Both together are possible only in house number 2.

NUMBER	**one**	**2**	**3**	**4**	**5**
COLOUR	YELLOW	BLUE	RED	GREEN	WHITE
NATIONALITY	NORWAY	UKRAINE	BRITISH		
DRINK	THIS	TEA	MILK	COFFEE	Orange juice
CIGARET	KOOLS	Chesterfields			L.STRIKE
ANIMAL		HORSE			

Other words pending; Japanese, Spanish, Old -Gold, Parliamentarians, fox, dog, snail, zebra.

Step 12:

14. Japanese smoke parliamentarians.

Both together are possible only in the 4th house.

NUMBER	**one**	**2**	**3**	**4**	**5**
COLOUR	YELLOW	BLUE	RED	GREEN	WHITE
NATIONALITY	NORWAY	UKRAINE	BRITISH	JAPANESE	
DRINK	THIS	TEA	MILK	COFFEE	Orange juice
CIGARET	KOOLS	Chesterfields		parliament	L.STRIKE
ANIMAL		HORSE			

Other words pending; Spaniard, Old -Gold, fox, dog, snail, zebra.

Step 13:

2. The Spaniard has a dog.

Both together are possible only in house number 5.

NUMBER	**one**	**2**	**3**	**4**	**5**
COLOUR	YELLOW	BLUE	RED	GREEN	WHITE
NATIONALITY	NORWAY	UKRAINE	BRITISH	JAPANESE	SPAIN
DRINK	THIS	TEA	MILK	COFFEE	Orange juice
CIGARET	KOOLS	Chesterfields		parliament	L.STRIKE
ANIMAL		HORSE			DOG

Other words pending; Old -Gold, fox, snail, zebra.

Step 14:

6. The person who drinks Old -Gold has a snail.

Both together are possible only in house number 3.

NUMBER	**one**	**2**	**3**	**4**	**5**
COLOUR	YELLOW	BLUE	RED	GREEN	WHITE
NATIONALITY	NORWAY	UKRAINE	BRITISH	JAPANESE	SPAIN

DRINK	THIS	TEA	MILK	COFFEE	Orange juice
CIGARET	KOOLS	Chesterfields	OLD-GOLD	parliament	L.STRIKE
ANIMAL		HORSE	Snail		DOG

Other words pending; fox, zebra.

Step 15:

10. Chesterfields smoker lives with a fox.

NUMBER	**one**	**2**	**3**	**4**	**5**
COLOUR	YELLOW	BLUE	RED	GREEN	WHITE
NATIONALITY	NORWAY	UKRAINE	BRITISH	JAPANESE	SPAIN
DRINK	THIS	TEA	MILK	COFFEE	Orange juice
CIGARET	KOOLS	Chesterfields	OLD-GOLD	parliament	L.STRIKE
ANIMAL	FOX	HORSE	Snail		DOG

Other words pending; zebra.

Step 16:

Now there is only one space left for the zebra. So the question was answered.

NUMBER	**one**	**2**	**3**	**4**	**5**
COLOUR	YELLOW	BLUE	RED	GREEN	WHITE
NATIONALITY	NORWAY	UKRAINE	BRITISH	JAPANESE	SPAIN
DRINK	THIS	TEA	MILK	COFFEE	Orange juice
CIGARET	KOOLS	Chesterfields	OLD-GOLD	parliament	L.STRIKE
ANIMAL	FOX	HORSE	Snail	**ZEBRA**	DOG

3. Conclusion

Logic is the work of making a new judgment by making use of existing or given judgments. To do this, reasoning is required.

People use their logic to distinguish between right and wrong. Of course, one must be intelligent to reach logical conclusions. Intelligent people make faster and more logical inferences. For this reason, people have always aimed to develop their own and their children's intelligence. They think that they can be more successful in life this way.

A person learns with his intelligence, solves problems, practices, adapts to society, and reaches logical results. In this respect, the intelligence development of individuals is very important. Logic questions appropriate to the level of the individual It is very important for the development of timely encountering and solving them, thinking about them.

REFERENCES

1) -Çikla , O. and Duatepe , A. (2002). A qualitative study on proportional reasoning skills of prospective elementary mathematics teachers, Hacettepe Faculty of Education Journal, 23, 32-40.

2) Altun MH Secondary Education Mathematics 12 Textbook Tutku Publishing Kavacik

Subayevleri Mah. Fahrettin Altay Cad. No.: 4/8 Keçiören/ANKARA ISBN 978-975-8851-89-8.
3) Anderson J.(2009) Mathematics Curriculum Development and the Role of Problem Solving , The University of Sydney, ACSA Conference 2009.
4) Arik Nermin, Jerry p. Translation from King , Mathematics art TÜBİTAK Popular science books 49, 1997 edition pages: 26-27 Artıbir publications, PISA-TIMSS-like questions, Mathematics New Generation Questions, 2019 pages: 175
5) Emin A., Gerboğa A., Güneş G., Kayacıer M. Secondary Education Mathematics 12 Textbook State Books First Edition, 2018
6) Gumusel I. S., Deviren ME Secondary Education Mathematics 12 Basic Level Textbook. MHG Book Printing and Publishing Trade Inc. ISBN: 978-605-84393-5-1.
7) Kemancı B., Büyükokutan A., Çelik S., Kemancı S. Secondary Education Science High School Mathematics 12 Textbook State Books First Edition, 2018
8) Nesin A. (2009) Journal of the World of Mathematics Year: 18 issues:80 pages:1.
9) https://www.researchgate.net/publication/339746696_Mantiksal_Akil_Yurutme_Sorulari_Daha_Kolay_Cozullenen_Uzerine_Bir_Calisma .
10) Demirkiran S., Opinion Gymnastics , Adana: Karahan Bookstore , (p:139-287).

A NEW APPROACH TO SOBER METRIC APPROACH SPACES

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ABSTRACT
Sobriety, good filtering and monotonous convergence can be chosen to rank the most important triad of topological spaces. Three of the most important properties of topological spaces, which have been extensively studied in field theory, are in this way. Some other weaker forms of sobriety and well-filtered also continue to be explored by some authors. The main purpose of this study is to introduce the concept of approach topological vector space, which is an extension of topological vector space, and the concept of sober metric space, which was introduced with its development. In this work, I will try to explain the relationship between the sober metric space and the approximation space. In this context, a compilation of previous studies by researchers will be presented.

Keywords: Topological Space, Metrik Space, Sober Space, Sober Metric Space.

1. Introduction

Approach spaces, introduced by Lowen [1], are a common extension of topological spaces and metric spaces. Here, by a metric on a set X we understand, as in Lawvere [7], a map $d : X \times X \to [0, \infty]$ such that $d(x, x) = 0$ and $d(x, y) + d(y, z) \geq d(x, z)$ for all $x, y, z \in X$. An extensive investigation of approach spaces can be found in the monographs of Lowen [9]. Following Lowen, an approach space is said to be topological if it is generated by a topological space; and it is said to be a metric one if it is generated by a metric space. Sober approach spaces, a counterpart of sober topological spaces, are introduced in [1]. It is proved there that for each topological space X, X is sober as an approach space if and only if it is sober as a topological space. Then, a natural question is to ask what kind of metric approach spaces are sober?

2. Main Results

Before answering this question, I think it would be useful to talk about the content of the study:

This presentation includes:

1. İntroduction
2. Topological spaces, metric spaces and approach spaces
3. Sober metric approach spaces
4. References

• Approach spaces, introduced by Lowen, are a common extension of topological spaces and metric spaces.

- Sober approach spaces, a counterpart of sober topological spaces in the metric setting.
- It is proved there that a topological space is sober as an approach space, if and only if it is sober as a topological space.

- So, it is natural to ask what kind of metric approach spaces are sober?

- This work presents a complete answer to this question.

- The answer is a bit surprising: a metric space is sober, as an approach space, if and only if it is smyth complete.

- Sober approach spaces, a counterpart of sober topological spaces in the metric setting.
- I will present this answer.
- A metric space is smyth complete if every forward cauchy net in it converges in its symmetrization.
- Smyth completeness originated in the works of smyth that aimed to provide a common framework for the domain approach and the metric space approach to semantics in computer science.
- As advocated in [5-6], we emphasize that the relationship between approach spaces and metric spaces is analogous to that between topological spaces and ordered sets.
- This point of view has proved to be fruitful, and is well in accordance with the thesis of Smyth.

Now here is the answer of the first question:

A partial answer is obtained in [1]: if d is a usual metric (i.e., d is symmetric, separated and finitary) on a set X, then it follows from Corollary 5.19 in [1] that (X, d) is sober, as an approach space, if and only if (X, d) is a complete metric space. This paper presents a complete answer to this question. The answer is a bit surprising: a metric space (X, d) is sober, as an approach space, if and only if it is Smyth complete. A metric space is Smyth complete if every forward Cauchy net in it converges in its symmetrization [7]. Smyth completeness originated in the works of Smyth that aimed to provide a common framework for the domain approach and the metric space approach to semantics in computer science. Since then, Smyth completeness has received wide attention, see e.g. [2, 3, 7]. In these works, Smyth completeness is more or less related to the topological properties of the space under consideration. However, as we shall see, if we view metric spaces as categories enriched over Lawvere's quantale $([0, \infty]^{op}, +)$, then Smyth completeness for metric spaces can be formulated purely in categorical terms: a metric space is Smyth complete if it is separated and all of its flat weights are representable (Definitions). This shows, in close resemblance to Lawvere's postulation of complete metric spaces (i.e., every Cauchy weight is representable), that Smyth completeness is a categorical property. As in [2, 8, 9], we emphasize that the relationship between approach spaces and metric space is analogous to that between topological spaces and preordered sets. This point of view has proved to be fruitful, and is well in accordance with the thesis of Smyth [4] "that domains are, or should be, a prime area for the application of quasi-uniform ideas, and can help us to get the definitions right."
Roughly speaking, a preorder on a set X is a map $X \times X \to \{0, 1\}$ fulfilling

certain requirements; a topology (identified with the corresponding closure operator) is a map $X \times X \to \{0, 1\}$ (the transpose of the closure operator) that satisfies certain conditions. If we replaces the quantale $2 = (\{0, 1\}, \wedge)$ by Lawvere's quantale $([0, \infty]^{op}, +)$ in the postulations of preordered sets and topological spaces, then we obtain metric spaces and approach spaces. The following squares are commutative:



Where
, • the involved categories are "self evident", and will be explained in the next section;

• the top row: Γ sends each ordered set $(X, \leq)$ to its Alexandroff topology, Ω sends a topological space to its specialization order;

• the bottom row: Γ sends a metric space to the corresponding metric approach space, Ω sends an approach space to its specialization metric;

• ω (in both cases) is a full and faithful functor with a right adjoint given by ι.

These facts can be found in references. The bottom row is a $[0, \infty]$-valued counterpart of the top row.
The problem considered in this paper is to characterize those metric spaces (X, d) for which Γ(X, d) are sober. To this end, some properties of the other functors will also be considered. The main results include:

(1) The specialization metric of a sober approach space is Yoneda complete (Proposition 5.2). This is a counterpart of the fact that the specialization order of a sober topological space is directed complete.

(2) For a metric space (X, d), the specialization metric space of the sobrification of Γ(X, d) coincides with the Yoneda completion of (X, d) (Theorem 5.4).

(3) For a metric space (X, d), Γ(X, d) is a sober approach space if and only if (X, d) is Smyth complete (Theorem 6.7).

Topological spaces, metric spaces, and approach spaces

Write 2 for the quantale (i.e., a small and complete monoidal closed category) $(\{0, 1\}, \wedge)$. An ordered set is then a 2-enriched category. Precisely, an ordered set is a set X together with a map
$p : X \times X \to 2$ such that for all $x, y, z \in X$:
(P1) $p(x, x) = 1$,

(P2) p(x, y) ∧ p(y, z) ≤ p(x, z). It is traditional to write x ≤ y for p(x, y) = 1 in order theory. Given a topological space X, the closure operator on X induces a map c : X × X → 2, given by

$$c(x, A) = \begin{cases} 1, & x \in \overline{A}, \\ 0, & x \notin \overline{A}. \end{cases}$$

This map satisfies the following conditions:

(C1) c(x, {x}) = 1,
(C2) c(x, ∅) = 0,
(C3) c(x, A ∪ B) = c(x, A) ∨ c(x, B),
(C4) c(x, A) ≥ c(x, B) ∧ V y∈B c(y, A).
Topologies on a set X correspond bijectively to maps c : X ×2 X → 2 that satisfy the conditions (C1)-(C4).
The specialization order [10] of a topological space X is the composite
from the category of topological spaces and continuous maps to the category Ord of ordered sets and order-preserving maps. The functor Ω has a left adjoint

Γ : Ord → Top

that maps an ordered set (X, ≤) to the space obtained by endowing X with the Alexandroff topology of (X, ≤) (i.e., the topology whose closed sets are the lower subsets in (X, ≤)). A non-empty closed subset A of a topological space X is irreducible if for any closed subsets B, C, A ⊆ B ∪ C implies A ⊆ B or A ⊆ C. The closure of a singleton set is clearly irreducible. A topological space X is sober if for any irreducible closed subset A, there exists a unique x ∈ X such that A equals the closure of {x}. It is well-known that the specialization order of a sober topological space is directed complete, i.e., every directed set in it has a join [1,5].

Definition: A metric space is a category enriched over the Lawvere quantale
$([0, \infty]^{op}, +)$.
Explicitly a metric space (X,d) consists of a set X and a map
d: XxX→ $[0, \infty]$ such that
d(x,x)=0 and d(x,y) + d(y,z) ≥ d(x, z) for all x,y,z∈ X.
The map d is called a metric, and the value d(x,y) the distance from x to y.

Definition: An approach space (x,δ) consists of a set X and a map δ:Xx2^x →
$[0, \infty]$, subject to following condditions:
(A1) $\sigma(X, \{X\}) = 0$
(A2) $\sigma(X, \emptyset) = \infty$
(A3) $\sigma(X, AUB) = \min\{\sigma(x, A), \sigma(x, B)\}$
(A4) $\sigma(x, A) \leq \sigma(x, B) + \sup\sigma(b, A)$
For all x∈X, b∈ Band A,B ∈ 2^x.
The map σ is called an approach distance on X.

- It is natural to wonder whether there is a relation between approach spaces and the classical notion of sobriety.
- The next two propositions will shed light on this relation.
- We will see that for topological spaces they are aquivalent, but in general the relationship is more intricate.

Sober topological space

- 1. Idea
- ıf

$\theta(X)$ is the topology on a topological space X (i. e. its frame of opens), and if a map $\theta(X) \rightarrow \theta(1)$ that preserves finite meets and arbitrary joins (a homomorphism of frames) is considered an instance of "seeing a point $1 \rightarrow$ X), and if we never see double.

- The condition that a topological space be sober is an extra condition taking to a separation axiom.
- In fact with classical logic it is a condition implied by the T2 separation axiom (Hausdorff implies sober) and implying To.

But the sobriety condition on a topological space has deeper meaning. It means that continuous functions betwen sober topolgical spaces are entirely determined by their inverse imege functions on the frames of opens, disregarding the underlying sets of points.
Technically this means that the sober topological spaces are presisely the locales among the topological spaces.

2. definition

- A topological space x is sober if its points are exactly determined by its lattice of open subsets. Different equivalent ways to say this are:

1. The continuous map from x to the space of points of the locale that ıt gives rise to is a homeomorphism.
2. The function from point of x to the completely prime filters of its open-set lattice is a bijection.
3. (Assuming classical logic) every irreducible closed set (non-empty closed set that is not the union of any two proper closed subsets) is the closure of a unique point.

- In each case, half of the definition is that x is TO, the other half states that x has enough points:
- A topological space X has enought points if the following equivalent conditions hold:

1. The continuous map from x to the space of points of the locale that it gives rise to is a quotient map.
2. The function from points of x to the completely prime filters of its open-set lattice is a surjection.
3. (Assuming classical logic) every irreducible closed set (nonempty is the closure of a point.

- Properties:
- Separation property
- Sobriety is a separation property that is stronger than TO, but incomparable with T1.
- With classical logic, every Hausdorff space is sober (see at Hausdorff implies sober), but this can fail constructively.

Hausdorff= T2 ⇒ sober ⇒ TO

Topologicl spaces, metric spaces, and approach spaces

- Proposition: If an approach space X is sober (in the approach sense) then its topological coreflection is sober (in the topological sense).
- Propoaition: A topological approach space X is sober if and only if its associated topology is sober.

Metric spaces:

- Lemma: For each metric space (X.d), the approach primes of $\neg(X, d)$ are exactly the flat weights of (X, d).

Proof: Given an approach prime φ of $\neg(X, d)$, we show that φ is a flat weight of(X, d).

- It suffices to check that φ satisfies the flat weidht conditions:
- Suppose $\varphi(xi) < \varepsilon 1 (i = 1,2)$. consider the functions $\Psi(x) = \max\{0, \varepsilon 1 - d(x1, x)\}$ and $\xi(x) = \max\{0, \varepsilon 2 - d(x2, x)\}$.
- It is easy to check that ψ and ξ are regular functions satisfying $\psi \leq \varphi(\psi(x1) = \epsilon 1, \xi(x2) = \varepsilon 2)$.

Sober approach spaces

- Now we come to the main result in this section.
- Proposition: the approach space P (rho) is the sobrification of the metric approach space $\neg([0, \infty), d_R)]$. In particular, P is sober.
- Proof. Suppose that $\emptyset$ is an approach prime of $\big([0, \infty), \neg(d_R)\big)$. Then is a forward Cauchy net $\{a_\lambda\}$ in $([0, \infty), d_R)$such That $\emptyset = \inf_\lambda \sup_{\sigma \geq \lambda} d_R(-, a_\sigma)$. ıf $\{a_\lambda\}$ is eventually a Cauchy net of real numbers in the usual sense, then

$$\phi = d_R(-, a) \text{where } a = \lim_\lambda a_\lambda.$$

If $\{a_\lambda\}$ is an almost increasing net that tends toinfinity, then ϕ is the constant function O On $([0,\infty), d_R)$ with value 0.

- Define a map by f: $P \to ([0, \infty), r(d_r))$
- By $f(a) = d_r(-, a)$ for all $a \in [0, \infty)$ and $f(\infty) = 0$. We claim that f is an isomorphism of approach spaces. Since f is clearly a bijection, we only need to check that $\delta_P(b, A) = r(d_R)(f(b), f(A))$ for all $b \in [0, \infty]$ and (non-empty) $A \subseteq [0, \infty]$.
- By above equation,
  - $r(d_R)\big(f(b), f(A)\big) = \sup\{\Phi\big(f(b)\big) \big| \Phi \in R[0, \infty), \forall a \in A, \Phi\big(f(a)\big) = 0\}$,
- Where, $R[0, \infty)$ denotes the set of regular functions of $([0, \infty), r(d_R))$. For each $\Phi \in R[0, \infty)$, we have $\Phi\big(f(a)\big) = \Phi\big(d_R(-, a)\big) = \Phi(a)$ for $a \in [0, \infty)$ and $\Phi\big(f(\infty)\big) = \Phi(0) = \sup_{x \in [0, \infty)} \Phi(x)$.
- We proceed with three cases.
- Case 1: SupA = ∞. In this case, the constant function 0 is the only regular function of $([0, \infty), r(d_R))$ that satisfies the condition that $\Phi\big(f(a)\big) = 0$ for all $a \in A$, hence $\delta_P(b, A) = 0 = 0\big(f(b)\big) = r(d_R)(f(b), f(A))$.
- Case 2: $b = \infty$, $\sup A < \infty$. Since the regular function $\Phi = d_R(-, \sup A)$ satisfies the condition that $\Phi\big(f(a)\big) = 0$ for all $a \in A$,

$r(d_R)\big(f(b), f(A)\big) \geq \Phi\big(f(b)\big) = \Phi(0) = \sup_{x\in[0,\infty)} d_R(x, \sup A) = \infty$, it follows that $\delta_P(b, A) = \infty = r(d_R)(f(b), f(A))$.

- Case 3: $b < \infty$, $\sup A < \infty$. Since $\Psi = d_R(-, \sup A)$ ıs a regular function of $([0,\infty), r(d_R))$ such that $\Psi\big(f(a)\big) = 0$ for all $a \in A$ it follows that

$$\delta_P(b, A) = d_R(b, \sup A) = \Psi\big(f(b)\big) \leq r(d_R)\big(f(b), f(A)\big).$$

- Consersely, let Φ be a regular function on $([0,\infty), r(d_R))$ such that $\Phi\big(f(a)\big) = \Phi(a) = 0$ for all $a \in A$.
- Since Φ is a weight of $([0,\infty), d_R)$ by Proposition above, it follows that $\Phi\big(f(b)\big) = \Phi(b) \leq \Phi(a) + d_R(b, a) = d_R(b, a)$ for all $a \in A$, hence $\Phi\big(f(b)\big) \leq \inf_{a\in A} d_R(b, a) = d_R(b, \sup A)$. Therefore $r(d_R)\big(f(b), f(A)\big) \leq d_R(b, \sup A) = \delta_P(b, A)$, completing the proof.

Sober Metric Approach Spaces

- In this section we characterize metric approach spaces that are sober space.

Theorem : Let (X, d) be a metric space if and only if the sobrification of r(X, d) is a metric approach space.

