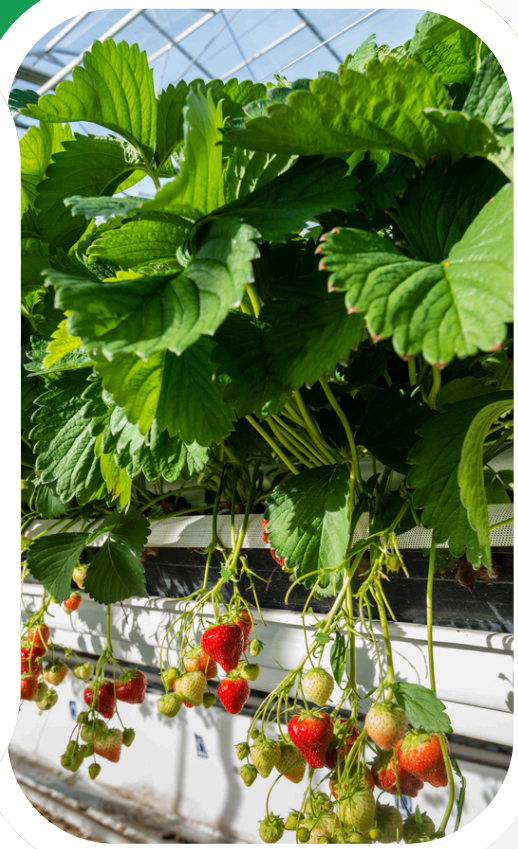
INTERNATIONAL CONGRESS OF HIGH VALUE ADDED AGRICULTURAL PRODUCTS

01-03 DECEMBER 2024 / IĞDIR, TÜRKİYE



EDITORS

Prof Dr. Mehmet Hakki Alma

Prof.Dr. Sefa Altikat

ABSTRACTS BOOK

ISBN: 978-625-378-039-5

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01-03 / DECEMBER / 2024 / IĞDIR, TÜRKİYE

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Prof. Dr. Mehmet Hakkı ALMA

Prof. Dr. Sefa ALTIKAT

Issued: 23.12.2024

ABSTRACT BOOK

ISBN: 978-625-378-039-5

CONGRESS ID

CONGRESS TITLE

INTERNATIONAL CONGRESS OF HIGH VALUE ADDED AGRICULTURAL PRODUCTS

DATE AND PLACE

December 1-3, 2024 – Iğdır, Türkiye

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Total Accepted Article: 173

Total Rejected Papers: 47

Accepted Article (Türkiye): 82

Accepted Article (Other Countries): 91

ISBN: 978-625-378-039-5

INTERNATIONAL CONGRESS OF HIGH VALUE-ADDED AGRICULTURAL PRODUCTS

01-03 / DECEMBER / 2024 / IĞDIR

23.12.2024

REF: Akademik Teşvik

İlgili makama;

Uluslararası Katma Değeri Yüksek Tarımsal Ürünler Kongresi, 1-3 Aralık 2024 tarihleri arasında Iğdır'da 18 farklı ülkenin (Türkiye 82 bildiri- Diğer ülkeler 91 bildiri) akademisyen/araştırmacılarının katılımıyla gerçekleşmiştir

Kongre 16 Ocak 2020 Akademik Teşvik Ödeneği Yönetmeliğine getirilen "Tebliğlerin sunulduğu yurt içinde veya yurt dışındaki etkinliğin uluslararası olarak nitelendirilebilmesi için Türkiye dışında en az beş farklı ülkeden sözlü tebliğ sunan konuşmacının katılım sağlaması ve tebliğlerin yarıdan fazlasının Türkiye dışından katılımcılar tarafından sunulması esastır." değişikliğine uygun düzenlenmiştir.

Bilgilerinize arz edilir,

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Prof. Dr. Sefa ALTIKAT
Dean of Faculty of Agriculture, Iğdır University
CONGRESS PRESIDENT

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Ziraat Fakültesi Dekanlığı

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Konu : Kongre Görevlendirme

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01-03 Aralık 2024 tarihlerinde düzenlenecek olan "INTERNATIONAL CONGRESS OF HIGH VALUE ADDED AGRICULTURAL PRODUCTS" Kongresi düzenleme kuruluna aşağıda unvan ve isimleri yazılı olan öğretim elemanları resmi olarak ve üniversite akademisyen temsilcisi olarak görevlendirilmiştir.

Gereğini bilgilerinize arz/rica ederim.

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Prof. Dr. Sefa ALTIKAT
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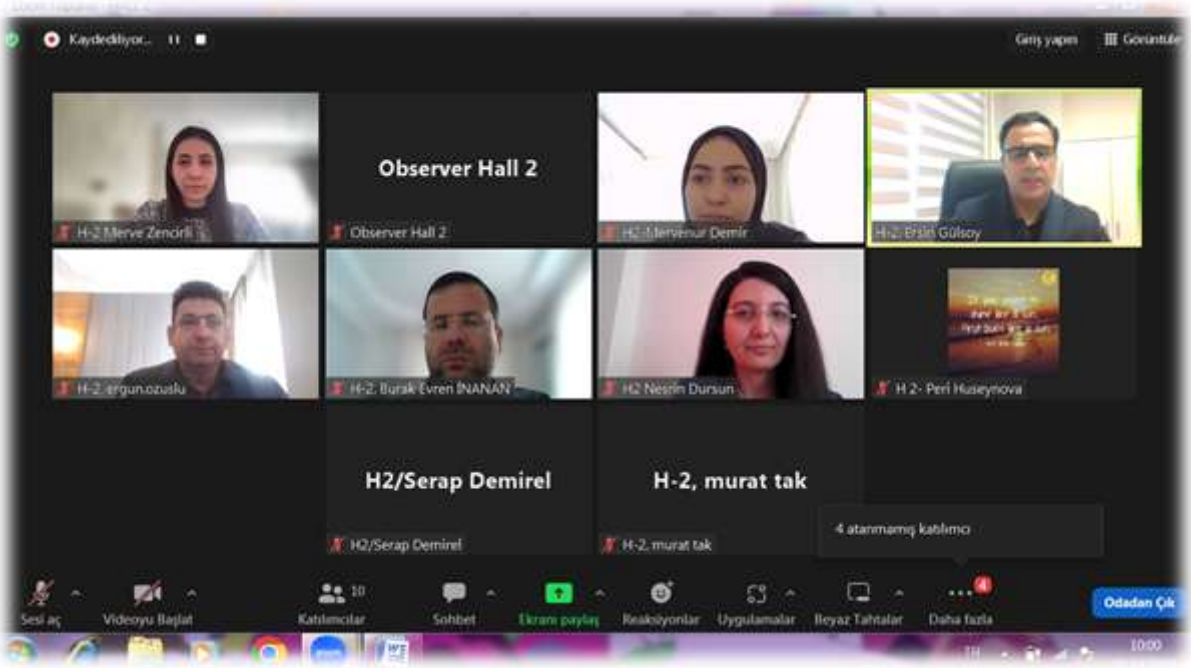

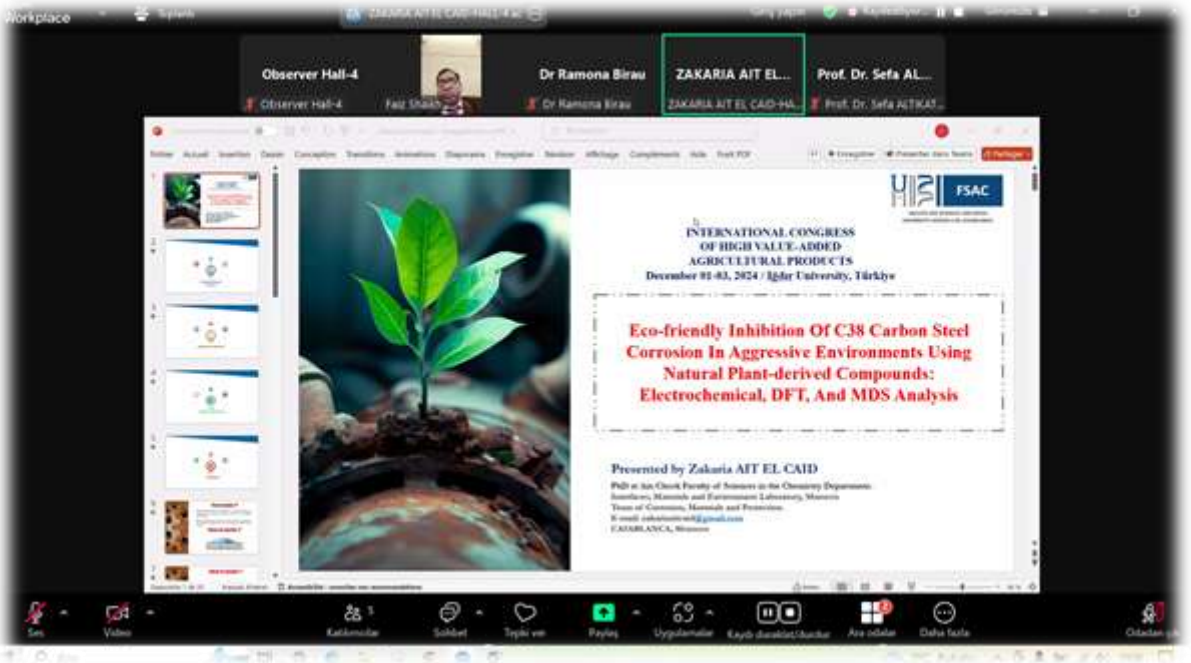

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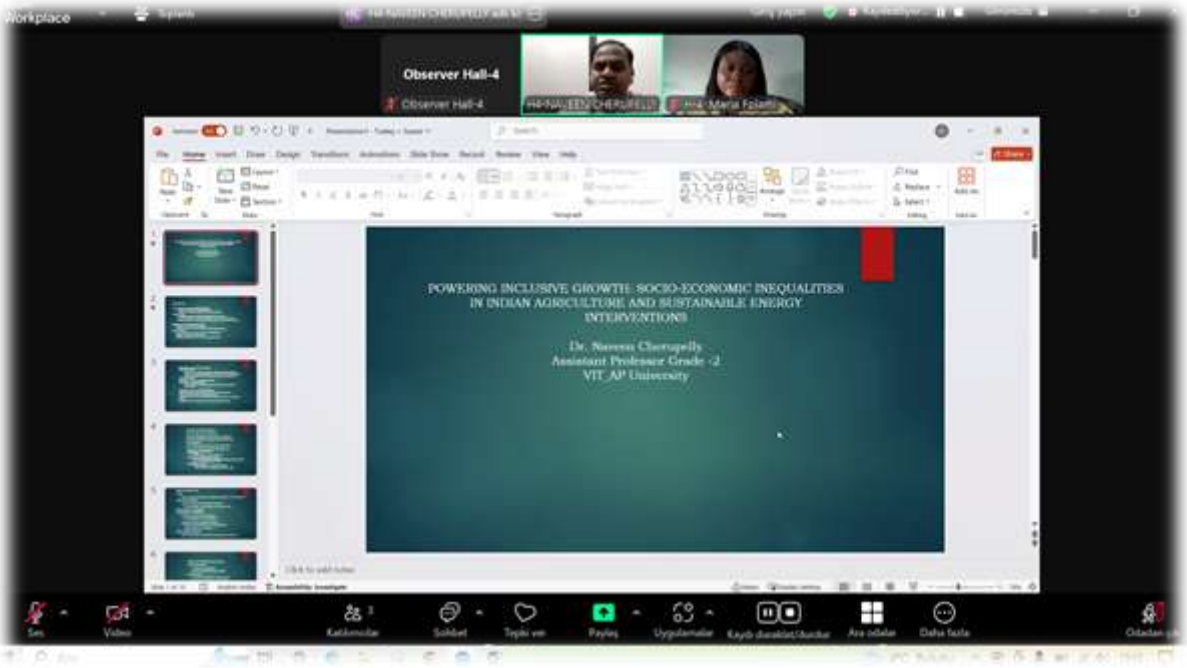

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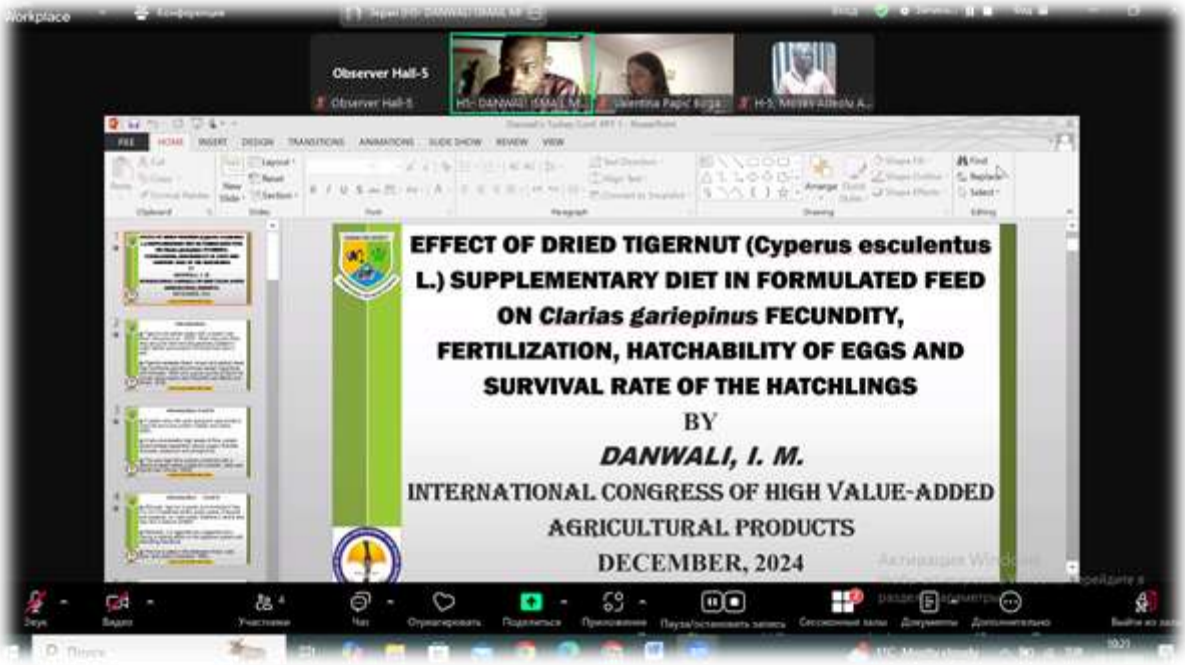

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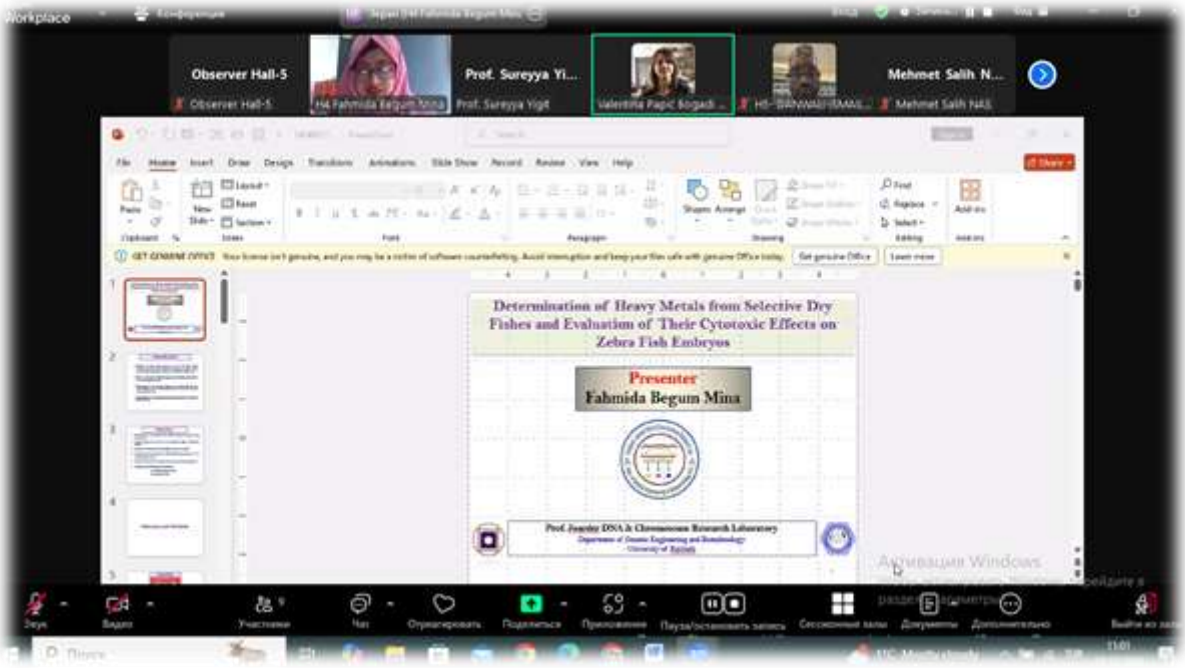

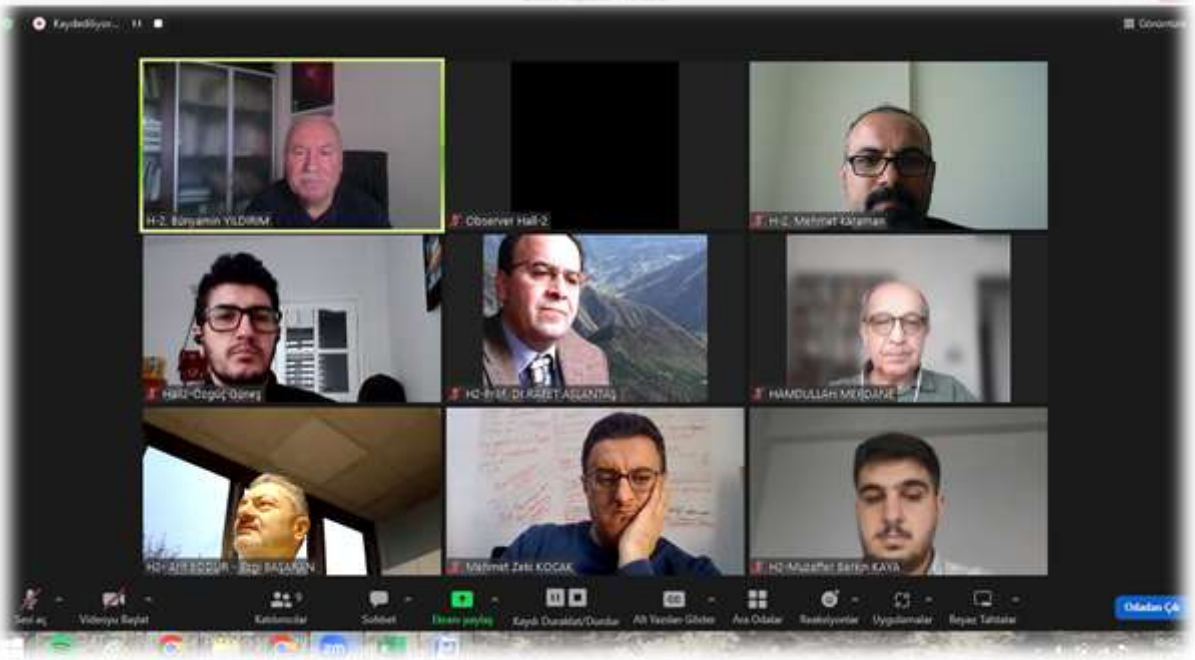

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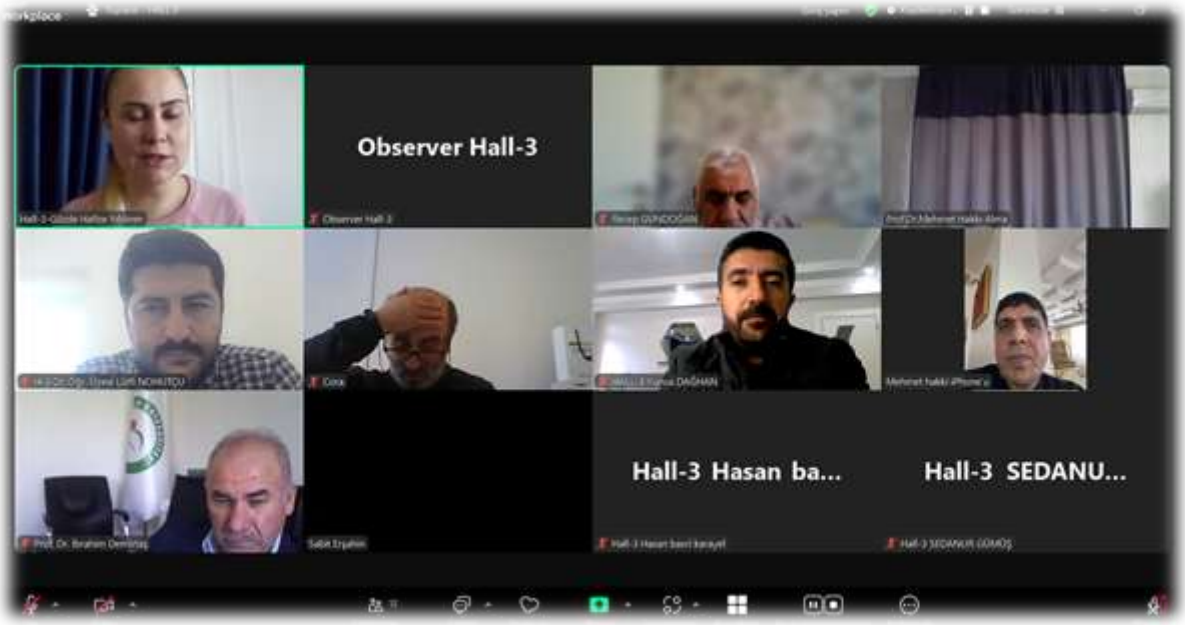

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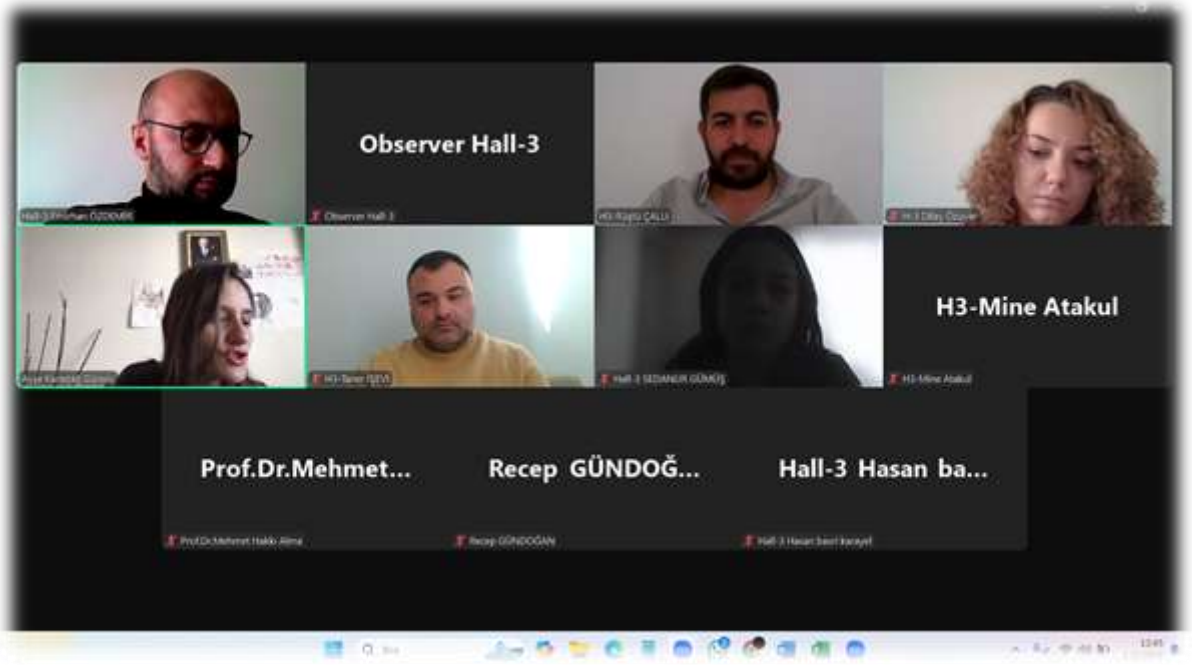

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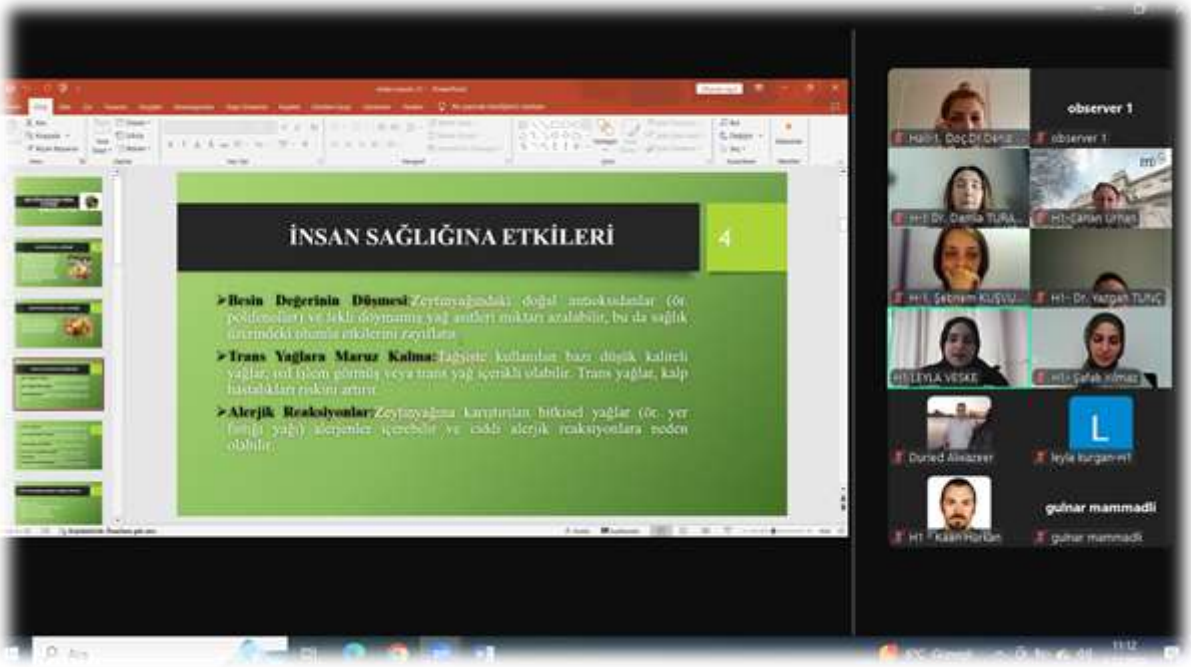

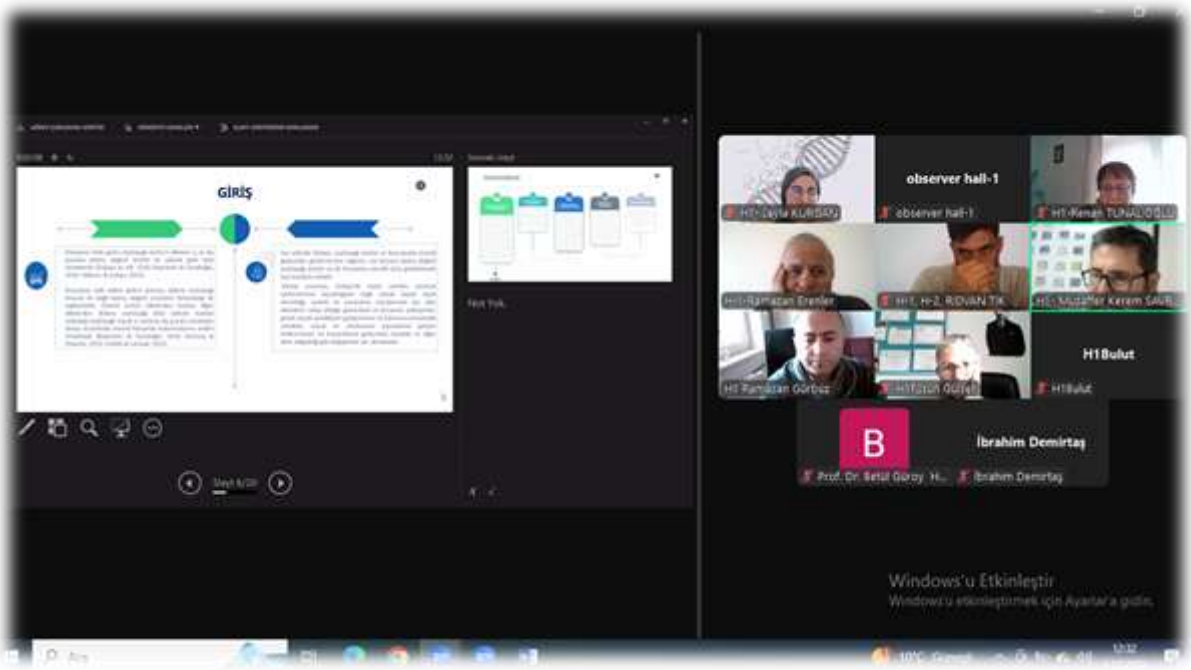

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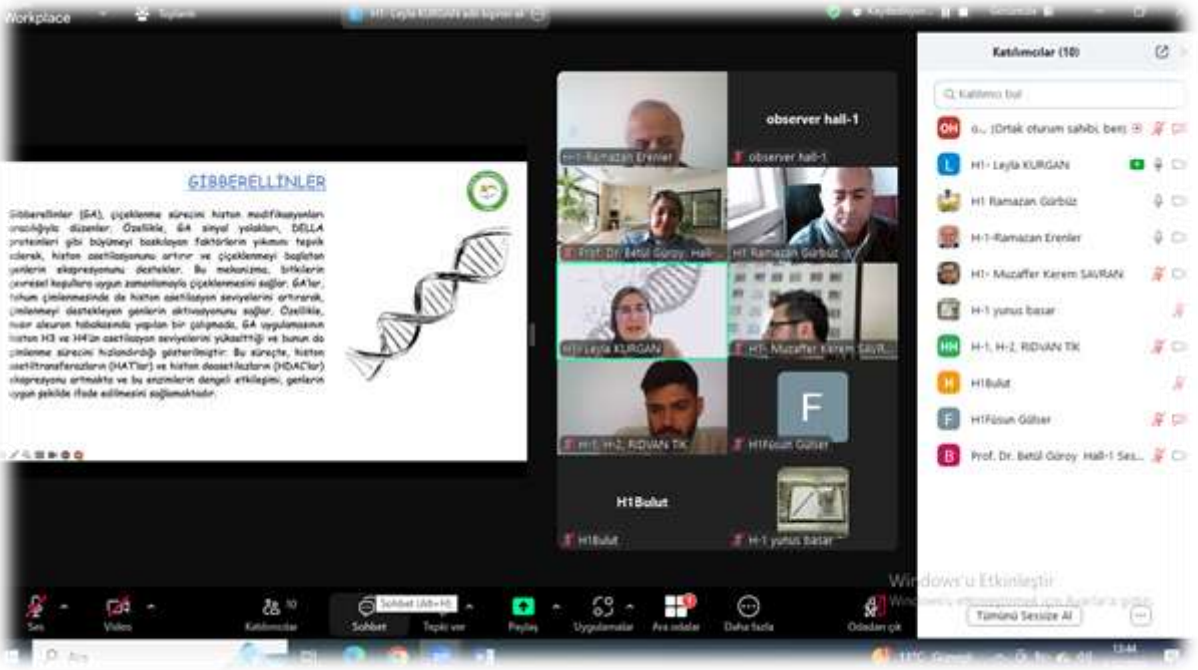

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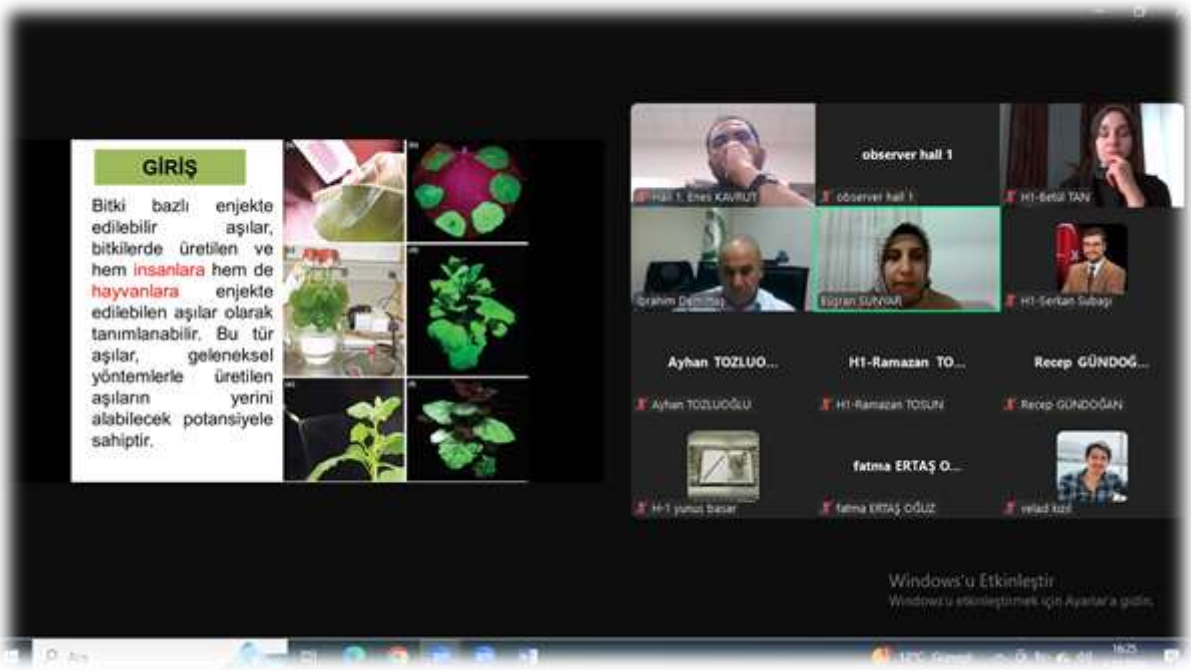

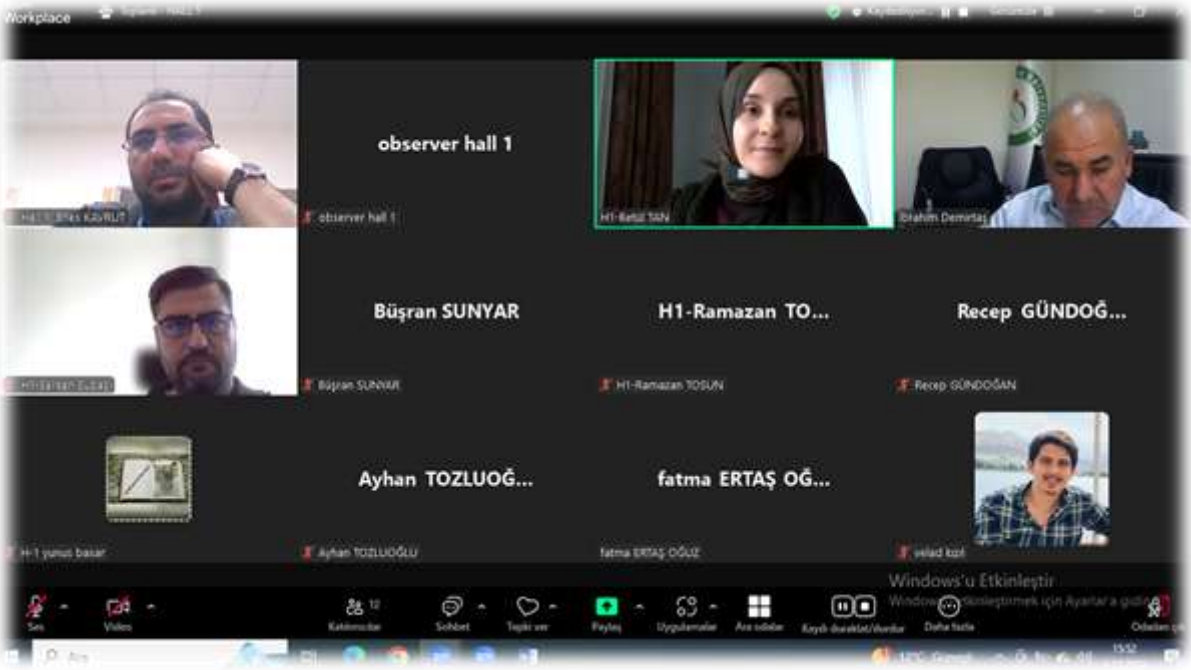

INTERNATIONAL CONGRESS OF HIGH VALUE-ADDED AGRICULTURAL PRODUCTS

December 01-03, 2024 / Iğdır University, Türkiye

CONGRESS PROGRAM

ONLINE

Meeting ID: 897 0755 8402
Passcode: 010203

Participant Countries (18)

TÜRKİYE, ROMANIA, PAKISTAN, CANADA, NORTH MACEDONIA, EAST SARAJEVO, SERBIA, RUSSIA, MOROCCO, EAST SARAJEVO, AZERBAIJAN, VIETNAM, INDONESIA, ETHIOPIA,BOSNIA AND HERCEGOVINA, CROATIA, GEORGIA, BANGLADESH

Önemli, Dikkatle Okuyunuz Lütfen

- Kongremizde Yazım Kurallarına uygun gönderilmiş ve bilim kurulundan geçen bildiriler için online (video konferans sistemi üzerinden) sunum imkanı sağlanmıştır.
- Online sunum yapabilmek için https://zoom.us/join sitesi üzerinden giriş yaparak "Meeting ID or Personal Link Name" yerine ID numarasını girerek oturuma katılabilirsiniz.
- Zoom uygulaması ücretsizdir ve hesap oluşturmaya gerek yoktur.
- Zoom uygulaması kaydolmadan kullanılabilir.
- Uygulama tablet, telefon ve PC'lerde çalışıyor.
- Her oturumdaki sunucular, sunum saatinden 5 dk öncesinde oturuma bağlanmış olmaları gerekmektedir.
- Tüm kongre katılımcıları canlı bağlanarak tüm oturumları dinleyebilir.
- Moderatör – oturumdaki sunum ve bilimsel tartışma (soru-cevap) kısmından sorumludur.

Dikkat Edilmesi Gerekenler - TEKNİK BİLGİLER

- Bilgisayarınızda mikrofon olduğuna ve çalıştığına emin olun.
- Zoom'da ekran paylaşma özelliğini kullanabilmelisiniz.
- Kabul edilen bildiri sahiplerinin mail adreslerine Zoom uygulamasında oluşturduğumuz oturuma ait ID numarası gönderilecektir.
- Katılım belgeleri kongre sonunda tarafınıza pdf olarak gönderilecektir.
- Kongre programında yer ve saat değişikliği gibi talepler dikkate alınmayacaktır.

Important, Please Read Carefully

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- The Zoom application is free and no need to create an account.
- The Zoom application can be used without registration.
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- The participant must be connected to the session 5 minutes before the presentation time.
- All congress participants can connect live and listen to all sessions.
- Moderator is 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.
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***

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Before you login to Zoom please indicate your hall number, name and surname

exp. H-5, Radmila Janičić

-Opening Ceremony-

Date: 01.11.2024

Time: 09:30-10:00

Meeting ID: 897 0755 8402 / Passcode: 010203

Prof. Dr. Sefa ALTIKAT

Dean of the Faculty of Agriculture, Iğdır University

HEAD OF CONGRESS

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Rector of Iğdır University

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ONLINE PRESENTATIONS

01.12.2024 / HALL-1 / SESSION-1

ANKARA LOCAL TIME: 10 00 - 12 00

HEAD OF SESSION: Prof. Dr. Şebnem KUŞVURAN

AUTHORS	AFFILIATION	TOPIC TITLE
Assoc. Prof. Dr. Deniz ŞAHİN Orhan YILMAZ Mustafa BAYSAL	*National Defense University TÜRKİYE* *Rebuplic of Turkey Ministry of Educatican, Ankara TÜRKİYE* *National Defense University TÜRKİYE*	THE POSSIBLE EFFECTS OF HEAVY METALS IN HONEY BEE ON HUMAN HEALTH
Prof. Dr. Harun ÇİFTÇİ Prof. Dr. Şebnem KUŞVURAN	*Çankırı Karatekin University TÜRKİYE*	SALT-BASED STRATEGIC FOOD AND AGRICULTURAL PRODUCTS
Prof. Dr. Şebnem KUŞVURAN Dr. Damla TURAN BÜYÜKDİNÇ	*Çankırı Karatekin University TÜRKİYE* *Recep Tayyip Erdoğan University TÜRKİYE*	EFFECT OF NANO-SILICON APPLICATIONS ON PEPPER GROWN UNDER DEFICIT IRRIGATION CONDITIONS
Dr. Yazgan TUNÇ Agr. Eng. Cafer İŞLEK Agr. Eng. Eray KOCA Agr. Eng. Göksel GÜNDÜR	*Ministry of Agriculture and Forestry, General Directorate of Agricultural Research and Policies Hatay TÜRKİYE* *Kahramanmaraş Sütçü İmam University TÜRKİYE*	NOVEL TECHNIQUES IN NUTRITION AND FOOD SCIENCE: A COMPREHENSIVE REVIEW ON THE ROLE OF OLIVES
Dr. Canan URHAN	*Istanbul Technical University TÜRKİYE*	SWOT ANALYSIS OF ACORN AS FOOD WITHIN A PESTEL FRAMEWORK IN TURKEY: A STAKEHOLDER PERSPECTIVE
Prof. Dr. Duried Alwazeer Şafak Yılmaz	*Iğdır University TÜRKİYE*	FUNCTIONAL FOODS: A KEY TO HEALTH AND ECONOMIC GROWTH
Leyla VESKE Kaan HÜRKAN	*Iğdır University TÜRKİYE*	FOOD ADULTERATION IN OLIVE OIL: DETECTION METHODS, ECONOMIC AND HEALTH IMPACTS

All participants must join the conference 10 minutes before the session time.
Every presentation should last not longer than 10-12 minutes.
Kindly keep your cameras on till the end of the session.

ONLINE PRESENTATIONS

01.12.2024 / HALL-2 / SESSION-1

ANKARA LOCAL TIME: 10 00 - 12 00

HEAD OF SESSION: Prof. Dr. Ahmet Zafer TEL

AUTHORS	AFFILIATION	TOPIC TITLE
Merve ZENCİRLİ Hatice Sena OLCAY Meral YILDIRIM-YALÇIN	*İstanbul Aydın University TÜRKİYE*	ENRICHMENT OF DURUM WHEAT PASTA WITH JERUSALEM ARTICHOKE AND PURPLE BASIL
Nesrin DURSUN	*Ardahan University TÜRKİYE*	INVESTIGATION OF BIOHYDROGEN PRODUCTION POTENTIAL OF WOOD SAWDUST WASTE
Dr. Mustafa AKÇAY	*Kafkas University TÜRKİYE*	EFFECTS OF Ag_2S NANOPARTICLES ON CRESS (Lepidium sativum L.) PLANTS IN VIVO CONDITIONS
Mustafa USTA Abdullah GÜLLER Serap DEMİREL	*Van Yüzüncü Yıl University TÜRKİYE* *Bingöl University TÜRKİYE* *Van Yüzüncü Yıl University TÜRKİYE*	CLADISTIC ANALYSIS of TURKISH DENİZLİ CUCUMIS MELO ALPHAENDORNAVIRUS (CmEV) ISOLATES FROM MELON (Cucumis melo L.)
Assoc. Prof. Dr. Burak Evren İNANAN Prof. Dr. Mustafa ÖZ	*Aksaray University TÜRKİYE*	USE OF FISH SPERMATOZOA IN THE ASSESSMENT OF TOXIC EFFECTS OF PESTICIDES IN AQUATIC ECOSYSTEMS
Assoc. Prof. Dr. Ersin GÜLSOY Mervenur DEMİR	*Iğdır University TÜRKİYE*	SUSTAINABILITY AND WASTE MANAGEMENT IN NUTS PRODUCTION
Murat TAK Prof. Dr. Ahmet Zafer TEL	*Iğdır University TÜRKİYE*	DETERMINATION OF AKDAĞ (ADIYAMAN/MALATYA) HABITAT DIVERSITY ACCORDING TO EUNIS HABITAT CLASSIFICATION SYSTEM
Ergün ÖZUSLU Prof. Dr. Ahmet Zafer TEL	*Gaziantep Islam Science and Technology University TÜRKİYE* *Iğdır University TÜRKİYE*	WILD PISTACHIO SPECIES DISTRIBUTED IN GAZİANTEP (TÜRKİYE) AND THEIR TAXONOMIC CHARACTERISTICS
Peri HUSEYNOVA	*Nakhchivan State University AZERBAIJAN*	METHODS TO EFFECTIVELY PROTECT THE APRICOT TREE FROM FREEZING DURING THE FLOWERING PERIOD

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ONLINE PRESENTATIONS

01.12.2024 / HALL-3 / SESSION-1

ANKARA LOCAL TIME: 10 00 - 12 00

HEAD OF SESSION: Prof. Dr. Murat TUNÇTÜRK

AUTHORS	AFFILIATION	TOPIC TITLE
Assoc. Prof. Dr. Hasan Basri KARAYEL	*Kütahya Dumlupınar University TÜRKİYE*	AREAS OF USE OF SOME MEDICINAL AND AROMATIC PLANTS FOUND IN THE FLORA OF MURAT MOUNTAIN (KÜTAHYA)
Assoc. Prof. Dr. Hasan Basri KARAYEL	*Kütahya Dumlupınar University TÜRKİYE*	COMPOSITION OF ESSENTIAL OILS OBTAINED FROM THE PLANT (Salvia virgata Jacq.) GROWN IN DIFFERENT ECOLOGIES
Res. Assist. Dr. Gözde Hafize YILDIRIM	*Recep Tayyip Erdoğan University TÜRKİYE*	EFFECTS OF DIGITAL AGRICULTURE TECHNOLOGIES ON YIELD AND QUALITY IN FIELD CROPS
Res. Assist. Dr. Gözde Hafize YILDIRIM	*Recep Tayyip Erdoğan University TÜRKİYE*	USE AND BENEFITS OF BIOFERTILIZERS
Yunus DAĞHAN Abdülmelik ARAS	*Iğdır University TÜRKİYE*	EFFECT OF ELEVATION ON PLANT SECONDARY METABOLITES
Assist. Prof. Dr. Lütfi NOHUTÇU Prof. Dr. Murat TUNÇTÜRK Prof. Dr. Rüveyde TUNÇTÜRK Lect. Dr. Ezelhan ŞELEM Assoc. Prof. Dr. Hüseyin EROĞLU	*Van Yüzüncü Yıl University TÜRKİYE*	MORPHOLOGICAL CHARACTERISTICS AND COLOR VALUES OF Colchicum szovitsii FISCH. ET MEY. AND Colchicum kurdicum (BORNM.) STEF. SPECIES GROWING NATURALLY IN VAN REGION
Prof. Dr. Murat TUNÇTÜRK Assist. Prof. Dr. Lütfi NOHUTÇU Lect. Dr. Ezelhan ŞELEM Prof. Dr. Rüveyde TUNÇTÜRK	*Van Yüzüncü Yıl University TÜRKİYE*	DETERMINATION OF SOME MORPHOLOGICAL, PHYSIOLOGICAL AND COLOR VALUES OF NATURALLY GROWNING DANDELION (Taraxacum montanum) PLANT COLLECTED FROM VAN LAKE AROUND
Assoc. Prof. Dr. İhsan CORA	*Giresun University TÜRKİYE*	OPPORTUNITIES AND THREATS IN HAZELNUT FARMING IN TURKEY

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ONLINE PRESENTATIONS

01.12.2024 / HALL-4 / SESSION-1

ANKARA LOCAL TIME: 10 00 - 12 00

HEAD OF SESSION: Dr. Faiz Muhammad Shaikh

AUTHORS	AFFILIATION	TOPIC TITLE
Virgil Popescu Ramona Birau	*Craiova University ROMANIA*	WEATHER DERIVATIVES AND THEIR IMPLICATIONS IN THE CONTEXT OF CLIMATE CHANGE
Dr. Faiz Muhammad Shaikh Dr.Liaquat Ali Bhutto Rasool Bux Junejo Muhammad Zafar Wassan Syed Mehtab Ali Shah Eng. Syed Mujeeb Hyder Shah	*Larkano University PAKISTAN* *Agriculture Research SAU-Tando jam PAKISTAN* *Agri.Extension-Government of Sindh PAKISTAN* *Conservator Forest -Larkana PAKISTAN* *Progressive Grower-Saleh Pat PAKISTAN* *Progressive Grower Ontario CANADA*	CLIMATE CHANGE AND PRODUCTION EFFICIENCY OF CHICKPEA KASHMORE-KANDHKOT DISTRICT
Ananda Majumdar	*Alberta University CANADA*	HARNESSING ECOLOGICAL PRINCIPLES FOR SUSTAINABLE AGRICULTURE
Omar BENAMARI Hassan AMHAMDI	*Abdelmalek Essaadi University MOROCCO*	IN VITRO ANTIOXYDANT AND ANTIINFLAMMATORY ACTIVITIES OF VARIOUS EXTRACTS FROM CISTUS LADANIFER L. LEAVES GROWN IN NORTHERN MOROCCO
Shanza Khanum Muhammad Asad Tehseen Fatima	*University of Education PAKISTAN*	THERAPEUTIC POTENTIAL OF SAREEHN (ALBIZIA LEBBECK) SEEDS EXTRACT AGAINST TOXIC EFFECTS OF GRAPHENE NANOSHEETS IN MORI (CIRRHINUS MRIGALA)
Muhammad Amjad Syed Makhdoom Hussain Adan Naeem Eman Naeem Muhammad Mahmood Shoaib Akhtar Muhammad Waseem	*Government College University PAKISTAN*	AGRO-WASTE BIOCHAR CONVERSION INTO A FISH FEED ADDITIVE: ASSESSING ITS EFFECTS ON THE HEALTH AND PERFORMANCE OF CYPRINUS CARPIO
Z. AIT EL CAID R. Kellal M. Zertoubi D. Benmessaoud left	*Hassan II University MOROCCO*	ECO-FRIENDLY INHIBITION OF C38 CARBON STEEL CORROSION IN AGGRESSIVE ENVIRONMENTS USING NATURAL PLANT-DERIVED COMPOUNDS: ELECTROCHEMICAL, DFT, AND MDS ANALYSIS
Assist. Prof. Srđan Jovanović Assoc. Prof. Snježana Đokić	*Independent University BOSNIA AND HERCEGOVINA*	AGRICULTURAL COMPANIES THAT APPLY REAL MARKETING IN THEIR BUSINESS BASED ON FINANCIAL MANAGEMENT BASED ON INFORMATION ON FINANCIAL STATEMENTS
Zineb El Hamri Ibrahim Maouhoubi	*Moulay Ismail University MOROCCO*	EFFECT OF WALNUT SHELL POWDER ON THE CHARACTERISTICS OF POLYPROPYLENE-BASED COMPOSITES
Assist. Prof. Srđan Jovanović Assoc. Prof. Snježana Đokić	*Independent University BOSNIA AND HERCEGOVINA*	PROMOTION OF ENTREPRENEURSHIP DEVELOPMENT AND MARKETING IN AGRICULTURAL PRODUCTION OF SENSITIVE GROUPS WHO ARE ENGAGED IN DEVELOPING AGRICULTURAL PRODUCTION AS AN EXAMPLE OF THE REPUBLIC OF SERBIA

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ONLINE PRESENTATIONS

01.12.2024 / HALL-5 / SESSION-1

ANKARA LOCAL TIME: 10 00 - 12 00

HEAD OF SESSION: Prof. Dr. Marina Todor STOJANOVA

AUTHORS	AFFILIATION	TOPIC TITLE
Prof. Dr. Marina Todor STOJANOVA Acad. Prof. Dr. Dragutin A. DJUKIC Dr. Monika STOJANOVA Prof. Dr. Ivana BOSKOVIC	*Ss. Cyril and Methodius University NORTH MACEDONIA* *Kragujevac University SERBIA* *Association for Scientific-research, Educational and Cultural Activities NORTH MACEDONIA* *East Sarajevo University EAST SARAJEVO*	EFFECT OF FOLIAR CALCIUM AMPLIFIERS ON THE CHEMICAL COMPOSITION OF SWEET PEPPER
Prof. Dr. Dragutin A. DJUKIC Prof. Dr. Leka MANDIC Dr. Monika STOJANOVA Prof. Dr. Marina T. STOJANOVA Prof. Dr. Alexander M. SEMENOV Prof. Dr. Vesna DJUROVIC Prof. Dr. Ivana BOSKOVIC	*Kragujevac University SERBIA* *Association for Scientific-research, Educational and Cultural Activities NORTH MACEDONIA* *M.V. Lomonosov Moscow State University RUSSIA* *Cyril and Methodius University NORTH MACEDONIA* *Kragujevac University SERBIA*	DYNAMIC NITROGEN BALANCE IN THE EARTH'S PEDOSPHERE AND ATMOSPHERE
Assoc. Dr. Ivana BOSKOVIC Prof. Dr. Dragutin DJUKIC Dr. Monika STOJANOVA Prof. Dr. Marina Todor STOJANOVA Dr. Marijana PESAKOVIC	*East Sarajevo University EAST SARAJEVO* *Kragujevac University SERBIA* *Association for Scientific-research, Educational and Cultural Activities NORTH MACEDONIA* *Ss. Cyril and Methodius University NORTH MACEDONIA* *Fruit Research Institute Čačak SERBIA*	BIOLOGICALLY ACTIVE PLANT COMPOUNDS AND THEIR MECHANISMS OF ACTION: REWIEV
Nguyen Thi Huynh Phuong Nguyen Trong Nhan Nguyễn Trung Hieu	*Hue University VIETNAM* *Can Tho University VIETNAM* *Tour guide in Can Tho city VIETNAM*	A STUDY OF THE FACTORS INFLUENCING AGRITOURISM DEVELOPMENT AT BAO GIA FARM, HAU GIANG PROVINCE, VIETNAM
Alexandra Raluca BORŞA (BOGDAN) Raluca Alexandra MATEI Adriana PĂUCEAN Melinda FOGARASI Andrei BORŞA Maria Simona CHIŞ Cristina Anamaria SEMENIUC	*University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca ROMANIA*	PRELIMINARY STUDY ON THE DEVELOPMENT OF WAFFLE CONES FORMULATED WITH POWDER FROM ROSEHIP WASTE
Zineb El Hamri Ibrahim Maouhoubi Assia Belhassan	*Moulay Ismail University MOROCCO*	PHYSICAL, MECHANICAL, AND THERMAL PROPERTIES OF POLYPROPYLENE COMPOSITES INCORPORATING WALNUT SHELL POWDER
RAUNAK GUPTA	*Vellore Institute of Technology INDIA*	AI-BASED MULTISPECTRAL IMAGING SYSTEM FOR PRECISION AGRICULTURE: TACKLING SOIL HEALTH, PESTS, AND CROP STRESS
Dio Samudra	*UIN KH.Abdurrahman Wahid Pekalongan INDONESIA*	QUALITY MANAGEMENT IN FISH PROCESSING AGRO-INDUSTRIES SURABAYA

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ONLINE PRESENTATIONS

01.12.2024 / HALL-1 / SESSION-2

ANKARA LOCAL TIME: 12 30 - 14 30

HEAD OF SESSION: Prof. Dr. Ramazan ERENLER

AUTHORS	AFFILIATION	TOPIC TITLE
Muzaffer Kerem SAVRAN Ferit ÇOBANOĞLU Renan TUNALIOĞLU	*Ministry of Agriculture and Forestry İzmir TÜRKİYE* *Aydın Adnan Menderes University TÜRKİYE*	VALUE ADDED OLIVE OIL PRODUCTION AND EXPORT OPPORTUNITIES: PROBLEMS AND SUGGESTIONS
Prof. Dr. Ramazan ERENLER	*Iğdır University TÜRKİYE*	QUANTITATIVE ANALYSIS OF BIOACTIVE COMPOUNS IN ROBINIA PSEUDOACACIA STEM AND ANTIOXIDANT EFFECTS
Prof. Dr. Betül GÜROY	*Yalova University TÜRKİYE*	STRATEGIC IMPORTANCE OF BLUE-GREEN ALGAE (CYANOBACTERIA) "SPIRULINA" AND GREEN ALGAE (CHLOROPHYTA) "ULVA" AS AQUATIC AGRICULTURE PRODUCTS
Bulut SARĞIN Siyami KARACA Füsun GÜLSER	*Van Yüzüncü Yıl University TÜRKİYE*	MICROPLASTIC CONTAMINATION AND SOIL HEALTH
Siyami KARACA Füsun GÜLSER Bulut SARĞIN	*Van Yüzüncü Yıl University TÜRKİYE*	THE INTERACTION BETWEEN SOIL MANAGEMENT AND CARBON FOOTPRINT
Leyla KURGAN Assoc. Prof. Dr. Adnan AYDIN	*Iğdır University TÜRKİYE*	THE RELATIONSHIP OF PLANT GROWTH REGULATORS WITH EPIGENETICS
Res. Assist. Rıdvan TİK Assoc. Prof. Dr. Ramazan GÜRBÜZ	*Iğdır University TÜRKİYE*	WHEN BEAUTY TURNS BEAST: ORNAMENTAL PLANTS THAT BECOME WEEDS
Assoc. Prof. Dr. Ramazan GÜRBÜZ Dr.Harun ALPTEKİN	*Iğdır University TÜRKİYE*	THE ROLE OF NANOTECHNOLOGY IN HERBICIDE DEVELOPMENT: MECHANISMS, FORMULATIONS, AND ECOLOGICAL IMPACTS

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ONLINE PRESENTATIONS

01.12.2024 / HALL-2 / SESSION-2

ANKARA LOCAL TIME: 12 30 - 14 30

HEAD OF SESSION: Prof. Dr. Sefa ALTIKAT

AUTHORS	AFFILIATION	TOPIC TITLE
Alperay ALTIKAT Prof. Dr. Mehmet Hakkı ALMA	*Iğdır University TÜRKİYE*	BIOCHAR USE AS A SEED COATING MATERIAL
Alperay ALTIKAT Prof. Dr. Mehmet Hakkı ALMA	*Iğdır University TÜRKİYE*	BIOGAS AND BIOMASS: A REVIEW ON RENEWABLE ENERGY SOURCES
Prof. Dr. Duried Alwazeer Berrak Iğdır	*Iğdır University TÜRKİYE*	BIOHYDROGEN PRODUCTION FROM AGRICULTURAL AND FOOD WASTE
Prof. Dr. Duried Alwazeer Tunahan ENGİN	*Iğdır University TÜRKİYE*	USE OF A HYDROGEN EXTRACTION METHOD FOR THE EXTRACTION OF PHYTOCHEMICALS
Prof. Dr. Sefa ALTIKAT	*Iğdır University TÜRKİYE*	REDUCING CARBON FOOTPRINT IN VERTICAL FARMING AND HYDROPONIC SYSTEMS
Prof. Dr. Sefa ALTIKAT	*Iğdır University TÜRKİYE*	SELECTION AND OPTIMISATION OF HYPERSPECTRAL AND MULTISPECTRAL BANDS IN AGRICULTURAL RESEARCH
Hilal DEMİR Prof. Dr. Kürşat DEMİRYÜREK Assoc. Prof. Dr. Nur İlkay ABACI Res. Assist. Ahmet Yesevi KOÇYİĞİT	*Ondokuz Mayıs University TÜRKİYE*	RENEWABLE ENERGY IN AGRICULTURE: A SYSTEMATIC REVIEW OF INNOVATIONS AND APPLICATIONS
Res. Assist. Rıdvan TİK Assoc. Prof. Dr. Tuncay KAYA	*Iğdır University TÜRKİYE*	POSSIBILITIES OF USING RENEWABLE ENERGY SOURCES IN LANDSCAPE STUDIES

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ONLINE PRESENTATIONS

01.12.2024 / HALL-3 / SESSION-2

ANKARA LOCAL TIME: 12 30 - 14 30

HEAD OF SESSION: Prof. Dr. Bahri KARLI

AUTHORS	AFFILIATION	TOPIC TITLE
Lect. Dr. Emirhan ÖZDEMİR Lect. Rüştü ÇALLI Assoc. Prof. Dr. Aliihsan ŞEKERTEKİN	*Iğdır University TÜRKİYE*	ANALYZING CROP DEVELOPMENT USING SENTINEL-2 BASED NDVI TIME SERIES
Lect. Rüştü ÇALLI Lect. Dr. Emirhan ÖZDEMİR Assoc. Prof. Dr. Aliihsan ŞEKERTEKİN	*Iğdır University TÜRKİYE*	DEVELOPING A BASIC QGIS-BASED AGRICULTURAL MANAGEMENT SYSTEM: INTEGRATING PARCEL, IRRIGATION, AND SATELLITE DATA LAYERS
Res. Assist. Dr. Ayşe KARADAĞ GÜRSOY Res. Assist. Bektaş KADAKOĞLU Prof. Dr. Bahri KARLI	*Iğdır University TÜRKİYE*	DEVELOPMENT OF APRICOT PRODUCTION IN TÜRKİYE: THE CASE OF IĞDIR PROVINCE
Res. Assist. Bektaş KADAKOĞLU Res. Assist. Dr. Ayşe KARADAĞ GÜRSOY Prof. Dr. Bahri KARLI	*Iğdır University TÜRKİYE*	STRUCTURAL ANALYSIS OF GOAT BREEDING IN TÜRKİYE
Taner İŞEVİ Prof. Dr. Ergin ÖZTÜRK	*Ministry of Agriculture and Forestry, Ordu TÜRKİYE* *Ondokuz Mayıs University TÜRKİYE*	NUTRITIONAL CONTENT AND BIOACTIVE COMPOUNDS OF WALNUT GREEN HUSK AND LEAVES: THEIR APPLICATIONS AND POTENTIAL USE IN ANIMAL NUTRITION
Sedanur GÜMÜŞ Assist. Prof. Dr. Barış EREN Assoc. Prof. Dr. Adnan AYDIN	*Iğdır University TÜRKİYE*	EVALUATION OF NEW MARKERS THAT CAN BE USED IN BLACK CUMIN PLANT
Dilay ÖZUYAR Assoc. Prof. Dr. Emir Zafer HOŞGÜN	*Eskisehir Technical University TÜRKİYE*	CHOLINE CHLORIDE/FORMIC ACID DEEP EUTECTIC SOLVENT SYSTEM FOR THE PRETREATMENT OF SUNFLOWER STALKS TO ENHANCE THE ENZYMATIC HYDROLYSIS YIELD
Mine ATAKUL Prof. Dr. Levent ÜNLÜ	*Selçuk University TÜRKİYE*	POPULATION DEVELOPMENT AND PARASITISM RATE OF SUNN PEST (Eurygaster spp.) AND WHEAT BUG(Aelia spp.) IN TRITICALE PLANT

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ONLINE PRESENTATIONS

01.12.2024 / HALL-4 / SESSION-2

ANKARA LOCAL TIME: 12 30 - 14 30

HEAD OF SESSION: Dr. Naveen Cherupelly

AUTHORS	AFFILIATION	TOPIC TITLE
Ahmed Attahiru Yusuf Haruna Abubakar Umar Birnin-Yauri Garba G. Jibo Adamu Almustapha Aliero	*Kebbi State University of Science and Technology NIGERIA*	QUALITATIVE PHYTOCHEMICAL ANALYSIS AND ANTIFUNGAL ACTIVITY OF AQUEOUS CRUDE LEAVES EXTRACT OF ACACIA NILOTICA
Ahmed Attahiru Yusuf Haruna Abubakar Umar Birnin-Yauri Garba G. Jibo	*Kebbi State University of Science and Technology NIGERIA*	ASSESSMENT OF ANTIFUNGAL ACTIVITY OF AQUEOUS FRACTIONS OF ACACIA NILOTICA LEAVES
Geeta Shinde Sakshi Ingale Chetana Shewale Aman Upaganlawar Chandrashekhar Upasani	*SNJBs Shriman Sureshdada Jain College of Pharmacy INDIA*	NEPHROPROTECTIVE ACTIVITY OF KUDZU ROOT EXTRACT IN STREPTOZOTOCIN INDUCED DIABETIC NEPHROPATHY IN RATS
Diayi V.N. Akinlabi A. K. Falope F.Y. Mosaku A.M. Oladipo G.O. Falana B.M.	*Federal University of Agriculture NIGERIA* *Bells University of Technology NIGERIA* *Federal University of Agriculture NIGERIA* *D.S. Adegbenro ICT Polytechnic NIGERIA* *National Biotechnology Research and Development Agency NIGERIA*	EFFECT OF CARBONIZATION OF WALNUT SHELL ON THE PHYSICO-MECHANICAL PROPERTIES OF NATURAL RUBBER
Sudhanshu Kumar Jha	*VIT Bhopal University INDIA*	CROP PREDICTION USING MACHINE LEARNING
CHANDRU E. SARAVANAN R.SRINIVASAN	*Bharath Institute of Higher Education and Research INDIA*	LEMON OIL
Dr. Naveen Cherupelly	*VIT-AP University INDIA*	POWERING INCLUSIVE GROWTH: SOCIO-ECONOMIC INEQUALITIES IN INDIAN AGRICULTURE AND SUSTAINABLE ENERGY INTERVENTIONS
FOLAMI, Maria	*Lagos State University NIGERIA*	CLIMATE CHANGE AND URBAN FARMING IN OJO LOCAL GOVERNMENT AREA, LAGOS STATE, NIGERIA: ADAPTING AND MITIGATING CLIMATE CHANGE IMPACTS

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ONLINE PRESENTATIONS

01.12.2024 / HALL-5 / SESSION-2

ANKARA LOCAL TIME: 12 30 - 14 30

HEAD OF SESSION: Assoc. Prof. Dr. Shaik Salma Asiya Begum

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. Mamoon Ur Rasheed Sabila Arooj Dr. Haroon Rashid Dr. Shafa Iman	*Government College University PAKISTAN*	GC-MS ANALYSIS, ANTI-DIABETIC, AND CYTOTOXIC EVALUATION OF PHLOMIS STEWARTII PLANT PHYTOCHEMICALS ON CIGARETTE SMOKE INHALATION AND ALLOXAN-INDUCED DIABETES IN WISTAR RATS
Sarah Abou el anouar Mohammed Bergui Boutaina Louafi Naoufal Ahidar Amine Salhi Meryem Benjelloun	*Sidi Mohamed Ben Abdellah University MOROCCO* *Abdelmalek Essaadi University MOROCCO* *Sidi Mohamed Ben Abdellah University MOROCCO*	ETHNOBOTANICAL STUDY OF CISTUS MONSPELIENSIS AND ITS USAGE FOR DIFFERENT PURPOSES IN THE RIF REGION (NORTHERN MOROCCO)
Dr. Elwahab Fathalah Prof. Benramel Mostafa Dr. Sedki Mohamed Prof. Ziri Rabea	*Ibn Toufail University MOROCCO* *Ibn Toufail University MOROCCO* *Regional Center of Agricultural Research of Kenitra MOROCCO* *Ibn Toufail University MOROCCO*	VALORIZING RENEWABLE ENERGIES FOR SUSTAINABLE RICE CULTIVATION IN MOROCCO: A PATHWAY TO AGRO-ECOLOGICAL RESILIENCE
Assoc. Prof. Dr. Shaik Salma Asiya Begum Shaik Tanveer Fathe Ahamed	*Lakireddy Bali Reddy College of Engineering INDIA* *Northern Tools and Equipment, Senior Front-End Developer INDIA*	GSAtt-CMNetV3: POTATO LEAF DISEASE CLASSIFICATION USING OSPREY OPTIMIZATION
Bashir, M.B. Fatima, A.B Faruk, A.U.	*Ahmadu Bello University NIGERIA*	SKILLS REQUIRED IN POULTRY PRODUCTION FOR ECONOMIC SUCCESS AMONG YOUTHS IN DANKO WASAGU LOCAL GOVERNMENT OF KEBBI STATE, NIGERIA
IS Liman A Mann LA Fadipe WN Adamu	*Federal University of Technology NIGERIA* *The Federal Polytechnic NIGERIA*	EVALUATION OF HYPOGLYCEMIC POTENTIAL OF THE METHANOL EXTRACT OF THE GYMNEMA SYLVESTRE PLANT IN WISTER ALBINO RATS
Khalida DERRADJI Leila SMAIL	*Ibn Khaldoun University of Tiaret ALGERIA*	SOIL MICROORGANISMS BIOTECHNOLOGY, A USEFUL INNOVATION FOR BIOLOGICAL AGRICULTURE AND ENVIRONMENT

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ONLINE PRESENTATIONS

01.12.2024 / HALL-1 / SESSION-3

ANKARA LOCAL TIME: 15 00 - 17 00

HEAD OF SESSION: Prof. Dr. İbrahim DEMİRTAŞ

AUTHORS	AFFILIATION	TOPIC TITLE
Assoc. Prof. Dr. Ali İhsan ATALAY Assist. Prof. Dr. Ramazan TOSUN	*Iğdır University TÜRKİYE*	INVESTIGATION OF ALTERNATIVE FEED SOURCES TO CORN AND SOYBEAN MEALS IN BROILER FEEDING
Assist. Prof. Dr. Ramazan TOSUN Assoc. Prof. Dr. Ali İhsan ATALAY	*Iğdır University TÜRKİYE*	POSSIBILITY OF USING LUPIN AS AN ALTERNATIVE PROTEIN SOURCE IN POULTRY NUTRITION
Prof. Dr. Duried Alwazeer Enes KAVRUT	*Iğdır University TÜRKİYE*	USE OF VALUE-ADDED PRODUCTS FOR SUSTAINABLE CUISINE
Prof. Dr. Duried Alwazeer Betül TAN	*Iğdır University TÜRKİYE*	AN EMERGING TECHNIQUE IN DRYING HIGH VALUE-ADDED PRODUCTS: REDUCING ATMOSPHERE DRYING
Prof. Dr. Serkan SUBAŞI Prof. Dr. Ayhan TOZLUOĞLU Ali Murat SÜRÜCÜ Çağrı AGİN	*Düzce University TÜRKİYE* *Düzce University TÜRKİYE* *Unigen Construction Materials Inc. Düzce TÜRKİYE* *Fiber Chemistry Inc. İstanbul TÜRKİYE*	UTILIZATION OF NANOCELLULOSE IN CALCIUM SULFATE BASED COMPOSITE PRODUCTION
Prof. Dr. Ayhan TOZLUOĞLU Prof. Dr. Serkan SUBAŞI Ali Murat SÜRÜCÜ Ahmet GÜRKAN UMUCU	*Düzce University TÜRKİYE* *Düzce University TÜRKİYE* *Unigen Construction Materials Inc. Düzce TÜRKİYE*	EFFECT OF FDM-IMPREGNATED HEMP FIBERS ON PHYSICAL, MECHANICAL AND THERMAL PROPERTIES IN CALCIUM SULFATE MATRIX COMPOSITES
Büşran SUNYAR Prof. Dr. Mehmet Hakki ALMA Velad KIZIL Prof. Dr. İbrahim DEMİRTAŞ Fatma ERTAŞ OĞUZ	*Iğdır University TÜRKİYE*	A BIBLIOMETRIC ANALYSIS ON HERB-BASED INJECTABLE VACCINES
Velad KIZIL Prof. Dr. İbrahim DEMİRTAŞ Büşran SUNYAR Prof. Dr. Mehmet Hakki ALMA Fatma ERTAŞ OĞUZ	*Iğdır University TÜRKİYE*	A BIBLIOMETRIC ANALYSIS ON TRANSGENIC PLANT-BASED EDIBLE VACCINES

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ONLINE PRESENTATIONS

01.12.2024 / HALL-2 / SESSION-3

ANKARA LOCAL TIME: 15 00 - 17 00

HEAD OF SESSION: Prof. Dr. Sabit ERŞAHİN

AUTHORS	AFFILIATION	TOPIC TITLE
Nisanur YAKUT Fatma KIZILER Assoc. Prof. Dr. Emrah KUŞ	*Iğdır University TÜRKİYE* *Siirt University TÜRKİYE* *Iğdır University TÜRKİYE*	A STUDY ON THE USE OF ELECTROSHOCK TECHNIQUES FOR WEED CONTROL
Mehdi GÜVEN Nisanur YAKUT Assoc. Prof. Dr. Emrah KUŞ	*Iğdır University TÜRKİYE*	EFFECTS OF USING SEED TUBE ON SEED DISTRIBUTION UNIFORMITY IN SINGLE SEED PLANTERS
Assoc. Prof. Dr. Emrah KUŞ	*Iğdır University TÜRKİYE*	CURRENT IMPROVEMENTS AND DEVELOPMENTS IN THE SEED PLANTERS
Lect. Dr. Azime SUBAŞI	*Düzce University TÜRKİYE*	INVESTIGATION OF THE USABILITY OF HEMP FIBERS AS REINFORCEMENT MATERIAL IN PHOTOCURED POLYMER COMPOSITES
Sabit ERŞAHIN Mücahit KARAOĞLU Faruk TOHUMCU Serdar SARI Seda AKBAY TOHUMCU	*Iğdır University TÜRKİYE*	USE OF GYPSUM MIXED IRRIGATION WATER TO IMPROVE SALINE-ALKALI SOILS
Şaika Gül İLİKSİZ Assoc. Prof. Dr. Emine KAYA ALTOP	*Ondokuz Mayıs University TÜRKİYE*	DETERMINATION OF THE GENETIC DIVERSITY OF AVENA FATUA (L), A PROBLEM IN WHEAT GROWING AREAS
Prof. Dr. Duried Alwazeer Ayhan ÇİĞDEM	*Iğdır University TÜRKİYE*	MOLECULAR HYDROGEN AS A REGULATOR IN PLANT GROWTH

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ONLINE PRESENTATIONS

01.12.2024 / HALL-3 / SESSION-3

ANKARA LOCAL TIME: 15 00 - 17 00

HEAD OF SESSION: Assoc. Prof. Dr. Abdul Qadeer Khan

AUTHORS	AFFILIATION	TOPIC TITLE
Yadessa Melaku Abera Kalbessa	*Adama Science and Technology University ETHIOPIA*	ANTIBACTERIAL AND ANTIOXIDANT COMPOUNDS FROM THE ROOT BARKS OF GNIDIA INVOLUCRATA
Ms. Vaibhavi V. Meshram Dr. Mrs. Alpana J. Asnani	*Priyadarshini J. L. College of Pharmacy INDIA*	FORMULATION AND ASSESSMENT OF HERBAL LOTION FORMULATED WITH LEUCAS ASPERA LEAF EXTRACT
Assoc. Prof. Dr. Abdul Qadeer Khan	*Azad Jammu University PAKISTAN*	BIFURCATIONS OF A TWO-DIMENSIONAL DISCRETE TIME PLANT-HERBIVORE SYSTEM
Okoro, John Chukwuma Ugwu, Johnmartins Ifeanyi	*Nigeria University NIGERIA*	HERBICIDE INFORMATION NEEDS OF FARMERS IN ENUGU STATE, NIGERIA
Zineb El Hamri M. Alami M. Assouag	*Moulay Ismail University MOROCCO*	INFLUENCE OF WALNUT SHELL POWDERS ON THE MORPHOLOGY, THERMAL, AND MECHANICAL PROPERTIES OF POLY(LACTIC ACID)
Rachid Flouchi Marwa Chraibi Karim Fahsi Ibrahim Touzani Kawtar Fikri-Benbrahim	*Sidi Mohamed Ben Abdellah University MOROCCO*	PHYTOCHEMISTRY AND ANTIMICROBIAL ACTIVITY OF RUTA MONTANA ESSENTIAL OIL AGAINST NOSOCOMIAL BACTERIA
Omowaye O.S A.A. Abdul-Rahman AbukaV.A Oche Josephen Otorkpa Dakun Yacop G.I.Ogu G.Odewale Attah Friday Olubiyo C.K E.Okolo	*Federal University Lokoja NIGERIA* *Open University NIGERIA* *Federal University Lokoja NIGERIA* *Federal University of Technology NIGERIA* *Kogi State University NIGERIA* *Federal University Lokoja NIGERIA*	In-vitro EVALUATION OF DIFFERENT EXTRACTS OF Telfeiria occidentalis ON Trypanosoma brucei brucei INDUCED MICE
Liman, I. S. Jiya, F. Adamu, W. N.	*The Federal Polytechnic NIGERIA*	PHYTOCHEMICAL AND IN-VIVO ANTIDIABETIC STUDIES OF THE ACTIVITY OF MOMORDICA CHARANTIA L. SEED

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ONLINE PRESENTATIONS

01.12.2024 / HALL-4 / SESSION-3

ANKARA LOCAL TIME: 15 00 - 17 00

HEAD OF SESSION: Assist. Prof. Samira N. H. Al-Hassoon

AUTHORS	AFFILIATION	TOPIC TITLE
Attah Friday Moses E. Abalaka Daniyan S. Yahaya Abdulsalami Halimat Umar M. Bello Muhammad F. Enagi	*Federal University of Technology NIGERIA*	PHYTOCHEMICAL ANALYSIS AND IN-SILICO EVALUATION OF DRUG-LIKENESS OF ETHANOLIC EXTRACT OF MITRACARPUS SCABER
Dhivya C R Arunkumar	*Tamil Nadu Agricultural University INDIA*	BLOCKCHAIN TECHNOLOGY IN AGRICULTURE FOR SCIENTIFIC RESEARCH
Nutan V. Sadgir Rahul A. Yelave Bapu S.Jagdale	*Loknete Vyankatrao Hiray Arts, Science and Commerce College Panchavati INDIA*	SYNTHESIS, CHARACTERIZATION, AND ANTIMICROBIAL ACTIVITY OF (E)-1-(BENZO[D][1,3]DIOXOL-5-YL)-3-(HETEROARYLARYL) PROP-2-EN-1-ONE DERIVATIVE"
Othmane Roby Rafik Saddik Said Tighadouini Aziz Aboulmouhajir	*Hassan II University MOROCCO*	SYNTHESIS, CHARACTERIZATION, ANTIMICROBIAL ACTIVITY EVALUATION, AND IN-SILICO PREDICTION OF NEW IMIDAZOPYRIDINE DERIVATIVES
Mohammed, U. Umar, I.S. Ubandoma, G.A. Ahmad, B.S.	*Ibrahim Badamasi Babangida University NIGERIA* *Federal University of Technology NIGERIA* *Ibrahim Badamasi Babangida University NIGERIA* *National Cereal Research Institute Badeggi NIGERIA*	ANALYSIS AND LIVELIHOOD BENEFITS OF BEANS CAKE (AKARA) PROCESSING IN OFFA LGA OF KWARA STATE. NIGERIA
ANUSHYA DR.SARAVANAN M.MONICA G.ASMA S.SHERLIN KUSHI SINGH	*Bharath Institute of Higher Education and Research INDIA*	THUTHI LEAF
S. Sherlin sheeba K. Sneha A. Ashwini G.Asma begum D. Anushya	*Bharath Institute of Higher Education and Research INDIA*	A SHORT REVIEW ON ALOE VERA

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ONLINE PRESENTATIONS

01.12.2024 / HALL-5 / SESSION-3

ANKARA LOCAL TIME: 15 00 - 17 00

HEAD OF SESSION: Dr. R. Saravanan

AUTHORS	AFFILIATION	TOPIC TITLE
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Ajesh Chauhan Shivam Rajput	*Hindu College of Pharmacy INDIA*	ROLE OF ARTIFICIAL INTELLIGENCE IN VETERINARY DISEASES MANAGEMENT
Abderrahmane Ziari Abderrahmane Medjerab	*Huari Bumedyen University of Science and Technology ALGERIA*	IMPACT OF CLIMATE CHANGE ON WATER RESOURCES IN NORTHEASTERN ALGERIA
Nadagouda Kalyani Chyaraju Balasai Yalakacharla Narasimha Devara Guru Venkata Prasad Dasari Rahul Gandhi Bommepalli Pradeep Reddy	*G. Pulla Reddy Engineering College INDIA*	APPLICATION OF REMOTE SENSING METHODS IN AGRICULTURE
Oderinde A.A. Okoye, C. I. Hanis, B. Adeyemi, M. A. Muhammad, N. O. Olukotun, G.B.	*National Biotechnology Research and Development Agency NIGERIA*	IMPROVEMENT OF THE NUTRITIONAL VALUES OF FERMENTED LOCUST BEAN/SOYA BEAN SEEDS USING CONSORTIUM OF TWO BACILLUS STRAINS
K.R.Padma K.R.Don	*Women's University INDIA* *Bharath Institute of Higher Education and Research INDIA*	PLANT-BASED BRAIN THERAPIES: CHALLENGES AND FUTURE PROSPECTS ALONG WITH MOLECULAR MECHANISM AIDED IN COGNITIVE PROTECTION
K. Pushpa raj R. Selva Kumar Dr.R. Srinivasan	*Bharath Institute of Higher Education and Research INDIA*	A REVIEW ON MEDICINAL ROLE OF PITHECELLOBIUM DULCE
Dr. R. Saravanan	*Bharath Institute of Higher Education and Research INDIA*	SYNTHESIS AND EVALUATION OF SILVER NANOPARTICLES FROM ETHANOLIC LEAF EXTRACT OF TRIDAX PROCUMBENS. L
Adeniyi, B.M Kyenge B.A Adah C.A Abel O.O Ibitoye O Ogungbemi K Balogun D.A Alejo, A.O Abdulbaki, M. K Solomon-I,O.M Ajala O.V Akeju B.M	*Benue State University NIGERIA*	BIOPESTICIDAL EFFICACY OF Heliotropium indicum LEAF EXTRACTS IN POSTHARVEST PEST CONTROL OF STORED GRAINS
Chaymae GHAFFOULI Khaoula FAIZ Adil ROUKBANI Bouchra LOUASTE	*Sidi Mohammed Ben Abdellah University MOROCCO*	CONSUMERS' WILLINGNESS AND ACCEPTANCE OF FOOD PRODUCTS WITH NATURAL PRESERVATIVES: A MOROCCAN PERSPECTIVE

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ONLINE PRESENTATIONS

02.12.2024 / HALL-1 / SESSION-1

ANKARA LOCAL TIME: 10 00 - 12 00

HEAD OF SESSION: Prof. Dr. Celalettin GÖZÜAÇIK

AUTHORS	AFFILIATION	TOPIC TITLE
Prof. Dr. Celalettin GÖZÜAÇIK Murat GÜVEN	*Iğdır University TÜRKİYE*	DETERMINATION OF DISTRIBUTION AND INFECTION RATES OF CONTARINIA MEDICAGINIS KIEFFER IN ALFALFA FIELDS OF IĞDIR
Prof. Dr. Celalettin GÖZÜAÇIK Hakan HEKİMHAN	*Iğdır University TÜRKİYE* *Ege Agricultural Research Institute, İzmir TÜRKİYE*	THE EFFICACY OF BEAUVERIA BASSIANA AND NEEM AZAL T/S ON HYPERA POSTICA (GYLLENHAL) IN FIELD CONDITIONS
Prof. Dr. Nurhan KESKİN Prof. Dr. Birhan KUNTER Assoc. Prof. Dr. Özkan KAYA M.Sc. Ali KILINÇ Agr. Eng. Melehat DURMAZ UYGUN	*Van Yüzüncü Yıl University TÜRKİYE* *Ankara University TÜRKİYE* *Erzincan Horticultural Research Institute TÜRKİYE* *GAP International Agricultural Research and Training Center, Diyarbakır TÜRKİYE* *Van Yüzüncü Yıl University TÜRKİYE*	GRAPE POMACE: VALUE ADDED RECYCLING PRODUCT FOR SUSTAINABLE VITICULTURE
Mihriban BATUK Prof. Dr. Nurhan KESKİN Assoc. Prof. Dr. Fadime ATEŞ Prof. Dr. Birhan KUNTER	*Van Yüzüncü Yıl University TÜRKİYE* *Van Yüzüncü Yıl University TÜRKİYE* *Manisa Viticulture Research Institute TÜRKİYE* *Ankara University TÜRKİYE*	A HIGH VALUE GRAPE VARIETY IN TURKISH VITICULTURE: "SULTANİ ÇEKİRDEKSİZ"
Dr. Sinem GÜLER Prof. Dr. Birhan KUNTER Prof. Dr. Nurhan KESKİN	*Ministry of Agriculture and Forestry General Directorate of Agricultural Research and Policies, Ankara TÜRKİYE* *Ankara University TÜRKİYE* *Van Yüzüncü Yıl University TÜRKİYE*	VALUE ADDED IN GRAPES: PRODUCT EVALUATION METHODS AND GLOBAL COMPETITIVENESS
Prof. Dr. Hikmet GÜNAL Assoc. Prof. Dr. Mesut BUDAK Kübra POLAT	*Harran University TÜRKİYE* *Siirt University TÜRKİYE* *Harran University TÜRKİYE*	IDENTIFICATION AND ANALYSIS OF MICROPLASTICS IN SOILS
Prof. Dr. Hikmet GÜNAL Assoc. Prof. Dr. Mesut BUDAK Kübra POLAT	*Harran University TÜRKİYE* *Siirt University TÜRKİYE* *Harran University TÜRKİYE*	*MANAGEMENT OF MICROPLASTIC POLLUTION IN SOILS: MITIGATION STRATEGIES AND REMOVAL TECHNIQUES*
Assoc. Prof. Adila Mahmudova Assoc. Prof. Novruz Guliev Assoc. Prof. Gulnar Mammadli Halila Mammadova	*Azerbaijan State Pedagogical University AZERBAIJAN* *Azerbaijan Tourism and Management University AZERBAIJAN*	CHANGES IN THE WATER-HOLDING CAPACITY OF MEAT AND MEAT PRODUCTS DURING HEAT TREATMENT

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ONLINE PRESENTATIONS

02.12.2024 / HALL-2 / SESSION-1

ANKARA LOCAL TIME: 10 00 - 12 00

HEAD OF SESSION: Prof. Dr. Bünyamin YILDIRIM

AUTHORS	AFFILIATION	TOPIC TITLE
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Muzaffer Berkin KAYA Prof. Dr. Rafet ASLANTAŞ	*Eskisehir Osmangazi University TÜRKİYE*	DETERMINATION OF PHENOLOGICAL AND POMOLOGICAL CHARACTERISTICS OF PISTACHIOS GROWN IN BATMAN ECOLOGY
Özgüç GÜNEŞ Kaan HÜRKAN	*Iğdır University TÜRKİYE*	BACTERIAL FLORA ON THE SURFACE OF GRAPE FRUITS: GENERAL INFORMATION AND ITS IMPORTANCE FOR FRUIT QUALITY
Prof. Dr. Bünyamin YILDIRIM Assist. Prof. Dr. Mehmet Zeki KOÇAK	*Iğdır University TÜRKİYE*	USE AND IMPORTANCE OF HIGH ADDED VALUE ASPIR (Carthamus tinctorius) PLANTS
Prof. Dr. Bünyamin YILDIRIM Assist. Prof. Dr. Mehmet Zeki KOÇAK	*Iğdır University TÜRKİYE*	USE OF MUSHROOMS WITH HIGH ADDED VALUE
Assoc. Prof. Dr. Mehmet KARAMAN	*Muş Alparslan University TÜRKİYE*	EVALUATION OF MEXICAN ORIGIN BREAD WHEAT ADVANCED STAGE LINES IN TERMS OF AGRICULTURAL CHARACTERISTICS IN DIYARAKIR PROVINCE CONDITIONS
Assoc. Prof. Dr. Mehmet KARAMAN	*Muş Alparslan University TÜRKİYE*	SELECTION OF BREAD WHEAT GENOTYPES IN TERMS OF THOUSAND GRAIN WEIGHT UNDER MULTIPLE ENVIRONMENTS WITH GGE BIPLOT ANALYSIS

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ONLINE PRESENTATIONS

02.12.2024 / HALL-3 / SESSION-1

ANKARA LOCAL TIME: 10 00 - 12 00

HEAD OF SESSION: Prof. Dr. İbrahim DEMİRTAŞ

AUTHORS	AFFILIATION	TOPIC TITLE
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Assoc. Prof. Dr. Vedat BEYYAVAŞ Assoc. Prof. Dr. Cevher İlhan CEVHERİ	*Harran University TÜRKİYE*	EFFECT OF DIFFERENT IRRIGATION LEVELS ON THE CHEMICAL QUALITY PROPERTIES OF COTTON FIBER (*Gossypium hirsutum* L.)
Lect. Musa KARADAĞ Dr. Yunus BAŞAR Prof. Dr.İbrahim DEMİRTAŞ Prof. Dr. Mehmet Hakkı ALMA	*Iğdır University TÜRKİYE*	NATURAL MEDICINE; PHYTOCHEMICAL CONTENT OF *HYPERICUM PERFORATUM* SUBSP. *ANGUSTIFOLIUM*
Prof. Dr. İbrahim DEMİRTAŞ	*Iğdır University TÜRKİYE*	OBTAINING BIOACTIVE COMPOUNDS FROM GREEN EXTRACTION METHOD USING SUPERCRITICAL CO_2 EXTRACTION TECHNIQUES
Prof. Dr. İbrahim DEMİRTAŞ	*Iğdır University TÜRKİYE*	VALUE-ADDED PRODUCTS AND RELATED COMPOUNDS FROM PROPOLIS
Prof. Dr. Recep GÜNOĞAN Prof. Dr. Hikmet GÜNAL	*Harran University TÜRKİYE*	IMPACTS OF AGROVOLTAIC SYSTEMS ON SOIL ECOSYSTEMS IN SEMI-ARID REGIONS