- Proof : First of all, by virtue of Lemma proved before, each approach prime of (X,r(d)) is a flat weight of (X, d), hence a Cauchy weight of (X, d).
- If we could show that for each approach prime $\Psi$of$(X, r(d))$ and every non-empty set $\{\Phi_i\}_{i\epsilon|}$ of approach primes of (X, r(d)), it holds that $r(d)\big(\Psi, \{\Phi_i\}_{i\epsilon|}\big) = \inf_{i\epsilon|} d(\Psi, \Phi_i)$, then the sobrification of (X, r(d)) will be a metric approach space, generated by r(X, d).
- To see this, we should calculate:

$$\begin{aligned} r(d)\big(\Psi, \{\Phi_i\}_{i\epsilon|}\big) &= \sup\{\xi(\Psi) \mid \xi \epsilon\, RX, \forall i \in |, \xi(\Phi) = 0\} \\ &= \sup\{\xi(\Psi) \mid \xi \epsilon\, RX, \forall i \epsilon |, \xi \leq \Phi\} \\ &= \sup\{\xi(\Psi) \mid \xi \epsilon\, RX, \xi \leq \inf \Phi_i\} \\ &= \inf_{i\epsilon|} \Phi_i(\Psi) \qquad (\inf_{i\epsilon|} \Phi_i \epsilon\, RX) \\ &= \sup x\epsilon X^{d_i}\left(\Psi(x), \inf_{i\epsilon|} \phi(x)\right) \\ &= \inf_{i\epsilon|} \sup_{x\epsilon X} d_i\big(\Psi(x), \Phi(x)\big) \qquad \text{(Lemma)} \\ &\inf_{i\epsilon|} d(\Psi, \Phi), \end{aligned}$$

- Then, it gives the sobrification of metric approach space.

Theorem : (X, d) be a metric space if and only if the approach space (X, r(d)) is sober.

Proof : Let Φ be an approach prime of (X, r(d)). By Lemma, Φ is a flat weight of (X, d), there is a unique $a \epsilon X$ such that = $\Phi = d(-, a) = r(d)(-, \{a\})$.

Hence (X, r(d)) is sober.

REFERENCES

[1] R. Lowen, Approach spaces: a common supercategory of TOP and MET, Math. Nachr. 141 (1989) 183–226.

[2] B. Banaschewski, R. Lowen, C. Van Olmen, Sober approach spaces, Topol. Appl. 153 (2006) 3059–3070.

[3] W. Li, D. Zhang, Sober metric approach spaces, Topol. Appl., 233 (2018) 67-88.

[4] M.B. Smyth, Quasi-uniformities: reconciling domains with metric spaces, Lecture Notes in Computer Science, 298 (1987) 236-253.

[5] M.B. Smyth, Completeness of quasi-uniform and syntopological spacesJ. Lond. Math. Soc. 49 (1994) 385-400

[6] S. Vickers, Localic completion of generalized metric spaces, Theory Appl. Categ., 14 (2005) 328-356.
[7] F.W. Lawvere, Metric spaces, generalized logic, and closed categories, Rend. Semin. Mat. Fis. Milano 43 (1973) 135–166.
[8] W. Li, H. Lai, D. Zhang, Yoneda completeness and flat completeness of ordered fuzzy sets, Fuzzy Sets Syst. 313 (2017) 1–24.
[9] R. Lowen, Approach spaces: a common supercategory of TOP and MET, Math. Nachr. 141 (1989) 183–226. [10] R. Lowen, Approach Spaces: The Missing Link in the Topology–Uniformity–Metric Triad, Oxford University Press, 1997. [23] R. Lowen, Index Analysis, Approach Theory at Work, Springer, 2015.

ENHANCING BIG DATA SECURITY AND EFFICIENCY WITH CLOUD INTEGRATION ALGORITHMS (CIA) IN MULTIMEDIA APPLICATIONS

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ABSTRACT

Computing cloud technology is a next generation way to perform information and software powered work that can transform the working environment of software. Computing resources are interconnected in this manner to effectively integrate, and to provide users with computing resources as a service. Also Mobile and cloud computing, which combines big multimedia data (image, video, 3D, etc.), have created unprecedented opportunities while also posing fundamental security and privacy challenges because they are not only unstructured and multimodal, but also big in volume. Several enterprises require open-source frameworks to put up their own private cloud infrastructure as a service (IaaS). As more corporate apps and data migrate to the private cloud, it's critical to examine the cloud environment's performance for both cloud users and cloud service providers. Existing cloud integration research has focused on virtual machine migration in real time, based on resource use. Those solutions, however, are ineffective for massive data, which includes multimedia applications. The major goal of this research is to show how multimedia apps perform in a cloud computing environment in secure manner and to offer a cloud integration method that takes into account the different types of applications. The suggested integration algorithm is superior to existing strategies when compared to existing ones.

Keywords: Security, Privacy, Cloud Computing, Infrastructure as a Service (IaaS), High Performance computing, Virtual machines.

ASSESSMENT OF SYRIAN REFUGEES' SOCIO-SPATIAL SEGREGATION IN ISTANBUL

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ABSTRACT

The actions against the Syrian government, that took place in March 2011, caused a civil war in Syria after a while and paved the way for the displacement of many Syrians. Mass migration movements that started with the civil war caused Syrians to settle in Lebanon, Jordan, Iraq and European Union countries, especially in Turkey. In the early years of mass migration, Syrian refugees started to reside especially in the provinces on the Turkish border and in the surrounding provinces of the border, and then they started to live in big cities such as Ankara, Izmir, Bursa and Istanbul.

The fact that Syrian refugees, who are called temporary guests mostly by Turkish government and media, have to migrate to many countries due to the civil war, is considered as a macro-scale crisis in the global context. According to February 2022, there are approximately 4 million Syrians in Turkey, and with the increase in their visibility in big cities such as Istanbul, Izmir and Ankara, they have provided a basis of social and spatial separation.

Along with the social and spatial segregation, neighborhoods and regions where Syrian refugees live intensively have emerged in the Istanbul Metropolitan Area. These regions, where ethnic and cultural socio-spatial segregation is experienced, become urban spaces where there is no qualified education opportunity for immigrants, employment is low, inequalities are seen, marginalization/othering and segregation are experienced.

In this study, the Syrians, who have been subjected to social and spatial separation in the city, especially in terms of language, belief system, culture, clothing style and way of life, are examined in the Istanbul Metropolitan Area and especially on the scale of the Historical Peninsula, which is defined as the traditional center of the city.

The method of the study consists of quantitative and qualitative methods. In addition to the quantitative and qualitative data obtained and the effect and distribution of socio-spatial segregation in Istanbul and the Historical Peninsula are spatially displayed through geographic information systems (GIS).

Keywords: social segregation, spatial segregation, refugee, dissimilarity index

1. INTRODUCTION

Cities have a form that has hosted many communities throughout history and is constantly changing and transforming due to economic, political and environmental factors. On the other hand, cities cause the concentration of different communities and cultures due to different attractive factors such as education, health, employment opportunities and housing, and become places where social inequalities and marginalization are experienced (Keleş, 2004).

In Syria, the anti-government actions that broke out in March 2011, later evolved into a civil war, paving the way for the forced displacement of many Syrians. During the Syrian crisis, countries such as Turkey, Lebanon and Jordan opened their doors to Syrian refugees and asylum seekers. The first mass migration to Turkey due to the Syrian crisis occurred with a group of

252 people in April 2011, and in this period from 2011 to 2022, mass migration movements still continue (Erdoğan, 2020).

In the first periods when mass migration movements were experienced intensely, Syrians settled especially in the provinces bordering Turkey and in the surrounding provinces. However, in the following periods, Syrians settled in big cities such as Istanbul, Ankara, Izmir, Mersin and Bursa due to the insufficient number of temporary accommodation centers and many attractive factors of big cities. With the increase in their visibility in the city and urban space, quantitatively, social and spatial clustering and segregations occur where Syrian immigrants are concentrated.

In this study, the social and spatial segregation of the forcedly displaced Syrian refugees and asylum seekers in Istanbul Metropolitan Area and Fatih District, which is the historical city center of Istanbul, will be examined.

1.1 Study Area

Social and spatial segregation will be evaluated through the Istanbul Metropolitan Area on a macro scale and the Historic Peninsula on a micro scale through Syrian refugees and asylum seekers. The Historic Peninsula has been chosen due to factors such as being under the dominance of the Roman, Byzantine and Ottoman Empires in the historical process, having a heterogeneous identity and culture, and having a historical texture. In addition, thanks to the social and spatial analyzes, fieldwork, quantitative and qualitative data obtained from non-governmental organizations and local governments, it was concluded that the Syrians clustered spatially in the Historic Peninsula.

In this study, firstly, the quantitative data of the Syrians in the world and in Turkey are given, and then the spatial distribution of the 39 districts in the Istanbul Metropolitan Area is conveyed by GIS. On the micro scale, the social and spatial distribution of the Syrians in the Historic Peninsula is examined.

1.2 Methodology

The method of the study consists of qualitative and quantitative data. The annual reports of the Presidency of Migration Management and the data sets they publish up-to-date constitute the data sources in all 39 districts in the Istanbul Metropolitan Area. These obtained data sets are spatially mapped and it is concluded that Istanbul hosts the most Syrian citizens. Along with the data of the Presidency of Migration Management, the fieldwork conducted in Istanbul and the Historic Peninsula is supported by the findings, the information obtained from non-governmental organizations and local administrations, and the survey study obtained by Fatih Municipality.

2. LITERATURE REVIEW

2.1 Social Segregation

In this study, which examines the social and spatial segregation of the Syrians, primarily the concepts of separation and segregation will be focused on conceptually. Afterwards, separation/segregation phenomena will be examined from a social and spatial perspective, and the concepts of social and spatial separation will be examined.

The concept of segregation is often used in many contexts. It is a concept that symbolizes the social composition of the inhabitants of the region in different urban spaces, and in another context, it also defines the spatial clustering of certain social or ethnic groups (Andersen, 2003). Segregation is the social process that results in certain individuals or social groups being separated from each other with little or no communication or interaction. It is seen as the

tendency of people with a common culture, race, religion, language, occupation, income level and other common interests to group together socially or geographically (Marshall, 1999). According to another segregation definition; it is defined as the involuntary isolation of a group of people who are oppressed into a defined spatial area (Marcuse, 2001).
In addition to the concept of segregation, the phenomenon of social exclusion is also examined in the context of social separation. Social exclusion is the situation of people or communities who are deprived of basic education/skills or who are discriminated against, being excluded from social life and not being able to integrate and participate in social life. The participation of those exposed to social exclusion in decision-making processes is limited or low (Adaman ve Keyder, 2006).

2.2 Spatial Segregation

In cities and urban spaces, forms of spatial segregation are embodied in many ways. There are concepts such as ghetto, hyper-ghetto, suburb, and slums used in everyday language and literature. These places, where social segregation and spatial segregation become concrete due to economic and cultural conditions, appear as shantytowns, suburbs in today's Turkey (Wacquant, 2015).
Factors such as common culture, identity, language, religion, race or ethnicity, access to consumer goods, education, and economic factors are effective in the social separation of individuals and communities. Socially segregated communities, on the other hand, voluntarily or involuntarily segregate spatially along with polarization.

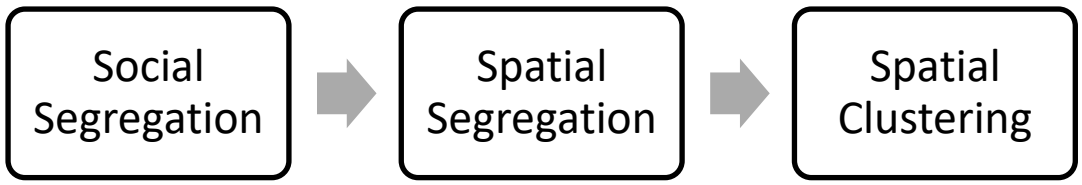

Figure 1: Relation between social and spatial segregation

The events that took place with the understanding of "creative-destruction" in 19th century in France caused the disappearance of the old texture and also the removal of the social structure living in working-class-intensive urban spaces (Harvey, 2013). The transformation works that took place with a creative-destruction approach in Paris, France, took place in Sulukule, where the Roman people live, and in Taksim, Tarlabaşı Region, where low-income citizens live.



Figure 2: Living spaces of the Romani people differing due to economic factors and lifestyle Paris/France (Url-1)

The concept of spatial segregation generally starts with social segregation in the process of the cultural phenomenon, which is formed by many factors such as language, religion, race, lifestyle, economy and education that creates the individual, society and social structure. As a result of the factors that make up the individual and the community, social segregation is observed, and it is pushed to the spatial segregation dimension voluntarily or involuntarily due to the dominant or more numerous communities.

3. RESEARCH AND FINDINGS

3.1 Distribution of Syrian Immigrants in the World and in Turkey

According to the data for 2021, of the United Nations High Commissioner for Refugees, a total of 89.3 million people in the world have been displaced forcibly. According to these data, 27.1 million people are in the refugee status and 4.6 million people are in the asylum seekers status. In addition, Turkey is the country hosting the most refugees in the world with approximately 3.8 million people, followed by Colombia with 1.8 million, Uganda with 1.5 million, Pakistan with 1.5 million and Germany with 1.3 million (UNHCR, 2022).

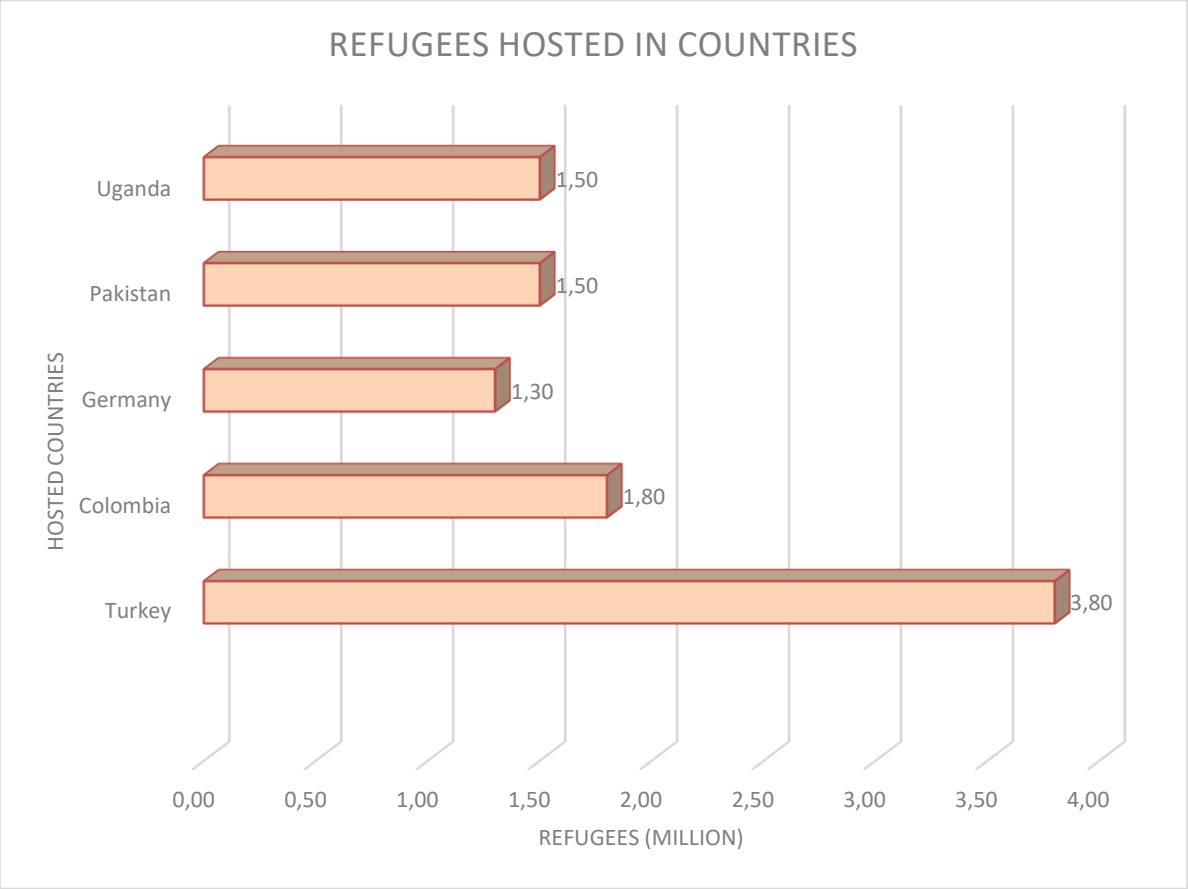

Figure 3: Refugees hosted in countries (UNHCR, 2022)

Although Turkey is the country hosting the highest number of refugees in the world with approximately 3.8 million refugees, this number is composed of Syrian refugees and asylum seekers. According to the data obtained below, based on the year 2011 and February 2022, the number of Syrians under temporary protection within the borders of Turkey has been increasing rapidly between 2013 and 2018, reaching approximately 3.8 million people in 2022.

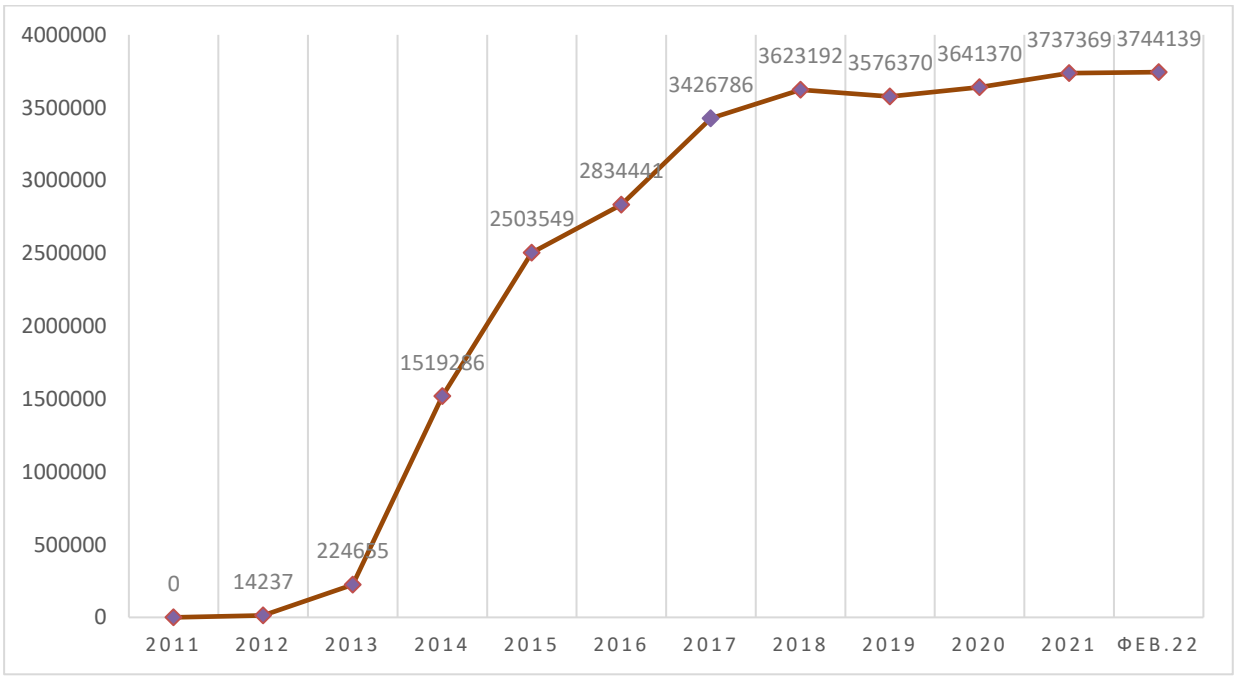

Figure 4: Syrians under temporary protection in Turkey between 2011-2022 (Göç İdaresi Genel Müdürlüğü, 2022)

According to the quantitative data obtained from the Presidency of Migration Management, the Syrian population under temporary protection in Turkey between 2012 and 2022 and the total Turkish population are compared. Accordingly, the rate of Syrians, which was 0.02% in 2012, is 4.42% today.

Table 1: The ratio of Syrians in the total population of Turkey by years (Göç İdaresi Genel Müdürlüğü, TUIK)

Year	Total Syrians' Population	Total Population of Turkey	Ratio (%)
2012	14237	75627384	**0.02%**
2013	224655	76667864	**0.29%**
2014	1519286	77695904	**1.96%**
2015	2503549	78741053	**3.18%**
2016	2834441	79814871	**3.55%**
2017	3426786	80810525	**4.24%**
2018	3623192	82003882	**4.42%**
2019	3576370	83154997	**4.30%**
2020	3641370	83614362	**4.35%**
2021	3737369	83154997	**4.49%**
2022	3744139	84680273	**4.42%**

The map below shows the quantitative distribution of Syrians in Turkey, based on February 2022. In line with the numerical data obtained, the number of Syrians residing in the Istanbul Metropolitan Area is 536,708 people, and it hosts the highest number of Syrians in Turkey. Outside of Istanbul, Gaziantep with 461,217 people, Hatay with 433,602 people, Şanlıurfa with 428,566 people and Adana with 256,088 people come.