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ONLINE PRESENTATIONS

02.12.2024 / HALL-4 / SESSION-1

ANKARA LOCAL TIME: 10 00 - 12 00

HEAD OF SESSION: Dr. C. Vijai

AUTHORS	AFFILIATION	TOPIC TITLE
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Bashir, Mohammed Bawuro	*Ahmadu Bello University NIGERIA*	MANAGEMENT PRACTICES OF CATTLE DISEASES AND PARASITES AMONG PASTORALISTS IN NORTH-EAST, NIGERIA
Dr. C. Vijai	*Dr. Sagunthala R&D Institute of Science and Technology INDIA*	IMPACT OF DIGITAL LITERACY ON RURAL ECONOMIC DEVELOPMENT
Faisal Nazir	*Agriculture University PAKISTAN*	PRODUCTION AND CHARACTERIZATION OF CARBON NANOTUBES FROM BIOCHAR UNDER MICROWAVE IRRADIATION
Maria Fareed Siddiqui Hammad Ur Rehman Umar Raees	*Lahore University PAKISTAN* *Pakistan Council of Research in Water Resources PAKISTAN*	GENETIC MANIPULATION AND THE ASSOCIATED HAZARDS OF GENETICALLY MODIFIED AGRICULTURAL PRODUCTS
Assoc. Prof. Dr. Chayanika Uniyal Assoc. Prof. Dr. Amna Mirza	*Delhi University INDIA*	RURAL WOMEN: DRIVING FORCE BEHIND NEW INDIA'S AGRARIAN TRANSFORMATION
Assoc. Prof. Dr. Sagaya Aurelia	*CHRIST University INDIA*	AI-DRIVEN AGRICULTURAL SENSORS AND CROP YIELD PREDICTION SYSTEMS IN INDIA
MOHANAPRIYA. P. Assoc. Prof. Dr. CHAMUNDEESWARI. M.	*St. Joseph's College of Engineering INDIA*	RHIZOSPHERE MEDIATED ELECTROGENESIS FOR HARNESSING BIO- ENERGY THROUGH CO_2 SEQUESTRATION- A POWER SOURCE FOR RURAL DEVELOPMENT
VIGNESH K Dr. K. SELVAM ARSHA G	*Palar Agricultural College INDIA*	INVITRO EFFICACY OF COPPER NANOPARTICLES AGAINST RICE SHEATH BLIGHT CAUSED BY Rhizoctonia solani
VIGNESH K Dr. K. SELVAM ARSHA G	*Palar Agricultural College INDIA*	INVITRO EFFICACY OF COPPER NANOPARTICLES AGAINST RICE BLAST CAUSED BY Pyricularia oryzae
Khaoula FAIZ Chaymae GHAFFOULI Adil ROUKBANI Mohammed BENLMLIH Bouchra LOUASTÉ	*Sidi Mohammed Ben Abedllah University MOROCCO*	UNVEILING THE MOLECULAR COMPOSITION AND BIOLOGICAL PROPERTIES OF OLIVE BY-PRODUCT

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ONLINE PRESENTATIONS

02.12.2024 / HALL-5 / SESSION-1

ANKARA LOCAL TIME: 10 00 - 12 00

HEAD OF SESSION: Prof. Dr. Süreyya Yiğit

AUTHORS	AFFILIATION	TOPIC TITLE
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Valentina Papić Bogadi Ph.D. Bernardica Črep, bacc.ing.agr.	*Križevci University CROATIA*	THE IMPORTANCE OF KNOWING A FOREIGN LANGUAGE FOR SPECIFIC PURPOSES IN THE AGRICULTURAL SECTOR
Prof. Dr. Süreyya Yiğit	*New Vision University GEORGIA*	WHAT ARE THE CHALLENGES FACING EUROPEAN AGRICULTURE
I. M. Danwali S. A. Okunsebor R. Mohammed	*Nasarawa State University NIGERIA*	EFFECT OF DRIED TIGERNUT (Cyperus esulentus L.) SUPPLEMENTARY DIET IN FORMULATED FEED ON Clarias gariepinus FECUNDITY, FERTILIZATION, HATCHABILITY OF EGGS AND SURVIVAL RATE OF THE HATCHLINGS
P. Pooja Dr. R. Saravanan	*Bharath Institute of Higher Education and Research INDIA*	ROLE OF VETERINARY PHARMACISTS IN ANIMAL HEALTHCARE
Oluwadamilola Peace AGOI Moses Adeolu AGOI Oluwanifemi Opeyemi AGOI	*Federal University of Agriculture Abeokuta NIGERIA* *Lagos State University of Education NIGERIA* *Obafemi Awolowo University NIGERIA*	EVALUATING THE EFFICACY OF TECHNOLOGY IN THE ASSESSMENT OF THE CORRELATION BETWEEN SEED COLORATION AND FUNGAL INFECTION ON SESAME PLANT
Dr. Rekha Suman Abhilasha	*Himachal Pradesh University INDIA*	FROM CHILLING HOURS TO RISING TEMPERATURES: UNDERSTANDING CLIMATE CHANGE'S IMPACT ON APPLE CULTIVATION IN HIMACHAL PRADESH'
Md. Muntasir Alam Muhib Fahmida Begum Mina Md. Faruk Hasan	*Rajshahi University BANGLADESH*	DETERMINATION OF HEAVY METALS FROM SELECTIVE DRY FISHES AND EVALUATION OF THEIR CYTOTOXIC EFFECTS ON ZEBRA FISH EMBRYOS
Prof. Bouchra LOUASTÉ Dr. Adil ROUKBANI Dr. Khaoula FAIZ Dr. Chaymae GHAFFOULI	*Sidi Mohammed Ben Abedllah University MOROCCO*	PHYSICOCHEMICAL CHARACTERIZATION AND PRETREATMENT FOR ENERGY PRODUCTION
Abah U.D Simon V.O Abaekere C.O. Daikwo S. Amuna O.T.	*Federal University Lokoja NIGERIA*	FUNGI ASSOCIATED WITH ANTHRACNOSE DISEASE OF MANGO LEAVES (MANGIFERA INDICA)
Amana A. E. Daikwo S. Ibrahin N. Lucas K.A. Amuna O.T Simon V.O. Abaekere C.O.	*Federal University Lokoja NIGERIA*	EFFECTS OF GARLIC AND GINGER EXTRACTS ON MICROBIAL LOAD OF LOCUST BEAN SEEDS (Parkia biglobosa)

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ONLINE PRESENTATIONS

02.12.2024 / HALL-6 / SESSION-1

ANKARA LOCAL TIME: 10 00 - 12 00

HEAD OF SESSION: Ehizogie Joyce FALODUN

AUTHORS	AFFILIATION	TOPIC TITLE
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Ehizogie Joyce FALODUN Anthony EDIALE	*University of Benin NIGERIA*	PERFORMANCE OF TIGER NUT (*Cyperus esculentus* L.) AS INFLUENCED BY ROW SPACING AND FERTILIZER APPLICATION IN A NIGERIAN RAIN FOREST
Nesrine Benkhaira Naoufal El Hachlafi Saad Ibnsouda Koraichi Kawtar Fikri-Benbrahim	*Sidi Mohamed Ben Abdellah University MOROCCO*	PHYTOCHEMICAL COMPOSITION AND BIOACTIVE PROPERTIES OF *Clinopodium nepeta* ESSENTIAL OIL: ANTIOXIDANT, ANTIMICROBIAL, AND ANTIDIABETIC POTENTIAL
Said Babou Miloud Chakit Radia El Gui Abdelhalem Mesfioui Youssef Sqalli-Houssaini	*Ibn Tofail University MOROCCO*	TOXICITY ASSESSMENT OF ETHANOLIC EXTRACT OF ROSMARINUS OFFICINALIS LEAVES IN FEMALE WISTAR RATS
Said Babou Miloud Chakit Abdelhalem Mesfioui Youssef Sqalli Houssaini	*Ibn Tofail University MOROCCO*	ANTILIPIDEMIC AND NEPHRO-HEPATOPROTECTIVE ACTIVITIES OF ROSMARINUS OFFICINALIS ETHANOLIC EXTRACT IN WISTAR RATS
Dr. BRAKNI Oumaima Dr. BIBIMOUNE Imene Prof. KERBOUA ZIARI Yasmina	*University of Science and Technology Houari Boumediene ALGERIA*	ADVANCED COMPUTATIONAL FLUID DYNAMICS ANALYSIS OF FLOW FIELD CHANNEL DESIGN
M'hamed Majji Abdelhak Talha Ouiam Chetto Rachid Benkirane Hamid Benyahia	*National Institute for Agricultural Research (INRA) MOROCCO* *Ibn Tofail University MOROCCO*	SCREENING OF NEW HYBRID CITRUS ROOTSTOCKS FOR SALINITY AT EARLY SEEDLING STAGES UNDER GREENHOUSE CONDITIONS
D. Malathi S. Bhuvaneswari	*Bharathi Women's College INDIA*	PHYTOCHEMICAL ANALYSIS OF TRADITIONALLY USED MEDICINAL PLANTS
Zineb ELABOUDI Samira EL AOUIDI Radouan SAADI Azzouz BENKDAD Zineb EL Mouridi Abdelmourhit LAISSAOUI Abdelaziz MADINZI Salah SOUABI	*Hassan II University MOROCCO* *Centre National de l'Energie, des Sciences et des Techniques Nucléaires MOROCCO* *Centre National de l'Energie, des Sciences et des Techniques Nucléaires MOROCCO* *Centre National de l'Energie, des Sciences et des Techniques Nucléaires MOROCCO* *National Institute of Agronomic Research (INRA) MOROCCO* *Centre National de l'Energie, des Sciences et des Techniques Nucléaires MOROCCO* *Hassan II University MOROCCO* *Hassan II University MOROCCO*	RADIONUCLIDE'S SOIL-PLANT TRANSFER FACTORS IN MEKNES SEMI-ARID AREA, MOROCCO

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REDUCING CARBON FOOTPRINT IN VERTICAL FARMING AND HYDROPONIC SYSTEMS

Sefa ALTIKAT

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ABSTRACT

Introduction and Purpose: The growing global population, projected to reach 9.7 billion by 2050, underscores the urgency for sustainable food production systems. Vertical farming and hydroponic systems offer innovative solutions to food security challenges by minimizing environmental impacts. These systems optimize resource use, reduce land dependency, and limit agrochemical application, presenting a viable alternative to traditional agriculture. This article aims to evaluate the sustainability potential of these technologies and identify strategies to address their challenges, particularly energy demands and carbon footprints.

Materials and Methods: Vertical farming employs controlled environments with energy-efficient LED lighting, while hydroponics replaces soil with nutrient-rich solutions. A life cycle analysis (LCA) was utilized to examine energy consumption, carbon emissions, and resource efficiencies in these systems. Key methods included implementing renewable energy sources, dynamic sensing technologies for real-time monitoring, and closed-loop nutrient recycling systems.

Results: Vertical farming enables year-round crop production with significantly reduced water usage and minimal nutrient runoff. Hydroponic systems prevent soil degradation and conserve up to 90% more water than traditional methods. High energy demands, particularly for lighting and climate control, were highlighted as critical barriers. The carbon footprint of vertical farming remains a challenge due to reliance on non-renewable energy sources.

Discussion and Conclusion: While vertical farming and hydroponic systems present transformative potential for sustainable agriculture, energy efficiency remains a critical limitation. The integration of renewable energy systems could mitigate carbon emissions and operational costs. Dynamic sensing technologies and closed-loop systems enhance resource efficiency, but scalability and cost barriers must be addressed. Additionally, urban implementation reduces transportation emissions, bolstering localized food security. Future research should explore improving carbon sequestration through plant trait optimization and developing economic models to make these systems more accessible. Vertical farming and hydroponics represent innovative pathways to sustainable agriculture, offering solutions to pressing global food security challenges. With advancements in renewable energy integration, dynamic monitoring systems, and enhanced plant-based research, these technologies can substantially reduce global carbon emissions while meeting future food demands. To achieve their full potential, interdisciplinary efforts in research, policy, and economic modeling are essential for widespread adoption.

Key Words: Vertical farming, hydroponic systems, carbon footprint, water conservation, renewable energy, sustainable agriculture.

SELECTION AND OPTIMISATION OF HYPERSPECTRAL AND MULTISPECTRAL BANDS IN AGRICULTURAL RESEARCH

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ABSTRACT

Introduction and Purpose: The article explores the use of hyperspectral and multispectral imaging technologies in agricultural and genetic research. It highlights the growing significance of spectral band selection and optimization in applications such as crop monitoring, stress detection, soil analysis, and genetic studies. Hyperspectral imaging offers high spectral resolution for detailed analyses, while multispectral imaging balances efficiency and cost-effectiveness. The study aims to provide a comprehensive overview of selection and optimization strategies for these technologies to improve research accuracy and efficiency.

Materials and Methods: The article discusses the technical differences between hyperspectral and multispectral imaging systems, including spectral resolution, data acquisition, and cost considerations.Various agricultural applications such as plant health monitoring, soil nutrient assessment, and phenotyping are analyzed alongside genetic studies involving genotype-phenotype mapping and stress tolerance evaluations.Methods such as machine learning, artificial intelligence, and mathematical modeling are presented for reducing data dimensionality and selecting the most relevant bands for specific research goals.

Results: Hyperspectral imaging detects chlorophyll levels, water stress, and soil properties with high precision, while multispectral imaging is suitable for yield forecasting and pest management. The use of hyperspectral imaging improves genotype-phenotype mapping, enabling detailed trait analyses. Bands like 400-700 nm (visible spectrum) and 1400-1900 nm (infrared) are particularly significant. AI models and mathematical algorithms effectively identify essential spectral bands, enhancing the quality of data for agricultural and genetic research.

Discussion and Conclusion: Hyperspectral imaging, while more resource-intensive, offers unparalleled accuracy for genetic and agricultural research. Multispectral imaging provides a practical alternative for broader applications requiring less detailed data. Combining spectral imaging data with other technologies like IoT, UAVs, and genomic datasets could significantly improve decision-making in precision agriculture and plant breeding.The high cost of hyperspectral systems, coupled with the complexity of data processing, poses a barrier to widespread adoption. However, advances in AI and computational tools are gradually addressing these limitations.The need for interdisciplinary research combining genetics, agriculture, and computer science is emphasized to fully harness the potential of spectral imaging technologies.

Key Words: Spectral Imaging, Band Selection, Hyperspectral Data, Multispectral Analysis, Agricultural Research, Genetic Phenotyping

ROLE OF FLAX SEED IN MITIGATING ENTERIC CH_4 EMISSION IN DAIRY CATTLE

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ABSTRACT

Enteric methane (CH_4) emissions from livestock, particularly ruminants like cattle, goats, and sheep, significantly contribute to greenhouse gas emissions. Researchers have identified dietary interventions to mitigate enteric methane emissions. Lipid supplements, notably those derived from oilseeds and flaxseed, have shown promising results in reducing CH_4 emissions. Flaxseed, rich in alpha-linolenic acid (18% ALA) and total fatty acids (53-56%), enhances omega-3 fatty acids and provides protein, fiber, and antioxidants in the cattle milk. Both whole and ground flaxseed are commonly added to cattle feed, with ground flaxseed efficiently boosting n-3 Polyunsaturated fatty acids (PUFA) content. Studies demonstrate flaxseed supplementation reduces enteric CH_4 production through multiple mechanisms: biohydrogenation of unsaturated fatty acids, enhanced propionate production, and protozoal inhibition. Oilseed feeding significantly reduces protozoal populations, sometimes eliminating rumen ciliates, resulting in lower CH_4 output. PUFAs inhibit microorganisms involved in fiber digestion, hydrogen production, and cellulolytic bacteria, potentially impairing methanogens that utilize hydrogen for CH_4 production. Flaxseed also decreases dry matter and organic matter digestibility, reducing CH_4 emissions due to diminished nutrient utilization. Optimizing flaxseed supplementation and forage quality can balance CH_4 mitigation with milk yield. This approach offers a sustainable solution for the dairy industry to reduce its climate footprint.

KEYWORDS: Enteric methane, flaxseed, Polyunsaturated fatty acids

CLIMATE CHANGE AND PRODUCTION EFFICIENCY OF CHICKPEA KASHMORE-KANDHKOT DISTRICT

Dr.Faiz Muhammad Shaikh
Professor-University of Larkano -Sindh

Dr.Liaquat Ali Bhutto
Director Agriculture Research SAU-Tando jam

Rasool Bux Junejo
Director Agri.Extension-Government of Sindh

Muhammad Zafar Wassan
Conservator Forest -Larkana

Syed Mehtab Ali Shah
Progressive Grower-Saleh Pat

Eng. Syed Mujeeb Hyder Shah
Progressive Grower Ontario-Canada

Abstract

This research investigates Climate Change and production efficiency of Chickpea Kashmore-Kandhkot District**.** A total of 300 genome-wide simple sequence repeat (SSR) markers were initially screened, out of which 89 were found polymorphic which generated 317 polymorphic alleles with an average of 3.56 alleles per SSR locus. The number of alleles at each locus varied from 2 to 7. The population genetic structure analysis grouped different genotypes in three major clusters and three genetically distinct subpopulations (SPs) (i.e., SP-1, SP-2, and SP-3) with one admixture subpopulation (SP-4). Both cluster and population genetic structure analysis categorized the advanced mung bean genotypes in a single group/SP and the released varieties in other groups/SPs, suggesting that the studied genotypes may have common ancestral history at some level. The population genetic structure was also in agreement with the genetic diversity analysis. The estimate of the average degree of linkage disequil

ibrium (LD) present at the genome level in 80 mung bean genotypes unveiled significant LD blocks. Over the four seasons, 10 marker-trait associations were observed significant for YMD and four seed yield (SY)-related traits viz., days to flowering, days to maturity, plant height, and number of pods per plant using the mixed linear model (MLM) method. These associations may be useful for marker-assisted mung bean yield improvement programs and YMD resistance

HERBICIDE INFORMATION NEEDS OF FARMERS IN ENUGU STATE, NIGERIA.

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The study assessed herbicide information needs of farmers in Enugu State, Nigeria. The specific objectives of the study were to: identify the types of crops grown by the farmers, farmers' practices of herbicide application, farmers sources of information on herbicides, farmer' level of knowledge on herbicide usage, ascertain farmer's constraints to assessing information on herbicide usage and to identify perceived information needs of farmers on herbicide usage. A multi stage sampling procedure was used to select 200 farmers for the study. The data were collected through the use of structured interview schedule and were analyzed using frequency, percentage, and exploratory factor analysis. The result shows that the majority (77.0%) of farmers were maize farmers, while 90.0% had poor herbicide practices. The farmers' major sources of information were friends (71.0%), neighbours (69.0%) and input dealers (65.5%). About 91.5% of the farmers had moderate knowledge level on herbicide practices. The farmers' perceived constraints to assessing information on herbicide usage were majorly financial, communication and ignorant constraints while their perceived areas of information needs were on the areas of herbicide hygiene, personal protective equipment, herbicide specification and herbicide poisoning. From the results of the study, it could be deduced that there is need for improved herbicide practices and knowledge among the farmers to ensure safety of the farmers, consumers of farm produce and the environment. The study recommends that agricultural extension agents should use more innovative ways of reaching out to farmers through social media to launch massive enlightenment campaign on the use of personal protective equipment in Enugu State, Nigeria. Again, due to the limited extension workers in the state, government and NGOs should register and train input suppliers on best practices on herbicide usage as these agro-dealers are often farmers' primary points of contact for both agro-inputs and technical farming advice. Reaching out to farmers through input dealers could have a multiplier effects.

Keyword: Herbicide, information needs of farmers, Enugu State, Nigeria

BLOCKCHAIN TECHNOLOGY IN AGRICULTURE FOR SCIENTIFIC RESEARCH

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Abstract

Block chain technology is revolutionizing agriculture by enhancing transparency, traceability, and efficiency across the supply chain, while offering robust solutions for challenges in scientific research related to the agricultural sector. This paper explores the integration of block chain into agriculture-focused research, emphasizing its role in data integrity, knowledge sharing, and fostering trust among stakeholders. The decentralized and immutable characteristics of blockchain provide a reliable framework for recording agricultural research data, including experimental results, climate data, and crop performance metrics. This ensures the reproducibility of research and prevents data manipulation, fostering greater trust in scientific outcomes. By enabling tamper-proof records, blockchain supports long-term data storage and access, critical for longitudinal studies and comparative analyses in agriculture. Blockchain's application in tracking provenance ensures the authenticity of agricultural produce, addressing concerns around food fraud and mislabeling. This capability not only boosts consumer confidence but also provides farmers and producers with better market opportunities for certified organic and sustainable products. blockchain facilitates the automation of transactions and agreements through smart contracts, reducing dependency on intermediaries and ensuring timely payments. This creates a seamless connection between farmers, researchers, suppliers, and end markets. The integration of blockchain with other digital technologies, such as IoT and AI, amplifies its potential, enabling real-time data collection, analysis, and transparent sharing across the agricultural value chain. These advancements position blockchain as a transformative tool for modernizing agricultural research and ensuring equitable, sustainable practices in farming systems globally. Case studies highlight successful implementation in areas such as precision agriculture, food safety, and carbon credit tracking, demonstrating how blockchain enhances collaboration and innovation. Despite its promise, the adoption of blockchain in agricultural research faces hurdles, including technical expertise, infrastructure costs, and regulatory barriers.

Keywords: Blockchain Technology, Agriculture and Scientific Research

INVITRO EFFICACY OF COPPER NANOPARTICLES AGAINST RICE SHEATH BLIGHT CAUSED BY *Rhizoctonia solani*

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ABSTRACT

Sheath blight, caused by *Rhizoctonia solani*, is a major fungal disease in rice that significantly impacts crop yields globally. The limitations of chemical fungicides, including environmental toxicity and pathogen resistance, have driven the need for alternative control strategies. This study evaluates the in vitro antifungal efficacy of copper nanoparticles (CuNPs) against *R. solani*. CuNPs were synthesized and characterized using techniques such as UV-visible spectroscopy, scanning electron microscopy (SEM), and X-ray diffraction (XRD). Their antifungal activity was assessed through mycelial growth inhibition assays on potato dextrose agar (PDA) medium. Results revealed a concentration-dependent inhibition of *R. solani* mycelial growth, with maximum suppression observed at higher concentrations of CuNPs. The nanoparticles also disrupted sclerotia formation and viability, indicating their potential to hinder the pathogen's life cycle. These findings highlight the potential of CuNPs as an environmentally friendly and efficient alternative for managing rice sheath blight. Further studies are recommended to explore the field-level efficacy, biosafety, and mechanisms of action of CuNPs, paving the way for sustainable disease management in rice cultivation.

KEY WORDS: Rice, Copper Nanoparticles, Sheath Blight, *Rhizoctonia solani*

QUALITY MANAGEMENT IN FISH PROCESSING AGRO-INDUSTRIES SURABAYA

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Abstract

This comprehensive research investigates the implementation and effectiveness of quality management systems within Surabaya's fish processing agro-industrial sector, a crucial component of Indonesia's maritime economy. The study employed a qualitative methodology, utilizing a case study approach to examine several leading fish processing companies in Surabaya, focusing on their quality management practices, challenges, and technological adaptations.The investigation revealed that the systematic implementation of internationally recognized quality management systems, particularly Hazard Analysis Critical Control Point (HACCP) and ISO 9001 certification, has resulted in significant improvements in both product quality and operational efficiency. These standardized systems have enabled companies to maintain consistent product quality while meeting international market requirements. The research particularly highlighted the positive impact of modern processing and packaging technologies in preserving product integrity throughout the supply chain. The study identified several persistent challenges facing the industry. Primary among these is the inconsistent supply of raw materials, which affects production planning and quality maintenance. This issue is compounded by a noticeable shortage of skilled human resources capable of effectively implementing and maintaining sophisticated quality management systems. The research also uncovered variations in quality management practices across different companies, suggesting a need for industry-wide standardization. The findings emphasize that effective quality management is not merely a technical requirement but a strategic necessity for the long-term sustainability and international competitiveness of Surabaya's fish processing sector. Based on these observations, the study recommends establishing stronger collaborative networks between industry stakeholders, government regulatory bodies, and educational institutions. Such partnerships could address the identified challenges through targeted training programs, technology transfer initiatives, and coordinated efforts to stabilize raw material supply chains. These interventions would contribute to elevating overall quality standards and strengthening the sector's position in both domestic and international markets.

Keywords: quality management, agro-industry, fish processing, supply chain management, food safety.

INVITRO EFFICACY OF COPPER NANOPARTICLES AGAINST RICE BLAST CAUSED BY *Pyricularia oryzae*

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ABSTRACT

Rice blast, caused by *Pyricularia oryzae*, is one of the most devastating diseases affecting rice crops worldwide, leading to significant yield losses. The increasing resistance of the pathogen to conventional fungicides necessitates the exploration of alternative approaches for disease management. This study investigates the in vitro efficacy of copper nanoparticles (CuNPs) against *P. oryzae*. Copper nanoparticles were synthesized and characterized using various techniques, including UV-visible spectroscopy, transmission electron microscopy (TEM), and X-ray diffraction (XRD). The antifungal activity of CuNPs was evaluated by assessing their inhibitory effects on the growth and sporulation of *P. oryzae* on agar plates. Results demonstrated that CuNPs exhibited a significant dose-dependent inhibitory effect on fungal mycelial growth, with an increase in inhibition as the concentration of CuNPs increased. Additionally, CuNPs were found to disrupt spore germination, further contributing to their antifungal activity. The study suggests that CuNPs have potential as an eco-friendly and effective alternative for controlling rice blast disease, offering a promising approach to sustainable agriculture. Further in vivo studies are warranted to confirm their efficacy under field conditions and explore their mechanism of action against *P. oryzae*.

KEY WORDS: Rice, Copper Nanoparticles, Blast, *Pyriculria oryzae*

PERFORMANCE OF TIGER NUT (*Cyperus esculentus L.*) AS INFLUENCED BY ROW SPACING AND FERTILIZER APPLICATION IN A NIGERIAN RAIN FOREST

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ABSTRACT

Tiger-nut (*Cyperus esculentus L*) serves as a source of income and nutrition for billions of people globally. Despite the economic importance of this crop, cultivation is not common in Edo rain forest of Nigeria and efforts to cultivate it require fertile soils and appropriate plant spacing. Field and laboratory trials were conducted to investigate the effect of row spacing and fertilizer application on the growth, yield and quality of Tiger-nut (*Cyperus esculentus L*) in the University of Benin, Nigeria using a 3 x 4 factorial arrangement fitted into randomised complete block design (RCBD), replicated three times. The treatments consisted of three plant spacing (S1= 15 cm x 20 cm, S2= 15 cm x 25 cm and S3= 15 cm x 30 cm) and four fertilizer application rates: F0: Control, F1: 400 kg ha $^{-1}$ NPK 15:15:15, F2: 20 t ha $^{-1}$ poultry manure F3: 10 t ha $^{-1}$ poultry manure + 200 kg ha $^{-1}$ NPK 15:15:15. The effect of plant spacing was not significant on the vegetative characters of tiger nuts but 15 cm x 20 cm plan spacing increased the yield components while application of 20 t ha $^{-1}$ poultry manure produced significantly ($p \leq 0.05$) more number of nuts (31.61), fresh weight of nuts (22.08g) per plant and the highest nut yield (5.98 t ha $^{-1}$) while N concentration and uptake increased at $S_2 F_3$ (15 cm x 25 cm spacing at 10 t ha $^{-1}$ poultry manure + 200 kg ha $^{-1}$ NPK 15:15:15) and the protein and carbohydrate content was highest at S_3F_1 (15 cm x 30 cm spacing with 400 kg ha $^{-1}$ NPK 15:15:15). Therefore, application of 20 t ha $^{-1}$ poultry manure at a spacing of 15 cm x 20 cm should be adopted for high nut yield.

Keywords: Tiger nut, Protein, yield, spacing, fertilizer.

RHIZOSPHERE MEDIATED ELECTROGENESIS FOR HARNESSING BIO-ENERGY THROUGH CO_2 SEQUESTRATION- A POWER SOURCE FOR RURAL DEVELOPMENT

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ABSTRACT

In response to escalating global energy demands and mounting environmental concerns, Microbial Fuel Cells have emerged as a groundbreaking technology, leveraging the unique abilities of microorganisms to harness bioenergy. The feasibility of power generation by non-destructive usage of rhizodeposits of *Oryza sativa* plant formed mainly due to photosynthesis-carbon sequestration mechanism was studied in rhizosphere based microbial fuel-cell (R-MFC). Four fuel-cell assemblies (non-catalyzed graphite-plates; membrane-less operation; air–cathode) were evaluated for their electrogenic activity by varying anode distances from root in rhizosphere [A1 – 0; A2 – 8; A3 – 12 and A4 – 16 cm] at 2 cm depth from soil-layer and analyzed their electrogenic potential. The fuel-cell assembly near to the root zone showed maximum electrogenic-activity (R1, 987 mV/4.52 mA) followed by R2 (650 mV/4.11 mA), R3 (620 mV/3.4 mA) and R4 (240 mV/1.2 mA). The observed maximum electrogenesis with R1 and minimum with R4 electrode-assemblies enumerated the critical role of root-exudates as substrates. All fuel-cell assemblies showed 20% higher electrogenic activity during day-time operation which can be directly attributed to plant's photosynthetic activity. The study enumerated the potential of plant to harness power in a sustainable way by optimum placement of fuel-cell setup in their rhizosphere.

Key words: Rhizosphere, Bioenergy, Paddy field, Carbon dioxide sequetration

PHYTOCHEMICAL ANALYSIS AND IN-SILICO EVALUATION OF DRUG-LIKENESS OF ETHANOLIC EXTRACT OF MITRACARPUS SCABER

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ABSTRACT

Medicinal plants have long been a vital part of healthcare since they have abundant bioactive substances that have positive effects on health. *Mitracarpus scaber*, the annual plant which belongs to the Rubiaceae family, is widely prized in Nigeria for its effectiveness in treating skin diseases including ringworm and eczema. Using both qualitative and quantitative techniques, a thorough phytochemical analysis of ethanolic extract of whole plant of *M. scaber* has revealed a number of important bioactive compounds, such as terpenoids, saponins, flavonoids, alkaloids, glycosides, tannins, and steroids after maceration method. By means of cutting-edge methods, Gas Chromatography-Mass Spectrometry (GC-MS) has found 17 important chemicals in the *M. scaber* extract, including pentadecanoic acid, 1,2,3-benzenetriol, and oleic acid in significant amounts. Moreover, the drug-likeness of these compounds was evaluated in *silico* using AdmetSAR software, demonstrating that they complied with Lipinski's Rule of Five. This implies that they could be useful for oral medication based on its ADME (absorption, distribution metabolism and excretion) properties. This study validates the use of *M. scaber* in ethno-medicine. Further study should be carried out on the extracts in order to determine their antimicrobial susceptibilities on the organisms that cause various infectious diseases in order to maximize its therapeutic promise in modern medicine

Key words: Phytochemicals, ethanolic extract, Druk-likeness, Plant, and *in-silico*

BIFURCATIONS OF A TWO-DIMENSIONAL DISCRETE TIME PLANT-HERBIVORE SYSTEM

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Abstract:

This work is purely dedicated to the bifurcations analysis of a two dimensional discrete time plant-herbivore system formulated by Allen et al. (1993). It is proved that the system undergoes a transcritical bifurcation in a small neighborhood of boundary equilibrium and a Neimark–Sacker bifurcation in a small neighborhood of the unique positive equilibrium. An invariant closed curve bifurcates from the unique positive equilibrium by Neimark–Sacker bifurcation, which corresponds to the periodic or quasi-periodic oscillations between plant and herbivore populations. For a special form of the system, which appears in Kulenovic and Ladas (2002), it is shown that the system can undergo a supercritical Neimark–Sacker bifurcation in a small neighborhood of the unique positive equilibrium and a stable invariant closed curve appears. This bifurcation analysis provides a theoretical support on the earlier numerical observations in Allen et al. (1993) and gives a supportive evidence of the conjecture in Kulenovic and Ladas (2002). Some numerical simulations are also presented to illustrate our theoretical results.

Keywords: Plant-herbivore system; stability; bifurcation; center manifold theorem; numerical simulations

CLIMATE CHANGE AND URBAN FARMING IN OJO LOCAL GOVERNMENT AREA, LAGOS STATE, NIGERIA: ADAPTING AND MITIGATING CLIMATE CHANGE IMPACTS

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ABSTRACT

Globally, urban farming is a crucial component of food security and livelihoods in cities which face many challenges ranging from food scarcity to urban population increase, limited land resources, high resource use and climate change risks. This paper reviews the potentials of urban farming in contributing to sustainable food production under climate change. Data for the maximum/minimum temperature and rainfall of the Ojo Local Government Area for a period of 31 years (1991 – 2021) and annual crop yield of Lagos State between 1999 and 2015 were used to analyse the impact of climate change on crop yield. Structured Questionnaires were administered to urban farmers to acquire data on the impact of climate change on urban farming activities as well as the mitigation and adaptation strategies adopted. The data obtained were analysed using descriptive and inferential statistical methods. The results of the climate trend analysis showed a steady rise in the annual maximum/minimum temperature and rainfall of the study area. The major impacts of climate change include, destruction of farmlands, post-harvest losses, choking of crops by weeds and more cost incurred on urban farming activities. The farmers adopted mulching, cover cropping, mixed cropping, rainwater harvesting to cope with the impact of climate change. The study recommends climate change awareness programmes to sensitize farmers on the impact of climate change and adaptive/mitigating strategies to adequately abate the impacts of climate change, as well as the creation of farmers' markets to help the urban farmers in the study area generate more income.

Keywords: Climate Change, Urban Farming, Food Security, Climate Change Mitigation, Sustainability

ECO-FRIENDLY INHIBITION OF C38 CARBON STEEL CORROSION IN AGGRESSIVE ENVIRONMENTS USING NATURAL PLANT-DERIVED COMPOUNDS: ELECTROCHEMICAL, DFT, AND MDS ANALYSIS

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Corrosion poses significant economic, environmental, and safety challenges, particularly impacting structures made of metallic materials. It is a leading cause of degradation and failure in installations and equipment. Various factors, including material composition, temperature, microbial presence, hydrodynamic conditions, and mechanical stress, influence corrosion processes.

In this study, we explore the use of an active compound derived from a natural plant as a corrosion inhibitor. The objective is to investigate the effectiveness of this compound in reducing the corrosion of C38 carbon steel in a 1 M hydrochloric acid solution. To evaluate its inhibitory performance, we employ several electrochemical techniques, including electrochemical impedance spectroscopy (EIS), chronoamperometry, and potentiostatic polarization curves. Additionally, we analyze key parameters such as extract concentration and temperature to assess their impact on corrosion inhibition efficiency. The experimental results are further supported and validated by theoretical studies using Density Functional Theory (DFT) and Molecular Dynamics Simulations (MDS), providing deeper insights into the inhibition mechanisms.

Keywords: Corrosion inhibitor, Carbon steel, PDP, EIS, DFT, MDS

EFFECT OF EXPLANT TYPE AND PLANT GROWTH REGULATORS ON MICROPROPAGATION *OF STEVIA REBAUDIANA* TROUGH CALLOGENESIS AND INDIRECT ORGANOGENESIS

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ABSTRACT

Stevia rebaudiana Bertoni is a medicinal plant indigenous to Paraguay and containing compounds named glycosides steviol that are about 300 time sweeter than sucrose. The method of indirect organogenesis for stevia plant regeneration is a promising strategy for generating genetic variability that may be applied in the development of novel cultivars. The process is heavily impacted by the type of explant and exogenous plant growth regulators. This study aimed to evaluate the effects of explant type and exogenous plant growth regulators on Callogenesis and indirect organogenesis of stevia in vitro. Leaf, internodes, nodes and roots explants were placed on Murashig and Skoog (1969) (MS) medium supplemented with 1-naphthaleneacetic acid (ANA) , Kinetin (KIN), 6-Benzylaminopurine (BAP), and Indole-3-acetic acid (IAA) for callus induction. An efficient and standardized medium for callus induction was developed using leaf, nodes, internodes and roots explants cultured on MS medium supplemented with 1mg/l 2,4D and 1mg/l BAP. This medium was appropriate to produce friable yellow callus. Our results imply that internode and leaf explants were better than node and root explants in terms of callus induction, size, texture, and callus color. The best organogenesis response was seen on MS medium supplemented with 1 mg/l BAP and 1 mg/l NAA.

Keywords: auxin, callogenesis, cytokinin, indirect organogenesis, glycosides steviol, leaf, roots, stevia.

SUSTAINABILITY AND WASTE MANAGEMENT IN NUTS PRODUCTION

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ABSTRACT

Introduction and Purpose: The nut industry, especially walnuts, hazelnuts, almonds and pistachios, is becoming increasingly important worldwide. However, production generates significant amounts of waste, including green shells, hard shells and other by-products, which, if not properly disposed of, can lead to environmental problems. This study examines the potential of converting waste from nut production into value-added products such as biofuel, compost and activated carbon.

Materials and Methods: Relevant scientific studies, reports and industrial practices at international and national levels were reviewed. The physical, chemical and biological properties of nut wastes, their negative impact on the environment and the recovery methods — such as composting, biofuel production and activated carbon production — were analyzed.

Results: The study highlights the composition and quantity of waste generated during nut production, including green shells and hard shells, and emphasizes the potential for energy production through biofuels, the improvement of soil fertility through compost and the development of industrial cleaning solutions through activated carbon. It also highlights the economic and environmental benefits of sustainable waste management in the industry.

Discussion and Conclusion: The adoption of sustainable waste management practices in nut production is crucial for reducing environmental impacts, creating economic value and improving the competitiveness of the sector. It is recommended to develop waste management infrastructure through public-private partnerships, expand technical training programs, and create incentive mechanisms to promote sustainable practices in the industry.

Keywords: Shell Fruit Waste, Waste Management, Sustainability, Added Value, Environmental Contribution**.**

VALORIZATION OF NON-EDIBLE FRUIT SEEDS INTO VALUABLE PRODUCTS: A SUSTAINABLE APPROACH TOWARDS CIRCULAR BIOECONOMY

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ABSTRACT

Introduction and Purpose: Global imperatives have recently shown a paradigm shift in the prevailing resource utilization model from a linear approach to a circular bioeconomy. The primary goal of the circular bioeconomy model is to minimize waste by effective re-usage of organic waste and efficient nutrient recycling. In essence, circular bioeconomy integrates the fundamental concept of circular economy, which strives to offer sustainable goods and services by leveraging biological resources and processes. Notably, the circular bioeconomy differs from conventional waste recycling by prioritizing the safeguarding and restoration of production ecosystems, focusing on harnessing renewable biological resources and their associated waste streams to produce value-added products like food, animal feed, and bioenergy.

Materials and Methods: It explores the emerging frontier of non-edible fruit seeds derived metallic nanoparticles and carbon dots, showing their diverse application in industrial and therapeutic potential. Further, it also comprehended the information about the non-edible fruit seeds derived biochar and bio-adsorbent along with their role in agricultural and environmental sectors. Moreover, it also discusses the non-edible fruit seeds derived biodiesel, which could serve as a viable and renewable energy source. Furthermore, this review also explores the potential uses of non-edible fruit seeds in the enrichment application in food (cereal-based foods, other food products, edible oil, and edible films/coating) and animal feed (chicken feed, fish feed, and grazing animal feed). Besides this, this review also meticulously addresses the safety aspects, focusing on cyanogenic glycosides in certain seeds and ongoing toxicological assessments..

Results: The multifaceted valorization of non-edible seeds into valuable products highlights their different application in diverse sectors within the circular bioeconomy. These non-edible seeds have demonstrated their potential as a rich reservoir of sustainable materials and compounds, presenting novel solutions to address environmental issues and promote the utilization of resources. Furthermore, the nature of developed product will determine whether to employ traditional or innovative valorization

Key Words: circular bioeconomy, non-edible fruit seeds, agricultural and environmental sectors, valuable products.

POWERING INCLUSIVE GROWTH: SOCIO-ECONOMIC INEQUALITIES IN INDIAN AGRICULTURE AND SUSTAINABLE ENERGY INTERVENTIONS

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Abstract

Agriculture remains a cornerstone of the Indian economy, intricately linked with the country's social structure, particularly the caste system. This paper explores the role of agriculture in India's economic development and its deep entrenchment within the rural caste hierarchy, where land ownership is often determined by caste. While India's agricultural output has increased significantly rising from 51 million tonnes of food grain production in 1950-51 to over 314 million tonnes in 2022, making India one of the world's largest agricultural producers, this growth has not benefited all social groups equally. The dominance of small landholdings in Indian agriculture has become increasingly pronounced, with 27% of farmers citing unprofitability as a major concern and 40% expressing a desire to leave farming if given the opportunity. Despite numerous land reform initiatives in post-Independence India, Dalits continue to face marginalization in land ownership, further entrenching social and economic disparities. Population pressure and land fragmentation have contributed to a decline in landholding size, with serious implications for agricultural productivity, mechanization, investments, and overall farm income. Through an analysis of agrarian structure and landholdings from a caste-based perspective, this paper highlights the persistent inequalities that influence farmers' access to resources and their agricultural needs. In light of the Indian government's goal to double farmers' income by 2022 and its vision of transforming India into a developed nation by 2047, this paper underscores the need for targeted interventions like addressing historical injustices and promoting inclusive growth in the agrarian sector is crucial to achieving sustainable agricultural development and ensuring equitable economic progress, particularly for marginalized communities like Dalits. This study, conducted in the Vidarbha region Prabhani district of Maharashtra, utilized a multi-stage sampling method for site selection and employed both qualitative and quantitative data collection methods, relying heavily on semi-structured questionnaires and in-depth interviews. the study identifies significant social inequalities. Lower caste farmers, particularly Dalits, had limited access to access the resources. The findings emphasize the necessity of a differentiated approach that considers the diverse needs of farmers based on their social category, ultimately aiming to increase their incomes and improve livelihoods.

Key words: Income, Agriculture, Green revolution Caste and Communication

INVESTIGATION OF ALTERNATIVE FEED SOURCES TO CORN AND SOYBEAN MEALS IN BROILER FEEDING

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The role of protein is essential in a healthy and balanced diet. It is emphasized that 70% of the daily protein requirement should be of animal origin and 30% should be of plant origin. The source of animal protein is red and white meat. White meat is an important source of animal-based protein due to its advantages, such as being cheaper than red meat, shorter production time, and easy accessibility. Broiler farming produces a large portion of white meat. However, the economics and sustainability of broiler farming on a global scale are becoming increasingly difficult. Because the basis of broiler rations consists of corn-soybean meal, the costs of these feed sources, especially soybean meal, are increasing day by day. In this case, it increases the cost of white meat and therefore causes the profitability of enterprises to decrease or white meat prices to increase. The increase in white meat prices restricts the access of segments of society to white meat and poses a significant risk to the sustainability of broiler chicken enterprises. To address this issue in broiler chicken breeding and lower the production cost of white meat, researchers have intensified their exploration of alternative feed sources for broiler chicken feeding. Research on various feed raw materials, particularly agricultural by-products, as alternative feed sources for broiler feeding has been ongoing. This study aims to disseminate knowledge on this topic by assessing the findings of recent studies in the literature on the utilization of alternative feed raw materials to corn and soybean meal, which serve as the foundation for broiler rations.

Keywords: Alternative feed source, animal protein, broiler chicken, soybean meal

USE AND IMPORTANCE OF HIGH ADDED VALUE ASPIR (*Carthamus tinctorius*) PLANTS

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ABSTRACT

Although safflower (*Carthamus tinctorius* L.) is known as an oil plant, it is an important industrial plant whose uses are not limited to the production of vegetable oil. It is used in traditional and modern medicine for the production of herbal medicines for various ailments, in the dyeing industry for its colourful flowers, in cosmetic products, in the production of various foods, in poultry feed and in the production of biodiesel. As a high-value crop, safflower is increasingly recognised for its economic importance. Safflower seeds are rich in oil production and are particularly high in unsaturated fatty acids, making them a valuable source of edible oil and industrial products. In addition, safflower is a drought-tolerant crop, making it suitable for arid regions and contributing to sustainable agricultural practices. The safflower plant is known as false saffron and its flowers are used to produce natural dyes that are in demand in the textile industry. Overall, the use and importance of high-value safflower crops goes beyond their economic benefits and stems from their environmental sustainability and multiple uses in health, nutrition, agriculture and industry, making them a vital crop in modern agriculture.

Key Words: *Carthamus tinctorius* L., Safflower, Alternative oil crops, Value added

USE OF MUSHROOMS WITH HIGH ADDED VALUE

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ABSTRACT

Mushrooms are known as an important nutrient for human beings because they are an important nutrient for human beings in terms of the nutritional values they contain with their ancient use; in addition to protein and vitamins; it is known as an important source of carbohydrates, fibre and mineral substances. Moreover, mushrooms are low in fat. In addition, edible mushrooms, which are used as a nutrient rich in protein sources, can also be shown to be an important alternative to traditional protein sources. Medicinal mushrooms, unlike edible mushrooms, are mushrooms that cannot be used directly as food, but are used in areas such as pharmaceuticals, i.e. drug synthesis, due to the components they contain. Edible and medicinal mushrooms are used as a valuable resource in many industries such as food, pharmaceuticals and cosmetics to improve human health and longevity due to their nutritional, anti-infective, and stress-relieving and antioxidant properties. The production and consumption of mushrooms is increasing every year due to their nutritional benefits, in addition to their taste, and are increasingly appreciated by the world's population. In addition, most of the medicinal and edible mushrooms exported from Türkiye to other countries are natural mushrooms. Natural mushrooms, which are mainly demanded by European countries and Japan, should be seen as a renewable and sustainable resource that can bring important foreign exchange inflows to our country.

Key Words: Mushrooms, Medicinal mushrooms, Türkiye, Edible mushrooms

TOXICITY ASSESSMENT OF ETHANOLIC EXTRACT OF *ROSMARINUS OFFICINALIS* LEAVES IN FEMALE WISTAR RATS

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Abstract

Rosmarinus officinalis (*Rosemary*), an aromatic plant rich in phenolic antioxidant compounds, is widely used in traditional therapy by Moroccan population. The objective of the current study was to assess the acute and subacute toxicity of ethanolic extract of *Rosmarinus officinalis* (EERO) in Wistar rats.

30 rats were divided into 5 groups (control, 1000, 2500, 3500, and 5000 mg/kg dose). Similarly, in the subacute toxicity study, 30 rats were divided into 5 groups (control, 200, 300, 500 and 1000mg/kg dose). The sub-acute toxicity study aimed to identify the NOAEL dose, by following the same signs of toxicity, hematological parameters, biochemical parameters, markers of oxidative stress, and histological analyses were evaluated.

No significant differences were observed in acute and sub-acute toxicity parameters (body weight, food, water), nor acute toxicity was any mortality observed, suggesting that the LD50 is greater than 5000 mg/kg. The sub-acute toxicity study showed no significant differences in hematological, biochemical, and histological parameters, while the extract increased CAT levels and decreased NO in the liver and kidney.

RO extract is non-toxic up to the doses tested and exerts antioxidant activity, manifested by a nitric oxide levels decrease and antioxidant enzyme catalase levels increase in in liver and kidneys.

Keywords: *Rosmarinus officinalis*, hematological analysis, acute and subacute toxicity, catalase (CAT), nitric oxide (NO)

EFFECT OF CARBONIZATION OF WALNUT SHELL ON THE PHYSICO-MECHANICAL PROPERTIES OF NATURAL RUBBER

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Walnut shell (WS), a biodegradable agricultural by-product, is rich in lignin and cellulose. When walnut shells are carbonized, they transform into a carbon-rich material with unique physical and chemical characteristics, making it a potential reinforcing filler in natural rubber (NR). Walnuts were de-shelled, washed, dried, milled, sieved and was then carbonized by tightly packing the WS powder in a muffle furnace at a certain temperature range for some hours, after which the carbonized portion for retained for use. The Carbonized walnut shell (CWS) and Uncarbonized walnut shell (UWS) were then characterized by determining the moisture content, Ash content, pH measurement, Loss on Ignition and particle size. The NR composites filled with CWS and UWS at three ratios of 100/0, 50/50 and 0/100 were prepared and labeled as Mixes A, B and C.

The NR-CWS composites exhibited high physico-mechanical properties, such as tensile strength, elongation at break, abrasion resistance, compression set, and hardness, compared to NR-UWS composites. These improvements were attributed to the higher carbon content in CWS, resulting in better network formation and increased cross-link density. X-ray Fluorescence Analysis (XRF) was conducted to identify elements present in CWS and UWS. Several elements were present including sulphur and calcium. The result showed higher concentrations of sulfur (548 ppm) and calcium (445 ppm) in CWS compared to sulfur (489 ppm) and calcium (422 ppm) in UWS. These higher values for CWS contributed to enhanced rigidity and stronger interactions with NR.

Key Words: Carbonized, Biodegradable, Blends, Characterize, Cross-link, Composite.

SYNTHESIS, CHARACTERIZATION, ANTIMICROBIAL ACTIVITY EVALUATION, AND *IN-SILICO* PREDICTION OF NEW IMIDAZOPYRIDINE DERIVATIVES

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The growing challenge of multidrug resistance in microbial infections highlights the urgent need for new and effective antimicrobial agents. In this study, a series of novel imidazopyridine derivatives was synthesized and evaluated for their antimicrobial potential. The synthetic approach involved the condensation of imidazopyridine carbaldehyde derivatives with various primary amines, yielding high-purity products without the need for additional purification. The structural characterization of the synthesized compounds was confirmed using IR, ^{1}H-NMR, ^{13}C-NMR, and GC-MS techniques.

The antimicrobial activities of these compounds were assessed using the disk diffusion method against key bacterial strains, including *Staphylococcus aureus*, *Escherichia coli*, and *Pseudomonas aeruginosa*, and fungal strains such as *Candida albicans*, *Saccharomyces cerevisiae*, and *Aspergillus brasiliensis*. Most of the compounds demonstrated significant antimicrobial activity, with notable efficacy against both bacterial and fungal pathogens.

To better understand the mechanisms underlying their activity, computational docking studies were conducted to explore the interactions between the compounds and their target microbial proteins. Extending our exploration, an analysis of the pharmacokinetic properties and toxicity by ADMET profiling confirmed the safe use of these newly synthesized compounds.

This work provides valuable insights into the synthesis, characterization, antimicrobial evaluation, and molecular interactions of novel imidazopyridine derivatives, offering promising avenues for the development of new antimicrobial agents

CLADISTIC ANALYSIS of TURKISH DENİZLİ CUCUMIS MELO ALPHAENDORNAVIRUS (CmEV) ISOLATES FROM MELON (*Cucumis melo* L.)

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ABSTRACT

Viruses in the Endornaviridae family are high molecular weight dsRNAs of 9.8 to 17.6 kb in size, initially discovered in broad beans and faba beans and subsequently reported in many plants, fungi and oomycetes. Endornaviruses are capsidless viruses that do not form classical virions. Plant endornaviruses are highly infectious via seeds, eggs or pollen. While the genomes of some endornaviruses have been completely sequenced, those isolated from seagrass, barley and melon have been partially sequenced.

In this study, symptoms reminiscent of cucurbit viruses were observed in melon (Cucumis melo L.) plants in Denizli region of Turkey. Genomic RNA was isolated from the leaves of 15 symptomatic and symptomless plants to identify the possible CmEV pathogen. The presence and evolutionary relationships were investigated using universal primers specific for the RNA-dependent RNA polymerase (RdRp) region, Reverse Transcriptase Polymerase Chain Reaction (RT-PCR), Sequencing and Mega 11 software. The tests performed produced DNA fragments of approximately 420 bp in size in 4 out of 15 samples on agarose gel. Two positive fragments were randomly sequenced and deposited in the gene bank (PQ507951 and PQ507952). The phylogenetic dendrogram based on the RdRp partial gene revealed that Turkish-Denizli CmEV isolates showed close phylogenetic affinity with Türkiye, China, Brazil, Spain, and Israel.

This is the first report to reveal the presence of CmEV and biological relationship information using molecular tools in melon plants cultivated in Denizli region of Türkiye.

Keywords: CmEV, RT-PCR, Molecular Phylogeny, Melon

PHYSICOCHEMICAL CHARACTERIZATION AND PRETREATMENT FOR ENERGY PRODUCTION

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ABSTRACT

Olive oil production is a key economic sector for producing countries, particularly in the Mediterranean region. However, the global increase in olive oil production has resulted in the generation of large amounts of waste, posing significant environmental challenges. This study investigates the potential of waste-to-energy treatments to convert these wastes into valuable energy resources.

The research focuses on the physicochemical characterization and pretreatments of olive oil waste. The findings reveal that olive oil waste has a high-value chemical composition, making it an excellent candidate for energy recovery through suitable treatment processes

Keywords: olive oil waste , physıcochemıcal characterızatıon, physıcochemıcal pre-treatement, enrgey production

ANTILIPIDEMIC AND NEPHRO-HEPATOPROTECTIVE ACTIVITIES OF *ROSMARINUS OFFICINALIS* ETHANOLIC EXTRACT IN WISTAR RATS

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Abstract

Rosemary, Rosmarinus officinalis, from the vernacular name Azir, is medicinal plant used by Moroccan population, it contains chemical compounds with great nutritional value and multiple phytotherapeutic virtues. The study aims to assess the effect of ethanolic extract of Rosmarinus officinalis on lipidic status and blood parameters in rats.

Male rats of Wistar strain were divided into 3 groups: control groups and two groups receiving the R. officinalis extract, one fed a standard diet and the other receiving a fat-enriched diet. The ethanolic extract of the Rosmarinus officinalis leaves was administered orally at a rate of 300mg/Kg for the group 2 and 1000mg/Kg for the group3. mg/kg of rat weight for 4 weeks. Serum parameters were measured using a spectrophotometer including: alanine aminotransferase (ALAT) and aspartate aminotransferase (ASAT) at 340nm, creatinine (Cr), cholesterol, glucose, total cholesterol (CHO), triglycerides (TG) at 500nm and urea at 600nm.

The results show that EERO administration for 28 days decreases the levels of ALT and AST urea and glucose ($P<0.05$), indicating a nephron-hepatoprotective activities, and without effect on cholesterol levels in treated rats with 300 mg/Kg and 100mg/Kg in comparison with control rats however, the triglyceride level was decreased in rats treated by EERO indicating a antilipidemic propriety of rosemary.

These findings show that EERO has a benefic effect on lipidemic, hepatic and nephrotic parameters.

KEYWORDS: Rosmarinus officinalis, blood, liver, kidney, biochemical parameter, Rats.

ADVANCED COMPUTATIONAL FLUID DYNAMICS ANALYSIS OF FLOW FIELD CHANNEL DESIGN

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Abstract

Proton Exchange Membrane Fuel Cells (PEMFCs) are at the forefront of clean and efficient energy solutions, with their performance being profoundly influenced by the complex fluid dynamics within flow field channels. This study leverages Computational Fluid Dynamics (CFD) tools, including Gambit and Fluent, to investigate the effects of various flow field channel designs, particularly those featuring constrictions and enlargements. By systematically analyzing these geometric modifications, the research evaluates their impact on critical performance factors such as mass transport, water management, and overall efficiency. Employing a comprehensive, multidimensional approach, the study examines a range of operational conditions and electrode configurations. The results not only illuminate the mechanisms driving PEMFC performance but also offer actionable insights for optimizing flow field channel designs. This work contributes to advancing PEMFC technology and supports the broader goal of achieving a sustainable energy future.

Keywords: PEMFC - Fluent - Fluid dynamics - Fuel cell designs.

PHYTOCHEMICAL COMPOSITION AND BIOACTIVE PROPERTIES OF *CLINOPODIUM NEPETA* ESSENTIAL OIL: ANTIOXIDANT, ANTIMICROBIAL, AND ANTIDIABETIC POTENTIAL

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Abstract

Clinopodium nepeta, a member of the Lamiaceae family, is valued for its traditional uses and medicinal benefits, particularly its antioxidant and antimicrobial properties. Analysis of its essential oil using GC-MS revealed a composition rich in oxygenated monoterpenes. Key compounds include 1,8-cineole, piperitenone oxide, and limonene.

The essential oil exhibited antibacterial effects, especially against *Bacillus subtilis* (17.53 ± 0.81 mm) and *Bacillus cereus* (16.19 ± 0.30 mm), as well as antifungal activity against *Candida albicans* and *Candida tropicalis*. Additionally, the oil showed strong antioxidant capacity, effectively scavenging ABTS radicals (IC50 = 571.2 ± 6.89 µg/mL), and protecting against lipid peroxidation (IC_{50} = 714.61 ± 7.96 µg/mL).

The results of this work demonstrate that this essential oil can be a source of natural, safe, and effective molecules with many biological properties.

Keywords: *Clinopodium nepeta*, GC-MS, antimicrobial, antiradical

CROP PREDICTION USING MACHINE LEARNING

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Abstract

Crop Prediction plays a pivotal part in icing food security and optimizing agricultural practices. With the arrival of machine learning (ML) ways, the task of prognosticating crop yields has witnessed significant advancements. This paper presents a comprehensive review and analysis of the operation of ML algorithms in crop vaticination.

The study begins by agitating the significance of accurate crop vaticination in agrarian decision- timber and highlights the limitations of traditional styles. latterly, it provides an overview of the abecedarian generalities of ML and its applicability to crop vaticination tasks.

A critical review of being literature is conducted to identify colourful ML models, data sources, and features employed in crop vaticination. The paper categorizes ML ways grounded on their felicity for different types of crops, geographical regions, and environmental conditions.

Likewise, the paper examines the challenges and openings associated with ML- grounded crop vaticination, including data failure, model interpretability, and scalability issues. It discusses strategies for mollifying these challenges and enhancing the robustness and delicacy of vaticination models.

Case studies and real- world operations of ML in crop vaticination are anatomized to illustrate the effectiveness and practical counteraccusations of these ways. also, the paper discusses unborn exploration directions and arising trends in the field, similar as the integration of remote seeing data, IoT bias, and advanced ML algorithms for perfection husbandry.

Overall, this exploration provides precious perceptivity into the current state of crop vaticination using ML and serves as a roadmap for experimenters, interpreters, and policymakers interested in using advanced technologies to optimize agrarian productivity and sustainability.

Keywords: CROP PREDICTION, ML (MACHINE LEARNING), AGRARIAN (AGRICULTURE)

VALORIZING RENEWABLE ENERGIES FOR SUSTAINABLE RICE CULTIVATION IN MOROCCO: A PATHWAY TO AGRO-ECOLOGICAL RESILIENCE

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Abstract

The integration of renewable energy technologies into rice cultivation presents an opportunity to address critical challenges in Morocco's agricultural sector, including water scarcity, rising energy costs, and environmental degradation. This study focuses on valorizing renewable energy sources such as solar, wind, and bioenergy to promote sustainable rice farming practices.

Solar-powered irrigation systems, wind-driven pumps, and the utilization of bioenergy from agricultural residues are explored as innovative solutions to enhance productivity while reducing the carbon footprint of rice cultivation. The findings emphasize the potential of renewable energy in optimizing resource efficiency, supporting agro-ecological resilience, and contributing to Morocco's sustainable development goals. By adopting these approaches, rice cultivation in Morocco can evolve into a more sustainable and climate-resilient system, ensuring food security and environmental conservation.

Keywords: Renewable energies, Sustainable agriculture, Solar energy, Rice cultivation, Morocco.

THE IMPACT OF VEGETABLE-POULTRY INTEGRATION SYSTEM ON GASTRO-INTESTINAL MICROBIOTA OF BROILER CHICKENS

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ABSTRACT

This study was embarked upon to assess the impact of vegetable-poultry integration production system on the gastro-intestinal microbiota of chickens, reared in Shabu-Lafia, Nasarawa State, Nigeria. Random samples of the caecum from sixteen chickens (8 cocks + 8 hens) were obtained on the last day of an 8-week experiment from sixteen farmers (8 males + 8 females). The samples were immediately transported and then subjected to bacteriological examinations in the laboratory to isolate and identify the prevailing bacteria using standard procedures. Salmonella-Shigella (SS) agar and MacConkey agar (for mixed growth) were used for the detection of bacterial isolates**.** The microbial counts were subjected to ANOVA and T-test based on the bacterial species and sex of birds. The proportion of the prevalence of the bacterial species was determined using Chi-square goodness-of-fit test. Three bacterial isolates were identified namely *Enterococcus* species, *Escherichia coli* and *Salmonella* species. The microbial counts (cfu/mL) ranged from 2.35-2.72 x 10^5 (bacterial species), 2.29-2.88 x 10^5 (sex of birds) and 2.28-2.89 x 10^5 (gender of farmers). *Salmonella* spp was the predominant bacteria, followed jointly by *Enterococcus* spp. and *Escherichia coli.* The microbial counts were within the acceptable limits, hence the bacterial species did not constitute any immediate health hazards. Therefore, vegetable-poultry integration production under the smallholder backyard farming system is prospective.

Keywords: Sustainable farming, chickens, microbiota, smallholders, Nigeria

SKILLS REQUIRED IN POULTRY PRODUCTION FOR ECONOMIC SUCCESS AMONG YOUTHS IN DANKO WASAGU LOCAL GOVERNMENT OF KEBBI STATE, NIGERIA

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ABSTRACT

The study was conducted on the Skills Required in Poultry Production for Economic Success among Youths in Danko Wasagu Local Government Area of Kebbi State, Nigeria. The specific objectives were to describe the socio-economic characteristics of the youths in the study area ; identify the essential skills and knowledge required on poultry production; determine the level Health maintenance skills needed to run a successful poultry farm; determine the disease management skills in Poultry. The population for the study consist of 55 poultry farmers and 45 youths who were interview by the use of questionnaire. Data collected were analyzed by the use of frequency, percentage, and mean. The findings revealed that the mean age of 13.8 years among predominance of middle-aged and youth farmers, particularly those between the ages of 19 -28 years. Majority (86.6%, 83.3% and 81.7%) of the respondents suggested a good skills and knowledge on startup capital, fencing and feeding Programme respectively. 90% of respondents suggested either endorsing it highly required or required, on startup capital contributes positively to the poultry. However, 84.9% of respondents endorsed destruction of as many harmful organism as possible, while 81.7% of respondents provide balance feed obtained from reputable millers as some of the level of Health maintenance skills. The study concluded youths in the study area required skills, training and capacity building programs in enhancing their employability and entrepreneurial potential in poultry industry. It is therefore, recommended that, there is need for government to establish Skill acquisition Centre that will be providing training on poultry production in the study area.

Keywords: Skills Required, Poultry Production, Youths, Kebbi State, Nigeria

GENETIC MANIPULATION AND THE ASSOCIATED HAZARDS OF GENETICALLY MODIFIED AGRICULTURAL PRODUCTS

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Abstract:

Genetic manipulation and the associated hazards of genetically modified agricultural products have become a matter of concern in recent years. There is growing public awareness that these changes may have unintended and possibly harmful consequences on the health of consumers. Genetically modified (GM) crops are plants whose genetic makeup has been modified in a lab, rather than through natural selection. There are a wide range of ways this can be achieved, but in general it involves isolating a specific trait from the DNA of one organism, for example, an insect, and inserting it into the DNA of another organism, for example, a plant. The aim is to endow the latter with that trait. This could be to improve a plant's resistance to weeds or insects, or to enhance its nutritional value, for example. There are some concerns for the risks associated with GM crops. Some of the risks that need to be considered are the unknown impact of genetically engineered plants on the environment, the possibility of adverse health effects from their consumption, and the ethical implications of altering nature in this way. Of particular concern is that some GM foods may pose health risks to humans and animals that consume them. In light of these concerns, consumers need to understand the risks associated with genetically modified foods, including the potential for harmful health effects. The information about the risks and benefits of consuming GM foods should be easily accessible and clearly communicated to consumers. More studies are needed to understand the potential impact of genetically modified foods on human health.

Keywords: GM crops, GM foods, Genetic manipulation, Agricultural products, Genetically engineered plants

A REVIEW ON MEDICINAL ROLE OF PITHECELLOBIUM DULCE

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Abstract:

The herb Pythecellobium dulce is multipurpose and plays a variety of roles in traditional medicine. Regarding the effectiveness of the entire plant or its components in treating various illnesses and foods, numerous studies are being carried out. Triterpenoids, flavonoids, sterols, and tannins are some of the plant's active constituents. Proteins, carbohydrates, steroids, and other substances have health-promoting qualities, and modern scientific research has examined and confirmed its disease-preventing qualities, which include antioxidant, antifungal, antiviral, antibacterial, anti-diabetic, diastolic, diuretic, anthlmintic effects, antipyretic, anti-inflammatory, hypoglycemic, and sedative activities. In this paper, we have examined the different medicinal qualities of Pithecellobium dulce.

Keywords: Pithecellobium dulce, therapeutic properties, anticonvulsant, cardio protective, antiulcerogenic.

SYNTHESIS, CHARACTERIZATION, AND ANTIMICROBIAL ACTIVITY OF (*E*)-1-(BENZO[*D*][1,3]DIOXOL-5-YL)-3-(HETEROARYLARYL) PROP-2-EN-1-ONE DERIVATIVE"

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Abstract

In this study, five novel (*E*)-1-(benzo[*d*][1,3]dioxol-5-yl)-3-(heteroarylaryl)prop-2-en-1-one derivatives were synthesized using the Claisen-Schmidt condensation reaction. The compounds were systematically characterized by various spectroscopic techniques, including FT-IR, ^{1}H NMR, ^{13}C NMR, and HRMS, which confirmed their molecular structures. The synthesized derivatives were further evaluated for their antimicrobial properties, specifically their in vitro antibacterial and antifungal activities. The antibacterial activity was tested against four bacterial strains: *Escherichia coli* (MTCC 443), *Pseudomonas aeruginosa* (MTCC 1688), *Staphylococcus aureus* (MTCC 96), and *Streptococcus pyogenes* (MTCC 442), using the standard serial broth dilution method to determine the minimum inhibitory concentration (MIC). Additionally, the antifungal activity was assessed against *Candida albicans* (MTCC 227), *Aspergillus niger* (MTCC 282), and *Aspergillus clavatus* (MTCC 1323). The results showed that the synthesized compounds exhibited good antibacterial activity,and demonstrated moderate antifungal effects. These findings suggest that the (*E*)-1-(benzo[*d*][1,3]dioxol-5-yl)-3-(heteroarylaryl)prop-2-en-1-one derivatives could serve as potential candidates for the development of new antimicrobial agents.

Keywords: Claisen-Schmidt condensation, antibacterial, antifungal, Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus, Streptococcus pyogenes, Candida albicans, Aspergillus niger, Aspergillus clavatus.

CHANGES IN THE WATER-HOLDING CAPACITY OF MEAT AND MEAT PRODUCTS DURING HEAT TREATMENT

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The topic of changes in the water-holding capacity of meat and meat products during heat treatment is a fundamental aspect of food technology and the meat industry. When meat is cooked, significant changes occur in the structure of proteins, cell membranes, and other components, which affect the meat's water-holding capacity.

One of the primary factors leading to these changes is the structural modification of proteins. Meat contains a significant amount of proteins such as myosin, actin, collagen, and elastin, which undergo structural changes during heat treatment (boiling, frying, baking, and other methods). During this process, protein denaturation occurs – at higher temperatures, the structure of proteins is disrupted, they lose their natural form, and this results in a change in their water-holding properties. For example, myosin and actin, which constitute muscle fibers, become less capable of holding water, leading to juice loss from the meat.

Collagen, the main component of connective tissues, turns into gelatin when cooked. This change helps increase the water-holding capacity of the meat, especially in parts where connective tissue is predominant (such as tougher parts of the upper layer). This process, known as "collagen melting," contributes to enhancing the juiciness of the meat.

Different cooking methods have various effects on the water-holding capacity of meat:

Boiling: During boiling, meat often loses a significant amount of water as the high temperature causes the juice to be released from the cells. This is associated with protein denaturation and the breakdown of cell membranes. However, if the meat is cooked in its own juice or broth, some of the water-holding capacity can be partially retained.

Frying: When frying meat in a pan or on a grill, water is also released, but due to the rapid heating and formation of a crust, water loss can be somewhat limited. However, prolonged frying can lead to significant water loss, resulting in reduced juiciness.

Baking: Water loss also occurs during baking, but it is generally less compared to frying. The formation of a crust during roasting is crucial, as it helps retain some of the water within the meat.

Grilling and Barbecuing: The process of water release is similar to frying, but intense heat results in the rapid formation of a crust, which helps retain some moisture within the meat.

The temperature and duration of heat treatment are critical factors in determining the degree of change in water-holding capacity. High temperatures promote faster protein denaturation and the breakdown of cellular structures, leading to greater water release.

Lower temperatures and prolonged processing (e.g., slow boiling or baking at low temperatures) minimize moisture loss and ensure higher juiciness.

In addition to temperature and time, the composition of the meat is another factor affecting its water-holding capacity. Meats from different animals and different parts of a carcass have varying water-holding abilities. For instance, meats with higher fat content and connective tissues (e.g., neck, brisket) tend to have better water retention properties after cooking.

The addition of salt and other ingredients can also modify the water-holding capacity of meat. Salt, due to its osmotic properties, helps retain moisture in the meat.

Cutting Methods: Smaller pieces of meat lose water faster than larger cuts due to a greater surface area-to-volume ratio.

When producing processed meat products such as sausages, meatballs, and similar items, the water-holding capacity plays a crucial role in the final product's texture and quality. The way meat retains water is influenced by mechanical processing (e.g., mincing), the addition of salt, phosphates, and other ingredients, as well as the methods of heat treatment chosen.

Cooking meat involves a complex process that alters water-holding properties depending on temperature, time, cooking method, and the meat's composition. Selecting the appropriate cooking methods based on the type of meat and its properties is essential to maximize water retention and improve the texture of the meat.

Keywords: proteins, myosin, actin, elastin, collagen melting, heat treatment.

MANAGEMENT PRACTICES OF CATTLE DISEASES AND PARASITES AMONG PASTORALISTS IN NORTH-EAST, NIGERIA

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ABSTRACT

This study assessed management practices of cattle diseases and parasites among Pastoralists in North East, Nigeria. The study described the socio-economic characteristic of the pastoralists and analyzed cattle diseases and parasites management Practice. 420 respondents were selected for the study. Percentage, frequency, mean, rating scale and logit regression were used in analyzing the data. Result shows that the mean age of the pastoralists was 35 years, majority (99.5% and 88.6%) were male and acquired Koranic education. Married pastoralists constituted 52.8% with an average household size of nine persons. Vaccination ($\bar{x}$ =2.9), use of herbs ($\bar{x}$ =2.77) and deworming ($\bar{x}$ =2.72) were the pastoralists commonly used management practices in curtailing cattle diseases and parasites. Coefficient of age (0.0224), friends (0.0042), sex (0.0865), were significant in management practice of cattle diseases and parasites. The study recommends the need for extending modern management practices of cattle diseases and parasites to pastoralists so as to increase productivity and higher efficiency in the cattle industry.

Keywords: Management Practices, Cattle Diseases and Parasites, Pastoralists, North-East, Nigeria

WEATHER DERIVATIVES AND THEIR IMPLICATIONS IN THE CONTEXT OF CLIMATE CHANGE

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Abstract: The main objective of this research paper is to investigate weather derivatives and their implications in the context of climate change. The global economy is affected by weather phenomena. Energy market also plays an important role in increasing the use of financial derivatives globally. Moreover weather derivatives represent risk management tools that have the major purpose of protecting the organization against adverse weather phenomena. For instance there is a linkage between the certain derivatives such as weather hedges and commodity prices. In previous recent periods, weather conditions had a very changing and broad dynamic which had severe implications on the financial markets.

Keywords: extreme weather events, sustainable development, weather derivatives, climate change, energy market

AGRO-WASTE BIOCHAR CONVERSION INTO A FISH FEED ADDITIVE: ASSESSING ITS EFFECTS ON THE HEALTH AND PERFORMANCE OF *CYPRINUS CARPIO*

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Abstract

A major problem nowadays is the proper and sustainable management of agro-waste. Supplementing the several fish feed formulations in this research were Biochar (BC) sourced from a variety of agricultural wastes, including cotton (C), wheat (W), corncob (CC), grass waste (Gw), and green waste (GW), and House wastes (HW). Different diets were administered to *Cyprinus carpio* fish in order to study their impact on growth, digestibility of nutrients and minerals, hematological, and body composition. For sixty days, they were given nothing but 2% biochar supplemented sunflower meal as a based diet. A control diet and six experimental diets were prepared, with each containing 2% of a different BC source: HW, CS, Gw, WS, CC, and GW. Each tank had 15 fingerlings, with three replicates for each test diet, and they were fed at 5% of their body weight. The results indicated that supplementation with CCBC significantly (p<0.05) enhanced the growth performance, digestibility, and carcass quality of Common carp, C. carpio, but HWBC had adverse outcomes. Adding 2% corn cob biochar (CCBC) to the feed of the test fishes resulted in the greatest efficiency in mineral absorption. Additionally, on being administered CCBC, the fish blood profiles shown significant improvements (p<0.05). Supplementing *C. carpio* with CCBC improved its growth, hematological, carcass, digestibility, and mineral status more than any other method.

Keywords: *C. carpio,* Biochar, corncob biochar, Agro-waste

ETHNOBOTANICAL STUDY OF *CISTUS MONSPELIENSIS* AND ITS USAGE FOR DIFFERENT PURPOSES IN THE RIF REGION (NORTHERN MOROCCO)

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Cistus monspeliensis L. is an aromatic shrub native to the Mediterranean region, commonly found throughout the Rif region of Morocco. Despite its ecological abundance, its traditional uses among local populations remain underexplored. This study aims to fill this knowledge gap by investigating the ethnopharmacological heritage of *C. monspeliensis* in the Rif region. An ethnobotanical survey was conducted from November 2023 to February 2024 in four municipalities and twelve villages across eight rural communes within Al Hoceima province. A total of 102 participants, reflecting diverse demographic characteristics such as origin, age, gender, profession, education, and socioeconomic status, took part in the survey. Data were collected using structured questionnaires and analyzed statistically with SPSS software (IBM SPSS Statistics version 29). The results revealed that of the 102 participants (52 men and 50 women), 55 were familiar with *C. monspeliensis*, while 47 were not. Among those aware of the plant, only 20.6% actively used it. Reported applications include fanning traditional oven

fires (47.8%), therapeutic purposes (26.1%), beekeeping (8.7%), livestock fodder (8.7%), and sweeping mud houses (8.7%). The whole plant is primarily used for oven fanning, while its leaves are decocted for digestive issues and skin wounds. Beekeepers collect its flowers as a pollen source, and livestock owners feed its leaves to goats. The plant is also traditionally employed for sweeping rural homes. This study underscores the underutilization of *C. monspeliensis* despite its abundance and potential. The findings highlight its diverse applications, ranging from therapeutic to agricultural and household uses, while calling for further research into its pharmacological properties and applications in fields like veterinary medicine and sustainable agriculture.

Keywords: Ethnobotanical, *Cistus monspeliensis* L., Biodiversity, Rif region, Morocco

IMPACT OF CLIMATE CHANGE ON WATER RESOURCES IN NORTHEASTERN ALGERIA

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Abstract :

The aim of this research is to assess the effects of climate change on social, economic, industrial, agricultural and aquatic systems, with particular emphasis on rainfall diversity and its consequences for water resources. By analyzing precipitation data from sixteen climate stations located in northeastern Algeria, this research aims to accurately determine the cold and dry seasons caused by climate. The results will be used to develop effective adaptation strategies for resource management in the context of climate degradation, ensuring sustainable management in a changing climat .

Key-words: Adaptation strategies, climate change, dry seasons, rainfall variability, wet seasons.

RADIONUCLIDE'S SOIL-PLANT TRANSFER FACTORS IN MEKNES SEMI-ARID AREA, MOROCCO

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Abstract

Agricultural products are inherently contaminated with natural radionuclides, which represent an internal radiation dose to humans via dietary intake. Thus, quantitative and qualitative understanding of the uptake of radionuclides by the edible parts of plants is of paramount importance for accurate assessment of the consequences of radioactive materials in soils. The establishment of transfer factors (TFs) on soil-to-plant uptake of radionuclides will enhance assessment of potential health risks to man as a result of radionuclide intake. In the present

study, the research program was directed toward the calculation of transfer factors for several kinds of agricultural products grown in the semiarid region. Soil samples and vegetable were collected in the region of Meknes located at about 500 meters above sea level. Samples were carefully prepared and analyzed by using High Purity Germanium, HPGe gamma, and alpha spectrometry for the measurement of radionuclide activity concentrations. Results from this study were the transfer factors for Th-234, Ra-226, Th-228, Ra-228, Pb-210, K-40, Cs-137, and Po-210 from the measured soil into the representative assortment of vegetables grown within a semi-arid agricultural landscape that envelops Meknes. A standardized experimental methodology was employed to derive TFs that align with international standards, thereby enabling straightforward comparison of these factors with studies conducted globally across similar and differing climatic conditions and food plant categories.

Keywords: Radionuclides, soil, plants, gamma spectrometry, alpha spectrometry, transfer factors, Meknes.

STRATEGIC IMPORTANCE OF BLUE-GREEN ALGAE (CYANOBACTERIA) "SPIRULINA" AND GREEN ALGAE (CHLOROPHYTA) "ULVA" AS AQUATIC AGRICULTURE PRODUCTS

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ABSTRACT

Introduction and Purpose: Cultivation of algal biomass is important for its conversion into food, feed ingredients, fuels/chemicals, and algae-derived bioplastics after harvest. In addition, algae offer environmental benefits with high added value, such as their use in carbon capture due to their effect on reducing carbon emissions and in the treatment of wastewater with high nutrient load.

Materials and Methods: Microalgae and macroalgae-based products can play an important role in the bio-economy for low-carbon emission industry insight. Integrated Multitrophic Aquaculture (IMTA) is considered a promising solution for the sustainable development of aquaculture.

Results: *Ulva* spp. (Chlorophyta) is a useful product for the food, feed and biomaterial industries. Although it reproduces intensively in algal blooms from time to time due to the increasing nutrient load in the seas around the world, large-scale production with controlled harvesting needs to be developed within the scope of sustainable bioeconomy. Spirulina, which is in the class of blue-green algae (Cyanobacteria), is considered a single-cell protein containing high protein concentrations (60-70%), carbohydrates, lipids and pigments. It is a food that is also known as the "best food of the future" and is described as "Space food" by NASA because it is rich in nutrients and can be consumed for a longer period of time.

Discussion and Conclusion:

Blue economy is the systematic use of marine and ocean resources through the integration of short- and long-term economic activities based on the principles of innovation, social inclusion and environmental sustainability in and around the sea. BlueHomeland; It covers all declared or undeclared maritime jurisdictions, internal waters, territorial waters, continental shelf, exclusive economic zone, rivers and lakes of Turkey. A new agricultural paradigm is proposed for Türkiye regarding the necessity of producing Spirulina, a microalgae, and Ulva, a macroalgae, that can make a sustainable contribution to bioeconomic activities within the scope of the blue economy.

Key Words: Sustainable; microalgae; macroalgae; Spirulina; *Ulva* spp.

DETERMINATION OF HEAVY METALS FROM SELECTIVE DRY FISHES AND EVALUATION OF THEIR CYTOTOXIC EFFECTS ON ZEBRA FISH EMBRYOS

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ABSTRACT

Introduction and Purpose: Globally, heavy metal pollution is one of the major serious environmental issues. The present investigations were carried out to determine the Nickel (Ni), Chromium (Cr), Cadmium (Cd), Arsenic (As), Lead (Pb) concentrations and revealed out the effects of dry fish on embryonic development using zebra fish embryo as well as to identify and characterize bacteria isolated from three dried fish species.

Materials and Methods: Three types of dried fish species viz. *Channa punctata*, *Harpadon nehereus* and *Pampus chinensis* were collected from the local and biggest dried fish market of Cox's Bazar Sea beach area, Bangladesh. The concentrations of heavy metals like, Ni, Cr, Cd, As and Pb in selective three commercially valuable dry fish samples were determined using Atomic Absorption Spectrophotometry (AAS) methods.

Results: The mean and comparison of heavy metal concentrations for As and Pb showed the highest levels of concentrations for *Harpadon nehereus* and *Channa punctata* were 3.64±0.08 and 3.28±0.07 ppm, respectively in examined species except *Pampus chinensis.* Zebra fish embryos were showed significant abnormalities of unequal blastomeric curve, yolk sac edema, pericardial edema, spinal curvature and tail deformation were detected in embryos when exposed 50µg/ml and 100µg/ml to dry fish at 24, 33, 48, 72 and 96 hour post fertilization (hpf).

Discussion and Conclusion: This research demonstrates new information about heavy metal distributions in three dried fish from Chittagong, Bangladesh. During edible parts of dry fish, metal concentrations are severely impaired with As and Pb metals; and the metal concentrations are in an alarming level compared to the standard level for fish and fishery products proposed by Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka. In the development of zebra fish embryos, after fertilization, the initial stage of embryonic expansion, and possibly the hatching period are most responsive to metal toxicity. During early fish development, numerous disturbances caused with heavy metals tend to lower numbers and larvae quality. In conclusion, the study reveled that the selected dried fishes are not safe for consuming.

Key Words: Dried Fishes; Heavy Metals, Zebrafish Embryos; Cytotoxicity

BIOLOGICALLY ACTIVE PLANT COMPOUNDS AND THEIR MECHANISMS OF ACTION: REWIEV

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ABSTRACT

Introduction and Purpose: Numerous studies conducted over the past few decades have confirmed that active compounds isolated from plants have multiple biological effects, including antioxidant, antimicrobial, anticancer, antiallergic, and anti-inflammatory properties. The primary focus of phytochemical research has been on phenolic compounds and their potential applications in medicine, cosmetics, pharmacy and agriculture.

The aim of this work is to highlight the significance of biologically active components isolated from plants and to clarify their mechanisms of action at the cellular level, with the goal of contributing to the development of plant-based antimicrobial and antioxidant agents.

Materials and Methods: In this scientific paper, we present the research results on biologically active compounds from plants and their mechanisms of action at the cellular level to summarize this field of study and, in part, contribute to the development of biologically active plant-derived compounds. During the database search, we used the following keywords: "biologically active plant compounds," "antimicrobial activity," and "antioxidant properties of plants."

Results: Plants are characterized by a mixture of various active mechanisms with different pharmacological profiles, allowing them to affect multiple diseases, unlike synthetic drugs, which are designed to inhibit or stimulate a single pharmacological pathway. The antimicrobial potential of essential oils and plant extracts is due to the presence of many pharmacologically active compounds, and their mode of action on bacterial cells depends on the concentration of the active substance, the type of microorganism, and the structure of their

cell wall. Biologically active compounds isolated from plants are associated with antioxidant activity in biological systems, as they play an important role in the absorption and neutralization of free radicals.

Discussion and Conclusion: In recent years, significant efforts have been made to isolate and examine biologically active compounds from plants and their antioxidant and antimicrobial properties. Special attention has been given to the mechanisms of action of these compounds on microbial cells. Biologically active compounds affect the transmembrane pH gradient and membrane integrity of microbial cells, causing leakage of intracellular contents, disruption of transport and energy production processes, as well as the respiratory chain, and play an important role in the absorption and neutralization of free radicals. A review of the literature concludes that the plant world represents an inexhaustible source of biologically active compounds with antimicrobial and antioxidant properties, which should continue to be studied to contribute to the development of plant-based antimicrobial and antioxidant agents.

Keywords: Biologically Active Compounds, Antimicrobial Properties, Antioxidant Activity.

DEVELOPING A BASIC QGIS-BASED AGRICULTURAL MANAGEMENT SYSTEM: INTEGRATING PARCEL, IRRIGATION, AND SATELLITE DATA LAYERS

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ABSTRACT

Introduction and Purpose: Agricultural management increasingly relies on Geographic Information Systems (GIS) to optimize land use, monitor crop health, and efficiently manage resources such as water and soil nutrients. An open-source GIS platform called QGIS provides a flexible and affordable way to create agricultural management systems that are suited to particular requirements and regional circumstances. By integrating diverse data sources, a comprehensive system can be designed to support informed decision-making in agriculture. This preliminary study aims to develop a basic QGIS-based agricultural management system that combines parcels, irrigation networks, and satellite data layers to provide farmers and land managers with actionable insights for precision agriculture, resource management, and sustainable practices.

Materials and Methods: As material, vector data namely, parcel boundaries and irrigation networks, were used. On the other hand, satellite-based raster data such as images with different band combinations, Normalized Difference Vegetation Index (NDVI), Land Surface Temperature (LST), Digital Elevation Model (DEM), etc. were considered. Data were processed in QGIS, where different layers were created for each data type. The parcel boundaries were used as the base layer, while irrigation systems and satellite-derived data were overlaid for spatial analysis. NDVI values were calculated to assess vegetation health, while LST data helped monitor land surface temperatures, which provide information about vegetation water stress. All layers were aligned using appropriate projections to ensure accurate spatial relationships.

Results: By integrating all data sets in an open source GIS software, this study provides a basic and simple agricultural management system for irrigation efficiency analysis, vegetation health and water stress monitoring, and agricultural product pattern mapping. Analyzing the irrigation system data in conjunction with parcel boundaries, we identify areas where irrigation coverage is insufficient or overlaps. This analysis highlights the regions with potential water inefficiencies, helping optimize the irrigation network. Using NDVI and LST data, we monitor vegetation health across the study area, identifying areas with poor crop growth, potential disease, or water stress. DEM data is used to calculate the slope of the terrain within each parcel. Identifying areas of steep slope shows that these areas are unsuitable for certain crops or erosion risks are high.

Discussion and Conclusion: This study demonstrates the development of a basic QGIS-based agricultural management system that integrates parcel boundaries, irrigation systems, and satellite data layers such as NDVI, LST, DEM, etc. By combining these diverse datasets, the system provides valuable insights into irrigation efficiency, vegetation health, and terrain suitability, enabling more informed decision-making for sustainable agricultural practices. The outputs from this system, including thematic maps and spatial analysis, can help farmers and land managers improve irrigation strategies, monitor crop health, and make better decisions regarding water usage and crop selection. By leveraging QGIS and remote sensing data, this system offers a practical and accessible tool for precision agriculture, ultimately contributing to more efficient, sustainable, and climate-resilient farming practices. Future work could expand on these methods, incorporating additional data layers and advanced analytical tools to refine and enhance agricultural management strategies.

Key Words: Agriculture; Geographic Information System; Remote Sensing; Precision Farming; Sustainable Agriculture

ANALYZING CROP DEVELOPMENT USING SENTINEL-2 BASED NDVI TIME SERIES

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ABSTRACT

Introduction and Purpose: Monitoring crop development is essential for effective agricultural management, enabling farmers to make informed decisions regarding irrigation, fertilization, and pest control. Remote sensing technologies, particularly through satellite imagery, have become invaluable tools for assessing vegetation health and tracking crop growth. Among these, the use of Sentinel-2's Normalized Difference Vegetation Index (NDVI) time series offers a powerful means of monitoring crop development at different stages throughout the growing season. In this study, the development of various agricultural parcels planted with wheat, sugar beet, and potato crops will be analyzed using monthly Sentinel-2 NDVI images.By examining the monthly variations in NDVI values, the purpose of this study is to assess how different crops progress through the growing season and how the spatial differences occur in each field.

Materials and Methods: In this study, monthly NDVI images from Sentinel-2 satellites were used to monitor the development of agricultural parcels planted with wheat, sugar beet, and potato crops. Throughout 2023, an NDVI image was acquired each month. These images were processed and analyzed using Google Earth Engine platform. The analysis focused on identifying patterns in crop development, comparing NDVI values across wheat, sugar beet, and potato crop types, and tracking spatiotemporal variations.

Results: Preliminary analysis of the Sentinel-2 NDVI time series revealed distinct growth patterns for wheat, sugar beet, and potato crop types across the agricultural parcels. Areas with low NDVI values were identified, indicating potential stress or poor vegetation health,

particularly during dry spells. Variability in crop development was observed across parcels, providing valuable insights into the spatial and temporal dynamics of crop health.

Discussion and Conclusion: This study reveals the potential of Sentinel-2 NDVI time series in monitoring crop development in agricultural parcels planted with wheat, sugar beet, and potato. By analyzing monthly NDVI variations, the research provides valuable insights into the growth patterns and health status of various crops throughout the season. The findings highlight the utility of remote sensing in identifying crop stress and optimizing management practices such as irrigation and fertilization. This approach offers a cost-effective and efficient tool for precision agriculture, supporting informed decision-making and enhancing crop management strategies.

Key Words: Agriculture; Remote Sensing; Sustainable Agriculture; Wheat; Sugar Beet Potato

THE IMPORTANCE OF KNOWING A FOREIGN LANGUAGE FOR SPECIFIC PURPOSES IN THE AGRICULTURAL SECTOR

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In the process of globalization, knowledge of a foreign language, and especially the language of a profession, is of great importance. A foreign language of a profession is primarily in the function of a profession and can be considered a communication upgrade of a general foreign language. Companies that operate outside the borders of the domestic market need to employ people who understand various social, cultural and communication aspects of business along with knowledge of professional terminology in order to be able to adapt to target markets. The basic goal of this paper is to determine the importance of knowing a foreign language of a profession in agricultural sector. The paper will analyze attitudes of employees in the agricultural sector about the importance of the language of a profession in a business environment. The intention is to determine how important knowledge of a foreign language of the profession is to employees employed in agricultural businesses, how often they use it, and how important it is to them in their career advancement. The results of the research will give employers an idea of the level of knowledge of foreign languages of employees and of the possible needs for improvement of the foreign language of the profession, and educational institutions can gain insight into which part of the language competences in the context of knowledge of a foreign language of the profession is most needed by employers.