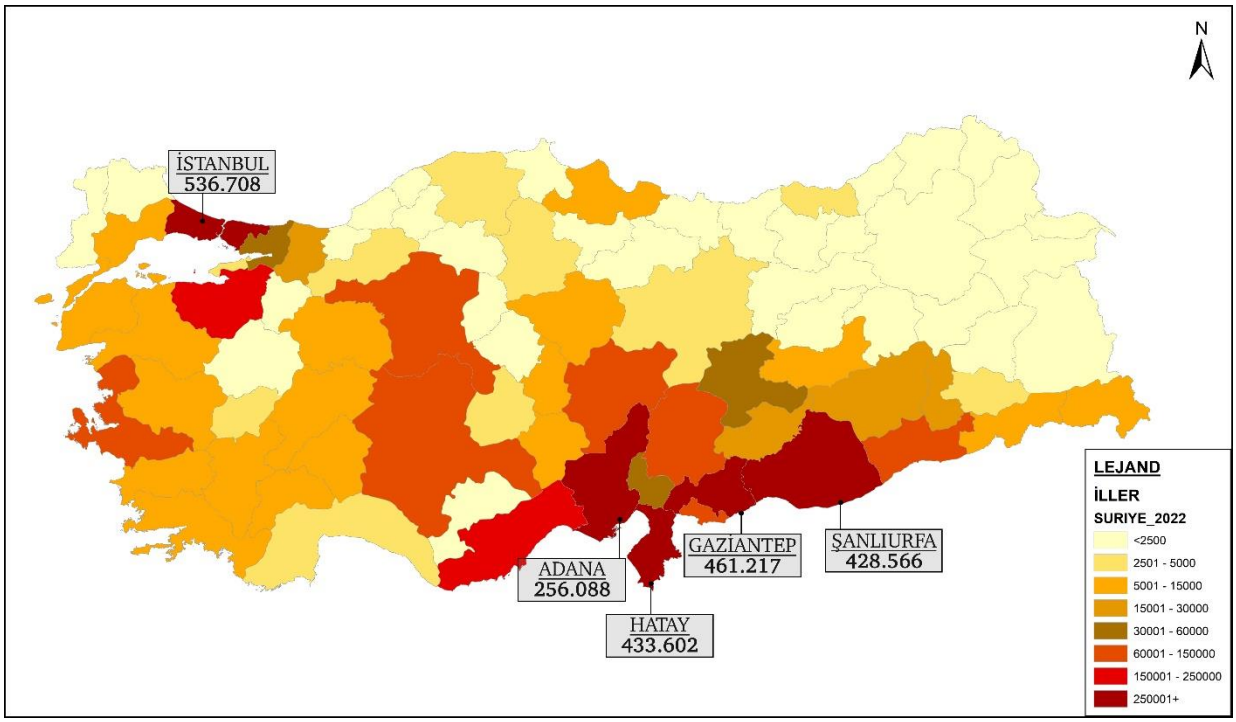

Figure 5: Distribution of Syrians under temporary protection in Turkey by provinces (Date of access: 17.02.2022) (It has been mapped by author with the help of GIS with the data obtained by the Presidency of Migration Management)

The provinces, where Syrians are clustered outside the Istanbul Metropolitan Area, are generally those that have borders with Syria and are close to Syria. In the next part of the study, the districts where Syrians are clustered in Istanbul are analyzed quantitatively.

3.2 Distribution of Syrian Immigrants in Istanbul

The distribution of Syrians in the Istanbul Metropolitan Area is primarily examined based on the European and Anatolian Sides. Accordingly, there are 440,843 people on the European side, which covers 87% of the Syrians living in Istanbul. There are 65,198 people on the Anatolian side and it covers 13% of Istanbul. In other words, the ratio of Syrians on the European side to the total population on the same side is 4.43%, while this rate is 1.18% on the Anatolian side. In this respect, it is seen that Syrians are densely clustered on the European Side.

Table 2: Distribution of Syrians under temporary protection in Istanbul Metropolitan Area (Erdoğan, Şener and Ağca, 2021)

ISTANBUL	Total Syrians' Population	Distribution of Syrians	Total Population	Ratio (%)
EUROPEAN SİDE	440843	87.12%	9959793	4.43%
ANATOLIAN SIDE	65198	12.88%	5502659	1.18%
TOTAL	506041	100%	15462452	3.27%

In the table below, the districts in which the Syrians in Istanbul mostly reside, respectively, are given. While nine districts out of a total of 10 districts are located on the European Side,

only the Sultanbeyli district is located on the Anatolian Side.

Table 3: Distribution of Syrians under temporary protection in Istanbul Metropolitan Area by districts (Erdoğan, Şener and Ağca, 2021)

District	Total Syrians' Population	Total Population	Ratio (%)
Küçükçekmece	38452	789633	4.87%
Bağcılar	48829	737206	6.62%
Sultangazi	40415	537488	7.52%
Fatih	25303	396594	6.38%
Esenyurt	61693	957398	6.44%
Başakşehir	23841	469924	5.07%
Zeytinburnu	18689	283657	6.59%
Esenler	34992	446276	7.84%
Sultanbeyli*	20444	343318	5.95%
Avcılar	19859	436897	4.55%
Toplam	506041	15462452	3.27%

The numerical and proportional values of the Syrians on the basis of districts were examined and visualized with the help of GIS on the map below. In this context, there are 38,452 people in Küçükçekmece district, the ratio of Syrians to the total population of the district is 4.87%, followed by Bağcılar with 48,829 people, Sultangazi with 40,415 people and Fatih with 25,303 people. The ratio of Syrians living in Fatih district to the total population of the district is 6.38%.

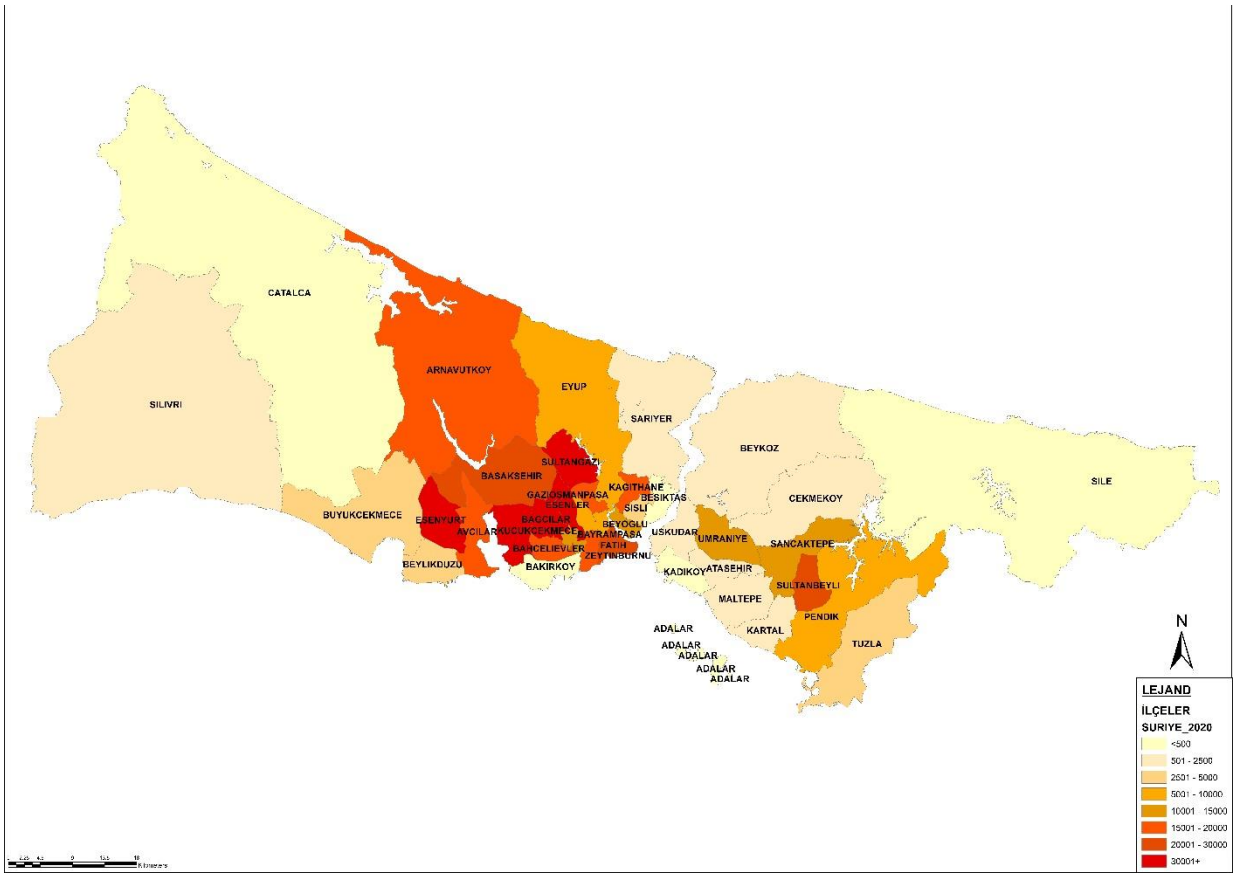

Figure 6: Distribution of Syrians under temporary protection in Istanbul by districts (Date of access: 17.02.2022) (It has been mapped by author with the help of GIS with the data obtained by the resource of Erdoğan, Şener and Ağca, 2020)

Among the 39 districts located in the Istanbul Metropolitan Area, Fatih is a district where the urban texture and the architectural texture meet, and it has hosted different immigrant groups from the past to the present. Today, besides being a district where Syrian immigrants are clustered quantitatively, it also includes regions where urban enclaves are formed in favor of immigrants spatially.

3.3 Syrian Immigrants and Social-Spatial Segregation in the Historical Peninsula of Istanbul

As a result of the data obtained by the United Nations High Commissioner for Refugees and the Presidency of Migration Management, it is concluded that Syrian immigrants mostly reside in Istanbul Metropolitan Area. Particularly in Istanbul, it is known that Syrians are clustered in the districts located on the European side, and it is seen that they are clustered in Fatih district, which is called the Historical Peninsula, especially in terms of social and spatial aspects.

The survey conducted throughout the Historic Peninsula focuses on the "perception" of dwellers for all immigrant groups, especially Syrian immigrants. With the data obtained, answers are sought to the questions of which immigrant groups live intensively in the Historic Peninsula, whether they are exposed to social and spatial segregation, and in which neighborhoods they are clustered together with socio-spatial segregation.

Within the scope of the observations, research and survey findings made in the fieldwork

(Fatih Belediye Başkanlığı, 2020):

- “Do immigrants live in your neighborhood?” with the answers given to the question, 76% of the participants ansered “yes” and said that immigrants mostly live in the Historical Peninsula.
- “What is the immigrant group you encounter most in Fatih District?” participants with their answers to the question;
- Syrians: 71%,
- Afghan: 6%,
- The least are the Turkmens and Black people, whom they refer to as “other”.
- In order to obtain the density of Syrian immigrants on the basis of neighborhoods in the Historical Peninsula, the question “Do immigrants live in the neighborhood and its immediate surroundings?” question has been addressed. According to the answers of participants;
- In Akşemsettin Neighborhood: 95,5%
- In Ali Kuşçu Neighborhood: 97,8%
- In Zeyrek Neighborhood: 93,2%, the answer was “yes”.



Figure 7: Signboad use of commercial units in the Historical Peninsula (Çöze, 2021)

Consequently, Syrians and other immigrant groups live intensively in the Istanbul Metropolitan Area, especially on the European Side. Districts on the European Side, such as Fatih District, Bağcılar District, Esenyurt District, Esenler District, Zeytinburnu District, while hosting a dense Syrian population, also pave the way for social and spatial segregation.

4. CONCLUSION

Cities and urban spaces are places where human mobility is experienced continuously and intensely because they contain many attractive factors. Therefore, beyond experiencing a dense population flow focused on individuals and society, it paves the way for the social segregation and homogenization of individuals and communities, especially cultural factors. Along with social segregation, it is seen that communities that are culturally and economically similar to each other are also subject to spatial segregation. As a result of spatial segregation, spatial clustering forms and polarizations occur, especially in big cities such as Istanbul.

In this study, literature review, fieldwork, observation, qualitative and quantitative data obtained from public institutions and local governments, and the evaluation of social and spatial segregation in the Istanbul Metropolitan Area are made. As a result of the answers given to the survey, it is concluded that 71% of Syrian immigrants live in the Historical Peninsula and the Syrian immigrant geography is clustered especially in Akşemsettin, Ali Kuşçu and Zeyrek Neighborhoods, which are located in the center of the Historical Peninsula. Consequently, although it is seen that the Syrians are socially and spatially separated, such separations cause them to be confronted with the dominant society, the problem of not being able to integrate into the existing culture and society, and many conflicts with it.

The way to be followed for urban spaces and regions where social and spatial segregation is experienced, socio-spatial and socio-economic segregation should be analyzed in detail and resolved with a participatory and comprehensive urban planning approach. In addition, migration, social segregation and spatial segregation, which are among the issues that the traditional planning approach cannot solve, should be examined and planned with the mentioned approaches.

REFERENCES

Adaman, F. ve Keyder, Ç., (2006). Türkiye'de Büyük Kentlerde Gecekondu ve Çöküntü Mahallelerinde Yaşanan Yoksulluk ve Sosyal Dışlanma. Erişim Adresi: https://ec.europa.eu/employment_social/social_inclusion/docs/2006/study_turkey_tr.pdf, Erişim Tarihi: 05.06.2022.

Andersen, H. S., (2003). Urban Sores. On the Interaction between Segregation, Urban Decay and Deprived Neighbourhoods, Danish Building and Social Research.

Çöze, Ş., (2021). Sosyal ve Mekânsal Ayrışmanın, Öteki ve Kimlik Üzerinden Okunması: Tarihi Yarımada Örneği, Yıldız Teknik Üniversitesi, İstanbul.

Erdoğan, M., (2020). Suriyeliler Barometresi 2019: Suriyeliler Uyum İçinde Yaşamın Çerçevesi. UNHCR, Ankara.

Erdoğan, M., Şener, B., ve Ağca, M., (2021). Marmara'nın Kent Mültecileri: Belediyelerin Süreç Yönetimi, Marmara Belediyeler Birliği Kültür Yayınları, İstanbul.

Fatih Belediye Başkanlığı (2020). Hane Halkı: Araştırma Raporu.

Göç İdaresi Genel Müdürlüğü, (2022). Geçici Koruma. Erişim Adresi: https://www.goc.gov.tr/gecici-koruma5638.

Harvey, D., (2013). Paris, Modernitenin Başkenti, Sel Yayıncılık, İstanbul.

Keleş, R., (2004). Kentbilim Terimleri Sözlüğü, İmge Kitabevi, Ankara.

Marcuse, P., (2001). Enclaves, Yes, Ghettoes, No: Segregation and State. Paper presented at Lincoln Institute of Land Policy-International Seminar on Segregation in the City.

Marshall, G., (1999). Sosyoloji Sözlüğü, Bilim ve Sanat Yayınları, Ankara.

United Nations High Commissioner for Refugees (UNHCR), (2022). Global Trends: Forced Displacement in 2021, Erişim Adresi: https://www.unhcr.org/62a9d1494/global-trends-report-2021

Url-1<https://www.dailymail.co.uk/news/article-4267560/Wall-rubbish-left-traveller-slum-cleared-Paris.html>, date of access: 08.07.2022

Wacquant, L., (2015). Kent Paryaları, Boğaziçi Üniversitesi Yayınevi, İstanbul.

KARMA FONKSİYON BİRLİKTELİĞİ VE YAŞAM
"İSTANBUL-FİKİRTEPE" ÖRNEĞİ

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Yeni Yüzyıl University, Architectural Department

ÖZET
Sürekli bir dönüşüm içinde bulunan kent yapılanması, özellikle son yıllarda ülkemizde, dönüşüm-değişim kavramından çok,farklı alanlarda birikim yaratma amaçlı kullanılmıştır. Bu hareketten en çok etkilenen, mekân ve toplumsal grup kavramları olmaktadır. Fiziki mekânın dönüşümü, niteliğine bağlı olarak; toplumsal sınıflarda ayrışmalara neden olmaktadır. Tarihsel süreçte yer edinmiş olan gecekondu bölgeleri kentsel dönüşüm projeleriyle yeni bir sürece girmiştir.
Türkiye'de 1950'lerden sonra kentleşme süreci hızlanmış, artan nüfus kentte plansız bir şekilde yerleşmiştir. 1970'lerden sonra artmaya devam eden nüfus yoğunluğu, bu alanlarda kimlik karmaşasına neden olmuştur. 1980'lerde iseplansız gelişen alanlar artık kentlerin içinde kalmış, yeniden kentle bütünleştirilme gerekliliği, bu doğrultuda kentsel dönüşüm girişimlerini başlatmıştır.
Kentsel dönüşümün farklı yüzü "karma yaşam" projeleri konut-ofis-alışveriş işlevlerini bir arada toplarken kent ölçeğinde kendisine yeni alan tanımlamaları oluşturmaktadır. Karma yaşam projeleri akıllı bina, ekoloji, sürdürülebilirlik kavramlarını içerirken, tasarlanan fiziksel mekanda bu kavramların tek çatı altındabirlikteliğiarayışlarına girişilmiştir.
İstanbul'da 1950'lere kadar gezinti alanı olarak kullanılan Fikirtepe, 1950'lerden sonra hızlı göç ile plansız yapılaşmaya başlamış, 1970'lerde bu yapılaşma artarak merkezi bir konuma ulaşmış, günümüzde ise karma yaşam projelerinin hayata geçirilmeye başladığı bir yerleşim alanı olmuştur.
Çalışma İstanbul'unFikirtepe semtinde,projelendirme çalışmalarınınbaşlamasının ardından geçen süreç sonrasında bugünkü fiziksel ve toplumsal mekan değişim ve dönüşümlerine odaklanmaktadır.

Anahtar kelimeler; Kent, Dönüşüm, Karma Yaşam.

AN EXAMPLE OF A MIXED LIFESTYLE PROJECT FIKIRTEPE

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ABSTRACT

Recent years continious motion and transformation of city planing has started to turn into a accumulation policy. Places and social groups are the most effected ones from this motion. These areas' transformation creates a class difference between people depending on the purpose. These transformation projects has started a new era for slums.

In 1950's citys reshaping process started to get faster but the population density's uncontrollable raise created a identity complexity around the suburban areas. In 80's these suburban areas needed to be used as a part of the city created attemps for a trasformation process.

These new types of "mixed lifestyles" projects (as residents-offices-malls) creates a new definiton for themselves. These mixed lifestyles projects offer smart houses,

Ecology and continiuty other than these they also offer social sites naturally. Fikirtepe that used as a promenade area in 50's started to become a part of the city in 70's because of the unplanned constructions that created by the mass amount of people's unctrollable motion. That’s why this area is the beginning of the transformation projects that creates "mixed lifestyle" areas.

This project focuses on the projects recent status that started many years ago in Fikirtepe which was once a suburban area.

Keywords: city, transformation, mixed lifestyle.

KURUM BAKIMINDA KALMIŞ KİŞİLERİN GÖZÜNDEN KURUM SÜRECİ VE SONRASININ DEĞERLENDİRİLMESİ

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ÖZET

Bu araştırmada, çocuk evinde ve çocuk evi sitesinde kalmış 18 yaş ve üzeri kişilerin kurum bakımı sırası ve sonrasında yaşadıkları deneyimlerin detaylı incelenmesi amaçlanmaktadır. Bu amaç doğrultusunda, bireylerin yaşamlarına ve karşılaştıkları sorunlarına dair derinlikli bilgilerin elde edilmesi amacıyla nitel araştırma yönteminin uygun olacağı düşünülmüştür. Kişilerin deneyimlerini paylaşmasına imkân tanıyan bu yöntem ile farklı tecrübelerin derinlemesine incelenerek ve anlamlı bir bütün oluşturularak okuyucuya aktarılması hedeflenmiştir. Veriler, fenomenolojik araştırma deseninde fenomen ile ilgili deneyimi olan bireylerden toplanmaktadır. Bu nedenle veri toplama araçlarından derinlemesine görüşme tekniği bu çalışmaya uygunluk göstermiştir. Çalışmada katılımcılara, amaçlı örnekleme yöntemlerinden kartopu örnekleme kullanılarak ulaşım sağlanmıştır. Kartopu örnekleme yöntemi, çoğunlukla "bu konuyla ilgili kiminle görüşmemi önerirsiniz?" sorusuyla başlayan ve ilerledikçe elde edilen isimlerle görüşülen, bu şekilde devam ederek kartopu gibi büyüyen süreci ifade etmektedir. Araştırma kapsamında toplamda 10 kişiye ulaşılması planlanmıştır. Katılımcılar, ilk olarak demografik bilgi formu ile tanınmış, ardından literatür temelli hazırlanmış olan yarı yapılandırılmış görüşme formuyla veriler elde edilmiştir. Görüşmeler 30-50 dakika arasında değişen sürelerde tamamlanmıştır. Görüşmelerin yapılmasının onam dahilinde alınan ses kayıtları, online bir uygulama aracılığıyla word belgesine aktarılmıştır. Bu verilerin analizinin gerçekleştirilmesi amacıyla MAXQDA 2020 programı kullanılmıştır. Bu program, nitel araştırma verilerinin kategorize edilmesi ve temalandırılması amacıyla çalışmada bulguların oluşturulması sürecine katkı sağlamıştır. Araştırma sonucunda veriler, kurum bakımının değerlendirilmesi, kurumdan beklentiler ve kurumdan ayrıldıktan sonra yaşanılan deneyimler olmak üzere ana temalara ayrılmıştır.

Anahtar Kelimeler: Çocuk evi, çocuk evi sitesi, çocuk koruma sistemi, nitel araştırma.

TÜKETİCİ DAVRANIŞI VE DENEYİMİNE YÖN VEREN AKILLI(SANAL) ASİSTANLARIN PAZARLAMA ALANINDAKİ UYGULAMALARINA YÖNELİK BİR DERLEME

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ÖZET
Teknolojinin gelişmesi her geçen gün insan yaşamını daha da kolaylaştırmaktadır. Teknolojiyle birlikte özellikle tüketicilerin hız, pratiklik, elverişlilik ve daha fazla memnuniyet duyacakları üretimler ön plana çıkmaktadır. Bu anlamda sanal asistanlar, teknolojinin önemli ürünleri arasında yerini almıştır. Sanal asistanlar, yapay zekanın yaşama entegrasyonu sürecinde ortaya çıkan önemli bir uygulamadır. Akıllı asistanlar olarak da bilinen bu sistem, kullanıcıların hızlı bir şekilde yardım alabildikleri, tıpkı bir insan gibi düşünen asistanları ifade etmektedir. Gündelik yaşamda hemen hemen her alanda kullanılabilen bu akıllı asistanlar özellikle kullanıcıların hızlı, pratik ve kolay bilgi elde edebilmeleri adına önemlidir. Avrupa çapında 1.500 tüketiciyle yapılan bağımsız bir ankette akıllı asistanların her geçen gün daha yaygın şekilde kullanıldığı ve insanlara her konuda yardımcı olabilecek yeni nesil yardımcılar olduğu bulgusuna ulaşılmıştır. Sonuçlar, insanların %81'inin, çevrimiçi deneyimlerini iyileştirdiği takdirde çevrimiçi bir sanal asistan ile etkileşim kurma olasılıklarının daha yüksek olacağını, %72'sinin her web sitesinde önemli görevler üstlenebileceklerini, özellikle tüketicilere birçok konuda yardımcı olabileceklerini göstermiştir. Tüketici davranışının biçimlenmesinde önemli ölçüde yeri bulunan ve verilen komutlar üzerinden tüketici isteklerine yanıt veren bu asistanlar yaşamın her alanında kullanılabilmektedir. Özellikle tüketici karar verme aşamasında sanal asistanın bilgilendirme ve yönlendirme fonksiyonu ön plana çıkmaktadır. Bu çalışmada öncelikle tüketim ve tüketici davranışlarına yönelik ön bilgilendirme yapılmış, endüstri 4.0 ve sanal asistanların içinde bulunduğu yapay zeka ve teknolojilerine değinilmiş, tüketim sürecinde akıllı asistanlar ele alınmıştır. Ayrıca 2018-2021 yılları arasındaki ulusal ve uluslararası çalışmalar derlenmiş ve bu çalışmaların ışığında, akıllı asistanların pazarlama ve tüketici davranışı alanındaki önemine ilişkin bir değerlendirme yapılmıştır.

Anahtar Kelimeler: Tüketici, Tüketici Davranışı, Akıllı Asistan, Sanal Asistan, Yapay Zekâ.

A REVIEW ON MARKETING APPLICATIONS OF SMART (VR) ASSISTANTS DIRECTING CONSUMER BEHAVIOR AND EXPERIENCE

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ABSTRACT
The development of technology makes human life easier every day. Along with technology, productions that will bring speed, practicality, convenience and more satisfaction to consumers come to the fore. In this sense, virtual assistants have taken their place among the important products of technology. Virtual assistants are an important application that emerged during the integration of artificial intelligence into life. This system, also known as smart assistants, refers

to assistants who think like a human, where users can get help quickly. These smart assistants, which can be used in almost every field in daily life, are especially important for users to obtain fast, practical and easy information. In an independent survey of 1,500 consumers across Europe, it was found that smart assistants are being used more and more and they are a new generation assistant that can help people in every way. The results showed that 81% of people would be more likely to interact with an online virtual assistant if it improves their online experience, 72% of them can take on important roles on every website, especially helping consumers in many ways. These assistants, which have an important place in shaping consumer behavior and respond to consumer requests through given commands, can be used in all areas of life. Especially in the consumer decision-making phase, the informing and guiding function of the virtual assistant comes to the fore. In this study, firstly, preliminary information about consumption and consumer behavior was given, industry 4.0 and artificial intelligence and technologies including virtual assistants were mentioned, and smart assistants in the consumption process were discussed. In addition, national and international studies between the years 2018-2021 were compiled and in the light of these studies, an evaluation was made on the importance of smart assistants in the field of marketing and consumer behavior.

Keywords: Consumer, Consumer Behavior, Smart Assistant, Virtual Assistant, Artificial Intelligence.

GİRİŞ

Literatürde yer aldığı ilk dönemlerde bir teknoloji denemesi olarak düşünülen, ancak daha sonra teknolojinin iş yaşamındaki ağırlıklı popüler kullanımı ve sağladığı rekabet avantajıyla birlikte akıllı bir dünyanın kapılarını aralayan Endüstri 4.0, yeni çağın belirleyicisi olan en önemli gelişmelerin başında gelmektedir (Yıldız, 2018: 547). Önde gelen araştırmacılar, dördüncü sanayi devriminin hükümet ve iş dünyası üzerindeki etkileriyle geleceği şekillendireceğini savunmaktadırlar. İnsanların ne teknoloji üzerinde ne de dördüncü sanayi devrimiyle birlikte gelen bozulma üzerinde hiçbir kontrolü yoktur. Ancak, dördüncü sanayi devrimi ile birlikte gelen fırsatlar şu şekilde tahmin edilebilir: 1) mucitler ve pazarlar arasındaki engellerin azaltılması, 2) yapay zekânın (AI) daha aktif rolü, 3) farklı teknik ve alanların entegrasyonu (füzyon), 4) yaşam kalitemizin artması (robot) ve 5) bağlantılı yaşam (İnternet). Endüstri 4.0 yani dördüncü sanayi devrimi dönemi bu bahsedilen fırsatlarla birlikte insan yaşamına yeni bir başlangıç getirmiştir. Bu başlangıç yaşamın en ileri noktada teknolojiyle kolaylaşması ve yaşam kalitesinin teknoloji yönlü tetiklenmesini ifade etmektedir (Xu etc., 2018: 91).

Schwab (2015) bir yazısında "*Yaşama, çalışma ve birbirimizle ilişki kurma biçimimizi temelden değiştirecek bir teknolojik devrimin eşiğindeyiz. Ölçeği, kapsamı ve karmaşıklığı bakımından dönüşüm, insanlığın daha önce deneyimlediği hiçbir şeye benzemeyecek. Henüz nasıl gelişeceğini bilmiyoruz, ancak bir şey açık: buna verilecek yanıt, kamu ve özel sektörden akademik ve sivil topluma, küresel politikanın tüm paydaşlarını dahil ederek entegre ve kapsamlı olmalıdır*" diyerek teknolojinin insan yaşamına entegre şekilde fayda sağlayacağından bahsetmiştir. Gerçekten de dördüncü sanayi devrimi insan yaşamına entegre olarak yaşamın doğal akışı içerisinde güç kazanmaktadır. Bugün yapay zekâ teknolojilerinin sağlıktan ulaşıma, iletişimden eğitime birçok alanda kullanılması onun çok daha vazgeçilmez olmasını ve geliştirilebilmesini sağlamaktadır. Bu nedenle yapay zekayı anlamak ve anlamlandırmak doğrudan yaşama entegre ederek mümkündür (Hoffman, 2021:1).

Yapay zekanın yaşama entegrasyonu sürecinde ortaya çıkan önemli bir uygulama da *sanal*

*asistanlar*dır. Akıllı asistanlar olarak da bilinen bu sistem, kullanıcıların hızlı bir şekilde yardım alabildikleri, tıpkı bir insan gibi düşünen asistanları ifade etmektedir. Gündelik yaşamda hemen hemen her alanda kullanılabilen bu akıllı asistanlar özellikle kullanıcıların hızlı, pratik ve kolay bilgi edebilmeleri adına önemlidir. Avrupa çapında 1.500 tüketiciyle yapılan bağımsız bir ankette akıllı asistanların her geçen gün daha yaygın şekilde kullanıldığı ve insanlara her konuda yardımcı olabilecek yeni nesil yardımcılar olduğu bulgusuna ulaşılmıştır. Sonuçlar, insanların %81'inin, çevrimiçi deneyimlerini iyileştirdiği takdirde çevrimiçi bir Sanal Asistan ile etkileşim kurma olasılıklarının daha yüksek olacağını, %72'sinin her web sitesinde önemli görevler üstlenebileceklerini, özellikle tüketicilere birçok konuda yardımcı olabileceklerini göstermiştir (İşlek, 2012: 21).

Bu çalışmada sanal asistanların tüketici davranış ve deneyimlerine yönelik ne şekilde bir fayda sağlayabilecekleri konusu ele alınmış, bu anlamda tüketicilerin sanal asistanlardan faydalanma durumuna ilişkin hazırlanan ulusal ve uluslararası çalışma örnekleri üzerinden bir kanaate varmak amaçlanmıştır.

1. LİTERATÜR TARAMASI

1.1. Tüketim ve Tüketici Davranışları

Tüketim faaliyeti yaşamın sürekliliği adına önem arz eden ve sürekliliği olan bir faaliyet türüdür. İnsanoğlunun beslenme, barınma gibi fizyolojik ihtiyaçları arasında yer alan tüketim ihtiyacı, onun aynı zamanda *tüketici* olarak adlandırılmasını da sağlamaktadır. Dolayısıyla tüketici olarak insan, yaşamın devamlılığı adına sürekli tüketmek zorundadır (Mucuk, 2009: 2). Maslow ihtiyaçlar hiyerarşisinde fizyolojik ihtiyaçlara bağlı tüketimin insanın zorunlu tüketimleri arasında olduğunu, fizyolojik ihtiyaçların giderilmesinden sonra onun yerini sosyal ihtiyaçların alacağını belirtmiş ve insan ihtiyaçlarını önem derecesine göre sınıflandırmıştır. Bu sınıflandırma yıllarca pazarlama ve reklam gibi alanlarda göz önüne alınmış ve tüketicileri anlamak adına kullanılmıştır. Zira tüketici davranışları her ne kadar karmaşık davranışlar olsa da onu anlamak, bu alanda çalışanları da yönlendirmektedir (İşlek, 2012: 4).

Tüketici davranışlarına yönelik yapılan araştırmalar insanın hem duygusal hem de düşünebilen bir varlık olması yönüyle rasyonel özelliklerini göz önüne almakta ve bu davranışların kestirilmesini, önceden tahmin edilmesini ve yönlendirilmesini oldukça zor bir eylem olarak belirtmektedir. Ancak tüketicilerin yaş, cinsiyet, medeni durum vb. demografik özellikleri, sosyal özellikleri ve diğer türde sayılabilecek özellikleri göz önüne alındığında ortak bir tüketici profili çizerek hareket etmek, tüketiciyi tanıma noktasındaki en önemli adım olacaktır (Mucuk, 2009: 4).

1.2. Yapay Zekâ ve Yapay Zekâ Teknolojisi

İnsanlık tarihinin en önemli dönüm noktalarından biri hiç şüphesizdir ki üretim biçiminin değiştiği Sanayi Devrimi'yle yaşanmıştır. Sanayi Devrimi (Industrial Revolution) insan ve hayvan gücüne dayanan üretim şeklini makine gücüne yönelten, 18.yüzyılda başlayan, ancak etkisi zaman içerisinde sürece bağlı olarak gelişen büyük bir olaydır. Sanayi Devrimi'yle birlikte öncelikle Batı'da üretim biçiminin değişmesiyle beraber yaşam biçiminin değiştiği, ardından artan kültürel etkileşimlerin dünyanın birçok noktasına aynı değişimleri götürdüğü görülmektedir. Öncelikle dokuma sektöründe ortaya çıkan makineleşme, sonraki yıllarda makinelerin insan emeğiyle yapılan zor işleri üstlenebileceği fikriyle pekişmiş, böylece günümüzde dördüncü aşamasına gelinen bir sanayileşme süreci ortaya çıkarmıştır (Küçükkalay, 1997: 52).

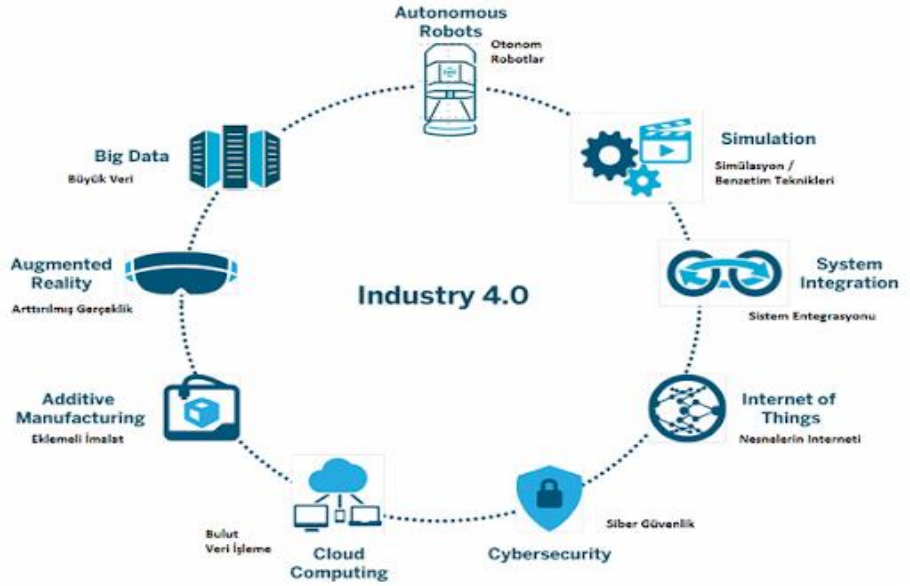
Sanayi Devrimi'yle başlayan makineleşme süreci, mal ve hizmet üretiminde yeni bir dönem başlatırken bu dönemin aynı zamanda teknik bilgi ve gelişmelerle bir noktada sınırlı kalmamasını ve devam etmesini de olanaklı kılmıştır. 1750-1890 yıllarında başlayan Birinci Sanayi Devrimi döneminde James Watt'ın buluşu olan buhar makinesi kullanılmış, ardından petrolün keşfi ve endüstri ile ulaşımdaki etkinliğiyle beraber İkinci Sanayi Devrimi dönemi başlamıştır. Doğu Bloğunun çöküşüyle başlayan bu dönemden 1898 senesine değin otomotiv sektörü başta olmak üzere ulaşımdaki diğer konularda gelişme sağlanmıştır. Üçüncü Sanayi Devrimi dönemi ise elektriğin kullanılmaya başlanmasıyla başlamıştır. Bu dönemde bilgisayar, mikro-elektronik, lazer gibi konularda gelişme kaydedilmiştir. Bu dönem aynı zamanda sanayileşmenin en yoğun şekilde gerçekleştiği ve toplumlarda değişmelerin hissedildiği dönemdir (Bulut &Akçacı, 2017: 52).

Tablo 1. Sanayi Devrimlerinin Temel Özellikleri

Periyot	**Geçiş Dönemi**	**Enerji Kaynağı**	**Temel Teknik Başarılar**	**Gelişen Temel Endüstriler**	**Ulaşım**
I: 1760-1900	1860-1900	Kömür	Buhar Motoru	Tekstil, Çelik	Tren
II: 1900-1960	1940-1960	Petrol, Elektrik	İçten yanmalı motor	Metalurji, Oto, Makine Yapımı	Tren, araba
III: 1960-2000	1980-2000	Nükleer enerji, Nükleer gaz	Bilgisayarlar, robotlar	Otomobil, Kimya	Araba, uçak
IV: 2000-	2000-2010	Yeşil Enerji	İnternet, 3D Yazıcı, Genetik Mühendisliği	Yüksek Teknolojili Endüstriler	Elektrikli Araba, Ultra Hızlı Tren

Kaynakça: Xu etc., 2018: 91

Sanayi Devrimi günümüzde dördüncü aşamasını yaşamakta, bu aşama Endüstri 4.0 adıyla da anılmaktadır. Endüstri 4.0 veya Nesnelerin İnterneti adı verilen bu dönem, siber-fiziksel sistemlere dayalı üretimin devreye girdiği, insan yaşamının internet ve çevrimiçi ağlar üzerinden değişimlere uğradığı, akıllı cihazlar, yapay zeka ve robotların insan hayatındaki yerinin gitgide arttığı bir dönemdir. Endüstri 4.0'ın ortamında büyük veri analizi, M2M, artırılmış gerçeklik, bulut teknolojisi, siber güvenlik, akıllı robotlar, 3D yazıcılar ve akıllı ürünler temel bileşendir. Tüm bu sistemler, insan hayatını kolaylaştırma amaçlı üretilmekte, robotların insanların fiziksel olarak yapamadığı ve zekâ olarak aşamadığı konularda devreye girmesini amaçlamaktadır (Fırat & Fırat, 2017: 213-214).



Şekil 1. Endüstri 4.0 Temel Bileşenleri

İlk olarak 2011 senesinde Hannover Fuarı'nda gündeme gelen, 2013 senesinde ise Alman Hükümeti tarafından nihai raporda yer alan Endüstri 4.0, sanayileşmenin tam anlamıyla tamamlanmasını sekiz aşamada gerçekleşecek bir süreç olarak görüyordu. Bu sürecin ilk aşaması referans donanım mimarisinin belirlenmesiyle başlıyor, karmaşık sistemlerin yönetilmesi, başarılı ve hızlı bir haberleşme alt yapısının kurulması, emniyet ve güvenliğin sağlanması, çalışma organizasyonunun kurulması, profesyonel gelişim, mevcut mevzuatın uygulanması ve verimli kaynak kullanımı ile devam ediyordu. Böylece akıllı fabrikaların görevini aşama aşama tamamlıyor, daha esnek ve verimli, ancak sistemli çalışan bir alt yapıyla çalışmalarını düzenliyordu (Kılıç & Alkan, 2018: 32).

Özsoylu (2017) Endüstri 4.0'ın en ayırt edici özelliklerinin "hız", "genişlik ve derinlik" ile "sistem etkisi" olduğunu dile getirmiş; üretilen teknolojinin en başta hız konusunda avantaj sağladığını, toplumda ve bireylerin yaşamlarında derinlik yarattığını, beraberinde oluşturduğu etkiyle birlikte ülkelerin ve sektörlerin büyük bir değişim içerisine girmesini de sağladığını belirtmiştir (Özsoylu, 2017: 46). Endüstri 4.0 yaşamda daha fazla esneklik, en yüksek derecede üretkenlik, daha fazla modülerlik – özerklik ve yeni iş modelleri geliştirme noktasında vaatlerde bulunmaktadır (Fırat & Fırat, 2017: 215). Dolayısıyla sanayi devriminin birinci döneminde buhar gücüyle oluşan dinamizm, dördüncü döneme gelindiğinde siber fiziksel sistemler aracılığıyla kazanılmaktadır. Endüstri 4.0 kendi içinde kurduğu akıllı yapılanmayla birlikte internet teknolojilerini yaşamın her alanına entegre eden, insan –alt yapı etkileşimiyle birlikte akıllı üretimler ortaya koyan, bu anlamda vizyonuyla birlikte hem bugüne hem de geleceğe yönelen bir çalışma prensibi yaratmaktadır (Bahrin etc. 2016: 6).

Otonom makineler ve sanal ortamlardan oluşan endüstri 4.0 dönemi 21.yüzyılda geleneksel sanayi üretiminin yerini bilgisayarlaşmaya dayalı bir sistemin kapsadığını göstermektedir. Endüstri 4.0 bunu yaparken dokuz temel bileşen üzerinden gerçekleştirmiştir. Aşağıda bu bileşenler ve endüstri 4.0 çerçevesinde içerikleri hakkında bilgi verilmiştir: (Hoffman, 2021:20-25)

- Özerk Robotlar: Endüstri 4.0'ın en önemli üretimi özerk robotlardır. Özerk robotlar, insan müdahalesi olmaksızın yazılımlarına bağlı olarak özerk çalışma kapasitesine sahip robotlardır. Bu sistem sayesinde geleneksel üretimde karşılaşılan hız, zaman veya müdahale

gerekliliği sorunları daha aza inmekte, robotların sensör teknolojisi üzerinden kendi kendine çalışmaları sağlanmaktadır.

- Simülasyon Teknolojileri: Gerçek hayatta var olan verilerin sanal ortama aktarılmasıyla meydana gelen simülasyon teknolojisi, gerçek sistemin temsili adına önem taşımaktadır. Bu sistemle birlikte sanal ortamda test edilen üretim süreciyle birlikte üretimde hata payı daha aza inmektedir (Bahrin etc. 2016: 7).
- Yatay ve Dikey Sistem Entegrasyonu: Teknolojik alt yapı kullanılarak üretim ve planlama sürecinin her bir adımının birbirine entegre edilmesi, böylece üretim sürecindeki hataların daha aza indirilmesiyle birlikte verimli bir çalışma planlamasına gidilmesidir.
- Endüstriyel Nesnelerin İnterneti: Nesnelerin interneti teknolojisinin endüstriyel üretim alanında kullanılmasıyla oluşan endüstriyel nesnelerin interneti, akıllı üretim makinelerinin geliştirilmesini sağlarken, bu üretim sürecinde hata payını en aza indirmeyi hedefler.
- Siber Güvenlik: Endüstri 4.0 döneminde siber güvenlik önlemleri, siber saldırıların karmaşıklığını göz önüne alarak daha detaylı ve geliştirilebilir bir çerçeve kazanmıştır.
- Bulut Bilişim: Web tabanlı uygulamalarla gelişen depolama alanını ifade eden bulut bilişim, büyük verilerin internet ortamında güvenli bir şekilde korunmasıdır. Bu koruma ve saklama sistemiyle birlikte kullanıcılar büyük çaplı verilerini saklama ve istenildiği zaman kullanma olanağına sahip olurlar.
- Eklemeli Üretim: Bilgisayar kontrolünde üç boyutlu veri üretimini ifade eden eklemeli üretim, geleneksel üretime kıyasla tasarım ve üretim arasındaki sürecin kısalmasını sağlamaktadır (Bahrin etc. 2016: 7).
- Artırılmış Gerçeklik: Nesnelerin dijital ortamda fiziksel ortamdakine benzer şekilde gerçeklikleriyle var olmasını, böylece insan duyusuna hitap edecek şekilde sanal gerçekliğin geliştirilmesini ifade etmektedir.
- Büyük Veri: Karmaşık yapıdaki çok fazla verinin büyük veri olarak oluşturulması ve analiz edilerek bilgi üretiminde kullanılmasıdır. Endüstri 4.0 yalnızca basit verilerin değil, karmaşık ve aynı zamanda büyük çaplı verilerin de bilgi üretiminde kullanılmasını olanaklı kılmaktadır.