Keywords: agricultural business environment, foreign language for specific purposes, career advancement, foreign language competences

POSSIBILITY OF USING LUPIN AS AN ALTERNATIVE PROTEIN SOURCE IN POULTRY NUTRITION

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Soybean meal is the most commonly used plant-based protein source in poultry nutrition due to its high-quality protein structure and balanced amino acid profile for poultry. However, due to many factors such as the decrease in soybean cultivation areas globally, supply-demand imbalance, food-feed competition due to the increased use of soybean as a protein source in human nutrition and its use as biofuel, its price is increasing day by day. In this case, it poses a significant risk to the economic profitability and sustainability of poultry enterprises. It is also stated that the majority of soybean cultivation is grown in countries such as the United States, Argentina and Brazil and transported from there to Europe, causing environmental pollution. For many reasons such as these, researchers have begun to search for alternative protein sources instead of soybean meal in poultry nutrition. For this purpose, the use of oilseed meals such as sunflower seed meal, rapeseed meal and some legumes has been and is being investigated. However, due to the high cellulose and antinutritional factors content of these oilseeds and legumes compared to soybean meal, their use in poultry is limited. In this study, it was aimed to share information about the nutritional content of lupin in poultry nutrition, antinutritional factors, its use in poultry nutrition and the methods applied to increase its use in poultry nutrition, and the possibility of using it as an alternative protein source by evaluating the results of current studies.

Keywords: Alternative protein source, lupin, poultry feeding, soybean meal

WILD PISTACHIO SPECIES DISTRIBUTED IN GAZİANTEP (TÜRKİYE) AND THEIR TAXONOMIC CHARACTERISTICS

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ABSTRACT

The genus Pistacia L., of which pistachio (Pistacia vera L.) is a member, belongs to the family Anacardiaceae and includes plants from the hard-shelled fruits group. Pistachio has been cultivated in the Southeastern Anatolia region of Turkey since ancient times. Pistachio is an economically more important species than its wild species and it is known that approximately 2 billion dollars of product is harvested annually. Because of this feature, pistachio trees are called ‘Golden tree’ or ‘Green gold’. Pistachio has two gene centers. One is the Central Asian gene centre and the other is the Near East gene centre, including Anatolia.

To determine the taxonomic characters and general characteristics of the genus Pistacia L., plant specimens were collected from Gaziantep. The collected plant specimens were identified using the Flora of Turkey. 175 leaf and fruit samples collected from 55 localities were measured.

In this study, the distribution of P. atlantica, P. eurycarpa, P. khinjuk, P. vera, P. terebinthus and P. palaestina species in Gaziantep was determined and the taxonomic characters and general characteristics used in the classification of these taxa were revealed.

According to the existing studies, it has been revealed that there is complexity in the kinship relationships of the genus due to the lack of genetic barrier between Pistacia L. species. In our field studies, it was observed that there are plants that differ from P. terebinthus in terms of some taxonomic characters.

Key Words: Pistachio; Pistacia; Wild Species, Taxonomic Characters

ANTIBACTERIAL AND ANTIOXIDANT COMPOUNDS FROM THE ROOT BARKS OF *GNIDIA INVOLUCRATA*

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ABSTRACT

Gnidia involucrata (thymelaeaceae) is traditionally been used as laxative, rheumatism, insecticides, antibacterial and antimalarial. In light of its traditional applications, the root bark was successively extracted using n-hexane, ethyl acetate (EtOAc), and methanol (MeOH), yielding crude extracts of 0.78%, 4%, and 6%, respectively. Chromatographic separation of the EtOAc extract via silica gel column chromatography resulted in the isolation of three compounds: tetratriacontanylcaffeate (**1**), 12-*O*-Dodeca-2,4-dienoyl phorbol-13-acetate (**2**) and naringenin (**3**). This is the first report of the isolation of tetratriacontanylcaffeate (**1**) from the family. The structures of the isolated compounds were established using NMR and MS. The extract and isolated compounds were assessed for their *in vitro* antibacterial and antioxidant activities. The EtOAc extract showed significant inhibitory activity against *S. aureus, E. coli, P. mirabilis* and *K. pneumonia* bacterial strains with the highest inhibition zone observed against *S. aureus* (23 mm), which is even greater than the reference drug, ciprofloxacin (22 mm). However, the inhibition displayed on these bacterial strains for the three pure compounds were marginal with variable degrees of potency between the compounds. The better activity of the extract could be due to the synergistic interactions of several phytochemicals present in the extract, which cannot be the case when pure compounds are evaluated alone. The antioxidant activities of the extracts and isolated compounds were evaluated using DPPH and ferric thiocyanate methods. The EtOAc and MeOH extract, compound 1 and 2 were found to inhibit DPPH radical by 70.7, 66.9, 85.8 and 52.8%, respectively. The EtOAc extract and compound 1 inhibited per-oxidation of lipids by 84 and 86%, respectively. The radical scavenging displayed by compound **1** was significant compared with ascorbic acid, indicating the strong anti-lipid peroxidation potential of the extract. Therefore, the extracts of the root bark of *G. involucrata* can be used as a remedy in combating diseases caused by bacteria and free radicals

Key words: Thymelaeaceae, *Gnidia involucrata*, Antibacterial, Antioxidant, Tetratriacontanyl caffeate

THE INTERACTION BETWEEN SOIL MANAGEMENT AND CARBON FOOTPRINT

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ABSTRACT

Soil is an important component of the global carbon cycle and serves as one of the largest reservoirs of organic carbon practices that affect the carbon footprint of agricultural systems by affecting the carbon dynamics of the soil. The relationship between soil management and carbon footprint involves interactions between soil structure, organic matter content, microbial activity, and the physical and chemical processes that govern the carbon cycle in soil. Effective soil management can enrich agricultural soils with carbon in the long term by increasing carbon sequestration. Soil science recognizes that SOC levels vary greatly depending on soil texture, structure, and moisture. Soil management plays a crucial role in shaping the carbon footprint of agricultural systems; soil science offers insights into how specific practices affect SOC dynamics and carbon sequestration. Soil management is an important factor in controlling the carbon footprint of agricultural practices. Practices such as conservation tillage, cover cropping, crop rotation, organic amendments and agroforestry increase soil carbon storage by preserving organic matter, increasing soil fertility and preventing erosion. However, difficulties in monitoring soil carbon, variability in soil types, and economic barriers make it difficult to widely adopt these techniques. Soil scientists play an important role in developing carbon management models, monitoring SOC changes, and improving techniques to increase SOC storage in various ecosystems. Collaboration between researchers, farmers, and policymakers is essential to overcome technical, economic, and practical barriers to effective soil carbon management. Accurate SOC monitoring also requires advanced tools such as remote sensing and soil spectroscopy to assess changes in SOC over time.

Key Words: Soil management, carbon footprint, soil carbon dynamics

MICROPLASTIC CONTAMINATION AND SOIL HEALTH

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ABSTRACT

Microplastics, defined as plastic particles smaller than 5 millimeters, have emerged as apervasive environmental pollutant, with significant implications for soil ecosystems. Research shows that microplastics can disrupt soil microbial communities, which play a vital role in nutrient cycling and organic matter decomposition. They enter terrestrial ecosystems through agricultural inputs, sewage sludge, industrial emissions, and atmospheric deposition. Once in the soil, microplastics alter physical properties, such as porosity and water retention, disrupt chemical processes by binding harmful pollutants, and affect biological functions by interfering with microbial diversity and activity. The effects of microplastics on soil ecosystems are further complicated by their interactions with other pollutants. Microplastics can absorb harmful pollutants, delaying their degradation and exacerbating their effects on soil health. Studies have shown that microplastics can increase the toxicity of coexisting contaminants such as heavy metals and organic pollutants, thus posing additional risks to soil health and food safety. Microplastics can interfere with interactions between soil microbes and plants, affecting nutrient availability and overall plant health The interaction of microplastics with soil components can negatively impact various soil properties such as pH, porosity, and water retention capacity, which are vital for maintaining soil health and supporting plant growth. Addressing microplastic pollution in soils requires comprehensive strategies, including reducing plastic use in agriculture, improving waste management systems, and developing bioremediationtechnologies.

Key Words: Soil health, microplastic, accumulation, soil properties

A STUDY ON THE USE OF ELECTROSHOCK TECHNIQUES FOR WEED CONTROL

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ABSTRACT

Introduction and Purpose: The crop yield decreases considerably when weeds are not adequately controlled, and producer income decreases accordingly. Furthermore, the environmental damage caused by herbicides is increasingly prompting interest in alternative methods of control. In this context, this study aimed to develop a basic robot using electroshock technology to combat weeds in small production areas. This robot is intended to be used in the fight against weeds, thus aiming to reduce the damage caused by pesticides. **Materials and Methods**: The robot system was assembled in the following order: Installation of the electric shock system, object detection sensor, Bluetooth device, wheels, and Arduino UNO setup. Experiments were then conducted on different types of leaves and stems to evaluate the robot's performance. For the applications on potted plants, the shocking process was performed in three parts: large-leaf plants (group A, leaf length: 8-10 cm), small-leaf plants (group B, leaf length: 4-5 cm), and stems (group C, stem thickness: 5-10 mm). Each experiment was conducted with three replicates. The deformations of the plants were visually assessed immediately after the shocking procedure and 3 hours and 24 hours later for the same region.

Results and Discussion: According to the results, localized small deformations were first observed in the leaves of group A, followed by growth in the area of the deformation and fractures after 3 and 24 hours. Group B leaves initially showed slight color changes and signs of deformation. After three hours, yellowing was observed, and after 24 hours, wilting and drying continued in some areas. In the stems, slight color changes and slight bending were initially observed; after three hours, the stems began to bend and wilt more severely, and after 24 hours, severe wilting and structural degradation of the plant stem were observed.

Conclusion: The experimental results show that treatment with electric shocks led to yellowing, wilting, drying, and breaking of the leaves as well as wilting and twisting of the stems. In the context of these results, it was hypothesized that the electroshock treatment was successful and could be offered as an alternative to chemical control in weed management.

Key Words: Weed control, robotic, electric shock system, environment,

SWOT ANALYSIS OF ACORN AS FOOD WITHIN A PESTEL FRAMEWORK IN TURKEY: A STAKEHOLDER PERSPECTIVE

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ABSTRACT

This study presents a comprehensive analysis of the acorn food value chain in Turkey through a combined SWOT-PESTEL framework. The research addresses the growing interest in traditional and sustainable food sources while examining the current state and future potential of acorn as a food resource in Turkey. Through extensive fieldwork conducted in three villages in the Aegean Region and planned research in Mid-Turkey, this study employs a qualitative methodology incorporating stakeholder interviews with acorn collector communities, chemical producers, government officials, researchers, and non-governmental organizations.The research identifies traditional food uses of acorn while highlighting challenges such as low awareness and lost cultural knowledge of preparation methods and recipes. The SWOT analysis, structured within the PESTEL (Political, Economic, Social, Technological, Environmental, and Legal) framework, provides a multi-dimensional understanding of the opportunities and challenges in developing acorn as a food resource. This integrated approach allows for a systematic evaluation of internal strengths and weaknesses alongside external opportunities and threats within each contextual dimension. Preliminary findings indicate significant potential for acorn as a sustainable food source, though several barriers exist, including limited awareness, lost traditional knowledge, and underdeveloped market mechanisms. The study contributes to both academic literature and practical applications by mapping the current state of acorn utilization in Turkey while identifying potential pathways for sustainable development of this traditional food resource.This research has important implications for policymakers, local communities, and businesses interested in developing sustainable food systems and preserving traditional food knowledge. Future research directions include expanding the geographical scope of the study and developing specific recommendations for stakeholders across the value chain.

Key Words: Acorn, SWOT analysis, PESTEL framework, Turkey, Sustainable food systems

CURRENT IMPROVEMENTS AND DEVELOPMENTS IN THE SEED PLANTERS

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ABSTRACT

Introduction and Purpose: From the past to the present, agricultural mechanics have developed in parallel with agronomic techniques and offered technological solutions for more efficient work and rational use of equipment. This process is in constant evolution, consolidating development models that can rationalize the use of natural resources through innovation and research. This development process has also provided significant advantages in the field of seed planters from the past to the present. This study, it is aimed to compile the current technologies used in seed planters.

Materials and Methods: In line with the purpose of the study, scientific studies and current data of manufacturing companies were used to determine the improvements and developments regarding seed planters.

Results and Discussion: The evolutionary process in the field of seed planters begins with the use of simple tools based on manpower and animal power for seeding and planting in Agriculture 1.0, and continues with smart agricultural systems that form the framework of Agriculture 4.0. According to studies, the technologies that make the biggest contribution to the improvements and developments in seed planters are; it is understood that there are sensors and variable rate application technologies that transform an agricultural machine into a smart system. These and similar technologies and their contributions; real-time control of planting homogeneity, smart downforce systems that adjust the compaction force according to the variability in the field, seed singulation devices with sensors, variable rate planting control systems where automatic section and rate control are provided, humidity sensors that provide fast and easy planting depth in different humidity conditions, seed tube systems with sensors that can increase the planting speed without reducing the performance of the planter in the planting process, automatic steering systems that allow planting according to the sloping lines of the field, etc. it is possible to sort as follows.

Conclusion: Thanks to these technologies, in addition to improving the horizontal and vertical seed distribution uniformity in the planting process, high profits can be provided to the producer with both seed savings and a better quality planting process.

Key Words: Planters, Smart Systems, Seeding Techniques, New Technologies.

EFFECTS OF USING SEED TUBE ON SEED DISTRIBUTION UNIFORMITY IN SINGLE SEED PLANTERS

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ABSTRACT

Introduction and Purpose: In single-seed sowing of small seeds, in addition to seed size and shape, critical problems can be experienced due to the electrostatic force that occurs during seeds adhering to the plate holes. To find a solution to these problems, the effect of using seed tubes in single-seed planters was the subject of the study.

Materials and Methods: For this purpose, the study, designed with two different seed drop heights (115 mm and 200 mm) and without and with seed tube, was carried out at three different forward speeds (0.5 m s-1, 1.0 m s-1, and 1.5 m s-1).

Results and Discussion: According to the analysis results applied to the data, it was determined that the seed distribution uniformity was negatively affected by the increase in seed drop height and progress speed, and the planting quality deteriorated. While it was expected that the use of seed tubes in single-seed planters would have a positive effect on the uniformity of seed distribution intra-rows and inter-rows, it was found that on the contrary, the uniformity of seed distribution deteriorated and there was a high degree of variation.

Conclusion: The best values for seed distribution uniformity were obtained with a forward speed of 0.5 m s-1, a seed drop height of 115 mm, and no seed tube.

Key Words: Small seeds, seed dropping method, seed drop height, forward speed

EVALUATING THE EFFICACY OF TECHNOLOGY IN THE ASSESSMENT OF THE CORRELATION BETWEEN SEED COLORATION AND FUNGAL INFECTION ON SESAME PLANT

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Abstract

The incorporation of modern day technology into human endeavors is tremendously making significant impact in various sectors including Rural development, Animal Sciences and Agriculture. In crop farming, Sesame (Sesamum indicum L.) is a plant that exhibits antioxidant characteristics and can combat damages that may occur in its cellular structure. Seed coloration is a key determinant of possible physiological conditions of plants including sesame seed development while poor plant productivity may be as a resultant of fungal infections. This study therefore evaluates the efficacy of technology in the assessment of the correlation between seed coloration and fungal infection on sesame plant. Questionnaires were drafted and administered by professionals to respondents using online Google form questionnaire instrument. The results were collated and subjected to reliability analysis. Conclusively, the paper inferred that the major seed coloration of sesame seed are cream, light-brown, dark-brown and deep-brown/black while the cream colour indicates that there is an incidence of fungi infection, noting that the variety of fungal species associated with the seed of sesame are Aspergillus flavus, Aspergillus niger, Fusarium sp., Penicillium sp. and Cercospora sp.

Keyword: Technology, Sesame, Seed Coloration, Fungal Infection.

INVESTIGATION OF THE USABILITY OF HEMP FIBERS AS REINFORCEMENT MATERIAL IN PHOTOCURED POLYMER COMPOSITES

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ABSTRACT

Introduction and Purpose

With the increasing quest for sustainable materials, the use of natural fibers in composite materials has become a significant area of research. Hemp fiber, known for its high strength, low density, and eco-friendliness, stands out in this field. On the other hand, polymers play a crucial role in composite production. However, many synthetically produced polymers emit volatile organic compounds (VOCs) during production and use. Photoinitiated systems, a greener polymerization method, are increasingly preferred for polymer composite production. This study investigates the engineering properties of polymer composites produced using hemp fiber reinforcement and eco-friendly photoinitiated polyester resins.

Materials and Methods

In this study, UV-cured polyester composites were reinforced with 1-5 mm long chopped micro fibrillated hemp fibers, obtained from the Kastamonu region, at weight ratios of 1%, 2%, and 3% of the resin. The produced composite sheets were subjected to density, hardness, tensile, flexural, compressive, and impact strength tests. Additionally, microstructural, and morphological analyses were performed using SEM-EDS, FTIR, and TGA.

Results

The results indicate that the use of hemp fibers in UV-cured polymer composites has great potential in improving mechanical properties and environmental sustainability. The natural and biodegradable properties of hemp fibers provide a significant advantage for future applications of these materials.

Key Words: Polymer; Composite; Hemp fiber; Photopolymerization; Reinforcement; Polyester

NOVEL TECHNIQUES IN NUTRITION AND FOOD SCIENCE: A COMPREHENSIVE REVIEW ON THE ROLE OF OLIVES

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Abstract

Olives (Olea europaea) are fundamental to the Mediterranean diet and have been the subject of extensive research due to their rich composition of bioactive compounds, such as polyphenols, monounsaturated fatty acids, and powerful antioxidants. These compounds are linked to numerous health benefits, including heart health support, anti-inflammatory effects, and antioxidant protection. Recent advancements in nutrition and food science have paved the way for the development of cutting-edge processing and preservation techniques. These innovations focus on maximizing the bioavailability, stability, and nutritional value of olives and olive-derived products, which are sensitive to traditional processing methods that can lead to nutrient loss. This review presents an in-depth exploration of these novel processing and preservation methods, such as ultrasound-assisted extraction, supercritical fluid extraction, and pulsed electric fields, each demonstrating the potential to retain and even enhance the nutritional profile of olives. Additionally, innovative preservation technologies, including high-pressure processing and cold plasma technology, are examined for their roles in extending shelf life without compromising the quality of bioactive compounds. The implications of these advancements are far-reaching, with potential applications in the health,

food technology, and nutraceutical industries. By optimizing the health-promoting compounds found in olives, these novel techniques not only support consumer health but also open new opportunities for the development of functional foods and supplements. This comprehensive review underscores the significance of these emerging technologies and outlines their current applications, potential health benefits, and future prospects in transforming the olive industry into a cornerstone of health-oriented food science. Furthermore, as consumer interest in health-conscious products grows, the adoption of these technologies could significantly enhance the marketability of olives and their derivatives.

Keywords: Antioxidants, Functional Foods, Food Processing Techniques, Monounsaturated Fatty Acids, Olive.

PHYSICAL, MECHANICAL, AND THERMAL PROPERTIES OF POLYPROPYLENE COMPOSITES INCORPORATING WALNUT SHELL POWDER

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ABSTRACT

Injection-molded samples were produced using walnut shell flour and polypropylene, both with and without maleic anhydride-grafted polypropylene (MAPP), at walnut shell filler contents of 40%, 50%, and 60% by weight. As filler content increased, the bending and tensile modulus of the composites rose significantly, while bending and tensile strengths showed notable decreases. Water absorption and thickness swelling also increased with higher filler levels. The addition of MAPP enhanced the interfacial bonding between the walnut shell flour and the polymer matrix. A formulation of 40% walnut shell flour, 57% polypropylene, and 3% MAPP is suitable for outdoor applications where high dimensional stability is required.

Keywords: Polypropylene, Composite, Mechanical and End-Use Properties, Walnut shell.

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EFFECT OF WALNUT SHELL POWDER ON THE CHARACTERISTICS OF POLYPROPYLENE-BASED COMPOSITES

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ABSTRACT

The study examined the impact of particle size and filler concentration on the mechanical and functional properties of polypropylene composites reinforced with walnut shell powder. Composites were produced using filler levels from 0 to 20 wt% and particle sizes of 0.100, 0.200, and 0.300 mm, with melt-blending and injection molding employed to achieve uniform distribution. Findings revealed that higher walnut shell filler content consistently led to reductions in tensile strength, elongation at break, and flexural strength for all particle sizes. In contrast, increased filler levels and larger particle sizes resulted in greater hardness and specific gravity. Water absorption was also found to increase with higher filler content, although smaller particle sizes helped to limit this effect. However, the addition of walnut shell powder did not significantly reduce the rate of flame propagation in polypropylene.

Keywords: Polypropylene, Composite, Mechanical and End-Use Properties, Walnut shell.

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INFLUENCE OF WALNUT SHELL POWDERS ON THE MORPHOLOGY, THERMAL, AND MECHANICAL PROPERTIES OF POLY(LACTIC ACID).

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ABSTRACT

Poly(lactic acid) (PLA) is an environmentally friendly material; however, its widespread application is limited by its brittleness, slow crystallization rate, and low heat distortion temperature. To address these shortcomings, this study incorporated walnut shell (WS) powders into PLA. The influence of WS powders on the morphology, as well as the thermal and mechanical properties of PLA, was thoroughly examined. Characterization techniques such as differential scanning calorimetry (DSC), infrared (IR) spectroscopy, polarizing optical microscopy (POM), and various mechanical property tests were employed. The findings revealed that WS powders significantly affected the morphology and improved the thermal and mechanical behavior of PLA. The tensile strength, impact strength, and elongation at break of the PLA/WS composites initially increased with rising WS powder content, peaking at 0.5 wt%, where maximum values of 51.2 MPa, 23.3 MPa, and 19.0% were observed, respectively. Beyond this concentration, these properties declined. Compared to pure PLA, the composites exhibited reduced spherulite grain sizes and the formation of irregular polygonal structures during crystallization. Additionally, the melting, cold crystallization, and glass-transition temperatures of the PLA/WS composites were lower than those of unmodified PLA.

Keywords: Poly(lactic acid), walnut shells, mechanical properties, composites, thermal properties.

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IN-VITRO EVALUATION OF DIFFERENT EXTRACTS OF TELFEIRIA OCCIDENTALIS ON TRYPANOSOMA BRUCEI BRUCEI INDUCED MICE

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Abstract

Rats infected with Trypanosoma brucei brucei were evaluated in the Advanced Microbiology Laboratory of Federal University Lokoja between 24th June, 2024 to 3rd July, 2024 using various extracts of Telfeiria occidentalis. Twenty-four rats(24) in total were split into six groups of four rats each at random. Following a three-day period of Trypanosoma brucei brucei inoculation and infection, the infected rats were treated with 0.1, 0.01, 0.001mg/ml of methanol Telfeiria occidentalis, n-hexane of Telfeiria occidentalis, petroleum ether of Telfeiria occidentalis, aqueous of Telfeiria occidentalis and albendazole (anti-parasitic drug) respectively for in-vitro evaluation. Group A (positive control) was not infected, group B was not infected but treated, group C was infected and not treated (negative control), group D, E and F was infected and treated with different extracts of Telfeiria occidentalis, albendazole and Tween 80 against the infected blood during in-vitro evaluation. Trypanosoma brucei brucei experimental rats was carried out by injecting 0.2ml of blood containing approximately 1.0 *10^5 Trypanosoma brucei brucei per unit, intraperitoneally into each rat in the infected group., The anti-trypanosoma effects of TOM, TOA, TOA, TON, Tween 80 and anti-parasitic drug were assessed on Trypanosoma brucei brucei level, haemoglobin, PCV, weight, body

temperature. The Trypanosoma brucei brucei count (in-vitro study) was observed to decrease in a concentration dependent on (0.1mg/ml, 0.01mg/ml and 0.001mg/ml) pattern of extracts. In vitro studies on haemoglobin (HB) level, packed cell volume (PCV) and temperature change of the experimental rats, revealed that treatment with TOM and TON among others reversed the abnormalities in HB, PCV, weight and body temperature towards negotiatiable control levels in a fast way especially TOM in in-vitro evaluation compared to others, and the anti-parasitic drug displayed same level of anti-trypanosomal potency in in-vitro experiment with Telfeiria occidentalis methanol. Hence, the usage of TOM could be supported and employed in the treatment of Trypanosomiasis with little or no side effect.

Across all parameters- weight, temperature, hemoglobin levels and packed cell volume-the LSD values indicate that the methanolic extract and the conventional drug Albendazole are more effective in maintaining or restoring normal physiological functions with no significant negative effects ($P > 0.05$). In contrast, aqueous extracts showed significant negative effects, with the several parameters exceeding the LSD range, indicating statistical significance ($P<0.05$), which suggests reduced effectiveness and possible toxicity at higher doses.

Keywords:: Telfeiria occidentalis,Trypanosoma brucei brucei, In-vitro,Mice, Lokoja

AGRICULTURAL COMPANIES THAT APPLY REAL MARKETING IN THEIR BUSINESS BASED ON FINANCIAL MANAGEMENT BASED ON INFORMATION ON FINANCIAL STATEMENTS

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ABSTRACT:

The development and strengthening of marketing in agriculture can also be observed through the influence of real financial management, which is based on the receipt of real financial reports. In this way, it can contribute to the making of valid management decisions by top management of agricultural enterprises, which, in addition to financial management, also pay attention to marketing.

Thus, agricultural production can be observed through the development of marketing, but also financial management, which is of great importance for a transitional country such as the Republic of Serbia.

Essentially, an increase in real marketing in agricultural production can mean an incentive for the development of already established entrepreneurial initiatives in agriculture.

In addition, the education of agricultural producers and improved management contribute to the growth of agricultural production, greater agricultural production, and the security of food satisfaction for a wide range of people both in wartime and in peacetime.

Keywords: management, accounting, analysis, risk factors, entrepreneurship in agriculture.

IMPACTS OF AGROVOLTAIC SYSTEMS ON SOIL ECOSYSTEMS IN SEMI-ARID REGIONS

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ABSTRACT

Introduction and Purpose: The purpose of this paper is to examine the potential of agrovoltaic (AV) systems in enhancing sustainability by integrating renewable energy production with agricultural practices, with a specific focus on their environmental and economic benefits in semi-arid regions.

Materials and Methods: This review is based on summarizing the results of numerous studies conducted on agrovoltaics and discussing their findings related to the topic.

Results, Discussion and Conclusion: Agrovoltaic systems represent an innovative sustainability approach that enables the simultaneous production of solar energy and agricultural crops on the same land. These systems are particularly crucial in semi-arid regions as a key tool in combating climate change. The AV systems offer several benefits, including mitigating climate change, enabling climate adaptation, and enhancing resilience to extreme weather events. The shading provided by solar panels helps to regulate soil temperature, reduce moisture loss, and protect crops from wind damage and erosion, ultimately improving soil health and agricultural productivity. The AV systems help reduce greenhouse gas emissions, thereby lowering the carbon footprint. By optimizing land use, they prevent deforestation and enhance carbon sequestration. Positive impacts on soil moisture content, microbial activity, and biodiversity further promote sustainable agricultural practices. Moreover, AV systems offer significant economic advantages. By enabling farmers to generate income from both crop production and energy generation, these systems enhance their economic resilience and provide a sustainable livelihood. In conclusion, AV systems represent a strategic solution that supports the transition to a low-carbon future, fostering environmental sustainability and economic prosperity in both the agricultural and energy sectors.

Key Words: Agrovoltaic, Energy Efficiency, Soil Ecosystem, Sustainability

AI-DRIVEN AGRICULTURAL SENSORS AND CROP YIELD PREDICTION SYSTEMS IN INDIA

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In India, sophisticated agricultural sensors powered by AI technology are utilized alongside innovative systems to forecast crop yields. Modern farming techniques in India focus on precision agriculture. The primary goal of the "Digital Agriculture Mission, 2021–2025" is to enhance the sector's efficiency by incorporating a range of cutting-edge technologies such as blockchain, artificial intelligence, and drone innovations.AI-driven model for predicting crop yields. In May 2018, NITI Aayog collaborated with IBM to create an AI-powered agricultural production forecasting algorithm, offering farmers timely advice. The partnership aims to boost farmers' income by sharing knowledge on how to increase crop yield, enhance soil productivity, and effectively manage agricultural resources. This program incorporates mobile applications, information technology, and detailed satellite weather information to enhance crop production and reduce expenses by improving agricultural management. Agricultural sensors enhanced with AI technology. The Indian government, in partnership with Microsoft, is supporting small-holder farmers by utilizing AI sensors to enhance agricultural yields and provide them with increased control over pricing. Drones have the capability to monitor the health of soil and crops. The Indian Council of Agricultural Research (ICAR) is partnering with six institutes on the innovative project called "SENSAGRI: Sensor-based Smart Agriculture. " This project is focused on creating a prototype for a drone system equipped with remote sensors to monitor the health of crops and soil. For extensive applications, this approach can incorporate satellite technologies as well. Illustrations of Precision Agriculture. Here are some illustrations of precision agriculture: An example of precision agriculture involves the use of Variable Rate Irrigation (VRI). Farmers have the ability to customize the flow and pressure of water for individual sprinklers or nozzles using VRI, taking into account factors such as soil moisture levels, crop development stages, and weather conditions. The utilization of VRI has the potential to improve agricultural efficiency and product standards, all the while promoting the preservation of energy, water, and fertilizer resources. An additional instance includes the utilization of sensors, cameras, and drones in combination with crop sensing and spraying technology. This system effectively detects weeds, pests, and diseases within crops, and then applies the precise chemicals required to the affected areas. This method has the potential to decrease the use of chemicals, enhance the effectiveness of spraying, and help in reducing pollution and resistance issues.

Keywords: Artificial intelligence, precision farming, prediction model, agricultural sensor

DETERMINATION OF AKDAĞ (ADIYAMAN/MALATYA) HABITAT DIVERSITY ACCORDING TO EUNIS HABITAT CLASSIFICATION SYSTEM

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ABSTRACT

It is in the form of European Nature Information System (EUNIS) codes identified in the study area C1.6, C2.6, D5.3, E5.12, E5.13, E5.14, F5.131, F5.14, F6.24, F6.27, F6.28, F6.2E, F9.1, F9.31, FB.4, G1.112, G1.38, G1.7C5, G1.D2, G1.D3, G1.D4, G2.135, G5.4, H1.1, H3.5, I1.1, I1.13, J1.1, J1.2, J2.1, J2.2, J2.4, J2.51, J2.52, J4.6, J4.7, J5.31. C1.6 coded habitta, C1.242- Although there are communities in shallow water [Ranunculus], *Alisma lanceolatum* was preferred because of its species density, characteristic feature and better representation of the Zivar Lake. In habitats coded C3.21, C3.23, [*Phragmites australis*-Reed] beds and [Typha-Wicker grass] beds better represent the C2.6 habitat.

Keywords: Adıyaman, Akdağ, Malatya, EUNIS,

Materials and Methods:

In the study area, plants were collected according to the season, identified, then evaluated and categorized according to the (EUNIS) habitat system and compiled into a table.

Results and Conclusion:

Although C1.242- Shallow water [Ranunculus] communities were also found in the habitat coded C1.6, Alisma lanceolatum was preferred due to its species density, characteristic features and better representation of Zivar Lake.

In habitats coded C3.21, C3.23, [Phragmites australis-Reed] beds and [Typha-Straw grass] beds better represent the C2.6 habitat.

A SHORT REVIEW ON ALOE VERA

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ABSTRACT:

• The Aloe vera plant has been known and used for centuries for its health, beauty, medicinal and skin care properties. The name Aloe vera derives from the Arabic word "Alloeh" meaning "shining bitter substance," while "vera" in Latin means "true." 2000 years ago, the Greek scientists regarded Aloe vera as the universal panacea. The Egyptians called Aloe "the plant of immortality." Today, the Aloe vera plant has been used for various purposes in dermatology. The botanical name of Aloe vera is Aloe barbadensis miller. It belongs to Asphodelaceae (Liliaceae) family, and is a shrubby or arborescent, perennial, xerophytic, succulent, pea- green color plant. It grows mainly in the dry regions of Africa, Asia, Europe and America. In India, it is found in Rajasthan, Andhra Pradesh, Gujarat, Maharashtra and Tamil Nadu

• Aloe vera is a commonly found household plant. It grows naturally in hot arid climates, like the desert (Aloe vera (aloe vera) (n.d.). Retrieved May 22, 2015). Aloe vera is a succulent plant, meaning parts of the plant are thicker in order to retain water. Aloe vera has a variety of uses and is found in many products. Aloe vera extracts are used cosmetically and medicinally (Aloe vera (aloe vera) (n.d.). Retrieved May 22, 2015). A glycoprotein found in the gel of the A. vera plant showed beneficial wound healing characteristics. The glycoproteins enhanced granulation and epithelialization in living organism models (Choi et al., 2001). In the laboratory setting, glycoproteins increased cell proliferation activity and enhanced epidermal tissue (Choi et al., 2001). Aloe vera extract also demonstrated anti-inflammatory activity. The mechanism of the anti-inflammatory activity was due to the inhibition of matrix metalloproteinase-9 on blood cells (Vijayalakshmi et al., 2012)

KEY WORDS: "Alloeh", barbadensis Miller, glyco protein, mettaloprotienase.

THUTHI LEAF

ANUSHYA

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ABSTRACT;

Abutilon indicum is a plant that belongs to the Malvaceae family, which is distributed throughout a number of tropical and subtropical areas and has been used for various disorders in traditional and folk medicine. The various medicinal applications of this plant include anti-inflammatory, antioxidant, demulcent, aphrodisiac, laxative, diuretic, pulmonary and sedative. Thus the present study was formed to identify the biological activities of A. indicum fruit by in silico and in vivo approach. The ethanolic extract was prepared and screened for in vitro antimicrobial activities against Staphylococcus aureus and Enterococcus faecalis and also against a fungi Aspergillus niger. The ethanolic extract was subjected to Gas chromatography–mass spectrometry (GC-MS) analysis for identification of compounds present in fruit sample. The identified compounds were then screened for anti-inflammatory activity by molecular docking against the Cyclooxygenase-2 inhibitors. Also, Density Functional Theory (DFT) & Absorption Distribution Metabolism Excretion and Toxicity (ADMET) studies were carried out to assess the quantum-chemical parameters and pharmacokinetics behaviour respectively. The ethanolic fruit extract of A. indicum showed moderate antimicrobial activity against S. aureus, E. faecalis and Aspergillus niger at the MIC of 25 µg/µl. AI 1003, AI 1004 and AI 1005 were identified as lead compounds against the target Cyclooxygenase −2 which exhibited strong hydrogen bond interaction & also desirable pharmacokinetic properties. DFT studies also showed the promising reactivity with lowest energy gap of compounds AI 1004 &AI 1005. Thus, owing to the significant interaction of the compounds with the target COX-2 and desirable pharmacokinetic properties of compounds of ethanolic extract of A. indicum could be further explored for anti-inflammatory properties by in vitro & in vivo analysis.

KEYWORDS Abutilon indicum Antimicrobial Molecular docking DFT Inflammation.

QUALITATIVE PHYTOCHEMICAL ANALYSIS AND ANTIFUNGAL ACTIVITY OF AQUEOUS CRUDE LEAVES EXTRACT OF *ACACIA NILOTICA*

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Abstract
Previous studies have demonstrated in laboratory trials that different plant tissues of *Acacia nilotica*, such leaves, seeds and roots possess inhibitory properties against microorganisms (bacteria, fungi) and insects. The leaves, roots and stem back of *Acacia nilotica* are traditionally used for the management of bacterial and fungal infections.The aim of this research work is to investigate the phytochemical and antifungal activity from aqueous leaves extract of *Acacia nilotica* against *Aspergillus flavus, Aspergillus fumigatus* and *Aspergillus niger*. The plant leaves were collected from Tudunwada area Aliero town Kebbi State, Nigeria. About 200 g of plant powder was macerated with 600 ml of distilled water in a 1000 ml conical flask for 24 hours. The mixture was filtered using wathman filter paper number one; the filtrate was allowed to evaporate to obtained crude extract. The extract was used for qualitative phytochemical and assessed for antifungal activity by using agar well diffusion method, with potato dextrose agar as media. Ketoconazole was used as positive control. The results of qualitative phytochemicals of the crude aqueous extract shows the presence of tannins, steroids, saponins, glycosides, phenols, alkaloids, flavonoids and terpenoids. The result of antifungal activity of aqueous leaves extract of *acacia niloticaa* showed that *aspergillus flavus* has the highest activity for all the tested concentrations at ($P<0.05$) i.e. 60 mg/ml, 80 mg/ml and 100 mg/ ml (1.06±0.03, 2.36±0.03 and 4.03±0.03) followed by *aspergillus fumigatus* (0.00±0.00, 1.23±0.03and 2.03±0.03) and *aspergillus niger* with the lowest activity (0.00±0.00, 0.00±0.00and 1.03±0.3). The positive control (Ketoconazole) revealed the highest activity for all the three tested concentrations. This study suggested that, the aqueous leaves extract of *acacia nilotica* justify the claimed of traditional system of medicine in the treatment different antifungal diseases, which may be due the presence of bioactive chemical compounds in the plant extract.

Key Words: *Acacia nilotica*, Ketoconazole, Aqueous, leaves, Concentrations, Antifungal Activity.

ASSESSMENT OF ANTIFUNGAL ACTIVITY OF AQUEOUS FRACTIONS OF *ACACIA NILOTICA* LEAVES

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ABSTRACT

Acacia nilotica is an imperative multipurpose plant that has been used broadly for the treatment of various diseases. Naturally, medicinal plants promote self-healing, good health and durability in a yurvedic medicine, practices and have acknowledged that *Acacia nilotica* can provide the nutrients and therapeutic chemical compounds to prevent, diminish or treat many diseases. The present study is aimed to investigate the antifungal activity from column fractions of *Acacia nilptica* leavesagainst *Aspergillus fumigatus, Aspergillus flavus and Aspergillus niger*. The plant sample were collected from Tudunwada area Aliero town Kebbi State, Nigeria. 300 g of the plant powder was macerated with 900 ml of water in a 1000 ml conical flask for 24 hours. The mixture was filtered using wathman filter paper number one; the filtrate was allowed to evaporate and obtained crude extract. The standard method was used for conducting column and thin layer chromatography were five pooled fractions leveled as B1, B2, B3, B4 and B5 was obtained and each fraction was evaluated for antifungal activity by agar well diffusion method using Potato Dextrose Agar Media, distilled water was used as negative control and ketoconazole as positive control. The Result showed the antifungal activity at fraction B3 only, with the *Aspergillus flavu s*having the highest concentration (4.03±0.03 µg/ml) followed by *Aspergillus fumigatus* (2.00±0.00 µg/ml) and *Aspergillus niger* with the lowest concentration (1.53±0.03 µg/ml). Fraction B1, B2, B4 and B5 showed zero activity. The activity of all the tested fractions showed lower activity compared to positive control (ketoconazole). The antifungal activity of column chromatographic fractions of *Acacia nilotica* leaves demonstrated the antifungal susceptibility only in fractions B3. The present study recommended that *Acacia nilptica* aqueous extract could be used as a source of potential antifungal agent, which might be due to presence of phytochemicals in the crude extract of plant sample such tannins, flavonoids, saponins, steroids, phenols, terpenes and alkaloids.

Keywords: *Acacia nilotica,* Fractions, Concentrations, Activity, Ketoconazole.

FORMULATION AND ASSESSMENT OF HERBAL LOTION FORMULATED WITH *LEUCAS ASPERA* LEAF EXTRACT

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Herbal medicine, often referred to as herbalism or phytotherapy, is a form of alternative medicine that involves the use of plant extracts and natural substances to prevent and treat various health issues. This ancient practice has been employed across different cultures for millennia. The objective of this study is to develop and assess a herbal lotion using plant extracts that hold both traditional and dermatological significance in Ayurveda, specifically *Leucas aspera* and *Ocimum teniflorum.* In today's cosmetic industry, the use of herbal antifungal lotions with natural ingredients is becoming increasingly accepted due to the public's preference for more natural treatments. This formulation incorporates extracts from Tulsi leaves, Aloe Vera gel, Rose water, and *Leucas aspera* leaves, offering a unique combination that has not been previously studied. The active compounds in these plant leaves exhibit various pharmacological effects, including antifungal, antioxidant, detoxifying, and antimicrobial properties.

Keywords: *Leucas aspera*, Antifungal Activity, Antimicrobial Activity, Herbal Lotion, Phytochemical Screening.

AI-BASED MULTISPECTRAL IMAGING SYSTEM FOR PRECISION AGRICULTURE: TACKLING SOIL HEALTH, PESTS, AND CROP STRESS

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ABSTRACT

Exponential growth in technology has greatly impacted the agricultural sector with new innovations in sustainable farming. The paper is on the fully integrated AI-based soil health management, pest control, and crop stress detection system that uses multispectral imaging and software-based filtering. The present study has worked out a cost-effective, user-friendly system that may help farmers monitor and make timely decisions so that productivity improves and the wastage of resources is reduced. The proposed system utilizes a DIY multispectral camera that aids in capturing reflectance values across different spectral bands, thus detecting definite parameters of soil health, crop stress indicators, and pest presence. The data obtained from these captures are then processed and analyzed by advanced machine learning algorithms to allow actionable insights and recommendations onto a user-friendly mobile application. This system works very well within different agricultural settings in terms of early detection of nutrient deficiency, water stress, and pest infestation. Preliminary results have been promising regarding its effectiveness in detecting and handling various challenges in agriculture, as well as in improving yields that contribute to sustainable farming. It also underlines the integration challenges and possible solutions as a way forward, thereby laying out the roadmap for future research and development. Such a pioneering approach toward precision agriculture will bring about food security and environmental sustainability.

Keywords: Precision Agriculture, AI-Based Soil Management, Multispectral Imaging, Pest Detection, Crop Stress Monitoring, Sustainable Farming Technologies

PHYTOCHEMICAL ANALYSIS OF TRADITIONALLY USED MEDICINAL PLANTS

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Abstract

Medicinal plants have long been a source of bioactive compounds with therapeutic potential. This study aimed to evaluate the phytochemical constituents of medicinal plants commonly used in traditional medicine. The qualitative techniques for phytochemicals were carried out in ten medicinal plants each belonging to different families. Ten medicinal plants including *Cassia auriculata* L., *Eucalyptus globulus* Labil., *Leucas aspera* Spreng., *Ocimum sanctum* L., *Polyanthia longifolia* Thw., *Punica granatum* L., *Ricinus communis* L., *Solanum nigrum* L., *Solanum Xanthocarpum* L., and *Vitex negundo* L. were used for the study. Phytochemical screening was performed on methanol extracts of the plant using standard qualitative tests for Alkaloids, Cardiac Glycosides, Coumarins, Flavonoids, Phlobatannin, Quinones, Saponins, Stereiods, Tannin, Terpenoids. The results revealed the presence of medically active compounds in most of the plants. Some species showed unique compounds, such as alkaloids, terpenoids in *Cassia auriculata L.* and saponins in *Leucas aspera* Spreng. These findings suggest that the selected medicinal plants contain bioactive phytochemicals, which may contribute to their therapeutic efficacy. Further studies are needed to isolated and characterize there compounds for potential pharmaceutical applications.

Keywords: Traditional Medicine, Bioactive compounds, Phytochemistry, Medicinal Plants, Therapeutics

CHOLINE CHLORIDE/FORMIC ACID DEEP EUTECTIC SOLVENT SYSTEM FOR THE PRETREATMENT OF SUNFLOWER STALKS TO ENHANCE THE ENZYMATIC HYDROLYSIS YIELD

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ABSTRACT

Introduction and Purpose: This study investigates the effects of pretreatment with acidic deep eutectic solvent (DES) on the yield of enzymatic hydrolysis of sunflower stalks. Acidic (formic acid-based) DESs were prepared at different molar ratios to optimize glucose release, which is critical for biofuel production. The main objective was to determine the optimal pretreatment conditions to improve the conversion of biomass into fermentable sugars.

Materials and Methods: The acidic DES was prepared with ChCl/formic acid in the molar ratios 1:1, 1:2 and 2:1 and mixed at 80°C for 2 hours until a homogeneous and transparent liquid was formed.

The raw biomass was pretreated with DES solutions containing ChCl/formic acid in the molar ratios 1:1, 1:2 and 2:1 at 90°C for 4 hours. The solid and liquid phases were then separated and the remaining solid residue was washed with an acetone/water solution to remove lignin and then with ethanol and stored. The pretreated sunflower stalks were subjected to enzymatic hydrolysis with cellulase and β-glucosidase in an acetate buffer at 50°C for 48 hours in an incubator.