Endüstri 4.0'ın insan yaşamında akıllı cihazlar odaklı kurduğu konfor kimi zaman bir tehdit olarak da algılanmakta, bu gelişmelerin teknolojinin sınırını aştığı, insanları robotlaşmaya yöneltirken, robotların da insan hayatını ele geçirdiğine yönelik korku senaryoları üretilmiştir (Bahrin etc. 2016: 6).

1.3. Akıllı (Sanal) Asistan

Akıllı asistanlar yapay zekanın öğrenme tabanlı olarak geliştirilmesi sonucu oluşan sistemlerdir. Öğrenme tabanının en basit şemasında öncelikle insan aklı yani sinir sistemleri yer almaktadır. Bilişim sistemlerinde insan aklının çalışma prensibi bir noktaya değin örnek alınabilir; zira aklın çalışmasında matematikteki gibi kesin kural ve sınırlar olmaması, duygu ve düşüncelerin bireysel şekilde tezahür edebilmesi durumu geliştirilen teknolojilerin doğrudan insan aklıyla eşdeğer olmasının önüne geçmektedir. İnsan aklının bir sonraki aşamasında derin öğrenme katmanı yer almakta, yapay sinir ağları üzerinden makine algoritmalarının çalışma prensibiyle bu sistemin hareket etkinliği sağlanmaktadır. Derin öğrenmenin üst kademesinde ise makine öğrenmesi yer almakta olup, makine öğrenmesi hem derin öğrenme hem de yapay zekâ ile ilişkilidir. Veri kümesinin modellenmesi ancak makine öğrenmesiyle gerçekleştirilebilmektedir (Hoffman, 2021:1).

Makine öğrenmesinin bir üst aşamasında ise yapay zekâ bulunmaktadır. Yapay zekâ (AI), yaygın olarak akıllı davranış olarak adlandırılan şeyin sayısal olarak anlaşılmasıyla ve bu tür davranışları sergileyen eserlerin yaratılmasıyla ilgilenen bir bilim ve mühendislik alanı' olarak tanımlanır (Ramesh etc. 2004: 334). Yapay zekâ makine öğrenmesine bağlı olarak zayıf ve güçlü yapay zekâ olarak adlandırılır. Zayıf yapay zekâ, makinelerin programlanıp zeki davranışlar göstermesiyken, zeki aynı zamanda şuurlu davranışlar göstermesi ise güçlü yapay zekâ olarak adlandırılır. Güçlü yapay zekâ, bugün ileri teknolojide sağlanmaya çalışılan ve aynı zamanda tartışmalara yol açan zekâ türüdür. Güçlü yapay zekâyla birlikte insan gibi düşünme ve davranmanın, en önemlisi "insanca" hareket etmenin mümkün olup olmayacağı tartışmalara yol açmaktadır (Öztürk & Şahin, 2018: 25).

Makine öğrenmesinin kullanıldığı en son yapay zeka teknoloji ürünlerinden biri de akıllı asistanlardır. Akıllı asistanlar doğal dili işleme yeteneği olan, böylelikle kendisine verilen komutları anlayan ve ona tepki geliştiren asistanlardır. Bu asistanlar sayesinde hem zaman tasarrufu sağlanmakta, hem de insanların dış dünyada hızlı ve pratik olmaları kolaylaşmaktadır. Siri, Alexa ve Google asistan bu asistanlara sayılabilecek en temel örnekleri oluşturmaktadırlar. Günümüzde yaşamın her alanında kullanılan akıllı asistanlar karar verme, problem çözme, akıllı çözüm üretimi ve daha birçok alanda fayda sağlamaktadırlar (Jiang et al. 2015: 506).

1.4. Tüketim Sürecinde Akıllı (Sanal) Asistanlar

Yapay zekâ ve yapay zekaya bağlı birçok ürün günümüzde şirketlerin (özellikle kâr amaçlı şirketler) gözdesi durumundadır. Bu şirketler, müşterilerine sundukları hizmetleri iyileştirmek ve beraberinde müşterilerine değer katmak adına teknolojiyi birçok alanda kullanmaktadırlar. Aşağıdaki tabloda yapay zeka uygulamaları ve onları kullanan şirketlerden örnekler sunulmuştur.

Tablo 2. Yapay Zekâ Kullanan Şirketler ve Yapay Zekâ Uygulamaları

	Teknoloji – Platformlar	**Yapay Zekâ Uygulamaları**
Google Deepmind	Arama Motoru, Haritalar Reklamlar, Gmail, Android, Google Chrome ve Youtube	İnsansız Arabalar
	Derin Q-Ağlar	Bilgisayar Programı Alpha Go, Derin Öğrenme odaklı oyunlar: DQN, İnsan Sesi Çalışmaları: Wavenet
OpenAI	Kar amacı gütmeyen Kuruluşlar, Evrimsel Algoritmalar, Derin Sinir Ağları	Derin Sinir Ağları ile çalışan Evrimsel Algoritmik Sistemler, Testbeds
IBM	Bilgisayar Donanım ve Yazılım Üreticisi Barındırma ve Danışma Hizmetleri Bilişsel Hesaplama	Deep Blue
Facebook	Sosyal Ağ Hizmeti	Uygulamalı Makine Öğrenme İnsan Bilgisayar Etkileşimi

Apple	Bilgisayar Donanım ve Yazılım Tüketici Elektronik Ürünler Online Hizmetler	Siri İnsansız Arabalar
Amazon	Bulut Hesaplama Online Perakende Hizmetler Elektronik Ürün ve Hizmetler	Alexa Amazon Yapay Zekâ Programı
Microsoft	Geliştirme, Üretme ve Lisans Bilgisayar Donanım ve Yazılım Tüketici Elektronik Ürünleri	Microsoft Azur Cortana

Kaynakça: Perez etc. 2017: 15

Sanal asistanlar, bir web sitesinde müşteri sorularını yanıtlama, çeşitli yardımcı görevleri yerine getirme ve gerektiğinde kurumsal sistemlere bağlanma gibi birden çok rol üstlenebilir. Zekâları, gerçekleri hatırlamalarına, konuşmalarından öğrenmelerine ve ziyaretçilerle iki yönlü bir diyalog sürdürmelerine olanak tanır.

Pazar araştırması uzmanları Axiall tarafından yürütülen araştırma çalışması, sanal asistan oluştururken yaş, cinsiyet ve görünüm gibi bir dizi kriterin ne kadar önemli olduğunu incelemiş, araştırma sürecinde tüketicilerin tercih ettiği karakter tipinin en çok 35-44 yaş arası, erkek veya kadın, söz konusu markaya uygun giyinmiş, hareketli, çekici ve mizah anlayışı olanlardan yana kullanıldığını göstermiştir. Gerçek dünyadaki en iyi iletişim uygulamalarını yansıtan Sanal Asistanların bilgili olması, endüstri çevrelerine uyum sağlaması, aynı zamanda yalnızca dilleriyle değil, jestler ve ifadelerle yüksek düzeyde duygusal zekâ ve empati gösterebilmesi gerekir. İnce bir mizah anlayışı da karakterlerin arkadaş canlısı ve ulaşılabilir olmalarına yardımcı olur. Yukarıda bahsedilen karakter özelliklerinin tümü, bir Sanal Asistana bir markanın kültürünü ve değerlerini yansıtan farklı kişiliğini vermek için birleşir. Bununla birlikte özelliklerin doğru karışımını kullanarak, müşteriler karakterle daha fazla etkileşime girme ve onların deneyimlerini iyileştirme olanağı sunar (Jiang et al. 2015: 507).

2. ULUSAL VE ULUSLARARASI ÇALIŞMALAR

Çalışmanın bu bölümünde tüketici davranışı ve deneyimiyle ilişkili olarak akıllı asistanların kullanımı ve faydalarını da kapsayacak araştırmalara yer verilmiştir. Bu araştırmalar üzerinden şekillenen çalışmayla birlikte tüketici davranış ve deneyiminde akıllı asistanların rollerine ilişkin genel bir değerlendirme yapılmıştır.

2.1. Ulusal Çalışmalar

Balcı (2019) "Overview of Intelligent Personal Assistants -Akıllı Kişisel Asistanlara Genel Bakış" başlıklı çalışmasında akıllı kişisel asistanların insan yaşamına etkisi, hangi özelliklere sahip oldukları, hangi özellikleriyle daha çok fayda sağladıkları gibi konuları ele almıştır. Yapılan çalışma çerçevesinde sanal asistanların geliştirilmesi gereken özellikleri olmakla birlikte, özellikle her türlü konuda araştırma yapma, bu araştırma sonuçlarını sunma ve hızlı hareket etme adına kullanıcılara büyük fayda sundukları, bir alışveriş sürecinde tüketiciye hızlı bilgi vererek alışveriş kararını yönlendirebildiği, aynı zamanda her türlü karar verme sürecine destek olabildiği sonucuna varılmıştır (Balcı, 2019).

Gülşen (2019) "İşletmelerde Yapay Zeka Uygulamaları ve Faydaları: Perakende Sektöründe Bir Derleme" başlıklı makale çalışmasında işletmelerde kullanılan yapay zeka uygulamalarına yönelik olarak yapılan çalışmalar üzerinden perakende sektöründeki bu tür uygulamaları derlemiştir. Çalışmada mağaza içi, ödeme bölümü ve daha birçok alanda kullanılan yapay zeka uygulamalarının müşterilere kolaylık sağladığı, bu uygulamalar arasında yer alan sanal asistan niteliğindeki akıllı robot sistemlerinin kullanıcı kolaylığı düşünülerek hazırlanıp müşteri memnuniyetini yükselttiğinden bahsetmiştir (Gülşen, 2019).

Zeylan ve Öztürk (2019) "Türkiye'deki Seyahat Acentelerinin Mobil Pazarlamayı Kullanımı" başlıklı makale çalışmalarında 2018 yılı Fortune 500 listesinde yer alan ilk 6 turizm acentesinin mobil platform kullanımına ilişkin araştırma yapmışlardır. Bu araştırmada çevrimiçi (online) seyahat sistemini kullanan ve mobil uygulamalarını müşteri odaklı düzenleyen yalnızca 2 şirket olduğu ve bu şirketlerin de müşteri memnuniyetini, tercihlerini ön plana aldıkları gözlemlenmiştir (Zeylan & Öztürk, 2019).

Ayyıldız ve Eroğlu (2021) "Restoranlarda Kullanılan Akıllı Teknolojiler ve Robot Restoranlar Hakkında Tripadvisor'da Yapılan Yorumların Değerlendirilmesi" başlıklı çalışmalarında restoranlarda akıllı teknoloji kullanımını ele almışlar ve bu çerçevede Hindistan, Fransa, İngiltere, Tayland ve Japonya'da robot çalışanlarla hizmet veren 10 adet robot restoranla ilgili Tripadvisor sitesindeki yorumları değerlendirmişlerdir. Yapılan bu çalışmanın temel amacı, bu restoranları deneyimleyen müşterilerin akıllı teknolojilerden ne denli memnun kaldıklarının ve aynı zamanda akıllı asistanların tüketiciye ne denli yardımcı olduklarını araştırmaktır. Çalışmada yapılan içerik analiziyle birlikte sonuçlar müşterilerin akıllı asistanlardan memnun olduklarını ancak genel olarak akıllı teknolojilerin fiyat, atmosfer ve yemek anlamında geliştirilmesi gerektiğini göstermiştir (Ayyıldız & Eroğlu, 2021).

Eren (2021) "Sanal Bankacılık Müşteri Asistanlarına İlişkin Hizmet Kalitesinin Müşteri Güveni, Müşteri Tatmini ve Müşteri Sadakatine Etkisi ve Ağızdan Ağıza İletişim" başlıklı makale çalışmalarında bankacılıkta yükselen teknolojik uygulamaları ele almayı amaçlamış ve sanal bankacılık müşteri asistanlarına yönelik bir araştırma yapmıştır. Yapılan araştırma çerçevesinde sanal müşteri asistanını deneyimleyen 346 banka müşterisinin verileri toplanmış ve Yapısal Eşitlik Modellemesi uygulanmıştır. Araştırma sonucunda elde edilen bulgular sanal bankacılık müşteri asistanına yönelik hizmet kalitesi boyutlarından kullanışlılık ve eğlence boyutunun müşteri güveni, müşteri tatmini ve sadakati üzerinde etkisi olduğunu, dolayısıyla sanal bankacılık uygulamalarının müşterilerin tercihlerini yönlendirebilecek durumda olduğunu ortaya çıkarmıştır (Eren, 2021).

2.2. Uluslararası Çalışmalar

Jones (2018) "Voice-Activated Change: Marketing in the Age of Artificial Intelligence and Virtual Assistants" başlıklı makale çalışmalarında modern pazarlamada sanal asistanlar konusunu ele almışlardır. Bu çalışma çerçevesinde Amazon'un Alexa'sı veya Google Asistanı gibi ses kontrollü sanal asistanların insan yaşamını oldukça kolaylaştırdıklarından bahsedilmiş ve bu asistanların tüketici davranışları konusundaki etkileri de araştırmaya konu edinilmiştir. Araştırma ABD'de pazarlama ve reklamcılık alanlarında vaka çalışmaları üzerinden yapılmıştır. Araştırmada katılımcılara çeşitli sorular yöneltilerek akıllı asistan kullanımıyla ilgili faydaların ölçülmesi ve anlaşılması amaçlanmıştır. Bu araştırma sonucunda öncelikle Google sesli asistanın çok fazla kullanıldığı ve kullanıcılara arama yaparak erişmek istedikleri bilgiyi vermeleri yönünde daha çok tercih edildiklerini göstermiştir. İkinci olarak ise içerikle ilgili bilgi vermesi ve istenen ürünün içeriğini tanıtması adına fayda sağlaması önemlidir. Bu

noktada tüketicilerin gerek bilgi edinme gerekse içerikle ilgili danışma açısından kararlarının akıllı asistanlarca etkilenebildiği ortaya çıkarılmıştır (Jones, 2018).

Esmailzadeh ve Rolandsson (2019) "Voice assistants and how they affect consumer behavior" başlıklı tez çalışmalarında teknoloji benimseme modeliyle birleştirilmiş kano modelini uygulayan bir anket aracılığıyla, ortamlar, demografi ve psikografikler arasında sesli yardımcılarla tüketici davranışındaki farklılıkları açıklamayı amaçlamaktadır. Tez çalışması 2010 senesinde üretilen sesli asistan Siri'den sonra tüketicilerin sesli asistanlara başvurma sıklıklarının arttığını ve bu nedenle de bu asistanların alışverişlere değer kattıklarını vurgulayarak çalışmaya başlamıştır. Bu tez çalışmasında 5222 kişi ankete katılmış, ancak bunların yalnızca 1731'i ankete dahil edilmiştir. Sonrasında yapılan ayrıntılı değerlendirmede ise 400 kişinin yanıtları çalışmaya dahil edilmiştir. Yapılan tez çalışmasıyla birlikte tüketicilerin doğruluk, gizlilik, reklamsız, tavsiyesiz, alışveriş ve yemek siparişi alanlarından ne şekilde etkilendikleri değerlendirilmiştir. Bu değerlendirmede tüketicilerin özellikle gizlilik sebebiyle akıllı asistanlardan faydalandıkları, ardından güvenilir olması yani doğruluk kriteriyle bu asistanları seçtikleri görülmüştür (Esmailzadeh & Rolandsson, 2019).

Garrotes (2021) "Exploring The Engagement Process Between Humans And Intelligent Virtual Assistans" başlıklı tez çalışmasında insanlar ve akıllı asistanlar arasındaki ilişkileri anlamayı amaçlamıştır. Çalışma kapsamında bağlanma teorisine bağlı olarak bir çerçeve oluşturulmuş ve katılımcı gruba sanal asistan kullanımına yönelik anket uygulanmıştır. Anketlerden elde edilen sonuçlar dahilinde insanların gündelik yaşamda sanal asistanlarla bir bağ kurdukları, bu bağ sebebiyle müşteri konumunda olduklarında kararlarının sanal asistanlardan etkilenebildiği ortaya çıkmıştır (Garrotes, 2021).

SONUÇ

Antik çağdan itibaren insanlar yorulmadan çalışmanın yollarını aramış, bu nedenle doğadan elde ettikleri malzemelerle kendilerine çeşitli mekanik araçlar yapmaya başlamışlardır. Modern dünyada aynı amaca bağlı olarak harekete geçmiş, fiziksel emeğin mekanizasyonundan sonra, insanlar uzun süredir tamamen insan ayrıcalığı olan zihinsel süreçlerin otomasyonunu düşünülmüştür. Nihayet 20.yüzyılda 1940'larla birlikte bilgisayar teknolojisinin gelişmesi nedeniyle, bellek kaynaklarını ve işlemci gücünü akıllı programlar oluşturmak için kullanmak mümkün hale gelmiş, insanoğlu en azından hafızasındaki yükü bir başka araç üzerinden saklayıp kullanma yoluna geçmiştir.

21.yüzyılın bilgi çağı olmasının en büyük sebebi teknolojinin gelişmesi ve insan aklıyla yarışabilecek seviyeye gelmesidir. Bu durumun en önemli örneği elbette ki yapay zekâdır. Yapay zekâ, standartlaştırılmış veriler arasında gezinerek ve yapılandırılmamış verileri, sayıları, konuşma kalıplarını ve cümleleri kapsamlı bir şekilde okuyup inceleyerek kaynaklardan ve zamandan kolayca tasarruf edebilir. İnsan aklının çalışma prensiplerini esas alan yapay zekâ tıpkı bir insan gibi düşünebilen ve olaylara karşı tepki verebilen bir yapılanmaya sahiptir. Onun bu yapılanması yaşamın her alanında kullanılarak hayatı kolaylaştırmaktadır.

Bu makale çalışmasında yapay zekâ teknolojileriyle birlikte oluşturulan akıllı asistanlar ele alınmış, bu akıllı asistanların tüketici davranışı ve deneyimindeki yerine ilişkin literatür taranmış ve örnek yurt içi-yurt dışı çalışmalar incelenmiştir. İncelenen çalışmalar sanal asistanların banka, yeme -içme işletmeleri ve daha birçok alanlarda kullanılabilecek türde bir yardımcı olduğunu ve tüketicilere fayda sağladığını göstermektedir. Her ne kadar bir insan beyninin karmaşık yapılanmasını taklit edememesi ve bu nedenle %100 başarılı sonuçlar

sunamamasına rağmen, tüketicilerin işini kolaylaştırması ve onlara her konuda yardımcı olabilmesi sanal asistanların en önemli özelliğidir. Tüketici davranışları yaş, cinsiyet, beğeni gibi birçok faktörden etkilenmektedir. Bu noktada sanal asistanlar olabildiğince tüketici komutlarına bağlı olarak onu anlamak ve tüketiciye en ideal olanı sunmak amaçlı çalışırlar. Bu noktada tüketim sürecinde sanal asistanların önemli bir yardımcı olduğu belirtilmelidir.

KAYNAKÇA

Abbas, N.N., Ahmed, T., Shah, S.H.U., Omar, M. & Park, H.W. (2019). Investigating the applications of artificial intelligence in cyber security. Scientometrics, 121, 1189–1211

Alhayani, B., Mohammed, H.J., Chaloob, I.B. & Ahmed, J.S. (2021). Effectiveness of artificial intelligence techniques against cyber security risks apply of IT industry. Materials Today: Proceedings,

Ashmore, W. C. (2009). Impact of Alleged Russian Cyber Attacks, Baltic Security & Defence Review, 11, 4-40

Ayyıldız, A.Y. & Eroğlu, E. (2021). Restoranlarda Kullanılan Akıllı Teknolojiler ve Robot Restoranlar Hakkında Tripadvisor'da Yapılan Yorumların Değerlendirilmesi. Journal of Tourism and Gastronomy Studies, 9 (2), 1102-1122

Bahrin, M.A.K., Othman, M.F., Azli, N.H.N. & Talib, M.F. (2016). Industry 4.0: A review on industrial automation and robotic. Jurnal Teknologi, 78, pp.6-13

Balcı, E. (2019). Overview of Intelligent Personal Assistants. Acta Infologica, 3(1), 22-33

Bhatele, K.R., Shrivastava, H. & Kumari, N. (2019). The Role of Artificial Intelligence in Cyber Security. IGI Global.

Bulut, E. & Akçacı, T. (2017). Endüstri 4.0 ve İnovasyon Göstergeleri Kapsamında Türkiye Analizi. ASSAM Uluslararası Hakemli Dergi (ASSAM - UHAD) ASSAM International Refereed Journal, 7, 50-72

Calderon, R. (2019). The Benefits of Artificial Intelligence in Cybersecurity. La Salle University La Salle University Digital Commons.

Cebeloğlu, F.S. (2020). Endüstri 4.0 Sistemlerinde Yapay Zeka Tabanlı Siber Güvenlik Yaklaşımlarının Geliştirilmesi. Elazığ: Fırat Üniversitesi Fen Bilimleri Enstitüsü Yüksek Lisans Tezi.

Das, R. & Sandhane, R. (2020). Artificial Intelligence in Cyber Security. Journal of Physics: Conference Series, 1964, 1-11

Efe, A. (2021a). Yapay Zekâ ve Endüstri 4.0 İlişkisinin Siber Güvenlik Perspektifinden Analizi. Aydın Adnan Menderes Üniversitesi, Sosyal Bilimler Enstitüsü Dergisi, 8(1), 123-143

Efe, A. (2021b). Yapay Zeka Odaklı Siber Risk ve Güvenlik Yönetimi. Uluslararası Yönetim Bilişim Sistemleri ve Bilgisayar Bilimleri Dergisi, 5(2), 144-165

Eren, B. A. (2021). Sanal Bankacılık Müşteri Asistanlarına İlişkin Hizmet Kalitesinin Müşteri Güveni, Müşteri Tatmini ve Müşteri Sadakatine Etkisi ve Ağızdan Ağıza İletişim. Pazarlama ve Pazarlama Araştırmaları Dergisi, 14(2), 239-283

Esmailzadeh, A. & Rolandsson, M. (2019). Voice assistants and how they affect consumer behavior. Master's thesis in MPQOM.

Fırat O.Z. & Fırat S.Ü. (2017). Endüstri 4.0 Yolculuğunda Trendler ve Robotlar. Istanbul University Journal of the School of Business- IUJSB 46(2), 211-223

Garrotes, P.S.M.S. (2021). Exploring The Engagement Process Between Humans And Intelligent Virtual Assistans, ISCTE Bussiness School.

Gökalp, Ö.M. (2022). Makine Öğrenmesi.

https://www.researchgate.net/publication/357974983 (Erişim Tarihi: 02.04.2022).
Gülşen, İ. (2019). İşletmelerde Yapay Zeka Uygulamaları ve Faydaları: Perakende Sektöründe Bir Derleme, Tüketici ve Tüketim Araştırmaları Dergisi, 11(2), 407-436
Hatipoğlu, C. & Tunacan, T. (2021). Türkiye'de Siber Saldırı ve Tespit Yöntemleri: Bir Literatür Taraması. Bilecik Şeyh Edebali Üniversitesi Fen Bilimleri Dergisi, 8(1), 430-445
Hoffman, W. (2021). AI and the Future of Cyber Competition, CSET Issue Brief, 1-35
İrdem, İ. & Çobanoğlu, S. (2021). Yapay Zekânın İç Güvenlik Yönetimi Üzerine Yansımaları-Siber Güvenlik, Kamu Yönetimi ve Teknoloji Dergisi, 3(2), 175-202
İşlek, M. S. (2012). Sosyal Medyanın Tüketici Davranışları Üzerine Etkisi, Karamanoğlu Mehmet Bey Üniversitesi Sosyal Bilimler Enstitüsü Yüksek Lisans Tezi.
Jiang, J., Hassan Awadallah, A., Jones, R., Ozertem, U., Zitouni, I., Gurunath Kulkarni, R. , and Khan, O. Z. (2015). Automatic online evaluation of intelligent assistants. In Proceedings of the 24th International Conference on World Wide Web (WWW '15). 506– 516.
Jones, V. K. (2018). Voice-Activated Change: Marketing in the Age of Artificial Intelligence and Virtual Assistants. Faculty Publications, College of Journalism & Mass Communications.
Karasoy, H. A. (2021) Kamu Güvenliğinde Yeni Paradigmalar: Hibrit Savaş Asimetrik Savaş Vekâlet Savaşı İstihbarat ve Terörle Mücadele, Ankara: Nobel Yayıncılık.
Khisamova, Z.I., Begishev, I.R. & Sidorenko, E.L. (2019). Artificial Intelligence and Problems of Ensuring Cyber Security. 9 International Journal of Cyber Criminology, 13, 564-577
Kılıç, S. & Alkan, R.M. (2018). Dördüncü Sanayi Devrimi Endüstri 4.0: Dünya ve Türkiye Değerlendirmeleri. Girişimcilik-İnovasyon ve Pazarlama Araştırmaları Dergisi, 2(3), 29-49
Koşan, M.A. & Benzer, R. (2018). Siber Güvenlik Alanında Derin Öğrenme Yöntemlerinin Kullanımı. Paper presented at the Fifth International Management Information Systems Conference. 1-10
Kubovič, O., Jánošík, J. & Košinár, P. (2020). Siber güvenlikte Makine Öğrenimi Dönemi: Daha güvenli bir dünyaya doğru bir adım mı, yoksa kaosun başlangıcı mı?. https://cdn1.esetstatic.com/ESET/TR/Documents/ML_WP_MWC_TR.pdf (Erişim Tarihi: 01.04.2022).
Kumar, K. & Thakur, G.S.M. (2012). Advanced Applications of Neural Networks and Artificial Intelligence: A Review. I.J. Information Technology and Computer Science, 6, 57-68
Kumar, N., Kharkwal, N., Kohli, R. & Choudhary, S. (2016). Ethical aspects and future of artificial intelligence. 2016 International Conference on Innovation and Challenges in Cyber Security (ICICCS-INBUSH).
Li, J.H. (2018). Cyber security meets artificial intelligence: A Survey. Frontiers of Information Technology & Electronic Engineering, 19, 1462–1474
Küçükkalay, A.M. (1997). Endüstri Devrimi ve Ekonomik Sonuçların Analizi. Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 2, 51-68
Mahesh, B. (2018). Machine Learning Algorithms - A Review. International Journal of Science and Research (IJSR). 9(1), 381-386
Marr, B. (2018). The key definitions of Artificial Intelligence (AI) that explain its importance. Retrieved from: https://www.forbes.com/sites/bernardmarr/2018/02/14/the-key-definitions-ofartificial intelligence-ai-that-explain-its-importance/#4da358124f5d. (Erişim Tarihi: 01.04.2022).
Mosteanu, N.R. (2022). Artificial Intelligence and Cyber Security – A Shield against Cyberattack as a Risk Business Management Tool – Case of European Countries. Quality - Access to Success . Apr2020, 21, p148-156

Mucuk, İ. (2009). Pazarlama İlkeleri, Ankara: Türkmen Kitabevi
Naveenkumar, K.H. (2021). "Artificial Intelligence", Learning Outcomes of Classroom research, Ed. J.Karthikeyan, Ting Su Hie, Ng.Yu Jin, India: Engineering and Technology
Ning, H., Zhang, Z., Shi, F., Farha, F., Xu, Y., Zhang, F. & Choo, KKR. (2022). Artificial intelligence in cyber security: research advances, challenges, and opportunities. Artificial Intelligence Review, 55, 1029–1053
Özsoylu, A.F. (2017). Endüstri 4.0, Çukurova Üniversitesi İİBF Dergisi, 21(1), 41-64
Öztürk, K. & Şahin, M.E. (2018). Yapay Sinir Ağları ve Yapay Zekaya Genel Bir Bakış. Takvim-i Vekayi, 6(2), 25-36
Patil, P. (2016). Artficial Intelligence İn Cyber Security. International Journal of Research In Computer Applications and Robotics. 4-5, 1-5
Perez, J. A.; F. Deligianni, D. & Ravi, G. Y. (2017) Artificial Intelligence and Robotics, UK: EPSRC UK-RAS Network.
Raiyn, J. (2014). A survey of Cyber Attack Detection Strategies, International Journal of Security and Its Applications, 8, 247-256
Ramesh, A.N., Kambhampati, C., Monson, J.RT & Drew, P.J. (2004). Artificial Intelligence In Medicine. Ann R Coll Surg England, 86, 334–338
Rifkin, J. (2015). Nesnelerin İnterneti ve İşbirliği Çağı, Çev. Levent Göktem, İstanbul: Optimist Yayıncılık
Sadiku, M.N.O., Fagbohungbe, O.I. & Musa, S.M. (2020). Artificial Intelligence in Cyber Security. International Journal of Engineering Research and Advanced Technology (IJERAT), 6, 1-8
Sagar, B.S., Niranjan, S., Nithin, K. & Sachin, D.N. (2019). Providing Cyber Security using Artificial Intelligence – A survey. 2019 3rd International Conference on Computing Methodologies and Communication (ICCMC).
Sarma, M., Matheus, T. & Senaratne, C. (2020). Chapter 4: Artificial Intelligence and Cyber Security: A New Pathway for Growth in Emerging Economies via the Knowledge Economy?. WSPC Series in Business and Emerging MarketsBusiness Practices, Growth and Economic Policy in Emerging Markets, pp. 51-67
Sedjelmaci, H., Guenab, F., Senouci, S.M., Mustafa, H. etc. (2020). Cyber Security Based on Artificial Intelligence for Cyber-Physical Systems. EEE Network, 34, 6-7
Soni, V.D.K. (2020). Challenges and Solution for Artificial Intelligence in Cybersecurity of the USA. USA. Campbellsville University
Soylu, A. (2018). Endüstri 4.0 ve Girişimcilikte Yeni Yaklaşımlar, Pamukkale Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 32, 43-57
Şenkaya, Y. & Adar, U.G. (2014). Siber Savunmada Yapay Zekâ Sistemleri Üzerine İnceleme. Akademik Bilişim, 1-7
TDK (2021). Türkçe Sözlük. Ankara: TDK Yayınları.
Thuraisingham, B. (2020). The Role of Artificial Intelligence and Cyber Security for Social Media. 2020 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW).
Wirkuttis, N. & Klein, H. (2017). Artificial Intelligence in Cybersecurity. https://www.inss.org.il/wp-content/uploads/2017/03/Artificial-Intelligence-in-Cybersecurity.pdf (Erişim Tarihi: 12.04.2022).
Yıldız, A. (2018). Endüstri 4.0 ve Akıllı Fabrikalar. Sakarya Üniversitesi Fen Bilimleri Enstitüsü Dergisi, 22(2), 546-556

Yılmaz, E. N. , Gönen, S. , Şanoğlu, S. , Karacayılmaz, G. & Özbirinci, Ö. (2021). Endüstri 4.0'ın Gelişim Sürecinde Unutulan Bileşen: Siber Güvenlik . Düzce Üniversitesi Bilim ve Teknoloji Dergisi, 9 (4), 1142-1158

Zeylan, T. & Öztürk, G. (2019). Türkiye'deki Seyahat Acentelerinin Mobil Pazarlamayı Kullanımı. Uluslararası Halkla İlişkiler ve Reklam Çalışmaları Dergisi, 2 (2) , 73-95

E-TİCARETTE YENİLİK YÖNETİMİ ve UYGULAMALARI

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ÖZET

Ülke ekonomileri üzerinde söz sahibi olma yolunda ilerleyen e-ticaret, yenilikçi yaklaşımlarla hacmini arttırmaktadır. Bu nedenle son dönemlerde işletmelerin en ağırlık vermeye çalıştığı konuların başında yenilik yönetimi gelmektedir. Küreselleşme ve yoğunlaşan rekabet koşulları, rakiplerinden farklılaşma gereksinimi duyan işletmeler tarafından yenilik yönetimi ile karşılanmaktadır. Öyle ki yenilikçi anlayış örgüt tarafından da benimsenmelidir.

Yenilik eğilimlerinde yaşanan artış ticaret uygulamalarının gelişmesine vesile olmaktadır. Özellikle ödeme yöntemlerinde oluşturulan yenilikler sektörü daha cazip kılmaktadır. Mobil ve internet kullanımındaki artış fiziki ortamların aksine e-ticarete yönelimi artırmaktadır. Türkiye'de 2016 yılında 30,8 milyar TL'ye ulaşan e-ticaret hacmi tüm gelişmeler ışığında 2018'de %42'lik büyüme yaşamıştır. Böylece 59,9 milyar TL'ye erişmiştir. Türkiye ve dünyada artan yenilik eğilimleri ekonomiye yenilikçi faaliyetler kapsamında boyut kazandırmakta ve e-ticaret uygulamaları ekonomi üzerinde daha fazla söz sahibi olmaktadır.

Araştırmanın amacı yenilik yönetimi ve e-ticarette geliştirilen yenilik uygulamalarını ortaya koymaktır. Bu nedenle araştırma iki ana bölümde ele alınmaktadır. İlk bölümde, işletmelerde yenilik ve yenilik yöntemleri, ikinci bölümde ise e-ticaret kapsamında yenilik yönetimine örnek teşkil eden Polkadot, Cardano, Ripple, Ethereum gibi Dijital Para, Blockchain Teknolojisi, NFC, QR gibi mobil ödeme uygulamaları incelenmiştir. Yenilik yönetiminde en önemli arz olan dış unsurun insan olduğu, yeniliklerin tüketici istekleri doğrultusunda oluşturulması gerekliliği, kaynakların planlanmasının hayati önem arz ettiği tespit edilmiştir. Etkin bir yönetim için kaynak teşkil eden unsurlar; kaynak kullanabilme, risk alma, katılımcı liderlik, yenilikçi örgüt yapısı ve kültürü, işletme otonomisi, bilimsel gelişmeler, tedarikçiler ve müşterilerdir. Sonuç olarak bu kaynaklardan elde edilen bilgilere göre, etkin yenilik yönetimi süreci sonunda piyasaya sürülen e-ticaret uygulamalarından en sık yararlanılan teknolojilerin; mobil ödeme, QR Kod ve NFC olduğu, diğer e-ticaret teknolojilerinin henüz gelişme gösterdiği tespit edilmiştir.

Gelecek araştırmalar için yaygınlaşan internet e-ticaret alanında yenilikçi fikir ve uygulamaların geliştirilmesine gereksinim doğduğu ve sosyal medya ile daha da yoğun bir hal aldığı göz önünde bulundurulmalıdır. Artan tüketici bilinci ve seçiciliği açısından bireyselleştirilmiş hususi içerik üretme zorunluluğu oluşmaktadır. Bu nedenle e-ticarette kitlesel özelleştirme kavramını önem verilmeli ve tüketicilerin beklentileri ile tercihleri önemle değerlendirilmelidir. Ayrıca cari açığı yüksek olan ülkelerde ödemeler dengesini rahatlatacağı saptanan e-ticaretin, önemli bir rekabet aracı haline geleceği gerçeği unutulmamalıdır.

Anahtar Kelimeler: E-ticaret, Teknoloji ve Yenilik Yönetimi, Yeni Teknolojiler

INNOVATION MANAGEMENT AND IMPLEMENTATIONS IN E-COMMERCE

ABSTRACT

E-commerce, which is on the way to have a say in national economies, is increasing its volume with innovative approaches. For this reason, innovation management is one of the most important issues that businesses try to focus on recently. Globalization and intensifying competition conditions are met with innovation management by businesses that need to differentiate from their competitors. So much so that the innovative approach should be adopted by the organization.

The increase in innovation trends is conducive to the development of trade practices. Especially innovations created in payment methods make the sector more attractive. The increase in mobile and internet usage increases the orientation towards e-commerce, unlike physical environments. The e-commerce volume, which reached 30.8 billion TL in 2016 in Turkey, experienced a 42% growth in 2018 in the light of all developments. Thus, it reached 59.9 billion TL. Increasing innovation trends in Turkey and in the world add dimension to the economy within the scope of innovative activities and e-commerce applications have a greater say on the economy.

The aim of the research is to reveal innovation management and innovation applications developed in e-commerce. In the first part, innovation and innovation methods in businesses, and in the second part, mobile payment applications such as Polkadot, Cardano, Ripple, Ethereum, Blockchain Technology, NFC, QR, which are examples of innovation management within the scope e-commerce. For this reason, the research is discussed in three parts. In the first part, the subject is introduced, innovation and innovation methods in businesses, and in the second part, innovative applications within the scope of e-commerce are defined. It has been determined that the most important external factor in innovation management is human, innovations must be created in line with consumer demands, and resource planning is of vital importance. Elements constituting a resource for an effective management; resources, risk taking, participatory leadership, innovative organizational structure and culture, business autonomy, scientific developments, suppliers, and customers. It has been determined that other e-commerce technologies, of which mobile payment, QR Code and NFC are the most frequently used e-commerce applications, which are put on the market at the end of the effective innovation management process by making use of these resources, are still developing.

For future research, it should be taken into account that there is a need to develop innovative ideas and applications in the field of internet e-commerce, which has become widespread, and it has become even more intense with social media. In terms of increasing consumer awareness and selectivity, it is necessary to produce individualized special content. For this reason, the concept of mass customization in e-commerce should be given importance and consumers' expectations and preferences should be evaluated. In addition, it should not be forgotten that e-commerce, which is determined to ease the balance of payments in countries with high current account deficit, will become an important competitive tool.

Keywords: E-commerce, Technology and Innovation Management, New Technology

GİRİŞ

Alışveriş kavramı dünya üzerinde en çok yinelenen olay ve olgulardan biridir. Kökeni incelenen kelimede karşılaşılan ödeme olgusu ürün-hizmet satın alımları karşısında verilen karşılığı ifade etmektedir. Modern çağda bu karşılık paradır. Gelişen teknoloji, bilim, bilgi, iletişim yöntemleri tüketicilerin alışveriş ve satın alma alışkanlık ve davranışlarını dönüştürdüğü gibi ödeme sistemlerine dair anlayışları da değiştirmektedir. Bu nedenle öncelikle fiziksel mağazalarda kredi kartlarının haricinde çeşitli ödeme yöntemleri ile karşılaşılmaya başlanmıştır. E-ticaret incelendiğinde benzer bir durumla karşılaşılmaktadır.

Dijital dönüşüm ile sağlanan yeniliğin, işletme ve markalar için yenilik yönetimini gerekli kılmaktadır. Çağa en yakın hizmeti sunan e-ticaretin ise yenilik yönetimi ağırlıklı olarak ödeme sistemleri üzerinden ilerlediği görülmektedir. Bu kapsamda doğası gereği dijital ortamda gerçekleşen alışverişlerin nakit ödemeyi imkansız kılması ve e-ticarete olan ilginin artması internet üzerinden satın alma davranışının benimsenmesine ve dijital kanallardan alışveriş yapma alışkanlığı kazanılmasına neden olmaktadır. Tüketicilerin tamamına hitap edebilmek, karar verici pozisyonunda olan müşteri veya tüketicilere alternatif kolaylıklar sunabilmek için işletmeler olabildiğince fazla türde ödeme sistemi aracına sahip olmayı istemektedir. Aksi takdirde kullanmayı istediği ve planladığı ödeme yöntemini seçemeyen tüketici satın alma kararını değiştirerek satın almama davranışı göstermektedir. Bu nedenle e-ticaret yenilik yönetimi uygulamaları adı altında incelenen ödeme araçları tüketicilerin satın alma güdülerini tetikleyebilen unsurlar olarak kabul görmekte; belirleyici bir rolü olan bu konunun araştırılması gerekmektedir. Bu araştırmada söz konusu nedenlerden dolayı e-ticarette yenilik yönetimi irdelenmektedir. Alanyazın araştırması ile desteklenen e-ticarette yenilik yönetimi örnek uygulamalarına geniş çapta yer verilmektedir.

ARAŞTIRMA VE BULGULAR

1. E-TİCARET VE YENİLİK YÖNETİMİ

1.1. E-Ticaret

TDK'nın genel ağ olarak nitelendirdiği internet, küresel çapta kullanıcı sayısını giderek arttırmaktadır (TDK, 2022). Çok sayıda bilgisayar sistemini birleştirebilen ve kullanım alanı global çapa yayılan iletişim ağı vasıtasıyla her alanda kullanılmaya başlamıştır. Bu durumdan ticaret de etkilenmiştir. Kullanımın ve gereksinimin artması ile elektronik ticaret uygulamaları başlatılmış ve kavram oluşmuştur. E-ticaret olarak da anılan kavram Web 2.0 teknolojisi kullanılarak oluşturulan alışveriş siteleri vasıtasıyla hizmet vermektedir. Böylece tüketici, ihtiyaç hissettiği ve gereksinim duyduğu her an fiziksel bir mağazaya gitmeksizin internet üzerinden dilediği zaman ve mekanda satın alma imkanı bulmaktadır (Vural & Bat, 2010, s. 3350).

Yaşanan gelişmelerin Türkiye'de sağladığı ilerleme ilk elektronik ticaret sitesi olarak açılan hepsiburada.com'dur. 1998'de kurulan bu sitenin kullanım oranlarının iyi olması neticesinde e-ticaret siteleri benimsenmeye başlamıştır. 2019 Nisan 2020 Mart arasındaki dönemde 19-74 yaş grubundaki bireylerin %36,5 oranında elektronik ticari faaliyet gerçekleştirdiği bilinmektedir. Önceki döneme oranla %7 oranında artış gösteren bu verilerin yanı sıra 2021'de açıklanan veriler durumu gözler önüne sermektedir (Özdöl, 2022, s. 36). 381.5 milyar TL bandında gerçekleşen e-ticaret hacmi %69 artış göstermiş olup sipariş adedi 3 milyar 347 milyona yükselmiştir. 2021 genel ticarete oranı yüzde 17.7 olan e-ticaret kampanya ayı olarak nitelendirilen Kasım ayında en yüksek (%20,4) paya ulaşmıştır. Ayrıca e-ticaret faaliyeti gerçekleştiren işletmelerin sayısı 484.347 olup Elektronik Ticaret Bilgi Sistemi (ETBİS)

üzerinde kaydı olanların sayısı 26.442 olarak paylaşılmıştır. 18-70 yaş grubunda edinilen verilerin genel popülasyona oranlanması ile 2021 yılı elektronik ticaret harcaması 4749 TL olarak tespit edilmiştir (Ticaret Bakanlığı, 2022).

1.2. Yenilik

Latince "ınnovatus" kelimesinden türeyen yenilik kavramı idari kültürel ve toplumsal ortamlarda kullanılmaya başlanan yeni yöntemleri ifade etmektedir. Inovation (İngilizce) sözcüğü, Türkçeye inovasyon olarak çevrilmektedir. Bu nedenle çoğu zaman inovasyon ve yenilik kavramı birbirinin yerine kullanılmaktadır (Elçi Ş. , İnovasyon: Kalkınma ve Rekabetin Anahtarı, 2.bs, 2007, s. 1-2).