Results: A glucose recovery of 53.18% was measured in the untreated samples. A molar ratio of 1:2 ChCl/FA was found to be the optimal pretreatment condition where acidic DES pretreatment significantly increased the enzymatic hydrolysis efficiency. At this molar ratio, glucose yield increased to 91.94%, which is a significant improvement in yield. This increase is attributed to the removal of lignin, which loosened the structure and provided a larger surface area and more efficient substrate area for hydrolysis, thus optimizing the enzymatic interaction and facilitating effective conversion.

Discussion and Conclusion: Acidic DES pretreatment significantly improved the efficiency of enzymatic hydrolysis. At an optimal molar ratio of 1:2, considerable glucose release was achieved, demonstrating the potential of DES pretreatment as an effective, sustainable method for processing lignocellulosic biomass for biofuels and lignin-based materials.

Key Words: Lignocellulosic Biomass, Deep Eutectic Solvents, Enzymatic Hydrolysis, Agricultural Waste, Sunflower Stalks.

DETERMINATION OF DISTRIBUTION AND INFECTION RATES OF *CONTARINIA MEDICAGINIS* KIEFFER IN ALFALFA FIELDS OF IĞDIR

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ABSTRACT

Introduction and Purpose: *Contarinia medicaginis* Kieffer (Diptera, Cecidomyiidae) larvae are monophagous pests that swell the base of the flower petals of the clover plant (*Medicago sativa* L.) and close them towards the tip, forming cone-shaped galls that prevent seed development. This pest was detected in Iğdır province in 2023. This study was conducted to determine the distribution and infestation rate of *C. medicaginis* in alfalfa fields in Iğdır province.

Materials and Methods: The survey studies were carried out in a total of 40 fields in Iğdır province, including Central (20 fields), Aralık (10 fields), Karakoyunlu (3 fields) and Tuzluca (7 fields) in August and September 2024. Samples were collected randomly from different parts of each alfalfa field by cutting the lower parts of the plant stems with inflorescences. The collected plant stems were placed in transparent nylon bags, labeled with information, and brought to the laboratory. The flowers on each stem were examined under a binocular microscope and the number of gall flowers were counted. Insect infestation rates in fields (%); Field infection rate was calculated with the formula = (Number of infected plants/Total number of plants) x 100. With these studies, the distribution rates of the pest in the alfalfa areas of the province were also determined.

Results: It was determined that *C. medicaginis* spread in 95% of the alfalfa fields in Iğdır province. The infection rates were recorded as 22.5% in the central district, 24.1% in Aralık, 27.4% in Karakoyunlu and 3.6% in Tuzluca. The average number of infested flowers on a stem was determined as 5.4% in the Central district, 3.8% in Aralık, 2.1% in Karakoyunlu and 2.5% in Tuzluca.

Discussion and Conclusion: This study, which was conducted to determine the distribution areas and larval infestation rates of *C. medicaginis* in alfalfa fields of Iğdır province and its districts, was carried out in a total of 40 alfalfa fields and a total of 2125 flowering alfalfa plants were examined. While no galled flowers were found in 1757 of these flowers, 367 were found to have galled flowers. As a result; It was understood that *C. medicaginis* was infested at a rate of 17.3% in alfalfa fields in Iğdır province.

Key Words: Iğdır; Alfalfa; Distribution; Infection Rate

THE EFFICACY OF *BEAUVERIA BASSIANA* AND NEEM AZAL T/S ON *HYPERA POSTICA* (GYLLENHAL) IN FIELD CONDITIONS

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ABSTRACT

Introduction and Purpose: *Hypera postica* (Gyllenhal, 1813) (Coleoptera: Curculionidae) is one of the most important pests of the alfalfa plant *(Medicago sativa* L.). Adults and larvae cause damage by feeding on every part of the plant except the root. This study was conducted to test the effects of two organic plant protection products against *H. postica* larvae in the alfalfa field in Aşağı Çiftlik village, Aralık district of Iğdır province**.**

Materials and Methods: The experiment was established in a clover field in Aşağı Çiftlik village, Aralık district of Iğdır province, in April and May 2017, according to the factorial experimental design in randomized blocks with 4 replications. Each application parcel was determined as 100 m^2. In the sampling, the larvae were counted on the netting and on plant before spraying and on the 7th and 14th days after spraying. In the atrap, 5 plants were counted at 5 different points of each parcel, and in plant counting, 5 plants were shaken into the tray and counted. In both counts, the larvae were released to the plots from which they were taken without being killed. As commercial organic plant protection products, 3 different doses of *Beauveria* bassiana and Neem Azal T/S were used. Percentage effects of the preparations on larvae were calculated according to the percentage-free Abbott formula. The obtained data were subjected to normality test in the JMP Pro 13 statistical package program and it was observed that the values conformed to normal distribution. Since there was a zero value in the data, it was analyzed by applying square root transformation and the statistically significant ones were grouped according to the $LSD_{0.05}$ test.

Results: According to the counts 7 days after spraying, the percentage effects of the counts made on the 14th day were determined to be higher. A difference was found between both plant protection products. While the average doses of *B. bassiana* in the 2nd count were determined to be over 90% in the atrap counts, the percentage effect of Neem Azal T/S in the 1st count was found to be higher than in the 2nd count. In the first count of the net, differences were detected between the applications at the 5% level in terms of the number of larval plants compared to the second count at the 1% significance level. In addition, statistical significance was determined at 5% level in the first count with the net for application x dose interaction, and at 5% level in the first count for the number of larvae on the plant.

Discussion and Conclusion: In this study, the effects of plant-based organic plant protection product and biological control agent *B. bassiana* on *H. postica* were investigated under field conditions. As a result of the experiments, it was determined that *B. bassiana* was more effective in counting than Neem Azal T/S. It was concluded that *B. bassiana* was successful as a biological control agent against the larvae of *H. postica.*

Key Words: *Hypera postica*; *Beauveria bassiana*; Neem Azal T/S; Percentage effect

BIOGAS AND BIOMASS: A REVIEW ON RENEWABLE ENERGY SOURCES

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Abstract

Biogas and biomass are two important components of renewable energy sources that attract attention with their sustainability and environmentally friendly features. Biomass is defined as biological material derived from organic wastes, agricultural residues, wood and energy crops, while biogas is produced when microorganisms break down organic matter in an anaerobic environment to produce methane and carbon dioxide. These energy sources play a critical role in reducing environmental impacts compared to fossil fuels, with the potential to be carbon neutral. Biomass can be used to produce electricity, heat energy and biofuels, while biogas is often utilized in power generation and blended into natural gas networks. Biomass is converted into energy through thermochemical (combustion, gasification and pyrolysis) and biochemical (fermentation, anaerobic digestion) conversion processes. Biogas is usually produced from agricultural waste, animal manure, food industry waste and sewage sludge. These processes provide solutions to waste management problems while supporting environmental sustainability. The use of biogas in energy production reduces greenhouse gas emissions, while the use of fermented waste as agricultural fertilizer contributes to the circular economy. The utilization of biomass resources supports energy supply security and rural development. However, challenges such as increasing energy efficiency, reducing logistics and storage costs are among the factors limiting the widespread use of these resources. In this review, biogas and biomass energy production methods, environmental impacts, economic benefits and current challenges will be discussed. It will also provide a perspective on the place of these resources in sustainable energy policies and their future potential. The development of biogas and biomass technologies will pave the way for innovative solutions in the energy sector.

Key words: Biogas, Biomass, Renewable energy, Sustainability, Environmentally friendly energy, Carbon neutral, Energy conversion processes, Waste management,

BIOHYDROGEN PRODUCTION FROM AGRICULTURAL AND FOOD WASTE

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As the global population continues to grow, the demand for energy in developing countries has significantly increased. The current dependence on fossil fuels has proven inadequate, leading to environmental pollution and critical climate changes. Therefore, it is essential to explore green and sustainable alternative energy sources. Research on hydrogen has surged due to its renewable, sustainable, and environmentally friendly characteristics. Various methods for hydrogen production are being investigated, including the use of agricultural and food waste as raw materials. Utilizing these abundant and renewable resources for hydrogen production offers significant advantages. Furthermore, producing biohydrogen from agricultural and food waste can enhance the economy by increasing the added value of these products. The aim of this study is to evaluate the research conducted on enhancing product value through hydrogen production using agricultural and food waste.

Keywords: Biohydrogen; sustainability; food and agriculture wastes

USE AND BENEFITS OF BIOFERTILIZERS

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ABSTRACT

Biofertilizers emerge as an eco-friendly alternative in agricultural production, offering a sustainable option to replace chemical fertilizers. Composed of biologically derived microorganisms, biofertilizers enhance plant growth and improve soil health. These fertilizers, when applied to the soil, enable plants to more effectively absorb nitrogen, phosphorus, and other essential nutrients. Notably, nitrogen-fixing bacteria form symbiotic relationships in plant roots, capturing atmospheric nitrogen and making it accessible to plants. Phosphate-solubilizing microorganisms also convert bound phosphorus in the soil into a form usable by plants. The use of biofertilizers reduces soil and water pollution caused by chemical fertilizers, preserves environmental health, and supports sustainable soil fertility. Additionally, biofertilizers increase the soil's organic matter content, promote microbial activity, and improve soil structure. This enhances water retention capacity and the aeration ability of plant roots. Regular use of biofertilizers not only accelerates plant growth but also boosts plants' resistance to diseases, thereby improving crop quality. The adoption of biofertilizers lowers costs for farmers and plays a role in supporting sustainability in agriculture. The aim of this review is to explain the use of biofertilizers in agricultural production and highlight the contributions of this practice to the environment, soil health, and productivity.

Keywords: Biofertilizer, Crop Quality, Nitrogen Fixation, Soil Fertility

PRELIMINARY STUDY ON THE DEVELOPMENT OF WAFFLE CONES FORMULATED WITH POWDER FROM ROSEHIP WASTE

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Introduction: The waste that remains after processing the rosehips to obtain rosehip purée (raw material for rosehip jam) can be a valuable source of fibres, carotenoid pigments, phenolic compounds, and micro- and macro-elements (Borşa (Bogdan) *et al*., 2023; Borsa (Bogdan) *et al*., 2024). Therefore, it could be recovered as a powder (Rp) for later use as an ingredient in the food industry.

Aims: The aim of this study was to use such a powder in the formulation of ice cream waffle cones by partially replacing (10, 15, and 20%, respectively) the wheat flour in a consecrated manufacturing recipe that uses a minimum amount of sugar necessary to obtain this type of product.

Materials and Methods: Four waffle cone formulations were prepared: control (WCc), with 3.7 (WC3.7%rp), 5.6 (WC5.6%rp), and 7.5% rosehip powder (WC7.5%rp) to fulfil the purpose. They were analysed for proximate composition, pH, colour, techno-functional and texture properties and sensory to identify the formula preferred by consumers.

Results: The use of Rp in the proportion of 7.5% caused a significant increase in the moisture content of waffle cones, the ash and fibre content, and a decrease in the fat and protein content, as well as the pH; instead, it did not significantly influence the carbohydrate content because wheat flour and Rp had close levels. The total colour difference (ΔE^*) of WC7.5%rp was obvious from that of WCc; however, consumers rated them to the same extent, with the difference between overall scores not being significant (8.1-8.4).

Conclusion: In conclusion, Rp is suitable for preparing ice cream waffle cones by replacing wheat flour in a proportion of up to 20%. Our further studies will evaluate these formulations' textural attributes, hydration properties, polyphenol and carotenoid content.

Keywords: colour, proximate composition, rosehip powder, sensory analysis, waffle cones

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LEMON OIL

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ABSTRACT:

ľkc aim or pícsc→ŧ i→ł:cstigatio→ı is to a→ŧalQsis tkc ckcmical compositio→ŧs or cssc→ŧtial oil obtai→ŧcd ríom Citί"s lcmo→ı Ļ. rί"it pccl collcctcd ríom local maíkct or Jaip"í, Rajastka→ı tkío"gk GC a→ŧd GC- MS a→ı alQsis a→ı d scícc→ı i→ı g or cssc→ı tial oil agai→ı st oíga→ı isms ca"si→ı g ski→ı i→ı rcctio→ı s i→ı k"ma→ı bci→ı gs. A total 45 compo→ŧc→ŧts wcíc idc→ŧtificd o"t or 100% or total cssc→ŧtial oil. Ļimo→ŧc→ŧc was ro"→ŧd to bc tkc majoí co→ŧstit"c→ŧt (4«.07%) rollowcd bQ β-pc→ŧtc→ŧc (12.61%), gamma tcípc→ŧc (11.4®%), α-tcími→ŧal (7.20%), α-pi→ı→ŧa («.«9%), MQlcc→ŧc (1.®7%), gcía→ŧiol (1.4®%), α-tcípc→ŧc (1.«2%), α-tíiroli→ı (2.«7%), li→ŧalool (1.0®%) a→ŧd cis-α-bcígamot(1.«®%). A→ŧtir"→ŧgal acti:itQ was dctcími→ŧcd tkío"gk disc dirr"sio→ı mctkod a→ŧd bQ mi→ŧim"m i→ŧkibitoíQ co→ŧcc→ŧtíatio→ı. Maxim"m 14fi0.000 mm i→ŧkibitio→ı zo→ŧc was obscí:cd agai→ŧst Micíospoíc roli"m a→ŧd ľiickopkQtc mc→ŧtagíopkQtcs rollowcd bQ 12fi1.000 mm agai→ŧst ľ. í"b í"m. MIC was ía→ŧgcd ríom 0.4-1.1 mg/ml. Its maxim"m crrcct was scc→ı agai→ŧst ľ. to→ŧsoíial 0.4fi0.000 mg/ml, rollowcd bQ 0.®fi0.000 mg/ml agai→ŧst ľ. í"b í"m, 0.®fi0.577 mm agai→ŧst ľ. mc→ŧtagíopkQtcs, 0.9fi0.000 mg/ml agai→ŧst M. roli"m a→ŧd 1.1fi0.050 gg/ml agai→ŧst C. baíbica→ŧs.

KcQ woíds: Ļcmo→ı oil, citί"s oil.

MORPHOLOGICAL CHARACTERISTICS AND COLOR VALUES OF *Colchicum szovitsii* FISCH. ET MEY. AND *Colchicum kurdicum* (BORNM.) STEF. SPECIES GROWING NATURALLY IN VAN REGION

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ABSTRACT

Introduction and Purpose: Turkey, which has many plant species, both widespread and endemic, is one of the richest countries for natural plants. Geophytes are an important part of this richness. Geophyte is the name given to herbs which stay dormant underground for the greater part of the year and have specialized food-storing underground stems such as bulbs, corms, rhizomes and tubers. As a part of this floral richness, geophytes, with their charming flowers, comprise 15% of the Turkish flora. *Colchicum* spp. have been used as medicinal plants for more than 3000 years are known. *Colchicum* species are used in modern medicine for toxic drugs such as colchicine. a therapeutically active alkaloid called colchinosinoid which are the source of alkaloids. These are the cause of Gout, FMF (Familial Mediterranean Fever) and Behçet's are used as medicines in the treatment of diseases. Geophytes are not only are used not only in medicine but also in the ornamental plant industry, and many of them are beautiful flowers are used as ornamental plants in parks and gardens.

Materials and Methods: In this study *Colchicum szovitsii* Fisch. Et Mey. and *Colchicum kurdicum* (Bornm.) Stef. morphological measurement and color values were determined.

Results: The plant height, plant width and flower length of *C. kurdicum* and *C. szovitsii* species were 11.33±1.15-10.83±0.76 cm, 2.17±0.76-0.53±0.15 cm and 5.33±1.53-2.73±0.25 cm, respectively. Color values of different organs such as leaves, stems and inflorescence of the species were determined for both species and expressed as L, a, b, Chroma and Hue values.

Key Words: Autumn crocus, Colchicum, Colour value, Meadow saffron

THE POSSIBLE EFFECTS OF HEAVY METALS IN HONEY BEE ON HUMAN HEALTH

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ABSTRACT

Introduction and Purpose: Environmental problems which increase as a result of economic, cultural and industrial developments cause the balance and continuity of nature to decrease day by day. Nowadays, this increase has reached a point that threatens the ecosystem. Honey bees, which help the pollination of plants and increase the yield and make great contributions to the agricultural ecosystem, are among the bodies most affected by this threat. The purpose of this study is to determine the effect of heavy metal hazard caused by environmental problems on honey bees.

Materials and Methods: Honey bees are directly or indirectly affected by many pollutants such as exhaust gases, air and water pollution, chemicals used in agricultural struggle, radiation, competition relations among themselves, Colony Collapse Disorder. In fact, it has been determined that magnetic fields have a negative effect on the colonies of honey bees in navigating and communicating. Honey bees are exposed to various pollutants during their foraging flights, collecting pollen and nectar, and collecting water. In addition, suspended solids in water, soil, vegetation or atmosphere, for example; pesticides, polycyclic aromatic hydrocarbons and heavy metals can be collected on the hairy bodies of honey bees and carried into the hive with the bee.

Results: Heavy metals found in honey bees and honey productions depend on various factors like how close the hives are to industrial centers, the number of nearby industrial centers, and distance from the highway. The effects of heavy metals, which are discharged to the environment as a result of many activities and have the feature of spreading and accumulating, on the ecological system and the human body are very important. Metal contamination in honey, which is a mineral source, can be toxic to human health. For example; Excess heavy metals including lead (Pb), arsenic (As), and cadmium (Cd) in foods such as honey cause diseases in the heart, kidney, and bones, while aluminum (Al) has been reported to cause damage to nerve, bone and hemopoietic cells. **Discussion and Conclusion:** By providing organic honey and ensuring the highest standards of honey, producers not only provides quality honey but also protects the environment.

Keywords: Environmental problems, Heavy Metals, Honey bee, Honey production, Human Health

SALT-BASED STRATEGIC FOOD AND AGRICULTURAL PRODUCTS

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ÖZET

Çankırı ili dünyadaki tuz madeni zenginliği bakımından, Polonya-Krakow'dan sonra ikinci sıradadır. Çankırı ilinin mevcut tuz yatakları, içermiş olduğu sodyum klorürün yanı sıra içerisindeki muhtemel eser toprak elementlerinin varlığıyla hem bir ham madde hem de stratejik alanlarda kullanılan endüstriyel ürünlere dönüştürülme potansiyeliyle "tuz temelli stratejik ürünler" ön plana çıkmaktadır. Gıda ve tarım alanında söz konusu potansiyelin kullanımı aynı zamanda bölgesel kalkınma anlamında da büyük bir öneme sahiptir. İhtisaslaşma programına dahil olan Çankırı Karatekin Üniversitesi İhtisaslaşma projesi kapsamında "Sektörel Tuz ve Tuz Temelli Stratejik Ürünler" alanında 6 odak noktasında (Sağlık, Analiz, İnovatif Ürünler Programı, Tuz Temelli Stratejik Ürünler Programı, Tuz Ekosistemi Programı, Sanat, Tasarım, Medya ve Farkındalık Programı) çalışmalarını yürütmektedir. Tuz Temelli Stratejik Ürünler Programı bünyesinde gerçekleştirilecek olan projeler ile Çankırı ilinin en önemli yeraltı zenginliklerinden ve gelir kaynaklarından olan tuzun stratejik ürünlere dönüştürülmesiyle bölgenin ve ülkenin katma değer potansiyelinin artırılması hedeflenmektedir. Bu çerçevede gıda sektörüne yönelik Çankırı Kayatuzu Katkılı Alternatif Ürünlerin geliştirilmesine ilişkin çalışmalar başlatılmıştır. Tuz Ekosistemi Programında yer alan projeler ile Çankırı iklimine uygun, tuzlu koşullara adapte olan tıbbi ve aromatik bitkilerin belirlenerek, bu bitkilerden sabit, uçucu yağlar ve ekstraktlar elde edilerek etki değeri yüksek gıda, kozmetik, sağlık ve temizlik ürünlerine dönüştürülmesine yönelik ilk adımların atılmasına imkan sağlanacaktır.

Anahtar Kelimeler: Çankırı, Kayatuzu, Tuz Temelli Stratejik Ürünler, Gıda, Tıbbi Ve Aromatik Bitkiler

DETERMINATION OF THE GENETIC DIVERSITY OF *AVENA FATUA* (L), A PROBLEM IN WHEAT GROWING AREAS

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ABSTRACT

The primary objective of this study was to investigate the genetic diversity of *Avena fatua* L. populations resistant to ALS inhibitors and evaluate how this diversity influences the development of herbicide resistance. ALS inhibitors are widely used in weed management; however, the repeated application of herbicides with similar modes of action has led to the emergence of herbicide-resistant weed populations, posing a significant challenge in agricultural practices. This study was conducted using *A. fatua* seeds collected from wheat-growing regions in four provinces (Samsun, Amasya, Çorum, and Sinop) of the Black Sea region in Turkey. Genetic variation among the populations was assessed using the Simple Sequence Repeat (SSR) marker technique. A total of 15 different primers were utilized to screen for both resistant and susceptible *A. fatua* populations. The analysis revealed 63 alleles across 15 loci in the 24 populations studied, with no evidence of low polymorphism. The overall genetic diversity of the populations was found to be 74%, with significant genetic differences between the resistant and susceptible populations. These findings highlight the importance of considering both the genetic diversity and resistance status of *A. fatua* in the development of integrated weed management strategies. The results provide valuable insights that could guide the management of herbicide resistance and contribute to the design of future, more effective weed control approaches.

Key Words: SSR, *Avena fatua*, Genetic Diversity, Wheat

EFFECTS OF DIGITAL AGRICULTURE TECHNOLOGIES ON YIELD AND QUALITY IN FIELD CROPS

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ABSTRACT

Digital agriculture technologies offer a comprehensive solution for enhancing the yield and quality of field crops by utilizing tools such as sensors, satellite imaging, data analytics, and artificial intelligence. These technologies enable a more precise assessment of essential plant needs, such as water, nutrients, and light. For example, precision agriculture technologies allow for real-time monitoring of soil and plant conditions, ensuring the accurate provision of necessary nutrients and water. Additionally, data collection and analysis facilitate early detection of adverse conditions, such as pest infestations or disease symptoms, which is crucial for maintaining plant health and maximizing yield. Digital agriculture technologies also support sustainable production goals by reducing input costs. From a sustainability perspective, these technologies minimize environmental impact by enabling reduced water and fertilizer usage. With these capabilities, digital agriculture technologies are valuable tools in modern agriculture, promoting yield and quality improvements while ensuring environmental responsibility. The purpose of this review is to examine the effects of digital agriculture technologies on yield and quality in field crops, highlighting the importance of these innovations in agricultural practices.

Keywords: Analytics, Quality, Sensors, Yield

BIOPESTICIDAL EFFICACY OF *Heliotropium indicum* LEAF EXTRACTS IN POSTHARVEST PEST CONTROL OF STORED GRAINS

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Abstract

The hexane, ethyl acetate, and methanol leaf extracts of *Heliotropium indicum* were screened for their biopesticidal activity against the weevils of rice, sorghum and maize grains. Each extract demonstrated promising efficacy in causing mortality at various concentrations (2.5 g/kg, 5.0 g/kg, 10 g/kg, and 20 g/kg) 24-96 h postexposure. Among the extracts, the methanol extract emerged as the most effective, exhibiting the highest mortality rate of 96.67% at a concentration of 20 g/kg, 96 h after exposure, comparable to the standard insecticide (cypermethrin). In contrast, the negative control, consisting of untreated grains, showed 1.67% mortality rate for *Sitophilus zeamais* 72 h post-exposure, which could be attributed to natural death or mechanical injury. .Additionally, the methanol, and ethyl acetate, extracts demonstrated high mortality rates for *Sitophilus zeamais*. This level of effectiveness is similar to that of cypermethrin, indicating that *Heliotropium indicum* could be a valuable biopesticide for the postharvest management of stored grains. This study suggests the potential for these plant extracts to serve as natural alternatives to synthetic insecticides, offering a sustainable solution for pest control in stored grain protection. The novelty of this research lies in its comprehensive approach to utilizing multiple solvent extracts from a single plant species, highlighting the untapped potential of *Heliotropium indicum* in the development of eco-friendly biopesticides. This could pave the way for further investigations into other medicinal plants with similar properties, ultimately contributing to safer and more sustainable agricultural practices.

EFFECTS OF Ag_2S NANOPARTICLES ON CRESS (*Lepidium sativum* L.) PLANTS IN VIVO CONDITIONS

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ABSTRACT

Introduction and Purpose: The adoption of nanotechnology in agriculture, a rapidly developing field in recent years, has gained an important ground due to its rapid solution capability and high potential for sustainable agriculture. Nanoparticles may be described as materials with diameters between 1 to 100 nm in at least one dimension. The application of NPs has gained widespread popularity in agriculture and allied sectors including various other fields, the chemical, biomedical, optical, food, pharmaceutical, and textile industries. In this study, the growth parameters and biochemical responses of soil application of Ag_2S nanoparticles to regenerated plant tissues from cress (*Lepidium sativum* L.) under in vivo culture were evaluated.

Materials and Methods: Cress seeds were surface sterilised in 5% sodium hypochlorite for 5 minutes and 96% ethanol for 30 seconds before sowing and finally washed several times with distilled water. Then the cress seeds were sown evenly to a depth of 2-3 cm in pots filled with peat+perlite+soil mixture. After sowing, the pots were placed in an acclimatisation cabinet adjusted to 24/20 ^{o}C (day/night) temperature, 16/8 (light/dark) photoperiod and 55% humidity. Seedlings were watered daily with distilled water until harvest. After 4 weeks of in vivo plant regeneration, Ag_2S NPs were added to the plant soil as 30 ml solution at 0, 10 and 20 ppm concentrations at 3-day intervals and this process was performed 3 times in total.

Results: Low concentration (10 ppm) Ag_2S NPs applied to cress plant showed a positive effect on the growth and development of the plant compared to the control. However, as the concentration of Ag_2S NPs (20 ppm) applied to the plant increased, plant, root and stem lengths decreased. At the same time, high concentration increased cell damage. Ag_2S NPs application at high concentration (20 ppm) showed the highest value with an increase in MDA (0.973 nmol/g^{-1}) and H_2O_2 (0.098 (µmol/g^{-1}) compared to the control.

Key Words: Lepidium sativum L., Ag_2S NPs, MDA, H_2O_2

EFFECTS OF GARLIC AND GINGER EXTRACTS ON MICROBIAL LOAD OF LOCUST BEAN SEEDS (Parkia biglobosa)

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ABSTRACT

This study was carried out to examine the extracts that inhibited the growth of all the isolates tested, fungi, aspergillus, the result of the present study showed that the aqueous extract has more activity. Additionally, the result showed that the methanol extract of Garlic has good activity against both the fungal strains (0.237 mg/ml) and A. niger. Aqueous extract was found to be less potent against E. coli with 2mm diameter of inhibition respectively. For all extracts tested, the Garlic extract exhibited maximum antimicrobial activity against the tested organisms, fungal strain showed more sensitivity to the extracts as compared to bacterial strain. All the extracts tested indicated the antimicrobial nature, but the degree varies among extracts.

USE OF GYPSUM MIXED IRRIGATION WATER TO IMPROVE SALINE-ALKALI SOILS

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ABSTRACT

Introduction and Purpose: Soil salinity and sodicity are serious problems threating food security worldwide. There are several ways to improve conditions of saline-alkali soils. Mixing gypsum in the soil and washing the soil with irrigation water is perhaps the most widely used method. This technique is highly time and labor consuming as mixing the material and then washing the soil with plenty amount of water takes long time especially in the clayey soils. This study aimed to evaluate effectiveness of irrigation water-mixed gypsum on productivity and improvement of saline-alkali soils in both field and laboratory conditions.

Materials and Methods: Alfalfa (Medicago sativa), sainfoin (Onobrychis viciifolia Scop.), tall fescue (Festuca arundinacea Schreb.) and birdsfoot trefoil (Lotus corniculatus L.) were tested in the field conditions in a completely block design. The data presented are the first year's preliminary results on the plant height and dry weight.

Results: The results of first two harvests showed that the water mixed gypsum appeared having positive influence on the plant height, moist weight, and dry weight, while this effect was not statistically significant.

Discussion and Conclusion: The results suggest that as the trial progresses and more gypsum-treated water is applied, leading to further reactions between the gypsum and the soil, the impact of the gypsum will become increasingly noticeable. The field trial is set to continue for an additional two years.

Key Words: Alfalfa, Birdsfoot trefoil, Gypsum mixed irrigation water, Sainfoin, Tall fescue

EFFECT OF FDM-IMPREGNATED HEMP FIBERS ON PHYSICAL, MECHANICAL AND THERMAL PROPERTIES IN CALCIUM SULFATE MATRIX COMPOSITES

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ABSTRACT

Introduction and purpose: In recent years, the use of sustainable and environmentally friendly materials has gained great importance in the construction sector. In this context, the use of natural fibers in composite materials is intensively researched in order to both reduce environmental impacts and increase the performance of traditional materials. Hemp fibers are a type of natural fiber that attracts considerable attention in this field due to their high strength, flexibility and sustainability. On the other hand, phase change materials are increasingly used due to their thermal energy storage performance. In this study, the effects of FDM impregnated hemp fibers on the physical, mechanical and thermal energy storage properties of calcium sulfate-based composites were investigated.

Material and Method: Paraffin impregnated hemp fibers were added to the waste paper fiber (AKL) reinforced calcium sulfate-based composite mixture by replacing them with 0, 15 and 30% of the AKL weight. The prepared mixture was compressed in high-pressure filtration presses and composite sheets of 60x60x3 cm were obtained. Density, water absorption percentage, hardness, bending strength and thermal energy storage properties were measured on samples taken from the panels subjected to oven curing process.

Results: As a result, it was observed that as the FDM impregnated hemp fiber ratio of the produced composites increased, the density values decreased, the water absorption rates decreased and the high amount of paraffin hardened after drying and made the material brittle or decreased the bending strength due to the negative effect it had on the fiber-matrix interface. On the other hand, it was determined that significant increases were achieved in terms of thermal energy storage properties.

Keywords: Gypsum, waste paper fiber, hemp fiber, bending, thermal energy storage, density.

EVALUATION OF MEXICAN ORIGIN BREAD WHEAT ADVANCED STAGE LINES IN TERMS OF AGRICULTURAL CHARACTERISTICS IN DIYARAKIR PROVINCE CONDITIONS

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ABSTRACT

Introduction and Purpose: Wheat is one of the most important plant nutrients in human nutrition. In addition to environmental factors, physiological characteristics, yield and its components directly or indirectly affect grain yield. The aim of this study was to observe the yield, yield components and normalized vegetation difference index (NDVI) of advanced bread wheat genotypes supplied from Mexico in Diyarbakır conditions.

Materials and Methods: The study was conducted in the rainfall conditions of Diyarbakır province in the 2018-2019 production season. The experiment was set up according to a randomized block design with 3 replications. In the experiment, 20 advanced bread wheat lines and 5 control varieties were used as materyal.

Results: In all investigated traits, significant differences were observed between genotypes at p≤0,01 level. It was found that spike length 5,34-9,44 cm, spikelet number per spike 21,80-34,6 spikelet/spike, grain number per spike 27,80-54,40 grain/spike, spike weight 0,96-2,74 g, grain yield 73,31-335,31 kg/da, and NDVI varied between 0,380 and 0,680. **Discussion and Conclusion:** The analysis results showed that there was a positive and significant relationship between NDVI at the stem elongation period and grain yield. It was determined that H1, H2, H4, H6, H13, H17 and H19, among the advanced bread wheat lines, were at the forefront in terms of many features. It was concluded that it is important to transfer these promising advanced bread wheat lines H17 and H19 to the gene pool for hybridization programs and that it would be appropriate to repeat the research with the same material in different environments.

Key Words: Wheat, Yield Components, Correlation, NDVI

SELECTION OF BREAD WHEAT GENOTYPES IN TERMS OF THOUSAND GRAIN WEIGHT UNDER MULTIPLE ENVIRONMENTS WITH GGE BIPLOT ANALYSIS

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ABSTRACT

Introduction and Purpose: Thousand grain weight is one of the important technological quality characteristics in wheat *(Triticum aestivum* L.*)* production. Although genetic structure is the main determining factor in thousand grain weight, the effects of environmental conditions and agronomic (fertilization, irrigation, etc.) practices are also important. The aim of the study was to identify high thousand grain weight and stable genotypes with based on GGE biplot analysis results in multiple environments. Additionally, we aimed to test the usability of GGE biplot graphs in the process of thousand grain weight driven selection.

Materials and Methods: The research was conducted in Diyarbakır Center and Kızıltepe conditions in the 2011-2012 season. The experiments were conducted in a randomized complete block design with 4 replications under rainfall and support irrigated conditions. In the experiment, 20 advanced bread wheat lines and 5 control varieties were used.

Results: According to the biplot analysis results, PC1 explained 77,04%, PC2 10,75% and PC1+PC2 87,79% of the variation between the genotypes. It was determined that Pehlivan, G9, G14 and G23 were the leading genotypes in terms of thousand grain weight, and Pehlivan and G14 gave stable and at the same time high thousand grain weight values. **Discussion and Conclusion:** It was determined that all the environments were located in the same mega environment. It was determined that the most suitable environment for selection for thousand grain weight was the 2nd environment (Diyarbakır supported irrigation). Finally, since all environments were located in the same mega environment, setting up a trial only in the 2nd environment for the selection to be made for thousand grain weight would be a sufficient and cost-effective decision. Also, it was observed that the GGE biplot technique was discriminative in determining the most ideal genotype in multiple environments and facilitated selection.

Key Words: Wheat, GGE Biplot, Thousand Grain Weight, Selection

PHYTOCHEMISTRY AND ANTIMICROBIAL ACTIVITY OF *RUTA MONTANA* ESSENTIAL OIL AGAINST NOSOCOMIAL BACTERIA

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Abstract

Healthcare-associated infections are a global public health problem with considerable individual and economic impact. Multidrug resistance of the microorganism frequently increases the risk that can be reduced by the use of biomolecules of essential oils (EO) of medicinal plants. This study investigated the phytochemical components and antimicrobial potential of Moroccan *Ruta montana* essential oil harvested in the Taza region, Morocco.

The chemical analysis of *Ruta montana* essential oil was performed by GC/MS and their antimicrobial effect was evaluated by microplate dilution method against eight bacterial strains resistant to nosocomial infections.

The main constituents of *Ruta montana* essential oil were 2-undecanone (85.76%), 2-nonanone (3.95%), 2-decanone (3.67%) and 2-dodecanone (1.94%). *Ruta montana* essential oil had more or less stable antimicrobial effects on all bacteria observed. The values of *Ruta montana* essential oil showed MIC values of 4% (v/v) for *Pantoea spp* and 8% (v/v) for the other strains tested (*Coagulase-negative Staphylococcus, Pseudomonas aeruginosa, Staphylococcus aureus, Escherichia hermannii, Escherichia coli and Stenotrophomonas maltophilia*) with the exception of *K. pneumonia* for which no effect was demonstrated. This Essential Oil has a more or less interesting antibacterial potential against nosocomial infections and further study is needed to compare our results.

Keywords: Antimicrobial potential, Essential oil, *Ruta montana*, Resistant strains, Nosocomial bacteria.

EFFECT OF FOLIAR CALCIUM AMPLIFIERS ON THE CHEMICAL COMPOSITION OF SWEET PEPPER

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ABSTRACT

This research aimed to determine the impact of two amplifiers of soil properties (Zeofit forte and Zeofit plus) that are completely ecological and of natural origin. They can also be successfully used for plant foliar nutrition due to the presence of a high content of calcium and magnesium. It stimulates the flowering of plants and increases immunity and yield.

In the Strumica region, North Macedonia, a field crop experiment was set in the protected spaces of 300 m^2. The material for the work was the sweet pepper variety 'Bela dolga', recognized for their high yield and fruit quality. The variants in the experiment were:

1. Control (untreated); 2. Zeofit forte (SiO_2 15%, CaO 35%, MgO 7%, P_2O_5 0.04%, K_2O 0.63%, MnO 0.043%, Fe_2O_3 4.70%) – 3 g/L; 3. Zeofit forte (SiO_2 15%, CaO 35%, MgO 7%, P_2O_5 0.04%, K_2O 0.63%, MnO 0.043%, Fe_2O_3 4.70%) – 5 g/L; 4. Zeofit plus (SiO_2 25%, CaO 21%; MgO 13%; K_2O 1.1%; Fe_2O_3 2.0%) – 3 g/L; 5. Zeofit plus (SiO_2 25%, CaO 21%; MgO 13%; K 1.1%; Fe_2O_3 2.0%) – 5 g/L.

Each variant was treated with tasted foliar fertilizer in concentrations of 3 g/L and 5 g/L solution. Foliar fertilization had a positive influence on the content of the examined parameters in pepper fruits. In all variants, the analyzed parameters gave better results compared to the untreated control variant. The highest content ($p<0.05$) of dry matter (13.50%), ash (1.15%), and vitamin C (127 mg/100g) were determined in the pepper fruits from variant 2. The highest ($p<0.05$) average content of nitrogen (1.41%), phosphorus (0.65%), potassium (2.20%), and calcium (1.53%) was determined in the pepper fruits from the variant 2, too. The highest ($p<0.05$) content of magnesium (0.49%) was determined in the pepper fruits from the variant 4.

Keywords: foliar nutrition; sweet pepper; amplifiers; organic production.

DYNAMIC NITROGEN BALANCE IN THE EARTH'S PEDOSPHERE AND ATMOSPHERE

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ABSTRACT

This review paper looks at the dynamic balance between the pedosphere and the Earth's atmosphere regarding the intensity of the emission of nitrogen oxides and molecular nitrogen and their uptake by the biosphere. Maintaining this balance is important for minimizing the consequences of excessive N_2O emission (desertification, greenhouse effect), on the one hand, and encouraging nitrogen fixation processes, on the other hand, which protects the soil from degradation.

Keywords: nitrogen, nitrogen fixation, balance, balance, cycle.

FUNCTIONAL FOODS: A KEY TO HEALTH AND ECONOMIC GROWTH

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ABSTRACT

Functional foods are foods that provide health benefits beyond basic nutrition. These foods, which contain bioactive compounds such as antioxidants, probiotics, and omega-3 fatty acids, play a crucial role in disease prevention and overall health improvement. Examples include olive oil rich in polyphenols and vitamin-enriched beverages. As consumer awareness grows, there is a rising global demand for functional foods, driven by a shift towards preventive healthcare. Recent technological advancements have greatly improved the production of functional foods. Techniques such as microencapsulation, fermentation, and nanotechnology enhance the stability and bioavailability of bioactive compounds. For example, probiotics can now survive harsh conditions in the digestive system due to protective coatings, while nanoemulsions improve the absorption of fat-soluble vitamins. These innovations increase product quality, extend shelf life, and meet the evolving needs of both consumers and the food industry. Moreover, functional foods offer solutions to global challenges such as malnutrition and chronic diseases. Fortified cereals and "golden rice" are examples of products developed to address micronutrient deficiencies, particularly in underserved populations. Economically, the functional food sector fosters innovation and market diversification, providing new opportunities for local and international markets. In Turkey, functional foods derived from regional ingredients like carob and black cumin seeds have gained international recognition. In conclusion, functional foods hold significant potential for improving health and stimulating economic growth. However, challenges such as regulatory standards, cost-effective production, and consumer education must be addressed to unlock their full potential.

Keywords: Functional foods; Fortified foods; Malnutrition.

FUNGI ASSOCIATED WITH ANTHRACNOSE DISEASE OF MANGO LEAVES (MANGIFERA INDICA)

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ABSTRACT

The aim of this study was to identify fungal organisms associated with Anthracnose disease of mango leaves in Lokoja, Kogi state. Anthracnose infected mango leaves were sampled from a total of 10 different mango trees within Lokoja. The infected leaves samples were immediately taken to the laboratory for direct isolation, characterization, and identification of fungal isolates. An average total of 102.6 fungal colonies were obtained from the anthracnose infected mango leaves. Based on similarity of morphological features (colony colour, texture, presence of septate mycelia or not, spore shape, and number of septa), fungal colonies were grouped into 4 species and were identified as Aspergillus niger, A. fumigatus, A. flavus, and Penicillium spp. Findings of this study have indicated that Aspergillus niger is the predominant fungal species responsible for anthracnose disease of mango leaves within Lokoja, Kogi state.

CONSUMERS' WILLINGNESS AND ACCEPTANCE OF FOOD PRODUCTS WITH NATURAL PRESERVATIVES: A MOROCCAN PERSPECTIVE

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ABSTRACT

The growing consumer demand for healthier and more sustainable food products has spurred interest in natural preservatives as alternatives to synthetic additives. In this context, our study investigates Moroccan consumers' willingness to accept and purchase food products preserved with natural bioactive compounds, such as essential oils. A cross-sectional survey was conducted, gathering data from 1000 participants across diverse socio-demographic backgrounds. The questionnaire assessed consumer awareness of natural preservatives, perceived benefits and risks, purchasing preferences, and the influence of socio-cultural factors on acceptance.

The results reveal that while most consumers have limited knowledge of natural preservatives, they express a strong preference for food products labeled as "natural" and "additive-free." The primary drivers of acceptance include perceived health benefits, eco-friendliness, and cultural alignment with traditional Moroccan culinary practices. Age, education level, and income emerged as significant predictors of willingness to purchase.

This study underscores the importance of targeted consumer education and strategic marketing to enhance the adoption of naturally preserved foods in Morocco. It also highlights the need for further research into the sensory and economic implications of incorporating natural preservatives into food systems, ensuring both consumer satisfaction and industry feasibility. These findings provide valuable insights for food producers and policymakers seeking to promote sustainable food preservation methods in Morocco and similar markets.

Keywords: Survey, Morocco, Consumer acceptance, Food products, Natural preservatives.

WHEN BEAUTY TURNS BEAST: ORNAMENTAL PLANTS THAT BECOME WEEDS

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ABSTRACT

Landscape ornamental plants, which are one of the important values of urban areas, have important benefits for the ecosystem of the city as well as the negativities they cause. The plants have caused significant problems by disrupting the ecology of the local species they invade, causing environmental problems and economic losses. Invasive landscape ornamental plants are superior to other species due to their rapid growth and high reproduction capacity. Therefore, invasive plants should be taken under surveillance. When determining the ornamental plants to be preferred, the possibility of invasiveness should be taken into consideration in addition to their aesthetic and functional features. Plants that are not included in the natural plants of an area but brought from other areas and grown for various purposes have a high potential to be invasive. Ornamental plants are among the plants considered in this category. Ornamental plants are the most important way of plant invasion worldwide. A large number of non-native plants are used as ornamentals and current policies do not address their invasion. Legislative measures are usually limited to a few high-risk species whose sale or cultivation is prohibited. Plants outside this limited number of species can give the impression of being safe. The continued widespread use of species whose risk of invasiveness has not yet been recognised could pose a major problem in the future. Since many non-native plants are commercially important and widely used for various purposes, a total ban on their import and use is an impractical solution in terms of control. For this reason, these plants should be well observed and the invasion should be prevented with appropriate methods as soon as their invasion potential starts to occur. Otherwise, it will be inevitable to cause serious damage to biodiversity and to create situations that are difficult to compensate.

Key Words: Invasive Plants; Landscape; Ornamental Plants; Weeds

HARNESSING ECOLOGICAL PRINCIPLES FOR SUSTAINABLE AGRICULTURE

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Abstract: Ecological agriculture aims to harness the inherent strengths of natural ecosystems and integrate them into modified agroecosystems designed for food and fibre production. This approach emphasizes three overarching strategies: first, the cultivation of resilient plants equipped with natural solid defence mechanisms; second, the strategic imposition of stress on pests to control their populations; and third, the active promotion of beneficial organisms that support plant health and ecosystem balance. Achieving these goals involves comprehensive habitat management that optimizes environments above ground and within the soil. Many practices that align with these strategies—such as the widespread use of cover crops, which enrich the soil and enhance biodiversity, and reduced tillage methods that preserve soil structure and health—are well established and documented. However, their limited adoption in some regions prompts further investigation into the barriers that farmers face. Ecological agriculture's challenges are especially pronounced in economically disadvantaged countries, particularly in the Global South, where structural inequalities—such as unequal access to land and resources—hinder progress. Engaging national governments in a renewed commitment to equitable and sustainable agricultural development is essential to address these multifaceted challenges effectively. This paper explores the complexities of ecological diversity and sustainability within the farming sector, advocating for enhancing natural biodiversity while laying the groundwork for long-term environmental sustainability. The chosen methodology for this exploration includes a thorough document analysis, aiming to answer a pivotal question: how can the principles of ecology not only survive but thrive within agricultural practices?

Keywords: Ecological Agriculture, Sustainable Agriculture, Agroecosystems, Resilient Plants, Pest Control.