1.2.1. Yenilik Yönetimi

Rekabet edebilmek adına aksiyona zorlayan itici güç olarak tanımlanan yenilik; işletmelerin hayatta kalabilmek üzere, süreçlerinde geliştirdiği organizasyonel ve teknik yöntemler, aradığı yeni pazarlar için zorunluluktur. Öyle ki yeniliğe sürükleyen sebeplerin bazıları işletmenin Kendi isteği veya tetiklendiği dış bir neden ile meydana gelmektedir. İşletmeler tarafından gerçekleştirilen her bir faaliyetin bir süreç olması ve yeniliğin bu kapsamda değerlendirilmesi çeşitli aşamalara tekabül etmektedir. Öyle ki günümüzde yenilik stratejileri ile temel stratejiler oldukça bağlantılıdır. Ayrıca yenilik örgüt kültürü niteliği de taşıyabilmektedir. Bu durumda organizasyonun yenilik faaliyetlerine göre geliştirilmesi; üst düzey verim ve faydalı bir çıktı için yeniliğin en iyi biçimde yönetilmesi gerekmektedir. Yenilik yönetimi performansı değerlendirilmeli, eksik ve zayıf yönler geri bildirimler doğrultusunda iyileştirilmelidir (Gökçek, 2007, s. 44).



Şekil 1. Yenilik Yönetim Yetkinlik Değerlendirme
Kaynak: (PM, 2018)

1.2.2. Yenilik Yönetiminde Etkisi Bulunan Unsurlar

Rekabet avantajının arttırılması, örgütsel yenilik sürecinin anlamlandırılması ve yenilik sürecinin yönetimi örgüt tarafından öğrenilmeye bağlıdır. Bu durumda yenilik yönetiminde etkisi bulunan unsurların bilinmesi ve öğrenilmesi hayati bir önem taşımaktadır. Örgütsel yenilik sürecinde ön koşul kişisel gelişim ve öğrenme disiplinin ifadesi olan ve öğrenme ile Zihni yönetebilme sanata olarak nitelendirilen kişisel iradedir. Üst düzey kişisel iradeye sahip bireyler beceri ve yeteneklerini sürekli olarak geliştirmekte ve örgüte katkı sunmaktadır. İkincil koşul, örgüt üyelerinin desteklendiği ve kendini yenilik ile öğrenmeye adammış olan liderlik tarzına sahip olmaktır. Üçüncül koşut erişilmek istenen gelecek, üretkenlik, yaratıcılık için yenilikçiliği teşvik eden ve paylaşılan vizyondur. Ayrıca işletmenin çevreye adaptasyonu ve dönüşümcülüğü ilerletme becerisi önemli diğer etkin unsurlarıdır (Garcia-Morales, Llorens-Montes, & Verdu-Jover, 2006, s. 22-35). Daha yenilikçi olan işletmelerin ileri düzeyde teknoloji ve bilgiye sahip oldukları, yoğun insan kaynağını nitelikli yetenekli ve profesyonel özelliklerde bulundurduğu, imkan çeşitliliği ve finansal kaynak yarattığı yapılan araştırmalarla ortaya konmaktadır (Sundbo, 2001, s. 92).Diğer sektörlerden daha fazla yenilikçiliğe sahip olduğu tespit edilen sektörler ağırlama hizmetleri, bankacılık ve e-ticarettir (Lopez-Fernandez, Serrano-Bedia, & Gomez-Lopez, 2011, s. 146). Gerçekleştirilen araştırmalarda yenilik yönetiminde etkili olan unsurlar uyum ve bağlılık, liderlik, örgütsel kültür normları, kaynak elverişliliği, örgütsel büyüklük ve örgütsel Yapı olarak listelenmektedir (Lyons, Chatman, & Joyce, 2007, s. 179). Diğer bir yönden işletmede yaşanan yenilik sürecinin teknoloji ve pazar bilgisi bakımından eksik kalması, meydana getirilen yeni veya dönüştürülmüş ürün ve hizmetlere yönelik tüketici ilgisinin yatay düzeyde oluşturulamaması yenilik süreci yönetimini olumsuz etkilemektedir (Lopez-Fernandez, Serrano-Bedia, & Gomez-Lopez, 2011, s. 147). Özellikle hizmet işletmelerinde yenilik uygulamalarında kilit nitelik teşkil eden unsurlar insan kaynağıdır. Ancak zorluk ve değişim süreçleri ile mücadelede gereken insan kaynağı kalifiye olma zorunluluğu taşımaktadır aksi takdirde yenilikçilik engellenmektedir (Warech & Tracey, 2004, s. 377). Aktarılanlardan hareketle yenilik yönetimi başarısında etkili olan ve önem arz eden örgütsel unsurlar içeriğin devamında listelenmektedir:

- Yenilik Kaynakları; Tedarikçiler, Müşteriler, Bilimsel Gelişmeler (Gökçek, 2007, s. 23-24). (Sönmez, 2016, s. 43).
- İşletme Otonomisi (Eren & Gündüz, 2002, s. 73).
- Yenilikçi Örgüt Yapısı ve Kültürü (Özge & Erkocaoğlu, 2009, s. 208). (Durna, 2002, s. 167) (Sönmez, 2016, s. 83):
- Katılımcı Liderlik (Akyan, 2004, s. 214). (Ocak, 2014, s. 33). (Tidd, Bessant, & Pavitt, 2001, s. 316).
- Risk Alma (Akman, 2003, s. 90). (Sönmez, 2016, s. 91).
- Kaynak Kullanabilme İmkânı (Naktiyok, 2007, s. 219)

2. E-TİCARETTE YENİLİK YÖNETİMİNE ÖRNEK UYGULAMALAR

2.1.Mobil Uygulama

Mobil endüstrinin en hızlı büyüme gösteren segmentlerinden biri mobil uygulama pazarı olup mobil işletim sistemlerinin kendilerine ait uygulama mağazalarında bulunmaktadır. Ekonomik maliyet, heterojen ve geniş tüketici kitlesi erişimi için imkan yaratan bu yönelik küçük ölçekli işletmelerin dahi küresel rekabetine imkan sağlamaktadır. Bunun nedeni mobil uygulama geliştirme bilgisine sahip olan ve kodlama yapabilen herkesin ürünü geliştirebilmesi ve

uygulamasını pazara yükleyebilmesidir. Ayrım yapılmaksızın herkese açık olan bu uygulamalar mağazalarda üç sınıfa ayrılmaktadır (Kim, Park, Kim, & Lee, 2014): mağaza sahibine ait uygulamalar, işletme uygulamaları, bağımsız uygulamalar (Kuusisto, 2016). Mağaza sahibine ait olan cihazda yerleşik bulunmakta (kamera, mesajlaşma vb.), bağımsız olanlar çeşitli kategorilerde geliştirilen uygulamalar olup işletme uygulamaları yazılım şirketleri tarafından sunulmaktadır. Ayrıca işletim sistemi olarak en yaygın olanlar; Blackberry cihazlar için Blackberry, Google için Android, Iphone ve Ipad gibi cihazlar için IOS işletim sistemidir. Android işletim sistemine ait uygulamalar Play Store, IOS işletim sistemine ait olanlar Apple Store mobil uygulama mağazasında yer almaktadır. Apple AppStore ve Google Play Store, mobil uygulamaların en büyük iki dağıtım kanalıdır. Güncel verilere göre Play Store 3.2 milyon uygulamayı içinde barındırırken, Apple store ise 1.7 milyon ile ikinci en çok mobil uygulamaya sahip mağazadır (Clement, 2019 aktaran Statista). Dünya genelinde uygulama indirme sayısı ise 2019 yılının ilk çeyreğinde yıllık %11,6 artışla 28,1 milyar olarak kayıtlara geçmiştir. Google Play indirmeleri %18.8 artışla 20.7 milyara yükselirken AppStore %4.7 düşüşle 7.4 milyara olarak açıklanmıştır (Sensor Tower, 2019). Play Store'un bu yükselişinin nedeni Android platformunun üçüncü taraf platformunun dağıtımına izin vermesi ve Android cihaz aralığının çok geniş olması ile hem ekonomik açıdan hem de cihaz çeşitliliği sayesinde insanların daha çok tercih etmesidir.

2.2. İnternet Bankacılığı

Bankacılık sektörünün küresel bir değişimde olması, hızlı gelişen teknoloji ve müşteri hizmetleri boyutları ile çeşitlenmesi, her alanda artış gösteren rekabet ve daralan kar marjları bireye dönük uygulamalar geliştirilmesini sağlamaktadır. Türk bankacılık sisteminde bu etkilerin tümü görülmekte olup özellikle e-ticaretin gelişimine öncülük etmektedir. Bankacılık hizmetlerinde satış sağlayabilen en yeni dağıtım kanalı olarak kullanıcının bulunduğu lokasyondan ayrılmaksızın telekomünikasyon ağları aracılığıyla ödeme yapma, transfer gerçekleştirme, bakiye görüntüleme gibi hizmetler internet bankacılığı tarafından sunulmaktadır (Aparikyan, 2000, s. 40-41). İşlemlerin daha az personel desteği ve maliyetle yapılmasını sağlayarak yöresel erişim kısıtlılığı barındırmamaktadır. Finansal hizmetler sunan bankaların bu durumları olmazsa olmaz nitelik taşıyabilecek hale kavuşmaktadır (İleri & İleri, 2014, s. 117).

2.3. Mobil Ödeme

Son dönemlerde kredi kartı işlemlerinden mobil ödeme sistemlerine dönüştürülen ödemeler ekonomideki değişimler internet teknolojisindeki ilerlemeler yaygınlaşan sosyal ağlar ve artan mobil cihaz kullanımı vasıtası ile gerçekleşmektedir. Yaygın meta olarak kullanımı sürdürülen akıllı telefonların yeni ödeme kanallarında yarattığı rahatlık ve kolaylık daha fazla talep çektiğinden finansal hizmet uygulamaları daha da kolaylaştırılarak teknik engeller azaltılmaktadır. Böylece kullanımları daha da kolay kılınmaya çalışılmaktadır (Ramos, Liebana-Cabanillas, Sánchez-Fernández, & Munoz, 2020). Mobil ödemeler için kullanılan yöntemler aşağıda sıralanmıştır.

2.3.1. E-cüzdan (Dijital cüzdan)

E-cüzdan; kullanıcıların kredi, banka ya da ön ödemeli kartlarınıaynı yere tanımlama fırsatı sunan elektronik bir cüzdandır. Karta ait bilgiler eklenmekte, silinmekte, değiştirilmektedir. e-

para ile QR Kod, NFC veya online ödeme yapılabilmekte, fiziksel kartla POS cihazı üzerinden gerçekleştirilmektedir (Ramos, Liebana-Cabanillas, Sánchez-Fernández, & Munoz, 2020).

2.3.2. OR (Quickresponse) Kod

QR Kod. 1994'te geliştirilen QR kod Japonya menşeili olup 2 boyutlu barkodu ifade etmektedir. Türkiye'de AUTO ED ve barkod yaygın olarak kullanılmaktadır. QR teknolojilerinin elektronik ortamlara hatasız ve hızlı aktarımını sağlayan sistemler tablo 1'de sıralanmıştır.

Barkod
Manyetik Mürekkeple Yazılmış Karakterlerin Tanınması (MICR)
Optik Yöntemle Karakterlerin Tanınması (OCR)
Radyo Dalgaları ile Tanıma (RF/ID)
Radyo Dalgaları ile Veri İletişimi (RF/DC)
Ses ile Algılama (Voice Recognition)
Sistem Entegrasyonu
Yapay Algılama (ArtificialVision)

Tablo 1. QR teknolojilerinin elektronik ortamlara aktarımını sağlayan sistemler

2.3.3. NFC (Near-Field Communications)

NFC iletişim protokolü, çalışma mesafesini, iletişim protokolünü ve güvenlik mekanizmasını sağlamak için bir standart olarak tanımlanan RFID iletişim protokolünün bir alt kümesidir. NFC okuyucu (telefon-tag), emsaller arası (telefon-telefon), temassız (telefon-POS) modlarda kullanılabilmektedir. NFC Teknolojisi standartları, 2004 yılında SonyTM ve Philips Semiconductors tarafından, mobil cihazların Temassız Okuyucu veya Temassız Kart olarak çalışabilmesi için tanımlanmıştır. Bazı kaynaklarda NFC ile e-ticaret vizyonunun genişlettiği belirtilmektedir (Türk, 2019); akıllı kart işlemlerini kolaylaştırmanın yanı sıra, cep telefonlarının gelişen multimedya özellikleriyle, NFC işlemlerinin video, müzik vb. "kartsız" satın alma ve indirme gerçekleştirdiği ifade edilmektedir (David, 2004).

2.4. E-Ticaret Sitesi Ödeme Sistemleri

2010'lu yıllardan önce bir iş kurulacağında işyeri lokasyonu, genişliği, tabela ve vitrini en fazla zaman ve önem ayrılan yerlerdi. Ancak günümüzde bu titizlik e-ticaret sitelerine dönüşmektedir. Büyük-küçük ölçekli işletmeler de online alışveriş yapılabildikleri e-ticaret sitelerine yönelmektedir. Bu durum ödeme sistemlerinin sorgulanmasına yol açmaktadır. E-ticaret siteleri çoklu yöntemlerde ödeme alabilmektedir. Site tasarımının ardından ödeme yöntemini seçmek sanal potansiyel müşteriler için önemlidir. E-ticaret işletmeleri ve çevrimiçi alışveriş yapan kitle için en tartışmalı yöntemlerdir (Saruhan, 2021). Fiziksel para, kapıda ödeme, EFT/Havale yöntemi gibi haricinde WireCard, iyzico, PayNet, PayTR gibi ödeme yöntemlerinden yararlanılmakta olup içeriğin devamında kısa tanımlara yer verilmektedir.

2.5. Dijital Para

Dijital para, katılan ve yürütülen olaylar arasında paylaşılan dijital muhasebe defterini içermekte olup dağıtılmış kayıt veritabanı halindeki blok zincirlerle gerçekleşmektedir. Bu kayıt bir bloğu ifade etmektedir. Çoklu tema teknolojileri entegrasyonu vasıtasıyla işlem gören blockchain dijital imza ve kriptografik tabanlı gerçekleşmektedir. Bu durum yüksek oranda mali tasarruf ve verimlilik sağlamaktadır. Yakın dönemlerde istikrarlı büyümeye sahip olan

piyasa %1200'ü aşkın değer kazanmış, 2017 yılının ardından yaygınlaşmayı sürdürmüştür. 26 Mart 2021'de piyasada dolaşımda bulunan kripto para 4479 adet olarak bildirilmiştir (Emek, 2021). Toplam piyasa değerleri 1,7 trilyon dolar olarak belirtilen bu kripto paralar toplam kapitalizasyondaen yüksek piyasa değerine sahip olma bakımından içeriğin devamında sırasız tanımlanmakta ve Tablo 2'de listelenmektedir.

➢ BinanceCoin (BNB)
➢ Bitcoin (BTC)
➢ Cardano (ADA)
➢ Ethereum (ETH)
➢ Litecoin (LTC).
➢ Polkadot (DOT)
➢ Ripple (XRP)
➢ Tether (USDT)
➢ Theta
➢ Uniswap (UNI)

Tablo 2. Kripto Paralar

2.6. Blockchain Teknolojisi

2007'de Nakamoto tarafından önerilen, 2008'e dek geliştirilen, 2009'un başında piyasaya sürülen blok zinciri, bloklar halinde depolanan merkezi olmayan veya dağıtılmış bir işlem defteri olarak tanımlanmakta, bloklar bir zincir oluşturarak birbirine bağlanmakta dolayısıyla blok zinciri olarak adlandırılmaktadır. Bu işlemlerin geçerliliği, merkezi olmayan bir ağda tarafından kararlaştırılmakta, tümü kriptografi ile korunmaktadır. Blok zincirindeki "düğüm", bloğu tutan veya sahibi olan müşteriye atıfta bulunmakta, defterin tam bir kopyasını saklamaktadır. "Blok", diğer bloklara girilmemiş en son işlemlerin tutulduğu yerdir, bu nedenle bir blok, bir defterin veya kayıt defterinin bir sayfasına benzemektedir (Yahya-İbrahim, 2021).

SONUÇ

Yenilik köken olarak yeni olan uygulama biçimlerini ifade etmektedir. Yenilik,idari ve kültürel ortamlarda, üretim, pazarlama ve tüketiciye sunma aşamasında yeni uygulama yöntemlerinin kullanılmasına işaret etmektedir (Elçi & Karataylı, 2008, s. 1). Kurumsal kapsamda ele alındığında isetüm işletme fonksiyonlarında karşılaşılabilen yenilikçi yaklaşımlar olup geleneksel çözümlerin ötesinde çözüm önerileri sunmaktadır. Yeni veya dönüştürülmüş yenilik, değer yaratabilecek düzeyde farklılaştırılmış ürünün piyasaya sürülmesini ifade etmektedir. Dolayısıyla yeniden üretim yerine niteliği arttırma veya hatayı mininize etme çabalarını içermektedir. E-ticaret konusunda kendisini tümüyle hissettiren yenilik değiştirilen veya yeni bulunan fikir proses yöntem vb. e-ticaret sektöründe kendisine sunabilmektedir. Bu nedenle yenilikçi eğilimlerle desteklenen e-ticaret süreçleri daha kolay başarıya ulaşmaktadır (Demirel & Eriş, 2019, s. 194-195).

Genişletilen ödeme sistemleri ve kargo seçenekleri yenilik faaliyetlerinin sonucunda geliştirilen e-ticaret hacmini işaret etmektedir. Amazon 2016'da test ederek kasiyerlerin işini sonlandıran bir uygulama geliştirmekte, alışverişini tamamlayan tüketicilerin mobil cihazına fatura göndermektedir. Bu örnekten dahi anlaşılacağı üzere Türkiye ve dünyada artan yenilik eğilimleri ekonomiye yenilikçi faaliyetler kapsamında boyut kazandırmakta ve e-ticaret uygulamaları ekonomi üzerinde daha fazla söz sahibi olmaktadır (Demirel & Eriş, 2019, s. 194-

195). Bu kapsamda etkin yenilik yönetimi sürecini takip ederek geliştirilen e-ticaret uygulamalarından en sık yararlanılanların mobil ödeme, QR Kod ve NFC olduğu diğer e-ticaret teknolojilerinin henüz gelişme gösterdiği gözlemlenmektedir.

KAYNAKÇA

Akman, G. (2003). *Bilişim Sektöründe Pazar Odaklılık, Yenilik Stratejileri ve Yenilik Kabiliyeti Arasındaki İlişkiler ve Bunların Şirket Performansı Üzerindeki Etkiler.* Gebze: Doktora Tezi, Gebze Yüksek Teknoloji Enstitüsü Sosyal Bilimler Enstitüsü.

Akyan, E. (2004). Kayseri'de Faaliyet Gösteren Girişimcilerin Liderlik Özellikleri. *Erciyes Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 2(17)*, 213-224.

Aparikyan, B. (2000). Bankacılıkta Teknoloji Kullanımı. *Banka ve Para Teknolojileri Dergisi, 6(2)*.

David, M. (2004, 02. 02). *Near-Field Communications Opens Vision Of E-Commerce*. https://www.electronicdesign.com/technologies/communications/article/21767672/nearfield-communications-opens-vision-of-ecommerce adresinden alındı

Demirel, D., & Eriş, V. (2019). Innovation trends in e-commerce applications: gittigidiyor.com case. *PressAcademia Procedia (PAP), 9*, 192-196.

Durna, U. (2002). *Yenilik Yönetimi.* Ankara: Nobel Yayınları.

Elçi, A. (2014). İş Ekipmanlarında Güvenlik Takibi İçin Bir Sistem Önerisi "Karekod Barkod Uygulama". 1-63.

Elçi, Ş. (2007). *İnovasyon: Kalkınma ve Rekabetin Anahtarı, 2.bs.* İstanbul : Tecnopolisgrup.

Elçi, Ş., & Karataylı, İ. (2008). İnovasyon Rehberi: Karlılık ve Rekabetin El Kitabı. *ANSİAD*.

Emek, M. (2021). *E-ticaret ve Kripto Para.* Ankara: Iksad Publications.

Eren, E., & Gündüz, H. (2002). İŞ ÇEVRESİNİN YARATICILIK ÜZERİNDEKİ ETKİLERİ VE BİR ARAŞTIRMA. *Doğuş Üniversitesi Dergisi, 3(1)*, 65-84.

Garcia-Morales, V., Llorens-Montes, F., & Verdu-Jover, A. (2006). Antecedents and Consequences of Organizational Innovation and Organizational Learning in Entrepreneurship. *Industrial Management & Data Systems, 106(1)*, 21-42.

Gökçek, O. (2007). *YENİLİK YÖNETİMİ SÜRECİ VE YENİLİK STRATEJİLERİ: OTOMOTİV SEKTÖRÜNDE BİR ALAN ÇALIŞMASI.* İstanbul: YÜKSEK LİSANS TEZİ, İSTANBUL ÜNİVERSİTESİ SOSYAL BİLİMLER ENSTİTÜSÜ.

İleri, Y., & İleri, H. (2014). İNTERNET BANKACILIĞI VE E-TİCARETİN TÜRKİYE EKONOMİSİ ÜZERİNDEKİ ETKİLERİ. *Selçuk Üniversitesi Sosyal Bilimler Meslek Yüksekokulu Dergisi, 14(2)*, 97-108.

iyzico. (2022). *Şimdi Kolay:iyzico ile Öde*. https://www.iyzico.com/kendim-icin/iyzico-ile-ode adresinden alındı

Kim, J., Park, Y., Kim, C., & Lee, H. (2014). Mobile Application Service Networks: Apple's App Store. *Service Business, 8(1)*, 1-27.

Kuusisto, T. (2016). *Marketing A Mobile Application In A Highly Competitive Global Marketplace.* Finland: LUT School of Business and Management.

Lopez-Fernandez, M., Serrano-Bedia, A., & Gomez-Lopez, R. (2011). Factors Encouraging Innovation In Spanish Hospitality Firms. *Cornell Hospitality Quarterly, 52(2)*, 144- 152.

Lyons, R., Chatman, J., & Joyce, C. (2007). Innovation In Services: Corporate Culture and Investment Banking. *California Management Review, 50(1)*, 174-191.