AREAS OF USE OF SOME MEDICINAL AND AROMATIC PLANTS FOUND IN THE FLORA OF MURAT MOUNTAIN (KUTAHYA)

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ABSTRACT

Introduction and Purpose: Murat Mountain, located in the Inner Western Anatolian Section of the Aegean Region, has been studied in terms of floristics. Murat Mountain is 130 km away from Kütahya province. It is 30 km away from Gediz district. Murat Mountain, located within the borders of Kütahya and Uşak provinces and with its highest point being 2309 m, extends in the northwest-southeast direction. The research area, which is under the influence of Mediterranean, Black Sea and Central Anatolian climates, has a rich flora due to this feature. Many plants continue to be collected from nature unconsciously for the purpose of using in domestic consumption or selling. As a result, many plant species that were previously rich in the flora of Murat Mountain have either become difficult to find or are facing extinction today. The sole purpose of this study is to draw attention to Murat Mountain and to ensure that the necessary precautions are taken as soon as possible.

Materials and Methods: In this study, some plant samples belonging to the Murat Mountain flora of Gediz (Kütahya) district were discussed. Face-to-face interviews were conducted with people over 60 years of age (25 people) living in the Gökler town, Çukurören, Gümüşlü, and Gümele villages around Murat Mountain, and a total of 15 medicinal and aromatic plant taxa were identified, the areas of use of which were determined. In addition, after receiving the opinions of 4 herbalists in the Gediz district of Kütahya province, information was obtained about the local usage patterns of the plants. The identification and diagnosis of the plants were made by me. The medicinal effects of the plants and the recipes in their use are the information used by the local people. In the findings section, the Turkish name of the plant, its family, Latin name and the used part of the plant are stated.

Results: Let's not forget that our humanity is valuable. Medicinal plants, which are frequently used by the public in the treatment of various diseases and whose positive effects cannot be ignored, should be consumed consciously. It is important to use plant species that have been analyzed, have known content, and are securely supplied, consciously in the alternative treatment of diseases so that public health is not negatively affected. There are other plants in addition to the plants we have identified on Murat Mountain. However, most of these plants have not been addressed so that they are not harmed. For this reason, the characteristics of the research areas have not been fully specified. Many plant species that used to be common in the Murat Mountain flora are now either extinct or on the verge of extinction. In order to prevent this, it is among the duties of authorized persons or institutions and organizations to take the necessary precautions and keep biodiversity at the highest level and to ensure that the natural ecosystem is protected on.

Key Words: Murat Mountain Flora, Use of Plants, Medicinal Plants

VALUE-ADDED PRODUCTS AND RELATED COMPOUNDS FROM PROPOLIS

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ABSTRACT

This study aims to investigate the chemical composition, antioxidant, and antimicrobial activities of solvent extracts from Turkish propolis. Propolis based natural compounds are widely used in the fields of pharmacology, cosmetics, agricultural chemicals and food. Natural products are effective in cancer, neurodegenerative disorders and broad spectrum of therapeutic properties. Propolis is a medicinal herbaceous product belonging to the bee products. It has therapeutic and biological activities such as anti-inflammatory, anticonvulsant, anti-oxidant, anti-emetic, anxiolytic and antipsychotic agent, and is therefore a potential medicine for the treatment of neuroinflammation, epilepsy, oxidative injury, vomiting and nausea, anxiety and schizophrenia, respectively. The main components of propolis are compounds such as caffeic acids, caffeic acid phenethyl ester is one of the key aromatic constituents collected from propolis. Propolis in which it may represent up to 10% of flavonoids and phenolic extracts. The major active plant-derived phenolics, which combines therapeutic properties with some important adverse effects. After decades of unknown bee products such as propolis.

Türkiye has rediscovered the importance of propolis as a product for the economy and the environment. Propolis production and cultivation is carried out in the provinces and districts of Artvin-Yusufeli, Aydın, Bayburt, Diyarbakır, Erzurum-Esendurak, Erzurum-Olur, Mersin, Ordu, Kahramanmaraş-Göksun, Osmaniye-Bahçe, Samsun-Terme, Samsun-Yakakent, Sivas-Zara and Tokat-Almus.

It is aimed to contribute economically to the people of the region by turning the propolis into agricultural products with high added value. For this purpose, the bioactive compounds of the propolis were obtained and content analysis was performed. These diterpenoid derivatives contribute to neuroprotective properties by being converted into food supplement products with high added value, such as pharmacological effects.

Key Words: Bee products; $scCO_2$; volatile parts; activities

OBTAINING BIOACTIVE COMPOUNDS FROM GREEN EXTRACTION METHOD USİNG SUPERCRİTİCAL CO_2 EXTRACTION TECHNIQUES

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ABSTRACT

Introduction and Purpose: Extraction of compounds from plants usually involves several separate steps and requires large volumes of organic solvents. In this work, a comprehensive two-step supercritical fluid extraction method using carbon dioxide, ethanol and water will be presented. This new approach allows the extraction of non-polar and polar analytes in two consecutive steps. The first step, which contains only low quantity of co-solvent and a dominant amount of CO_2, allows the selective extraction of non-polar volatile terpenes in only 20 min. Increasing the co-solvent volume in the extraction solvent up to 45% (v/v) allows the extraction of more polar compounds, including flavonoids and phenolic acids, in less then one hour. Changing the supercritical fluid extraction (SFE) conditions does not require any manual intervention, but results in two separate fractions containing target compounds with distinctly different physicochemical properties. This new method has been validated in terms of reproducibility, accuracy, precision and greenness.

Materials and Methods: Two-step SFE was applied to plant species differing in volatile terpenes and phenolic profiles. The results proved that this concept is suitable for the analysis of complex plant samples. It also reduces the consumption of toxic solvents, extraction time and manual intervention required for traditional extraction approaches while isolating different metabolite groups. Supercritical CO_2 extraction method is important due to the use of environmentally friendly, non-toxic solvents, ability to operate at lower temperatures that do not cause degradation of bioactive compounds and rapid extraction capacity. The extracts obtained showed superior properties due to their activities. In order to obtain extracts as a bioactive agent, 20 kg of the dried part was weighed and this pure and organic plant placed in tubes and extracted with supercritical carbon dioxide. Volatile components of plant extracts obtained from plant were determined on the LC-MS/MS and GC-MS/MS device.

Results: According to the analysis results, 16 compounds were identified; cannabidiol and fatty acids.

Discussion and Conclusion: The aim of this presentation is to provide an in-depth understanding of supercritical CO_2 extraction method and to discuss its advantages and disadvantages. The study includes specific data on various plant materials and includes details such as plant name and region, bioactive compounds or compound classes, extraction temperature, pressure, time, co-solvent used and flow rate. This study covers the investigations on the isolation of bioactive compounds and the activities of the obtained extracts.

Key Words: Dried plants; $scCO_2$; LC-MS/MS; flavonoids; GC-MS/MS

OPPORTUNITIES AND THREATS IN HAZELNUT FARMING IN TURKEY

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ABSTRACT

Hazelnut is a type of hard-shelled fruit and can be stored and kept in stock for a certain period of time. In our country most of it is produced in the Eartern Black Sea Region, and a small amount is producrd in Sakarya, Adapazarı and Düzce provinces.The rainy and humid climate of the Eastern Black Sea Region is very suitable for hazelnut cultivation. Hazelnut cultivatıon has been carried out in our country for about a century. While very little of the hazelnuts produced are consumed in the domestic market, most of them are exported to foreign markets.Hazelnuts are among the top agricultural products exported by our country. With this feature, it bring significant foreing currency to our country. Türkiye accounns for approximately %70 of world's hazelnut production. Accorting to the data World Food Organization, the total production amount of other hazelnut producing countries is only half of Turkey's production. The majority of hazelnuts, %80 of which are chocolate,are used in the confectionary, biscuit, ice cream, pastry and oil industries. Although our country has many adventages. Since we cannot turn these advantages into opportunities, we face many threats. That's why we haven't been able to avoid being the suplier of chocolate companies in European countries for nearly a hundred years. The saddest part is that these countries buy hazelnuts from us, make chocolate and sell it back to us. Despite this, we have always sold shelled hazelnuts for three generations. The grandfather sold shelled hazelnuts, his son sold shelled hazelnuts and the grandson sells shelled hazelnuts. We could not take this one step further and make and sell chocolate from hazelnuts. Hawever, hazelnuts are a products with high added value.

An İtalian company buys hazelnuts from Turkey , cocoa from Ghana or Ivory, palm oil from Malaysia and Indonesia and sugar from Brazil and makes a billion- dolar turnover by producing choocolate or a product with high added value that is spread on bread. This company in question, with its three thousand emloyees more than our five million Eastern Black Sea families.

In this study the opportinuties and threads in hazelnut production are revealed and how we can turn threads into opportunities is diccussed .

Key Word: Hazelnut Production, Chocolate Making, Creating added Value.

IMPACT OF DIGITAL LITERACY ON RURAL ECONOMIC DEVELOPMENT

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Abstract

Digital literacy is increasingly recognized as a critical component for economic development, especially in rural areas where limited technological access and infrastructure create a significant digital divide. This paper examines the impact of digital literacy on rural economic development, exploring how digital skills empower rural populations with enhanced access to information, employment opportunities, and essential services. By facilitating e-commerce, improving agricultural productivity, and promoting small-scale entrepreneurship, digital literacy plays a transformative role in rural economies. Through an analysis of existing literature and case studies from countries like India and Kenya, the paper highlights successful digital literacy initiatives and the economic benefits they provide. Additionally, it addresses the primary challenges faced in implementing digital literacy programs, such as infrastructure limitations and sociocultural barriers. The study concludes with recommendations for policymakers to support sustainable digital literacy initiatives, emphasizing the importance of public-private partnerships and community engagement. This paper ultimately underscores the potential of digital literacy to bridge the rural-urban economic gap and foster inclusive economic growth.

Keywords: Digital Literacy, Rural Economic Development, Digital Divide, Rural Empowerment, E-commerce in Rural Areas

USE OF FISH SPERMATOZOA IN THE ASSESSMENT OF TOXIC EFFECTS OF PESTICIDES IN AQUATIC ECOSYSTEMS

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ABSTRACT

Introduction and Purpose: Although environmental risk assessment of contaminants such as pesticides is today a well-established field of study, developing new techniques for evaluation of their toxicity levels have gained scientific interest during the last decades. For instance, some *in vitro* tests instead of *in vivo* tests used fish, daphnia, and algae have been evaluated in the determination of effective concentrations of pesticides in aquatic environments. Using fish spermatozoa for evaluating the toxic effects of pesticides is one of the prominent *in vitro* techniques. The aim of the current study was to reveal the usage of fish spermatozoa in toxicity tests of different pesticides, describing both the advantages and disadvantages of it.

Materials and Methods: Spermatozoa samples sterlet (*Acipenser ruthenus*) and rainbow trout (*Oncorhynchus mykiss*) were used for *in vitro* toxicity tests of vinclozolin (VNZ), lambda-cyhalothrin (LCT), cypermethrin (CPM), captan (CPT), mancozeb (MCZ), and azoxystrobin (AZX) pesticides in the previous studies. Spermatozoa samples were diluted with appropriate extenders containing different concentrations of these pesticides at µg/L levels. After incubation of 2 h at +4 °C, some spermatological and biochemical parameters such as sperm motility, oxidative status, DNA damage, and fatty acids profile were determined and compared to those parameters from their control groups.

Results: Changes in all considered parameters were detected at certain concentrations of the pesticides. ≥ 10µg/L of VNZ, ≥0.6 µg/L of LCT, ≥1 µg/L of CPM, ≥2 µg/L of CPT, ≥1 µg/L of MCZ, and ≥5 µg/L of AZX concentrations significantly affected relevant parameters, most particularly sperm motility.

Discussion and Conclusion: It has been shown that fish spermatozoa samples were highly sensitive to pesticides. Fish spermatozoa could be useful for understanding not only possible damages of pesticides to fish reproduction, but also mechanism of toxicity of pesticides on cells. Moreover, these results encouraged further studies on the usage of fish spermatozoa as an alternative to both cell cultures and even *in vivo* tests using the organisms.

Key Words: Pesticides; Fish Spermatozoa; Sperm Motility; Oksidative status

GSAtt-CMNetV3: POTATO LEAF DISEASE CLASSIFICATION USING OSPREY OPTIMIZATION

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ABSTRACT

Introduction and Purpose: Potato is a staple crop with increasing demand due to population growth. Accurate diagnosis, early detection, and flawless identification of potato leaf diseases can significantly enhance farmers' income. Currently, deep learning (DL)-based techniques provide cost-effective and time-efficient solutions for identifying plant diseases. Therefore, we hypothesized that an optimized DL model could efficiently classify the presence or absence of potato leaf disease through an effective feature learning process. The objective of the present study was to propose and evaluate a novel DL model to classify potato leaf diseases accurately, leveraging advanced techniques for feature extraction and classification.

Materials and Methods: The study consisted of four major stages: Pre-processing, Segmentation, Feature Extraction, and Classification. In the pre-processing stage, input images were resized, and the Improved Contrast Limited Adaptive Histogram Equalization (ICLAHE) technique was applied to enhance the quality of the potato leaf images. During segmentation, the Kernelized Gravity-based Density Clustering (KGDC) technique was utilized to isolate diseased portions of the leaf images. Subsequently, the Gated Self-Attentive Convoluted MobileNetV3 (GSAtt-CMNetV3) model was proposed to extract features and classify potato leaf diseases. To optimize the parameters of the proposed DL model, a novel Osprey Optimization Algorithm (Os-OA) was introduced, improving the classification performance. The study was implemented using the Python platform, and the publicly available PlantVillage dataset was used for simulation.

Results: The proposed model demonstrated outstanding performance in classifying potato leaf diseases. For an 80% training split, the accuracy, precision, and recall values achieved were 97.87%, 96.87%, and 97.08%, respectively.

Discussion and Conclusion: The current study highlights the effectiveness of the proposed GSAtt-CMNetV3 model with the Os-OA optimization in achieving accurate classification of potato leaf diseases. The results suggest that the integration of ICLAHE, KGDC, and optimized DL techniques can significantly enhance the identification and classification of plant diseases, ultimately benefiting farmers by reducing costs and time**.**

Key Words: Potato leaf disease classification, bacterial spot disease, gated self-attentive convoluted mobilenet-V3, osprey optimization algorithm, Kernelized gravity-based density clustering.

EVALUATION OF HYPOGLYCEMIC POTENTIAL OF THE METHANOL EXTRACT OF THE GYMNEMA SYLVESTRE PLANT IN WISTER ALBINO RATS

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ABSTRACT

Diabetes mellitus is a metabolic disorder that impairs glucose homeostasis and can lead to severe complications if poorly managed. This current study aimed to explore the antidiabetic effect of methanol extract of gymnema sylvestre in alloxan-induced diabetic rats. Preliminary phytochemical screening revealed the presence of phenols, alkaloids, flavonoids, tannins and saponins which has been proven to possess antidiabetic properties. A total of 20 wistar albino rats were grouped into four equal groups: Normal control, diabetic control, diabetic treated with 500 mg/kg body weight (bw) metformin and diabetic treated with 400 mg/kg bw G. sylvestre for three weeks. Diabetes was induced to all the study group animals except normal control by intravenous administration of alloxan monohydrate (80 mg/kg bw). Blood glucose level was measure after 72 hours and subsequently, every week for three weeks using glucometer. Result showed that both G. sylvestre and metformin significantly ($p<0.05$) decreased the fasting blood glucose. The study concluded that G. sylvestre have comparable effects with metformin in normalizing the blood glucose level, hence, this plant maybe be the good alternative medicine in managing the diabetes mellitus.

Key words: Diabetes mellitus, alloxan, gymnema sylvestre, metformin.

AN EVALUATION OF THE DEVELOPMENT OF THE AGRICULTURAL INDUSTRY AND ITS IMPACT ON THE AGRICULTURAL SECTOR

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ABSTRACT

The agricultural industry, particularly export-oriented industries, serves as a crucial lever for the sustainable development of the agricultural sector. Farmers' reliance on fresh consumption markets (such as wholesale markets, local bazaars, and chain stores etc.) is often insufficiently rewarding and contributes only marginally to agricultural advancement.

Establishing agricultural industries in regions where fresh agricultural products are grown or in nearby areas is essential. The objective is to procure fresh agricultural products, which serve as raw materials, at optimal cost and in ideal conditions from regions where they are naturally best suited to grow. Once processed in these facilities, the value of these products increases, their volume generally decreases, making them more suitable for transport to subsequent industrial sectors that use them as raw materials.

Additionally, locating agricultural industries in rural areas fosters social interaction, creates new employment opportunities, and facilitates the emergence of ancillary industries, such as agricultural machinery manufacturing. This, in turn, helps mitigate rural-to-urban migration and the associated challenges.

Moreover, investments in agricultural industries generally offer a shorter payback period compared to other industrial sectors. The capital required to provide employment for one person in the agricultural industry is also significantly lower than in other industries.

Our nearly two decades of experience encompasses various agricultural industry activities, including the processing of vegetable products produced primarily through family farming, such as canning, freezing, drying, and paste production. Drawing on this experience, this paper examines key aspects of agricultural industrial development and presents recommendations for fostering growth in the agricultural sector.

Key Words: Agricultural Industry; Rural Development; Value-added Agricultural Products; Sustainable Agricultural Development; Agricultural Economy

DEVELOPMENT OF APRICOT PRODUCTION IN TÜRKİYE: THE CASE OF IĞDIR PROVINCE

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ABSTRACT

Introduction and Purpose: Apricot, one of the stone fruits, is a widely cultivated fruit due to Türkiye's favorable climatic conditions. Apricot kernel is consumed as fresh and dried food as well as used in the pharmaceutical and cosmetic industries. This study aimed to reveal the status of apricot cultivation in Türkiye over the years.

Materials and Methods: TurkStat data covering the years 2004-2023 were used in the study.

Results: While there were 900,000 decares of apricot planting area in Türkiye in 2004, there are 1,449,405 decares of apricot planting area as of 2023. In 2023, the total production amount is 750,000 tons and apricot yield per unit area (decare) is 517,45 kg. Many types of apricots, including dried and table varieties, are grown in different provinces of Türkiye. Important apricot production centers in Türkiye include Malatya, Kahramanmaraş, Elâzığ, Mersin, Iğdır and Hatay. Şalak, an important variety for table production, is grown in Iğdır province. Iğdır province, which has a high yield per tree, is very advantageous in terms of apricot production. The total apricot planting area in Iğdır province in 2023 is 40,618 decares. While the share of Iğdır province in Türkiye was 0.79% with 2,520 tons of apricot production in 2004, its share in Türkiye increased to 5.13% with 38,441 tons of apricot production as of 2023. In terms of planting area in Iğdır province, apricot is mostly found in the Central district with a share of 54.16%, followed by Tuzluca with 32.01%, Karakoyunlu with 8.17% and December with 5.66%.

Discussion and Conclusion: Apricot, whose planting area and yield have increased over the years, has an important place in fruit farming in Iğdır province. However, the number of fertilizers and pesticides should be more controlled, and fruits should be collected carefully so that they are not crushed during harvest. Lack of producer organization in the region is one of the most important problems encountered during marketing and distribution. Since Igdir province is an important province where fruit is grown in the Eastern Anatolia region in terms of climate and soil conditions, eliminating these problems will make a great contribution to the regional economy.

Key Words: Apricot; Production; Yield; Iğdır; Türkiye

STRUCTURAL ANALYSIS OF GOAT BREEDING IN TÜRKİYE

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ABSTRACT

Introduction and Purpose: Goat's milk, meat, skin, hair and mohair are utilized to generate multifaceted income. Goat is important not only for human nutrition but also for providing raw materials for the textile industry. In this study, it is aimed to reveal the development of goat existence in the world and Türkiye.

Materials and Methods: The economic characteristics of goat breeding enterprises were examined by utilizing the research on the economic analysis of goat breeding in various provinces and regions of Türkiye. Statistical records on goat breeding and scientific studies on goat breeding in the literature constitute the materials of the study. The developments in the goat population in the world and Türkiye over the years were analyzed by simple index calculation.

Results: Türkiye's share in the total goat population in the world as of 2022 is 1.01%. Türkiye ranks 22nd in the world in terms of goat production. Türkiye's share, which was 7.07% in 1961, showed a downward trend until 2010, increased in 2015 and followed a horizontal course after this year. Approximately 98.00% of the goat breeds raised in Türkiye are hair goats, and 2.00% are Angora goats. According to 2023 data, the share of goat in total bovine and ovine livestock is 14.94%, the share of goat in meat production is 5.41%, and the share of goat in milk production is 2.53%. The share of goat in small ruminant livestock is 19.68%, the share of goat in meat production is 18.48%, and the share of goat in milk production is 36.78%. In the studies conducted, the ratio of average variable costs in goat breeding was determined as 59.82% and the ratio of average fixed costs as 40.52%. The relative profit of goat breeding was determined as 1.49 on average. Accordingly, goat breeding enterprises earn 149 units of income in return for 100 units of expenses, of which 49 units are profit.

Discussion and Conclusion: Although goat breeding is a profitable production activity, there are some factors affecting its sustainability. These are increases in feed prices, insufficient pasture areas, difficulties in finding shepherds, small-scale and dispersed enterprises, and problems encountered during the marketing of products. Focusing on these problems is important for the sustainability of goat breeding in Türkiye.

Key Words: Goat; Hair Goat; Angora Goat; Structural Analysis; Türkiye

SOIL MICROORGANISMS BIOTECHNOLOGY, A USEFUL INNOVATION FOR BIOLOGICAL AGRICULTURE AND ENVIRONMENT

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Abstract :

This work is part of a biological control trial studying the ability of soil microorganisms (Actinomycetes) to inhibit the activity of a number of crop insect pests.

We tried to test the effect of soil actinomycetes extract on:

- White grubs, which live in the soil and attack the roots of all plants,

- Insect pests belonging to the locust family (e.g. grasshoppers, locusts, etc.),

- Hemipteran insects (e.g. aphids) that feed on plant sap, which can cause serious damage to leaves, stems and flowers.

The results show that actinomycete-based pesticides have an effective inhibitory effect on grubs. Actinomycetes, which are beneficial soil bacteria, produce antimicrobial and insecticidal substances that disrupt the metabolism and survival of grubs.

These bio-pesticides are particularly advantageous because they specifically target pests, while being more environmentally friendly than traditional chemical pesticides. Thus, the use of actinomycete-based pesticides offers a promising method for managing grub populations in an environmentally friendly and sustainable way.

Key words: Soil, Biotechnology, Biological agriculture, Actinomycetes, Bio-pesticide.

NUTRITIONAL CONTENT AND BIOACTIVE COMPOUNDS OF WALNUT GREEN HUSK AND LEAVES: THEIR APPLICATIONS AND POTENTIAL USE IN ANIMAL NUTRITION

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Abstract

Walnut is considered an important fruit due to its rich nutritional content. The green husks and leaves of the walnut are also evaluated as by-products, containing high concentrations of phenolic compounds, such as flavonoids, chlorogenic acid, caffeic acid, ferulic acid, as well as unique compounds like juglone, and other bioactive substances. These compounds possess antioxidant, antimicrobial, and anti-inflammatory properties. Due to these properties, they can be utilized in a wide range of fields, from industrial dye production to therapeutic applications in medicine. Additionally, these compounds are known to support animal health and provide protective effects against diseases. This article explores the nutritional content and bioactive components of walnut by-products, specifically the green husks and leaves, and discusses their potential applications in the field of animal nutrition.

Key Words: Green walnut shell, green walnut leaves, animal nutrition, phenolic compounds

EFFECT OF DIFFERENT IRRIGATION LEVELS ON THE CHEMICAL QUALITY PROPERTIES OF COTTON FIBER (*Gossypium hirsutum* L.)

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ABSTRACT

Introduction and Purpose: Cotton fibers are an important commodity in the industry due to their use in the textile industry and the oil in the food sector. Cotton farming is intensively practiced in our region. For high yields, both macro and micro nutrients are applied to the soil and leaves. Additionally, irrigation needs to be provided at a certain level for high-quality yield. Today, global warming and drought are among the major negative factors affecting agricultural production. To reduce the negative effects of drought, water usage in cotton farming must be efficient.

Materials and Methods: This study was conducted in 2022 and 2023 at the experimental field of the Faculty of Agriculture, Harran University. In the study, irrigation practices were applied at 50%, 75% reduction levels, and 100% full irrigation. The experiments were set up using a randomized block design with 3 replications. The plot length was 12 meters, with 75 cm row spacing and 10 cm intra-row spacing, and consisted of 4 rows. A 3-meter gap was left between the plots. The chemical properties of the fibers obtained in the study were analyzed.

Results: In the study, the chemical properties of the fibers, including Holocellulose (%) and Cellulose (%), were examined. The results showed that Holocellulose (%) and Cellulose (%) properties were statistically significant at $p<0.01$ level.

Discussion and Conclusion: Holocellulose ranged from 89.93% (50% irrigation) to 98.31% (100% irrigation). Cellulose values ranged from 87.99% (50% irrigation) to 96.56% (100% irrigation). The data obtained from the experiments were analyzed using variance analysis in the JMP 13.2 statistical software, based on a randomized block design, and means were grouped according to the LSD (0.05) test.

Keywords: Cotton, Fiber Chemistry, Fiber Quality.

EFFECT OF NANO-SILICON APPLICATIONS ON PEPPER GROWN UNDER DEFICIT IRRIGATION CONDITIONS

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ABSTRACT

Introduction and Purpose: Drought is already one of the most significant issues facing agriculture in our country, as it is in many other parts of the world. This study examined the impact of nanosilicon (NS) applications on the morphological and physiological yield of pepper plants grown under limited irrigation conditions.

Materials and Methods: Seedlings were transplanted to compressed cocopeat slabs, and drought stress was initiated 45 days after transplanting. For this purpose, stress was created in control plants with two different levels of water restriction: full irrigation (S100), 30% reduced irrigation compared to full irrigation for drought stress (S70), and 50% reduced irrigation compared to full irrigation (S50). The study used a 0.5 mM dose of nanosilicon. Plant growth and yield parameters were evaluated 95 days after planting.

Results: Under drought stress conditions, a 6–50% decrease occurred in the examined parameters compared to control plants, and this negative effect became apparent at the S50 level. Membrane damage index (MZI) increased by 35% in S70 applications and 65% in S50 applications. However, NS application limited the negative effects of stress and provided improvement at varying rates (4–46%). The research concluded that NS application could effectively promote sustainable production, particularly in areas that benefit from abiotic stress conditions like drought.

Key Words: *Capsicum annum*, Ion Regulation, Drought, Nanotechnology, Yield

THE RELATIONSHIP OF PLANT GROWTH REGULATORS WITH EPIGENETICS

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Epigenetic mechanisms including DNA methylation, histone modifications and small interfering RNAs (siRNAs) are crucial in regulating gene expression without altering the DNA sequence. In plants, these mechanisms are tightly linked to growth, development and stress responses. Plant growth regulators, often called hormones, such as auxins, gibberellins, cytokinins, abscisic acid (ABA), ethylene and brassinosteroids, serve as critical mediators of these epigenetic processes. Auxins regulate root and shoot development by altering chromatin structure through histone acetylation and DNA demethylation, activating key gene networks involved in cell division, elongation and differentiation. Gibberellins regulate epigenetic mechanisms by modulating histone methylation, altering DNA methylation patterns and interacting with transcription regulators such as DELLA proteins, enabling precise control of processes such as germination, flowering and stress adaptation. Cytokinins regulate epigenetic mechanisms by increasing histone acetylation, promoting DNA demethylation and interacting with chromatin remodelling complexes to control gene expression, cell division, differentiation and stress responses. ABA governs stress-responsive genes by altering their chromatin state under drought and salt stress conditions. Ethylene contributes to maturation and senescence through histone modifications, while brassinosteroids regulate stress tolerance and growth by modulating DNA methylation and histone acetylation. Furthermore, the combinatorial effects of hormones allow precise control over gene expression in response to environmental and developmental cues, emphasising their synergistic effects on epigenetic pathways. Plant hormones significantly influence epigenetic mechanisms, enabling dynamic gene regulation that is crucial for growth, development and stress adaptation. Understanding these interactions provides valuable information for improving crop yield and quality under changing environmental conditions. Further research into these mechanisms could improve agricultural productivity by enabling targeted applications in crop breeding endeavours. This paper aims to advance knowledge in the field of plant science and stress tolerance strategies by elucidating the complex relationships between plant hormones and epigenetic mechanisms.

Keywords: Auxin, ABA, DNA Methylation, siRNA

FOOD ADULTERATION IN OLIVE OIL: DETECTION METHODS, ECONOMIC AND HEALTH IMPACTS

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ABSTRACT

Introduction and Aim:

Food adulteration in olive oil is a widespread issue that undermines consumer trust and poses economic and health risks. Fraudulent practices include mixing low-quality or other vegetable oils with olive oil, often sold as authentic products. These deceptions compromise the integrity of the olive oil market, harm the reputation of producers, and deprive consumers of olive oil's recognized health benefits. This study aims to summarize detection methods for olive oil adulteration, assess its economic and health impacts, and propose solutions to mitigate these challenges.

Discussion and Conclusion:

Adulteration in olive oil has far-reaching economic consequences. It disrupts market fairness by enabling counterfeit products to undercut authentic olive oils, causing financial losses for genuine producers and exporters. Regulatory authorities also incur significant costs for inspections and enforcement to combat fraud. Reputational damage to the olive oil industry diminishes consumer trust and stifles market growth.

From a health perspective, adulterated olive oils often lack key nutrients such as healthy fatty acids and antioxidants, which are vital for heart health. Mixed oils may introduce allergens, harmful compounds, and trans fats, increasing the risk of chronic diseases like heart disease and inflammation. Long-term consumption of these counterfeit products disrupts healthy dietary practices and may lead to digestive and overall health issues. Combating olive oil adulteration requires a multi-faceted approach, including robust regulatory frameworks, advanced detection technologies, and enhanced consumer awareness. Recent inspections by the Ministry of Agriculture and Forestry revealed the prevalence of seed oil mixtures and highlighted the need for stricter monitoring. Addressing these challenges is crucial to restoring consumer trust, protecting public health, and maintaining the economic stability of the olive oil market. Ensuring access to authentic, high-quality olive oil must remain a priority for both industry stakeholders and regulators.

Keywords: Authenticity, consumer trust, nutritional integrity, regulatory enforcement, market stability.

PHYTOCHEMICAL AND IN-VIVO ANTIDIABETIC STUDIES OF THE ACTIVITY OF MOMORDICA CHARANTIA L. SEED

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ABSTRACT

This study investigates the anti-diabetic properties of Momordica charantia L. (bitter melon) seeds, focusing on bioactive compounds and their potential therapeutic impact for diabetes management. The phytochemical analysis (mg/100g) revelaed key bioactives phytochemicals: phenols (170.7 ± 1.71), flavonoids (58.47 ± 2.76), tannins (50.93 ± 1.02), saponins (133.095 ± 1.08), alkaloids (26.635 ± 0.44), and terpenoids (1.265 ± 0.07) %. Saponins and phenols emerged as the most prominent compounds, with strong hypoglycemic and antioxidant activities, supporting mechanisms like insulin enhancement and oxidative stress reduction. The extract also shows significant hypoglycemic activity at 400 mg/kg body weight with very little difference when compared with the standard (metformin) in wister albino rats. These findings align with previous research, underscoring the therapeutic potential of M. charantia L. Seed seeds for glucose regulation. Based on the results, it may be concluded that M. charantia L. seeds offer significant promise as a natural anti-diabetic agent. Recommendations include developing M. charantia L. seed-based supplements, conducting clinical trials, isolating key bioactives, and optimizing compound bioavailability for therapeutic efficacy. This research supports further exploration of M. charantia L. seeds as a complementary approach for diabetes management, providing a foundation for developing plant-based interventions.

Key words: Phytochemicals, M. charantia L, diabetes.

ENRICHMENT OF DURUM WHEAT PASTA WITH JERUSALEM ARTICHOKE AND PURPLE BASIL

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ABSTRACT

Nowadays, studies are frequently carried out to enrich pasta produced from durum wheat with components obtained from different sources to increase its nutritional value. In this study, dried Jerusalem artichoke powder was substituted in 5%, 10%, and 15% instead of durum wheat used in traditional pasta production. In order to increase the nutritional value of pasta produced with Jerusalem artichoke powder, 1% purple basil powder was added to the pasta. Jerusalem artichoke (*Helianthus tuberosus* L.) is a vegetable, belonging to the *Asteraceae* family, in the form of fleshy tubers resembling potatoes. Phytochemical compounds in Jerusalem artichoke have antioxidant, antimicrobial, antifungal, and anticancer properties. Jerusalem artichoke tubers store excess energy in the form of inulin and are therefore a good source of dietary fiber. It is also known to have a prebiotic effect. Basil (*Ocimum basilicum* L.) is a medicinal and aromatic plant from the *Lamiaceae* family. Purple basil, purple due to the anthocyanin compounds accumulated in its leaves, has a high bioactive content. It was aimed to add functionality to durum wheat pasta by adding Jerusalem artichoke powder and purple basil powder. Moisture, ash, protein, fat, and total dietary fiber analyses of the produced pasta were performed and compared with the control sample that did not contain Jerusalem artichoke powder and purple basil powder. Color values of all pasta were measured. Cooking time, substance passing into the water, water absorption, and volume increase amounts of pasta were analyzed as cooking analyses. In addition, total phenolic substance, antioxidant activity, and monomeric anthocyanin amount analyses were performed to determine the bioactive content of pasta. The obtained results showed that Jerusalem artichoke powder can be used as a substitute for durum wheat pasta production, and medicinal aromatic plants such as purple basil can be added.

Keywords: Durum wheat pasta, Jerusalem artichoke, purple basil, pasta quality

IDENTIFICATION AND ANALYSIS OF MICROPLASTICS IN SOILS

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Abstract

The detection and characterization of the chemical composition of microplastics, which enter soils through various pathways and eventually degrade into micro- or even nano-sized particles, are crucial for understanding the extent of microplastic pollution and developing effective mitigation strategies. The analysis method for microplastics in soils follows steps similar to those used for sediments in aquatic environments, including the separation of plastics based on density differences, their identification, quantification, and chemical characterization. Generally, soil samples are dried, sieved, and subjected to density separation to isolate light or heavy particles. After the removal of organic matter from the sample, the remaining particles are examined under a microscope to determine the morphological characteristics and quantities of microplastics. Subsequently, chemical structures are identified using techniques such as micro-Fourier transformed infrared (m-FTIR) or Raman spectroscopy. However, research in microplastic characterization in soils is still in its infancy, and due to the complex nature of soil, no standardized method has yet been established by researchers. This limitation delays the comprehensive understanding of the environmental impacts of micro- and nano-plastics and the development of effective intervention strategies. This study discusses the fundamental principles and limitations of the existing methods used for detecting microplastics in soils.

Keywords: Floating, Density separation, Raman spectroscopy, FTIR, Microplastic Pollution

POPULATION DEVELOPMENT AND PARASITISM RATE OF SUNN PEST(*Eurygaster* spp.) AND WHEAT BUG(*Aelia* spp.) IN TRITICALE PLANT

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ABSRACT

Introduction and Purpose: Agriculture is the basis for supporting economic development in addition to providing nutrition to the world population. Agriculture is one of the important sources of employment in Turkey and contributes to exports, while also constituting a significant portion of national income. Cereals have been one of the important building blocks of our food sources and also the agricultural sector since ancient civilizations. Triticale, a type of grain obtained from the hybridization of wheat and rye and resistant to harsh climate conditions, is grown worldwide. Although Triticale is an important agricultural product with its high yield and nutritional value, it is threatened by various pests. Sunn pest (*Eurygaster* spp.) and Wheat bug(*Aelia* spp.) are the leading pests among these pests. The degree of damage caused by Sunn pest and Wheat, which are the main pests of cereals in our country, to the Triticale plant, the presence of adult and egg parasites-parasitoids in the region where the study is conducted, and parasitism rates will be evaluated.

Materials and Methods: The studies were conducted in Çukurbucak, Hengeme and Hamzalar locations of Ahırlı (Konya) district. Three Triticale fields were determined at least 2 km apart from each of these locations. Weekly checks were made in each Triticale field during two production seasons to determine population development. During the weekly checks, the number of adults, parasitized and unparasitized egg packages were counted; parasitized egg packages were collected and stored in glass tubes.

Results: In all locations where the study was conducted, the highest number of adults was observed in the last week of May and the first week of June. It was determined that the number of parasitized egg packages increased proportionally during the same dates.

Discussion and Conclusion: The adult population of Sunn pest was highest in the last week of May in 2022/2023, and a total of 93/38 were counted in 50 nets thrown in 9 fields where the study was conducted, while the adult population of Wheat bug was highest in the first week of June in 2022/2023, and a total of 23/11 were counted. The number of parasitized egg packages was highest in the first week of June in both years of the study. Despite the chemical spraying interventions, which are generally unconsciously carried out by the local people who earn their living from animal husbandry and farming and as the only method of control, the presence of egg parasitoids was observed in Triticale cultivation areas, although no extra work was done on them. After the studies to be carried out to maintain and increase the presence of egg parasitoids, population densities that may cause economic damage can be suppressed without the need for chemical spraying. After the local people are sufficiently informed on this issue, they will have both financial gain and a cleaner environment.

Key Words: Triticale, Sunn pest, Wheat Bug, Egg parasitoid, Konya

ANALYSIS AND LIVELIHOOD BENEFITS OF BEANS CAKE (AKARA) PROCESSING IN OFFA LGA OF KWARA STATE. NIGERIA

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ABSTRACT

This study examines the analysis and livelihood benefits of beans cake (Akara) processing in Offa Local Government Area of Niger State, Nigeria. The study also assess the socio-economic characteristics of beans cake (Akara) processors, livelihood benefited from beans cake (akara) processing and the constraints faced by beans cake (akara) processors. Data were collected through the use of structured questionnaires supplemented with oral interviews. A total of one hundred and thirteen (113) questionnaires were administered randomly to four communities in the LGA, analytical tools used was descriptive statistics. It was observed that majority of the processors were female (80%) with moderate age of 25-40 years and were married. It was also observed in the study area that the respondents have long term experience of more than 10 years in beans cake (akara) processing. Majority of the respondents in the study area sustained their source of livelihood of beans cake (akara) processing through thrift savings (Adashi). However, the result basically indicated that majority of the respondents in the study area have been able to raise their children in school through the business of beans cake processing. The major constraints faced by the respondents ranges from inadequate capital, lack of credit facilities, poor working condition and high cost of raw materials. The study recommended that provision of credit facilities, good working environment conditions and access to should be provided by the government and Non-governmental organization, for sustainable livelihood for beans cake (akara) processing.

KEYWORDS: Analysis, Livelihood, Processing, Benefits and beans cake

DETERMINATION OF PHENOLOGICAL AND POMOLOGICAL CHARACTERISTICS OF PISTACHIOS GROWN IN BATMAN ECOLOGY

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ABSTRACT

Introduction and Purpose: Pistachio (*Pistacia vera L.)* is a concentrated fruit type known as "Green Gold" in its homeland countries and has high economic returns with its alternative consumption. Siirt variety has fresh and processed snack fruit characteristics that comply with world standards. It is also a variety used in the production of different products with high added value (such as paste, dessert, ice cream, cake, salami). This research with high original value was conducted to determine the phenological and pomological values of Siirt variety grown in Batman ecology, which is considered as a new production area for pistachio and where large gardens have been established in recent years.

Materials and Methods: The material of the research was the 15-year-old trees of the "Siirt" variety, which were planted at 8x8 m intervals and distances grafted onto Siirt plains in dry conditions in Batman ecology in 2023 and 2024. Phenological observations (swelling of buds, first bloom, full bloom, end of bloom, blooming period, time from full bloom to harvest) were made in the field conditions and pomological characteristics (fruit weight, split nuts rate, internal yield and empty fruit rate) were made on fruits sampled from the garden.

Results: In the phenological observations made in 2024 of the Siirt variety grown in Batman ecology, it was determined that the flower buds swelled on average on April 1, the first blooming was on April 4, full blooming was on April 11, and the end of blooming was on April 17, while the blooming period was determined to be 13 days. It was determined that the period from full blooming to harvest date was 148 days. Considering the pomological characteristics, in 2023, the fruit weight was 1.066 g, the internal yield was 43.82%, the splitting rate was 66.67%, the empty fruit rate was 6,67%, and in 2024, the fruit weight was 1.179 g, the internal yield was 48.98%, the splitting rate was 74.7%, the empty rate was 6,67%.

Discussion and Conclusion: It is understood from the current literature findings that the phenological and pomological characteristics of pistachio, which has a special climate preference, change according to the changes in ecological conditions. In this first study conducted in Batman ecology, it was observed that pomological characteristics can change from year to year. It can be stated that the differences in the findings due to the changes in ecological factors are due to the cumulative effect of multiple gene effects and a requirement of quantitative inheritance in the emergence of the characteristics. Although it is a new

production region, it can be stated that the findings are in general harmony with the data of the regions where mass production is made. In this study, appropriate strategies are suggested for garden establishment, fertilization biology and annual maintenance works in pistachio cultivation in the region.
Key Words: Pistachio, Phenology, Pomology, Batman

EFFECT OF DRIED TIGERNUT (*Cyperus esulentus L.)* SUPPLEMENTARY DIET IN FORMULATED FEED ON *Clarias gariepinus* FECUNDITY, FERTILIZATION, HATCHABILITY OF EGGS AND SURVIVAL RATE OF THE HATCHLINGS

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ABSTRACT

Study was carried out in the demonstration farm of the Department of Aquaculture and Fisheries Management to evaluate the effect of tigernut (*Cyperus esulentus*) supplementary diet on fecundity, fertilization, and hatchability and survival rate of *Clarias gariepinus* hatchlings. Twenty female broodstock with average of 859g to 1kg were sourced and randomly distributed into ten concrete tanks. Nine experimental diet of 40% crude protein containing 0%, 5%, 10%, 15% and 20% of wet and dry tigernut respectively were included in the feed, formulated and fed to the female broodstock at 3% of body weight twice daily for 30 days. Data on fecundity, percentage fertilization, and hatchability and survival rate were collected and analysed using two-way ANOVA with Genstat. In the average weight of egg with egg sac, the dried tigernut treatment diet was significantly higher than that of wet. The fecundity of the fish result shows that there is significant difference between the wet and dry tigernut supplementary diet with TSD 15 showing the highest value for the wet and dry followed by TSD 05 and TSD 10. Which were significantly different from other treatments and the control. The result of the fertilization shows no significant difference between wet and dry control, TSD 5, TSD 10 respectively, but is significantly different for TSD 15 and TSD 20. The hatchability result shows the control with no significant difference between the wet and dry treatments of hatchability, TSD 20, TSD 15, TSD 10 also shows no significant difference between the wet and dry treatments except for TSD 5 which shows significant difference. TSD 10 of the dry treatment shows the highest value while TSD 15 has the lowest value. The survival rate result shows that there is a significant difference between wet and dry tigernut diet in TSD 00, TSD 05, TSD 10 and TSD 15. TSD 15 have the highest significant value in survival rate more than any other treatments in wet experimental diet This study has shown that inclusion of tigernut in the feed of fish enhance fecundity, fertilization, hatchability and survival of *C. gariepinus* fry. This study established the efficacy of tigernut seed meal as fertility enhancer and hatchling survival in *C. gariepinus* broodstock and should be encouraged as it will minimize the dependence on synthetic drugs as fertility enhancing agents.

Keywords: Tigernut, Fecundity, Fertilization, Hatchability, *Clarias gariepinus.*

UTILIZATION OF NANOCELLULOSE IN CALCIUM SULFATE BASED COMPOSITE PRODUCTION

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ABSTRACT

Introduction and purpose: Nanocellulose has become an important part of composite material technology in recent years. This material is used especially for the reinforcement of polymer composites and to increase their performance. Nanocellulose stands out as an alternative to traditional materials thanks to its properties such as high mechanical strength and low density. The use of nanocellulose in composites has a great potential especially in the automotive and construction sectors. Nanocellulose has gained an important place in many industries, especially in composite material applications, thanks to its natural polymeric structure. In this study, it is aimed to improve the properties of composite boards produced for raised floor systems by integrating nanocellulose into calcium sulfate-based composites.

Material and Method: Nanofibrillated cellulose obtained from weighted raw cellulose subjected to mechanical fibrillation processes was added to the calcium sulfate-based composite mixture at 1, 3, 5, 10 and 15% of powder binder by weight. The prepared mixtures were compressed in a drained press and composite boards were produced. Density, hardness, moisture level, static loading and bending strength tests were performed on samples taken from the sheets dried in the oven for 24 hours after 1 day.

Results: It was observed that there was no significant change in density, moisture and hardness values depending on the amount of nanocellulose, but there were increases in static breaking load and bending strength values.

Keywords: Nanocellulose, Calcium Sulfate, Composite, Bending strength, Density.