Naktiyok, A. (2007). Yenilik Yönelimi ve Örgütsel Faktörler. *Atatürk Üniversitesi İ.İ.B.F. Dergisi, 21(2)*, 211-230.

Ocak, S. (2014). *Okul Müdürü ve Öğretmenlerin Liderlik Stillerinin Bazı Değişkenler Açısından İncelenmesi (Erzurum İli Örneği).* İstanbul: Yüksek Lisans Tezi, İstanbul Üniversitesi Eğitim Bilimleri Enstitüsü .

Özdöl, E. (2022). *Covid-19 Pandemi Sürecinde Tüketicilerin E-Ticaret Sitelerinden Satın Alma Niyeti: E-Ticaret Kullanıcıları Üzerine Bir Araştırma.* İzmir: YAŞAR ÜNİVERSİTESİ LİSANSÜSTÜ EĞİTİM ENSTİTÜSÜ.

Özge, H., & Erkocaoğlu, E. (2009). Kurumsal Girişimcilik ile Örgüt Yapısı Arasındaki İlişki. *Ç.Ü. Sosyal Bilimler Enstitüsü Dergisi, 18(1)*, 203-214.

PM. (2018, 02. 02). *Proje İnovasyon Yönetimi*. Proje Yönetim Merkezi: http://www.projeyonetimmerkezi.com/proje-inovasyon-yonetimi/ adresinden alındı

Ramos, d., Liebana-Cabanillas, F., Sánchez-Fernández, J., & Munoz. (2020). Mobile Payment Adoption in the Age of Digital Transformation: The Case of Apple Pay. *Sustainability, 12*.

Saruhan. (2021, 05. 03). *E-Ticaret Sitelerinde Ödeme Yöntemleri ve Sanal Pos Kullanımı*. https://www.saruhanweb.com/blog/e-ticaret-sitelerinde-odeme-yontemleri-ve-sanal-pos-kullanimi adresinden alındı

Sönmez, A. (2016). *YENİLİK YÖNETİMİ VE YENİLİK YÖNETİMİNİ ETKİLEYEN FAKTÖRLERİN YENİLİK PERFORMANSI AÇISINDAN İNCELENMESİ: YENİLİK DESTEĞİ ALAN İŞLETMELER ÜZERİNDE BİR ARAŞTIRMA.* Kocaeli: YÜKSEK LİSANS TEZİ, KOCAELİ ÜNİVERSİTESİ SOSYAL BİLİMLER ENSTİTÜSÜ.

Sundbo, J. (2001). *The Strategic Management of Innovation.* Danimarka: Roskilde Üniversitesi; Edward Elgar Yayınları.

Taymaz, E. (2016, 08. 17). *Yenilik Kavramı ve Yenilik Politikaları*. metu.edu.tr: http://users.metu.edu.tr/etaymaz/yenilik-kavrami.html adresinden alındı

TDK. (2022). *Yenilik.* Türk Dil Kurumu Sözlükleri: https://sozluk.gov.tr/ adresinden alındı

Ticaret Bakanlığı. (2022, 04. 08). *T.C. TİCARET BAKANLIĞI ELEKTRONİK TİCARET BİLGİ SİSTEMİ (ETBİS) 2021 YILI VERİLERİ.* ELEKTRONİK TİCARET BİLGİ SİSTEMİ (ETBİS) 2021 YILI VERİLERİ: https://www.eticaret.gov.tr/dnnqthgzvawtdxraybsaacxtymawm/content/FileManager/Dosyalar/2021%20Y%C4%B1l%C4%B1%20E-Ticaret%20B%C3%BClteni.pdf adresinden alındı

Tidd, J., Bessant, J., & Pavitt, K. (2001). *Managing Innovation: Integrating Technological, Market and Organisational Change, 2.bs.* Chichester: Wiley.

Türk, İ. (2019). *NFC FEATURE BOX: AN OPEN, NFC ENABLER INDEPENDENT MOBILE PAYMENT AND IDENTIFICATION METHOD.* Ankara: MIDDLE EAST TECHNICAL UNIVERSITY.

Vural, Z., & Bat, M. (2010). Yeni Bir İletişim Ortamı Olarak Sosyal Medya: Ege Üniversitesi İletişim Fakültesine Yönelik Bir Araştırma. *Journal of Yasar University, 20(5)*, 3348-3382.

Warech, M., & Tracey, J. (2004). Evaluating The Impact of Human Resources: Identifying What Matters. *Cornell Hotel and Restaurant Administration Quarterly, 45(4)*, 376- 387.

Yahya-İbrahim, A. (2021). *MUSIC ROYALTY PAYMENT SCHEME USING BLOCKCHAIN TECHNOLOGY.* Karabük: Master Thesis, Karabuk University Institute of Graduate Programs.

RECOBRIMENTO DO FIO-GUIA DE AÇO INOXIDÁVEL COM ÓXIDO DE GRAFENO

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RESUMO

Os biomateriais são materiais sintéticos ou naturais usados para substituir ou restaurar a função de um tecido ou órgão, de maneira temporária ou permanente, sem causar reação adversa ao organismo. Os biomateriais sintéticos podem ser metálicos, poliméricos, cerâmicos ou compósitos. Os metálicos são utilizados há décadas, implantados ou não no corpo humano. O número de aplicações dos biomateriais apresenta crescimento contínuo devido à evolução das áreas biomédica e de Ciência dos Materiais. Dentre as aplicações dos biomateriais metálicos, destacam-se o uso de ligas metálicas como implantes na substituição de tecidos duros, como veículo para a liberação de drogas e como acessórios em cirurgias. Estas aplicações são diversificadas. Dentre as principais ligas utilizadas estão os aços inoxidáveis que são usados como implantes ou dispositivos médicos, como por exemplo, na forma de fio-guia em cirugia cardiovascular e em sondas enterais. No presente trabalho, foi estudado o recobrimento de fios de aço inoxidável ASTM F138, também chamados de mandril, usados na inserção das sondas enterais dos pacientes, por um filme de óxido de grafeno. Este tipo de fio-guia auxilia na introdução da sonda na posição determinada pelo médico. Após a introdução da sonda, o fio-guia é retirado e guardado pela equipe de enfermagem para um uso futuro no mesmo paciente. Durante o uso ou no processo de armazenamento, pode ocorrer a contaminação bacteriana, visto que a duração do tratamento de nutrição enteral pode permanecer por até 40 dias. Uma possibilidade de mitigar os riscos durante o tratamento seria o recobrimento com bactericidas, entre eles a deposição de óxido de grafeno. O recobrimento minimiza ou até elimina a contaminação por bactérias. No presente estudo, o fio-guia de aço inoxidável foi recoberto com óxido de grafeno e avaliado a qualidade do recobrimento.

Palavras-chave: Biomateriais. Aço Inoxidável. Dispositivos Médicos. Fio-guia. Óxido de Grafeno.

ABSTRACT
Biomaterials are synthetic or natural materials used to replace or restore the function of a tissue or organ, temporarily or permanently, without causing an adverse reaction to the organism. Synthetic biomaterials can be metallic, polymeric, ceramic or composites. Metallics have been used for decades, implanted or not in the human body. The number of applications of biomaterials shows continuous growth due to the evolution of the biomedical and Materials Science areas. Among the applications of metallic biomaterials, the use as implants in the replacement of hard tissues, as a vehicle for drug delivery and as accessories in surgery deserves to be highlighted. These applications are diverse. Among the metallic biomaterials, stainless steels are used as implants or medical devices, for example, in the form of guide wires in cardiovascular surgery and in enteral tubes. In the present study, ASTM F138 stainless steel wires, also called mandrel, used in the insertion of the patients' enteral tubes, were covered. This type of guidewire assists in introducing the probe in the position determined by the physician. After the insertion of the probe, the guidewire is removed and kept by the nursing team for future use in the same patient. During use or in the storage process, bacterial contamination can occur, as the duration of enteral nutrition treatment can last up to 40 days. One possibility to mitigate the risks during the treatment would be the coating with bactericides, including the deposition of graphene oxide. The coating minimizes or even eliminates bacterial contamination. In the present study, the stainless steel guidewire was coated with graphene oxide and the quality of the coating was evaluated.

Keywords: Biomaterials. Stainless Steel. Medical Devices. Guide Wire. Graphene Oxyde.

INTRODUÇÃO

Os biomateriais podem ser definidos como materiais naturais ou sintéticos a fim de restaurarem ou substituirem a função de um órgão ou tecido do corpo, de forma temporária ou permanente, de maneira que não cause malefícios ao hospedeiro. Segundo Pires; Bierhalz; Moraes (2015), não é possível generalizar quais serão as características desejadas dos biomateriais, pois dependerão do uso, porém, algumas propriedades são frequentemente avaliadas: biológicas (biocompatibilidade), associada à hemocompatibilidade, citotoxicidade, alergenicidade, estimulação de adesão e proliferação celular; as físicas (morfologia da superfície), energia superficial, encaixe anatômico, rugosidade, porosidade, cor, transparência e permeabilidade. Assim como as propriedades mecânicas: tensão de ruptura, alongamento e flexibilidade e por fim, as propriedades químicas: densidade, estabilidade, resistência à esterilização e forma de degradação quando em contato com o organismo para que o projeto do dispositivo possa ser realizado de forma efetiva e economicamente atraente.

O processo tem início a partir da identificação da necessidade de um biomaterial para uma certa aplicação, desde o tratamento de uma doença, substituição de um órgão ou até mesmo para o uso cosmético. A seguir, começarão alguns testes, e em todas as etapas necessitará de profissionais com variadas formações para analisar vários aspectos requeridos. Desta forma, pode-se assegurar que a abordagem para o desenvolvimento dos biomateriais é multidisciplinar (Pires; Bierhalz; Moraes, 2015).

Dentre os diferentes tipos de matérias-primas disponíveis para a obtenção de biomateriais, a classe dos metais destaca-se por apresentar excelente desempenho mecânico, como alta resistência à fadiga e à fratura. Logo, os metais têm sido amplamente utilizados como componentes estruturais visando à substituição, reforço ou estabilização de tecidos rígidos, os quais são constantemente submetidos a altas cargas de tração e compressão. Neste âmbito, as

aplicações mais comuns incluem fios, parafusos e placas para fixação de fraturas, implantes dentários e próteses para substituição de articulações (Sumita; Hanawa; Teoh, 2004).

Atualmente, os metais mais utilizados na área biomédica são os grupos dos aços inoxidáveis, as ligas de titânio e o titânio comercialmente puro, e as ligas à base de cobalto-cromo. Segundo Disegi & Eschbach (2000), os aços inoxidáveis apresentam boas propriedades mecânicas, baixo custo em relação a outros metais, fácil processamento e alta disponibilidade.

Nos últimos tempos, o setor de biomateriais cresceu em número de produtos disponíveis e em desenvolvimento, como também avançou economicamente de maneira significativa. Entretanto, apesar da grande disponibilidade atual de biomateriais, os desenvolvimentos nesta área são ainda uma necessidade, visto que boa parte dos dispositivos tecnologicamente mais avançados está restrita ao uso por uma pequena parte da população mundial (Pires; Bierhalz; Moraes, 2015). Em se tratando de biomateriais tecnologicamente mais modernos, alguns estudos vêm mostrando a eficiência de se adicionar reforços como a tentativa de aprimorar as características inerentes do material, por exemplo, o uso do óxido de grafeno com a finalidade de mitigar ou inibir micro-organismos patogênicos.

De acordo com Oliveira et al. (2018), a matéria-prima para obtenção do óxido de grafeno é o grafite, encontrado na natureza na forma de flocos ou em pó. O óxido de grafeno possui estrutura semelhante ao grafite, mas com um diferencial de ter grupos funcionais contendo oxigênio, com isso, proporciona uma característica hidrofílica ao material, ou seja, pode ser solúvel em água, diferente do grafite, de caráter apolar, que não solubiliza em água. O Brasil é um dos países com as maiores reservas naturais de grafite do mundo, logo, a obtenção de óxido de grafeno através do grafite torna-se um método barato e de grande potencial, por fornecer elevada quantidade de matéria-prima para produção (Alencar; Santana, 2017).

PESQUISA E DESCOBERTAS

Conforme mencionado anteriormente, os aços inoxidáveis possuem adequadas propriedades mecânicas para o fim, excelente custo-benefício e maior disponibilidade comparado aos outros materiais. Consoante a Pires; Bierhalz; Moraes (2015), as ligas de aço inoxidáveis, podem formar precipitados de carbonetos de cromo nos contornos dos grãos, que acabam ocasionando um enfraquecimento da camada passiva e assim uma diminuição da resistência à corrosão. Por isso, em dispositivos biomédicos é importante que se tenha uma baixa quantidade de carbono, por exemplo, no aço austenítico 316L (ASTM F138), o qual possui o máximo de 0,03% de carbono. Além do baixo teor de carbono, este tipo de aço é composto por cromo (16 a 18%), níquel (12 a 15%) com a finalidade de estabilizar a estrutura austenítica do ferro e melhorar a resistência à corrosão e molibdênio (2 a 3%) para tornar a camada passiva mais resistente a meios corrosivos. Isso é necessário pois esses materiais são utilizados em ambientes corrosivos, neste caso, são os fluidos corpóreos.

Uma alternativa para melhorar as propriedades do aço inoxidável seria a utilização de um revestimento em sua superfície, como por exemplo, o uso do óxido de grafeno, a fim de melhorar a resistência à corrosão. O óxido de grafeno é um material altamente promissor e tem sido estudado para ser utilizado como um biomaterial. Esse tipo é uma variação do grafite e vem sendo estudado e analisado nos dispositivos médicos como agente para inibir ou reduzir o crescimento bacteriano nas superfícies desses materiais que podem ser provenientes do ambiente, utensílios ou das mãos do manipulador ou até de processos inflamatórios.

A respeito do fio-guia da sonda enteral, sua função é de orientar a passagem do tubo enteral, fornecendo estabilidade para que o técnico de enfermagem consiga realizar o procedimento de forma mais rápida, segura e com menos desconforto. Após a inserção, o fio-guia (figura 1) é

retirado e armazenado para caso haja a necessidade de reintrodução. O tempo de permanência dessa terapêutica é de até 40 dias e pode ser o suficiente para adesão bacteriana ou processos patológicos ocorrerem.

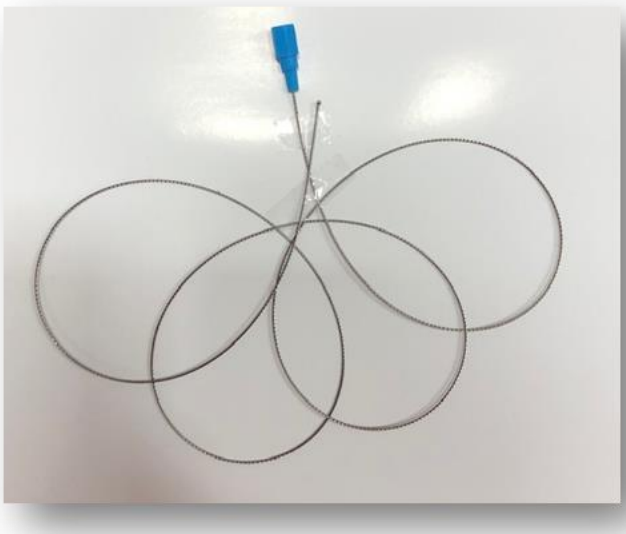

Figura 1 - Fio-guia de sonda enteral.

Um teste fora realizado no aço inoxidável em formato de discos, a fim de se obter maior área superficial para a avaliação da deposição de óxido de grafeno e observar como ficou depositado. Para facilitar a deposição, o disco de aço foi "embutido" em resina acrílica e soldado com fio de cobre para gerar o contato elétrico (figura 2a). O método da deposição utilizado foi a eletrodeposição, a qual se utiliza um ânodo, neste caso foi a placa de platina e um cátodo que foi a amostra de aço inoxidável inseridos em um béquer contendo o óxido de grafeno diluído (figura 2b).



Figura 2 – a) Amostras embutidas;
b) Eletrodeposição do aço inoxidável no óxido de grafeno diluído.

Como resultado, foi feito a análise no microscópio eletrônico de varredura (MEV/SEM). Nota-se que o óxido de grafeno foi depositado, assim como também mostrou as dobras das suas nanofolhas.

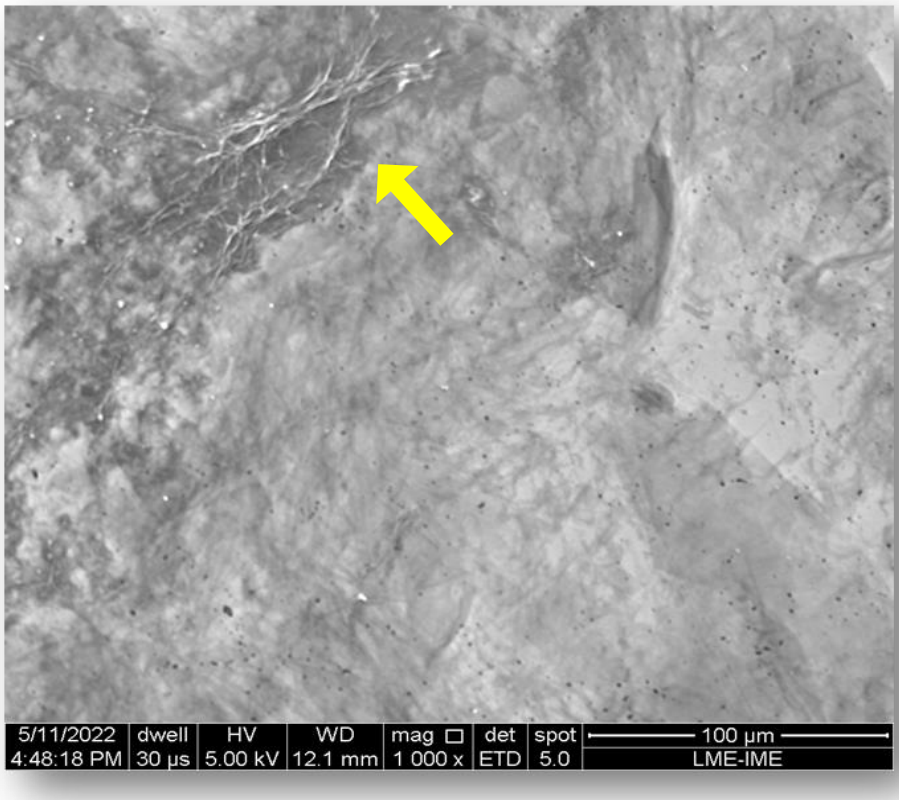

Figura 3 – Micrografia do aço inoxidável e óxido de grafeno depositado.

De acordo com Matos (2017), o óxido de grafeno é facilmente disperso em água por causa da presença dos grupamentos polares em sua estrutura. Porém, existem vários fatores que podem influenciar a quantidade de óxido de grafeno realmente esfoliado e disperso oriundo do óxido de grafite, tais como: método de obtenção do óxido de grafite, método de esfoliação (ultrassom ou agitação mecânica), temperatura, tempo e quantidade de energia mecânica fornecida. Conhecer a concentração de óxido de grafeno presente na dispersão é imprescindível para a síntese de nanocompósitos, permitindo estabelecer um controle adequado sobre quantidades de carga adicionada e avaliar sua influência nas propriedades do material.

CONCLUSÃO

O óxido de grafeno foi depositado na superfície do aço inoxidável, provando que o método escolhido teve sucesso, porém mais testes precisarão ser feitos a fim de obter a resposta se essa deposição de óxido de grafeno terá caráter antimicrobiano e se será aceitável de ser utilizado como uma alternativa segura contra a ação microbiana nos dispositivos médicos metálicos.

REFERÊNCIAS

Moo, J. G. S., Khezri, B., Webster, R. D., & Pumera, M. (2014). Graphene Oxides Prepared by Hummers', Hofmann's, and Staudenmaier's Methods: Dramatic Influences on Heavy-Metal-Ion Adsorption. *ChemPhysChem*, *15*(14), 2922-2929.

Saba, N., Alothman, O. Y., Almutairi, Z., Jawaid, M., & Asad, M. (2019). Introduction of graphene-based nanotechnologies. *Graphene-Based Nanotechnologies for Energy and Environmental Applications*, 3-21.

Oliveira, M., Poletto, M., & Severo, T. C. (2018). Rota química para produção de óxido de grafeno a partir de oxidação do grafite comercial. *Revista Interdisciplinar de Ciência Aplicada*, *3*(6), 16-20.

Alencar, E., & Santana, D. (2017). Processos De Obtenção Do Grafeno, Suas Aplıcações E Sua Importâncıa Para O Brasıl. *Oswaldo Cruz Paper*.

Pires, A. L. R., Bierhalz, A. C., & Moraes, Â. M. (2015). Biomateriais: tipos, aplicações e mercado. *Química nova*, *38*, 957-971.

Sumita, M., Hanawa, T., & Teoh, S. H. (2004). Development of nitrogen-containing nickel-free austenitic stainless steels for metallic biomaterials. *Materials Science and Engineering: C*, *24*(6-8), 753-760.

Poinern, G. E. J., Brundavanam, S., & Fawcett, D. (2012). Biomedical magnesium alloys: a review of material properties, surface modifications and potential as a biodegradable orthopaedic implant. *American Journal of Biomedical Engineering*, *2*(6), 218-240.

Hanawa, T. (2012). Research and development of metals for medical devices based on clinical needs. *Science and technology of advanced materials*, *13*(6), 064102.

Disegi, J. A., & Eschbach, L. (2000). Stainless steel in bone surgery. *Injury*, *31*, D2-D6.

Matos, C. F. D. (2015). Materiais nanocompósitos multifuncionais formados por látices poliméricos e grafeno ou óxido de grafeno: síntese, caracterização e propriedades.