NATURAL MEDICINE; PHYTOCHEICAL CONTENT OF HYPERICUM PERFORATUM SUBSP. ANGUSTIFOLIUM

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ABSTRACT

Introduction and Purpose:Hypericum perforatum is a well-known medicinal plant that possesses a wide spectrum of biological properties, including antiviral, antimicrobial, anti-inflammatory, antitumor and antiangiogenic, antidepressant, antioxidant, and antifungal activities, as well as various secondary metabolites, and is widely used in traditional treatment. Therefore, in this study, we attempted to determine the phytochemical content in H. perforatum subsp. angustifolium plant using chromatographic methods (HPLC and GC-MS/MS).

Materials and Methods: The plant H. perforatum subsp. angustifolium from the Ağrı Mountains, Iğdır, Turkey, was harvested in July. It was dried in a suitable environment and ground into powder. Then 20 grams were weighed and extracted with hexane for 72 hours. The solvent-extract mixture was filtered and the solvent was removed using a rotary evaporator. Then the solvent methanol-chloroform was added and the extraction process was carried out sequentially. The solvent was removed using a rotary evaporator. Hexane and methanol-chloroform extracts were obtained. The extract obtained was stored at +4 C in a refrigerator. The hexane extract was analyzed by GC-MS/MS (fatty acid), the methanol-chloroform extract was analyzed by HPLC (phenolic content) and the content of phytochemicals was determined.

Results:As a result of the fatty acid analysis by GC-MS/MS, the main components were determined as oleic acid methyl ester (50.83%), linoleic acid methyl ester (34.71%), palmitic

acid methyl ester (9.24%) and stearic acid methyl ester (3.12%). In the HPLC analysis, ferulic acid (86.210 ng/µl), naringin (40.914 ng/µl), catechin (12.148 ng/µl) and protocatechuic acid (11.221 ng/µl) were detected as the main components.

Discussion and Conclusion:H. perforatum can be transformed into products with high added value such as food, medicine and cosmetics thanks to its numerous biological activities and its content of secondary metabolites.

Key Words:Hypericum perforatum; phytochemical content; fatty acid; phenolic compounds

NEPHROPROTECTIVE ACTIVITY OF KUDZU ROOT EXTRACT IN STREPTOZOTOCIN INDUCED DIABETIC NEPHROPATHY IN RATS

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Abstract:

Diabetic nephropathy (DN) remains a prevalent complication of diabetes mellitus, necessitating novel therapeutic interventions. Present study investigates the nephroprotective effects of Kudzu root extract (KRE) in streptozotocin-induced diabetic nephropathy, with a focus on attenuating oxidative stress and ameliorating diabetic parameters. Diabetes was induced in male rats with a single injection of streptozotocin (55mg/kg/i.p). After 72 hours the rats were tested for diabetes, those rats showing blood glucose level above 250mg/dl were considered as diabetes and further tested for the development of nephropathy. Rats with diabetic nephropathy were treated with KRE (50 and 100mg/kg/p.o) for 2 week. At the end of treatment period various biochemical parameters and markers of oxidative stress were studied. Rats treated with KRE shows significant alteration in blood glucose levels, kidney function markers, markers of oxidative stress, membrane bound ATPases and Histopathological changes. In conclusion KRE showed significant nephroprotective effects which might be due to its strong antioxidant property

Keywords: Diabetes nephropathy, oxidative stress, streptozotocin, Kudzu root extract, membrane bound phosphatases

INVESTIGATION OF BIOHYDROGEN PRODUCTION POTENTIAL OF WOOD SAWDUST WASTE

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ABSTRACT

Introduction and Purpose: The near depletion of non-renewable fuels and their negative environmental effects have increased interest in biofuels. Among biofuels, biohydrogen possesses the advantages of having H_2O as a by-product of combustion, being non-toxic, and being obtained by using wastewater/waste rich in carbohydrates. This study aims to determine the potential of biological hydrogen production through the dark fermentation method in batch bioreactors using mixed bacteria and wood sawdust waste at pH values of 4.5 and 4.0 under operating conditions.

Materials and Methods: Anaerobic batch bioreactors with a volume of 120 mL, designed to prevent the growth of phototrophic microorganisms, were used. In the study, mixed bacteria obtained from the anaerobic reactor of a biological wastewater treatment plant were heat pretreated at 100±1 ºC for 55 minutes. The bioreactors were capped to contain pretreated mixed bacteria, nutrient composition, and wood sawdust waste. After this process, nitrogen gas was given into the bioreactors for 4 minutes. Thus, oxygen was removed from the contents of the bioreactors. Bioreactors were operated in a 160 rpm shaker incubator in a dark room at 38±1 ºC. Gas sampling was carried out using a gas-tight glass syringe. Gas analysis was performed in a gas chromatography device. Calibration was performed with high-purity hydrogen, carbon dioxide, and methane gas.

Results and Discussion: No gas production was observed in the first hours in bioreactors operated at different pH values. Biohydrogen production was determined at the eighth hour in the bioreactors. After this hour, hydrogen production increased in the bioreactors and reached maximum hydrogen production. The study indicates that different pH values affect biohydrogen production.

Conclusion: Maximum biohydrogen production was determined as 2181.10^{-4} mL and 1161.10^{-4} mL in the bioreactor operated at pH values of 4.5 and 4.0, respectively. In addition, it was determined that biohydrogen production was better in the bioreactor operated at a pH value of 4.5. In conclusion, biohydrogen production was detected in all bioreactors operated at different pH values using wood sawdust waste.

Key Words: Wood Sawdust Waste; Biohydrogen Production; Bioreactor

IMPROVEMENT OF THE NUTRITIONAL VALUES OF FERMENTED LOCUST BEAN/SOYA BEAN SEEDS USING CONSORTIUM OF TWO BACILLUS STRAINS

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Abstract

Fermentation to improve the nutritional bases of foods have received attention in recent years due to awareness of the potential benefits. Low nutrients availability in foods as well as the presence of antinutrients often account for their low utilization. Microbial fermentation of substrate has been used for modifying, fortifying and improving the sensory properties of the foods. This study examined the potential application of microbial fermentation of mixed cultures for modifying and fortifying the nutritional composition of locust bean with soya beans substrates. A total of one hundred and fifty Bacillus strains were isolated purified from fermented locust beans seeds using cultural and biochemical techniques. Afterwards, *Bacillus subtilis* B15 and *Bacillus megaterium* B05 were studied in respect to their fermentative abilities, singly and in consortium using solid state fermentation method. The analysis of the fermented locust beans and soya beans with and without augmentation using Bacillus strains revealed increased proteins 21.6%, 16.3% and 12.7% and 8% by *Bacillus subtilis* B15 with *Bacillus megaterium* B05 consortium, *Bacillus subtilis* B15 alone, *Bacillus megaterium* B05 alone and control (spontaneous fermented locust beans and soya beans) respectively. The antinutrient, phytic acid also decreased in the order; 3.8%, 7.4%, 11.5% and 19.7% as recorded by the control, *Bacillus subtilis* B15 alone, *Bacillus megaterium* B05 alone and *Bacillus subtilis* B15 with *Bacillus megaterium* B05 consortium respectively. The consortium of *Bacillus subtilis* B15 with *Bacillus megaterium* B05 was efficient at producing fermented products with increased proteins and reduced antinutritional phytate contents. The observation might be due to a synergetic activity of the two Bacillus strains in a co-cultured system. The use of the consortium of Bacillus strains comprising of *Bacillus subtilis* B15 with *Bacillus megaterium* B05 is hereby suggested. However, there is need to determine their effects on other antinutritional factors present in the food substrates.

Keywords: Fermentation, Consortium, Nutrients, Bacillus strains, Locust beans and soya beans

APPLICATION OF REMOTE SENSING METHODS IN AGRICULTURE

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ABSTRACT

Reflectance data is being used in agriculture more and more as satellite, aerial, and ground-based remote sensing technologies progress. This study examines several remote sensing techniques intended to preserve the environment and maximise the profitability of agricultural crop production. The study provides examples of how remote sensing data can be used to anticipate crop yields, evaluate plant nutritional needs and soil nutrient content, calculate plant water demand, and control weeds.

Key words: crop irrigation, plant protection, agronomy, vegetation indices, and remote sensing.

GRAPE POMACE: VALUE ADDED RECYCLING PRODUCT FOR SUSTAINABLE VITICULTURE

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ABSTRACT

Introduction and Purpose: Grape pomace is a by-product of grape processing technology and is a recycled waste with high potential for adapting recovery products. Therefore grape pomas has a valuable resource in the circular economy. The management of this post-production waste is a major challenge. However, there are technological approaches for the recovery of grape pomace in line with sustainability and high value-added production strategies.. This study aims to address the bioactive components of grape pomace and their contribution to sustainable production.

Materials and Methods: In this review, scientific studies and industry reports on the utilization of grape pomace were analyzed. The study addresses the recovery of bioactive components such as polyphenols and dietary fibers, with a particular focus on green extraction methods. Technologies such as supercritical fluid extraction and ultrasound-

assisted extraction are examined in detail. In addition, the acceptability of recycled products is evaluated through consumer behavior research and policy analysis.

Results: It has been reported in the literature that grape pomace contains high-value bioactive components that can be used in different sectors such as food, pharmaceuticals and cosmetics. Advanced green technologies enable efficient recovery of these components with minimal damage to the environment. However, consumer perception and acceptance of recycled products remains a significant barrier. R&D, branding and awareness campaigns have been found to be effective in increasing the acceptability of these products in the market.

Discussion and Conclusion: The recycling of grape pomace contributes to sustainability by reducing waste mainly in the wine industry and in other processes such as grape juice, pekmez.. Prioritizing green technologies and overcoming social barriers can lead to more effective use of grape pomace in the circular economy. Collaboration between producers, researchers and policy makers is critical to fully unlocking this potential.

Key Words: Grape pomace, Sustainable viticulture, Value added products, Waste management, Recyclable agricultural products

VALUE ADDED IN GRAPES: PRODUCT EVALUATION METHODS AND GLOBAL COMPETITIVENESS

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ABSTRACT

Introduction and Purpose: Grapes hold strategic importance in global agricultural production. In addition to direct consumption as table grapes (fresh) and raisins, grapes are also utilized in the production of wine, grape juice, vinegar, and must. Value added processes support local economies and enhance competitiveness in global markets. This study aims to discuss the role of value added grape products in global competition and evaluate Türkiye's foreign trade potential in terms of challenges and opportunities.

Materials and Methods: Data from industry reports and trade statistics were utilized in this study. Türkiye's role in grape production, exports, and value-added product development was compared with other major producing countries. Additionally, the impact of locally implemented innovations and sustainable production practices on market share was examined. Sub-sectors of strategic importance for global competition, such as wine production and organic grape cultivation, were also considered.

Results: Türkiye has been identified as holding a strong position globally in value added grape production. However, evaluation of this potential requires a focus on reliable and innovative methods for marketable production. Particularly, prioritizing high value products such as wine, raisins, and traditional or organic grape-based goods can significantly boost exports. Analyses reveal that R&D activities and branding increase competitiveness in global markets. Türkiye's geographically indicated grape varieties offer a unique advantage in international trade.

Discussion and Conclusion: In conclusion, improving value added processes in grape production could enable Türkiye to play a more effective role in global markets. Prioritizing sustainable production techniques and innovation will support long-term success in the sector. Supporting grape producers and fostering sectoral collaborations are essential in this context.

Key Words: Grapes; Consumption Patterns; Global Competition; Innovation and Branding; Türkiye

A HIGH VALUE GRAPE VARIETY IN TURKISH VITICULTURE: "SULTANİ ÇEKİRDEKSİZ"

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ABSTRACT

Introduction and Purpose: Raisins are rich and functional products included in the World Health Organization's list of healthy foods. Türkiye is the global leader in seedless raisin production and export. The "Sultani Çekirdeksiz" grape variety, predominantly grown in the Manisa, İzmir and Denizli region, is a product of significant commercial value both as fresh fruit and as raisins in global markets. Within Turkish viticulture, it stands out as a strategic product. This study examines the production potential, economic benefits, and value-adding capacity of "Sultani Çekirdeksiz".

Materials and Methods: The study analyzed the production and trade capacities of seedless raisins for both Türkiye and the world. Literature-based analyses were conducted, combined with insights from industry representatives and field observations, along with a sectoral assessment of the 2023-2024 season.

Results: "Sultani Çekirdeksiz" grapes account for 90% of Türkiye's total raisin exports. The application of modern viticultural techniques enhances both productivity and quality, bringing it to global standards. Organic and sustainable production practices, in particular, enable the product to achieve higher prices in international markets. In the 2023-2024 season, Türkiye's

seedless raisin exports decreased by 20% in volume to 207,000 tons, while foreign exchange revenue increased by 11% to reach $490 million. The European Union maintained its position as the largest market, constituting 78% of total exports, with the United Kingdom, the Netherlands, and Germany leading. Additionally, exports to East and Southeast Asian countries rose by 27%. The decline in yield was attributed to adverse effects of climate change, with production falling 100,000 tons below the long-term average.

Discussion and Conclusion: “Sultani Çekirdeksiz” continues to be a high-value product in Türkiye’s viticulture sector. Despite the decline in yield, the increase in foreign exchange earnings highlights the success of exports and the product's strong position in international markets. In this context, focusing on sustainable production practices to improve quality and efficiency is essential.

Key Words: Turkish viticulture, Sultani Çekirdeksiz, Raisin exports, High value product, Sustainable grape production

IN VITRO ANTIOXYDANT AND ANTIINFLAMMATORY ACTIVITIES OF VARIOUS EXTRACTS FROM CISTUS LADANIFER L. LEAVES GROWN IN NORTHERN MOROCCO

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ABSTRACT

In several civilizations, natural substances from plants have multiple economic uses and applications in the food, cosmetics, and pharmaceutical industries.

Cistus ladanifer L. (rockrose), referred to locally as “Touzalt”, is a common perennial shrub found in many parts of the Mediterranean region, pertaining to the family Cactaceae, and is a crucial aromatic plant utilized in the perfumery sector. The aerial parts of this shrub are often used in traditional medicine in northern Morocco to treat a range of ailments, such as an anti-diarrheal and antispasmodic. Scientifc investigations confrmed several biological activities of CL extracts, such as antioxidant, antimicrobial, cytotoxic, and insecticidal.

The purpose of the current research is to assess the DPPH and FRAP assays for antioxidant activity (AOA), and the percentage inhibition of protein (BSA) denaturation for activity inflammatory exhibited by various extracts, which were determined by measurement of absorbance with a UV spectrophotometer.

The results indicated that the Cistus ladanifer L ethanol extract (EECL) exhibited the highest scavenging activity (RSA = 94.534 ± 1.24%) at 800 µg/ml and FRAP (1.017 ± 0.12) at 400 µg/mL. The extract also showed better anti-inflammatory activity (95.61 ± 0.92%) at 1000 µg/ml. This investigation aims to compare different extracts of Cistus ladanifer L. leaves. Additionally, it serves as a reference for future research on CL leaf extracts offering valuable insights for their potential applications in various felds.

Key Words: Cistus ladanifer L., Traditional uses, Polyphenols, Antioxidant, Anti-Inflammatory.

BACTERIAL FLORA ON THE SURFACE OF GRAPE FRUITS: GENERAL INFORMATION AND ITS IMPORTANCE FOR FRUIT QUALITY

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ABSTRACT

Introduction and Aim:
The surface of grape fruits harbors a diverse bacterial flora that plays a critical role in the overall quality and post-harvest life of the fruit. These microorganisms include both beneficial and potentially harmful species, influencing grape health, fermentation processes, and storage stability. Understanding the composition and function of this bacterial flora is essential for improving grape quality and preventing spoilage. This study aims to summarize the bacterial communities on grape surfaces, their interactions with the fruit, and their impact on fruit quality and post-harvest management.

Discussion and Conclusion:
The bacterial flora on grape surfaces originates from various sources, including the vineyard environment, soil, and agricultural practices. Beneficial bacteria, such as lactic acid bacteria, contribute positively by enhancing fermentation processes and suppressing pathogens. Conversely, spoilage bacteria, such as Acetobacter and certain species of Pseudomonas, can lead to undesirable effects, including fruit rot and quality deterioration. Factors such as grape variety, climatic conditions, and pesticide use significantly influence the composition of this microbial community.

Recent studies have highlighted the potential of manipulating bacterial flora to improve fruit quality. For example, applying biocontrol agents or promoting beneficial microbes through sustainable agricultural practices can enhance grape health while reducing the reliance on chemical interventions. Advanced molecular techniques, such as next-generation sequencing, have provided deeper insights into bacterial diversity, allowing for more targeted approaches to managing microbial communities.

The bacterial flora on grape surfaces plays a dual role, acting as both a protector and a potential threat to fruit quality. Managing this microbial community through ecological and biotechnological strategies offers a promising pathway to enhance grape quality, extend shelf life, and reduce spoilage. Future research should focus on understanding specific bacterial interactions and developing innovative approaches to harness beneficial microbes effectively.

Key Words: Vitis vinifera L., disinfestation, 16S V3/V4 metabarcoding, bacterial diversity, microbiota

A BIBLIOMETRIC ANALYSIS ON HERB-BASED INJECTABLE VACCINES

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ABSTRACT

Introduction and Purpose: Plant-based injectable vaccines are an innovative biotechnological approach developed by utilizing genetic engineering to produce antigens in plants. These vaccines aim to overcome the challenges of transportation, storage, and administration associated with traditional vaccines. Bibliometric analyses play a crucial role in understanding the evolution of scientific literature in this field, identifying research trends, and examining significant collaborations, helping to map global research networks. Recent bibliometric studies indicate that plant-based injectable vaccines have emerged as a rapidly developing research area, particularly at the intersection of disciplines like biotechnology, genetic engineering, and pharmaceutical research.

The purpose of this study is to conduct a bibliometric analysis of research on plant-based injectable vaccines, with the aim of uncovering the current state of literature, key research trends, and prominent topics in this field.

Materials and Methods: In this study, a comprehensive search was conducted in the Scopus database using the keyword "plant-based injectable vaccines." The bibliometric data obtained from this search were analyzed in detail using VOSviewer and R software to examine relationships between publications, authors, journals, and citations within the research field. VOSviewer was used for data visualization, allowing for the mapping of research networks, collaborations, and key themes, while R software performed statistical analysis, providing in-depth information on scientific trends, productivity levels, and impact factors in this area. This analytical process has provided valuable insights into the position and evolution of plant-based injectable vaccines in the research literature.

Results: Bibliometric analyses of plant-based injectable vaccines track the evolution of research in this area, offering a comprehensive examination of developments, research trends, and strategic directions within the scientific literature. These analyses, especially by investigating scientific productivity, collaborations, and research networks, reveal the diseases for which plant-based injectable vaccines are being developed and highlight areas that require further research. The bibliometric analysis also offers strategic guidance on future research directions, helping to better understand the potential of plant-based injectable vaccines. This technology could play a pivotal role in shaping global vaccine strategies in the coming years.

Key Words: Plant-Based Vaccines, Bibliometrics, Antigen Production

EFFECT OF ELEVATION ON PLANT SECONDARY METABOLITES

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ABSTRACT

The relationship between organisms and the environment is quite complex. The environment in which plants grow has a great impact on their development and the secondary metabolites they produce. Secondary metabolites are chemical compounds produced by plants for functions other than basic life functions. Secondary metabolites serve critical functions for plants such as defense, signaling, reproduction and adaptation to the environment. These compounds protect the plant with their color, odor, taste and antioxidant properties. Altitude significantly affects the type and amount of secondary metabolites produced by plants. It is known that plants increase secondary metabolite synthesis as part of their adaptation strategies to high altitude living conditions. High altitude and poor oxygen levels create stress factors for plants. This causes the plants' defense mechanisms to be triggered. In the process of coping with stress, plants increase the production of secondary metabolites. These metabolites strengthen the biochemical content and antioxidant activity of the plant. In addition, plants growing at high altitudes increase their medicinal and aromatic properties. These properties play an important role in the adaptation process to climatic conditions. For example, the synthesis of compounds such as flavonoids and anthocyanins, which play a protective role against UV rays, increases at high altitudes. Similarly, it is known that the production of terpenes and phenolic compounds, which provide resistance to stress, is higher at high altitudes. In this study, the change in secondary metabolites of plants depending on altitude was discussed.

Key Words: Elevation, secondary metabolite, antioxidant activity, biological content

A BIBLIOMETRIC ANALYSIS ON TRANSGENIC PLANT-BASED EDIBLE VACCINES

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ABSTRACT

Introduction and Purpose: Plant-based edible vaccines are an innovative approach developed by combining genetic engineering and biotechnology, offering a revolutionary potential in vaccine production by providing low-cost and accessible solutions. These vaccines aim to overcome the transportation, storage, and administration challenges associated with traditional vaccines. Plants are transformed into biological "factories" for producing these vaccines, enabling immunity to be conveyed to humans and animals through directly consumed foods.

Bibliometric analyses of plant-based edible vaccines provide a detailed insight into how the scientific literature in this field has evolved over time, which key topics have emerged, and which areas research communities are focusing on. These analyses also examine collaborations between different research groups and institutions, visualizing global research networks and interactions. Furthermore, bibliometric analyses identify influential authors,

high-impact journals, and highly cited studies, helping to define existing research gaps and potential opportunities for future research.

Materials and Methods: In the studies, a comprehensive search was conducted in the Scopus database using the keyword "plant-based edible vaccines." The bibliometric data obtained from this search were analyzed using R software, the web-based interface of bibliometrix “biblioshiny,” and “VOSviewer” software. The bibliometric analyses conducted through these tools comprehensively examine the scientific literature of a specific research field, identifying key trends, authors, journals, and citation relationships within the area.

Results: Bibliometric analyses offer a powerful tool for understanding the position and importance of plant-based edible vaccines in global scientific literature. This approach provides critical insights that can accelerate the development of the technology and help formulate innovative strategies. In the future, this technology will play a crucial role in developing low-cost, cold-chain-free, and easily applicable vaccines. It has significant potential, especially for improving vaccine access in developing regions and enabling faster responses to global health crises. Thus, bibliometric analyses in this field not only depict the current state of the scientific literature but also highlight future research directions and strategic opportunities for this innovative technology.

Key Words: Edible Vaccine, Biotechnology, Bibliometric Analysis

THE ROLE OF NANOTECHNOLOGY IN HERBICIDE DEVELOPMENT: MECHANISMS, FORMULATIONS, AND ECOLOGICAL IMPACTS

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ABSTRACT

The increasing problems (such as herbicide resistance, environmental pollution and reduced efficacy) caused by traditional herbicides used to control weeds that pose a problem in agricultural production areas have led people working on these issues to look for alternative solutions. Nanoherbicides, which use nanotechnology to improve the transfer, stability and efficacy of herbicides, are a promising innovation in weed management. This study has provided a general and comprehensive overview of the mechanisms of action, formulations and effects of nanoherbicides in accordance with the available information. Nanoherbicides are an innovative technology that is used in the agricultural sector for plant protection. This technology enables more effective, environmentally friendly and lower-dose use of herbicides, while offering the possibility of controlled release to the target area. Nanoherbicides reduce the risk of environmental damage and increase their effectiveness by encapsulating the active ingredients of herbicides in nanoparticles. However, we do not yet have a complete understanding of the long-term environmental effects of nanoherbicides and their potential risks to human health. A great deal of research is therefore needed before these products can be used on a large scale. Major nanoformulation strategies including encapsulation, nanoemulsions and solid lipid nanoparticles are discussed in relation to their ability to control herbicide release and improve targeted weed control. However, the study highlights the potential benefits of nanoherbicides such as reduced environmental impact, improved herbicide efficacy and minimised off-target effects. In addition, the challenges associated with the environmental impact, toxicity, biodegradability and regulatory concerns of nanoherbicides will also be addressed.

Key Words: Nanotechnology, Herbicide Development, Weeds, Formulations, Ecological Impacts

BIOCHAR USE AS A SEED COATING MATERIAL

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ABSTRACT

This study investigates the potential of biochar as an innovative and sustainable seed coating material. The physical and chemical properties of biochar, such as high porosity, water holding capacity, nutrient release and carbon sequestration, make it a viable option for improving seed germination and early stages of plant development. The study highlighted biochar's abilities to enhance soil health, provide resistance to environmental stresses and act as a slow-release nutrient carrier. These properties distinguish biochar from traditional seed coating materials such as clay and polymers. The use of biochar in seed coating techniques aims to increase its effectiveness by combining it with other materials such as molasses and polymers. The study compares the structural and chemical properties of biochar produced from different biomass sources and analyzes the effects of this material on coating performance. Moreover, the environmental contributions of biochar are highlighted with advantages such as reducing greenhouse gas emissions and utilization of agricultural waste. This research indicates that further studies are needed to optimize biochar coating formulations and expand their use. In particular, the integration of beneficial microorganisms into biochar is seen as an important opportunity to improve the efficiency of seed coating. As a result, biochar is positioned as a multifunctional and environmentally friendly seed coating material that supports environmental sustainability while increasing agricultural productivity. The findings of this study show that biochar has significant potential as an innovative tool in seed coating technology.

Key words: Biochar, Seed coating, Germination efficiency, Water retention, Carbon sequestration, Soil health

METHODS TO EFFECTIVELY PROTECT THE APRICOT TREE FROM FREEZING DURING THE FLOWERİNG PERIOD

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ABSTRACT

Introduction and Purpose: In recent years, one of the difficulties faced by agriculture in the world is the freezing of fruits and vegetables in cold weather, which reduces productivity. In this article, I present different ways to protect fruit trees from freezing. When the weather is cold, forecasts about the days and hours of frost should be carefully monitored, and physical and simple protection methods must be used before the expected frost, as well as the use of special liquid-fertilizer sprays and the complex application of the drip irrigation system.

Materials and Methods: The experiment was conducted in the spring of 2023 and 2024, in the months of March-April, on 3 apricot trees of the same species of 6-7 years of approximately the same size and similar productivity. The trunks of the trees are limed to protect them from pests. A solution of 50 ml of Potassium-Dextrose-Lactose spray, 50 ml of grape vinegar and 2 l of clean water was prepared for the process. Different amounts of spray were applied to the flowers of the trees with a special sprayer. In 2023, the dose of spray was used up to 600 ml for the 1st tree, 700 ml for the 2nd tree, and 800 ml for the 3rd tree. From every frosty day for the 1st tree applied 20 hours ago, 2nd tree 30 hours, 3rd tree 48 hours ago. The application of the spray was repeated for 10 days in March and 3 times in April. In 2024, the experiment was repeated with the same parameters. However, in the current year, the application of the spray was repeated for only 8 days in March.

Results: The productivity of trees during the harvest period was compared for each year. I can note that the cold protection process is considered more successful when the daily dose of the spray is in the range of 600-700 ml and is applied 30-36 hours before frost.

Key Words: fertilizer spray, apricot tree, frost protection protection, productivity

A STUDY OF THE FACTORS INFLUENCING AGRITOURISM DEVELOPMENT AT BAO GIA FARM, HAU GIANG PROVINCE, VIETNAM

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Abstract

Agritourism provides a valuable platform for combining tourism and agriculture, resulting in a range of financial, educational, and social benefits for tourists, producers, and communities. Nestled in Hau Giang province, Bao Gia Farm stands out as a promising hub for agricultural tourism growth, characterized by its distinctive agritourism products and services, unspoiled environment, and serene vistas. The study methods comprised the utilization of secondary data collection, on-site surveys, and interviews with 120 domestic tourists who explored agricultural tourism at Bao Gia Farm. Exploratory factor analysis and linear regression analysis were employed for analysis. The research outcomes reveal five pivotal factors influencing agritourism development at Bao Gia Farm: Security and safety, Human resources, Quality of agritourism products and services, Infrastructure and Agritourism resources. Based on the aforementioned, the paper put forward several solutions to bolster the advancement of agritourism in this destination.

Key words: Factors, agritourism, Bao Gia Farm, Hau Giang province.

PLANT-BASED BRAIN THERAPIES: CHALLENGES AND FUTURE PROSPECTS ALONG WITH MOLECULAR MECHANISM AIDED IN COGNITIVE PROTECTION

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Abstract

Neurodegenerative maladies are characterized by the progressive destruction of neurons and nervous system connections, resulting in neuronal dysfunction and impairments in mobility, cognition, coordination, sensibility, and strength. Stress-related metabolic changes, such as abnormal protein aggregation, widespread production of reactive oxygen and nitrogen species, mitochondrial malfunction, and neuroinflammation, have been shown to cause neuronal cell damage. Currently, no neurodegenerative condition is curable, and existing standard medicines can only give symptomatic relief and slow disease progression. Neuroprotection has become a primary focus in medication research. Using natural ingredients extracted from traditional medicinal herbs. The WHO reports that medicinal plants are used by 80% of the world's population to treat or prevent illnesses. Plants provide highly effective medicinal compounds. Herbal medicine has gained global acceptability due to its natural basis. Traditional medicines may be a better option for treating neurodegenerative illnesses than allopathic medications, which have limited effectiveness and sometimes have serious side effects. Plants and microbes produce natural products, secondary metabolites, and bioactive compounds. Nootropics are substances that have been used for centuries to enhance human cognition. Plants are the primary source of natural nootropics. This comprehensive review aims to present current knowledge on the confirmed and untested effects of plant-derived nootropics (PDNs) on human cognition in health and disease. Plant-derived biologically active compounds have been studied for their therapeutic effects, such as anti-apoptotic, antioxidant, anti-inflammatory, anticancer, and antibacterial. Other health benefits include neuroprotective, hepatoprotective, and cardioprotective properties. In recent decades, plant-based bioactive chemicals have garnered greater attention than synthetic bioactive compounds for treating many disorders, including dementia. Integrating plant-derived bioactive compounds and formulations can improve the efficacy of traditional medicines. This article summarizes recent technological advancements in natural product drug discovery, including the qualities of plant formulations and bioactive substances, and their molecular mechanisms against neurological disorders. Highlighting particular possibilities while investigating substantial possibilities.

Keywords: Neurogenerative disorders, Dementia, Plant-based bioactive compounds, traditional medicines, Nootropics, Human cognition.

MOLECULAR HYDROGEN AS A REGULATOR IN PLANT GROWTH

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ABSTRACT

Usable agricultural lands are decreasing day by day due to climate change. The efficient use of agricultural lands will be of great importance in the future. The increasing world population shows that we will need more food and crops. Increasing food demand indicates that we need new agricultural production methods that increase the quality and yield of products without leaving residue in the product and harming the environment. Molecular hydrogen, which is a selective scavenger of reactive oxygen species, is an antioxidant, signal molecule, nontoxic and harmless. Hydrogen-rich water (HRW) is applicable because it can be easily obtained with methods such as nanobubbles, hydrogen saturation and production with magnesium alloys. Molecular hydrogen can regulate plant growth via repairing damage in plants under stress, promoting seedling growth, development and photosynthetic efficiency. Exogenous HRW application on plant roots up-regulates the salt tolerance-related gene expression, improves H+-transport activity, and maintains the Na+/K+ balance, diminishes oxidant damage, reduces osmotic stress, and therefore promotes the root growth. HRW also triggers elongation of hypocotyls and roots in plants through mediating the level of endogenous hormones. Importantly, the application of molecular hydrogen is a safe method, offering a promising avenue for the production of agricultural products because it does not leave residues.

Keywords: Molecular Hydrogen; Root elongation; Seedling growth

PRESENTATION TITLE: GC-MS ANALYSIS, ANTI-DIABETIC, AND CYTOTOXIC EVALUATION OF *PHLOMIS STEWARTII* PLANT PHYTOCHEMICALS ON CIGARETTE SMOKE INHALATION AND ALLOXAN-INDUCED DIABETES IN WISTAR RATS

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Abstract

In the present work, the machinal shaking extraction conditions were studied using Box-Behnken response surface design and examining its total phenolic content (TPC), total flavonoid content (TFC), antioxidant potential, cigarette smoke (CS) inhalation, and alloxan induce diabetes in Wistar albino rats. For eight weeks, twenty-four rats were kept in an aerated cage and subjected to CS after receiving a single dosage of alloxan (body weight 140 mg/kg) after six weeks to develop diabetic mellitus (DM). Three independent parameters that affect the productivity of machinal extraction, including solvent concentration (Y1) 100 mL, 150 mL, and 200 mL, extraction time (Y2) 2 hours, 5 hours, and 8 hours, and speed (Y3) 100 rpm, 150 rpm, and 200 rpm. Gas chromatography-mass spectroscopy (GC-MS) detected the various bioactive components. Under the optimized condition the Y1 (200mL), Y2 (2 hours), and Y3 (100 rpm) run 15 showed the highest extraction yield (1.92 ± 0.19), moreover highest extraction of TPC (5.34 ± 0.31) and TFC (1.16 ± 0.31). The potent extracts were investigated to examine their inhibitory ability against α-amylase and α-glucosidase. The alanine phosphatase (ALP), aminotransferase (ALT), and aspartate aminotransferase (AST) levels increased ($p < 0.05$) in positive control groups (PCG) due to CS inhalation and alloxan induced diabetes. Low-density lipoproteins (LDL), total proteins, creatinine, uric acid, globulin, total oxidant status (TOS), blood urea, bilirubin, and malondialdehyde (MDA), as compared to the negative control group (NCG). The study's findings suggest that *P. Stewartii* CCl4 extracts have good potential for hepatoprotection, nephroprotection, and antioxidant activity. The extracts effectively restored the clinical parameters tested in animals with CS/alloxan-induced diabetes.

Keywords: Phytochemicals, GC-MS, cigarette smoke, alloxan

PROMOTION OF ENTREPRENEURSHIP DEVELOPMENT AND MARKETING IN AGRICULTURAL PRODUCTION OF SENSITIVE GROUPS WHO ARE ENGAGED IN DEVELOPING AGRICULTURAL PRODUCTION AS AN EXAMPLE OF THE REPUBLIC OF SERBIA

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ABSTRACT

The development and strengthening of entrepreneurship in agriculture, which can also include traditional crafts, which can have a high degree of hand-crafting, which are linked to functioning in agriculture.

In this way, it can contribute to the creation of new jobs, it can improve functioning in the field of production of healthy food and other inputs, the application of which will lead to stronger development and a better position of farmers and small processing plants in a country like the Republic of Serbia.

A substantial increase in the promotion of agricultural production can mean encouraging the development of already established entrepreneurial initiatives in agriculture, that is, increasing the promotion and education of farmers about the importance of processing and placing products with added value.

Vulnerable groups in the development of agriculture can have a strong support, such as groups that are responsible for the development and education of female farmers, but also women in rural areas, groups that are undergoing rehabilitation in the phase of recovery from drug use, mentally ill patients who, through engagement in agriculture, end up own treatment and other groups.

Keywords: management, accounting, analysis, risk factors, entrepreneurship in agriculture sensitive groups.

AN EMERGING TECHNIQUE IN DRYING HIGH VALUE-ADDED PRODUCTS: REDUCING ATMOSPHERE DRYING

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ABSTRACT

Drying is the oldest preservation technique. Many conventional drying methods, such as sun drying, hot air drying, and vacuum drying, mostly use high temperatures and air as a drying atmosphere. Air, the atmosphere surrounding the food, contains oxygen, causing losses in the sensory and nutritional quality of dried foods. As an alternative to these drying techniques, the Reducing Atmosphere Drying (RAD) system, which is a closed system, is based on the use of a reducing gas mixture ($H_2/N_2/CO_2$) containing hydrogen (H_2) in the drying atmosphere. In order to preserve the quality of the product, the RAD is the first technique in the world to use H_2 in the drying atmosphere. H_2 is an antioxidant gas with reducing properties. With the RAD drying technique, by utilizing the ability of H_2 to diffuse into subcellular units quickly, more effective results can be obtained in the absence of oxygen in the environment. In previous studies, the RAD system has proven effective in preserving apples and apricots' sensory and nutritional quality (color and antioxidants).

Keywords: Drying; Hydrogen gas; Reducing atmosphere; Value-added products

QUANTITATIVE ANALYSIS OF BIOACTIVE COMPOUNS IN *ROBINIA PSEUDOACACIA* STEM AND ANTIOXIDANT EFFECTS

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ABSTRACT

Introduction and Purpose: Natural products are important for food and pharmaceuticals due to a large variety of biological effects. Flavonoids are a diverse group of plant compounds with powerful antioxidant properties. They belong to a class of polyphenols, found abundantly in fruits, vegetables, tea, and other plant-based foods. Known for their health-promoting effects, flavonoids help protect cells from oxidative damage, reduce inflammation, and may even support cardiovascular health, immune function, and cancer prevention. *Robinia pseudoacacia,* commonly known as black locust or false acacia, is a plant that is resistant to harsh climate conditions. It grows widely in North America, Europe and Asia. Antioxidants play a crucial role in neutralizing free radicals, which are unstable molecules that can damage cells. Free radicals are byproducts of natural cellular processes and external sources, such as pollution, UV radiation, and smoking. When free radicals accumulate, they can cause oxidative stress, which is linked to aging and various chronic diseases, including cancer, heart disease, and neurodegenerative conditions. Antioxidants donate electrons to free radicals, stabilizing them and preventing them from causing further harm.

Materials and Methods: The stem of *Robinia pseudoacacia* was dried and powdered then extracted with methanol. The stock solution was prepared by dissolving the extract in methanol (1.0 mg/mL). The solution was diluted to 2.0 µg/mL and then pipeted to the vials for LC-MS/MS analysis. The stem of *Robinia pseudoacacia* was subjected to antioxidant analysis using the DPPH- and ABTS assays.

Results: Quantitative analysis of bioactive compounds found in the stem of *Robinia pseudoacacia* revealed that the syringic acid (24.8 µg/mL extract), salicylic acid (14.7 µg/mL extract), kaempferol (10.7 µg/mL extract), trans-ferulic acid (8.5 µg/mL extract) were the major compounds. Moreover, *Robinia pseudoacacia* stem displayed good antioxidant activity.

Key Words: *Robinia pseudoacacia,* quantitative analysis, biological activity, natural products.

RENEWABLE ENERGY IN AGRICULTURE: A SYSTEMATIC REVIEW OF INNOVATIONS AND APPLICATIONS

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ABSTRACT

Introduction and Purpose: Renewable energy technologies have gained significant attention in agriculture due to their potential to enhance sustainability, reduce dependency on fossil fuels, and mitigate environmental impacts. However, the integration of these technologies into agricultural practices remains an evolving field, with various innovations and applications still to be fully explored. The purpose of this systematic review is to assess the current innovations and practical applications of renewable energy technologies in agriculture, highlighting their effectiveness in addressing challenges such as energy consumption, resource management, and environmental sustainability in farming practices.

Materials and Methods: Studies published between 2010 and 2024 related to the keywords "renewable energy," "sustainability in agriculture," "solar energy applications," "wind energy," and "bioenergy" were systematically collected through major academic databases such as Scopus, Web of Science, and Google Scholar. The studies were selected based on predefined inclusion criteria, focusing on the integration of renewable energy technologies into agriculture and their impacts on agricultural sustainability. The methodologies, findings, and implications of the studies for agricultural energy systems were thoroughly assessed.

Discussion and Conclusion: This review demonstrates that renewable energy technologies have the potential to enhance sustainability in agriculture; however, their integration is hindered by various economic, technical, and infrastructural barriers. Overcoming these barriers will not only improve the effectiveness of these technologies but also facilitate the transition to more efficient and resilient agricultural systems. Our study emphasizes the need for further research and policy support to optimize the integration of renewable energy solutions in the agricultural sector.

Keywords: Renewable Energy, Sustainability in Agriculture, Solar Energy Applications, Wind Energy, Bioenergy and Agriculture

FROM CHILLING HOURS TO RISING TEMPERATURES: UNDERSTANDING CLIMATE CHANGE'S IMPACT ON APPLE CULTIVATION IN HIMACHAL PRADESH"

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Abstract

Himachal Pradesh, a picturesque state in northern India, is renowned for its apple farming, which significantly contributes to the local economy and livelihoods of its residents. However, the effects of global warming and climate change are increasingly evident in the region, posing substantial challenges to Horticulture and agricultural process in the hilly region of Himachal Pradesh, India. Among the most critical impacts are rising temperatures and reduced chilling hours, both of which are essential for optimal apple cultivation. These climatic changes threaten not only the quantity and quality of apple production but also the economic stability of farming communities reliant on this vital crop.

To gather data on the impact of climate change, an empirical study was conducted to examine its effects on apple farming. A sample of 50 apple farmers was selected, and structured questionnaires were developed to capture their experiences and perceptions regarding climatic variations. The main objectives of this research are to elucidate how changing climatic conditions—specifically rising temperatures and diminishing chilling hours—affect apple farming practices and productivity. By analyzing the responses from the farmers, this study aims to enhance understanding of the adaptive strategies currently employed to address these environmental challenges.

The findings will enhance the understanding of the connection between climate change and apple production in Himachal Pradesh, providing critical insights for policymakers and agricultural stakeholders. This information is essential for developing strategies aimed at improving resilience and sustainability within this vital sector.

Keywords : Climate change, Global warming, apple farming, investigating, temperature.

ROLE OF ARTIFICIAL INTELLIGENCE IN VETERINARY DISEASES MANAGEMENT

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Artificial intelligence (AI) is revolutionizing various sectors, including veterinary medicine. This abstract delves into the potential applications of AI in managing veterinary diseases, focusing on its ability to enhance diagnosis, treatment, and disease prevention. AI-powered image analysis tools can accurately identify abnormalities in medical images, such as X-rays and ultrasounds, aiding in early disease detection. Machine learning algorithms can analyze vast datasets of patient records to predict disease outbreaks and identify risk factors, enabling proactive interventions. Additionally, AI-driven robotic systems can perform precise surgical procedures, improving outcomes and reducing recovery time. Furthermore, AI can optimize drug development by analyzing molecular interactions, accelerating the discovery of new treatments. By integrating AI into veterinary practices, we can improve animal health, reduce costs, and enhance overall efficiency. However, ethical considerations and data privacy concerns must be addressed to ensure responsible and beneficial use of AI in veterinary medicine.

ROLE OF VETERINARY PHARMACISTS IN ANIMAL HEALTHCARE

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Abstract:

The role of veterinary pharmacists in animal healthcare is increasingly recognized as crucial for the effective and safe treatment of animal patients. Veterinary pharmacists bring specialized knowledge in pharmacology, drug interactions, and therapeutics, tailored specifically for various animal species. This report explores the multifaceted contributions of veterinary pharmacists, emphasizing their impact on improving animal health outcomes through precise medication management, formulation, and dispensing. Veterinary pharmacists collaborate closely with veterinarians to ensure the optimal use of pharmaceuticals, addressing the unique physiological and metabolic differences among animals. Their expertise is vital in managing complex medication regimens, preventing adverse drug reactions, and enhancing compliance through innovative drug delivery systems. Additionally, veterinary pharmacists play a critical role in combating antimicrobial resistance by promoting judicious use of antibiotics and educating both veterinary professionals and pet owners. They are also instrumental in ensuring the safety and efficacy of compounded medications, which are essential for treating individual animals with specific needs. The findings underscore the importance of integrating veterinary pharmacists into the broader healthcare team, highlighting their contributions to advancing animal health, enhancing therapeutic outcomes, and supporting the overall well-being of animal patients.

Keywords:Veterinary Pharmacists,Animal Healthcare,Medication Management,Drug Interactions,Antimicrobial Resistance, Compounded Medications, Drug Delivery Systems,Veterinary Therapeutics

RURAL WOMEN: DRIVING FORCE BEHIND NEW INDIA'S AGRARIAN TRANSFORMATION

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Abstract:

Rural women are emerging as the cornerstone of India’s agrarian transformation, leveraging their resilience, knowledge, and adaptability to overcome systemic challenges in agriculture. This abstract explores the multifaceted role of rural women in shaping New India's agricultural landscape through their involvement in diverse activities, from crop production and livestock management to agri-entrepreneurship and the adoption of sustainable practices. Despite facing barriers such as limited access to land, credit, and education, rural women are catalysing change by embracing technological advancements, participating in cooperatives, and fostering community-led innovations. Their contributions not only enhance food security but also drive socio-economic development, empowering households and communities alike.

The focus on women's role in agriculture acquires more importance in light of launch of National Mission on Natural Farming (NMNF), with its aim of promotion of natural farming via a mission mode, focusing on traditional indigenous mechanisms etc. Be it be transitioning or working on empowerment of farmers, the agency of women at rural grassroots, through community outreach, self-help groups etc. is significant to factor in. In light of these developments, the paper underlines that addressing gender concerns in agriculture will not only augment innovation but aid in bigger challenges like health safety etc.

The central question guiding this analysis is: How can the recognition and empowerment of rural women as key stakeholders in agriculture unlock the full potential of India's agrarian transformation while addressing persistent gender disparities? Recognizing their pivotal role and addressing these disparities through policy reforms, capacity-building initiatives, and inclusive frameworks is essential to sustaining this transformative momentum. This abstract underscore the urgency of integrating rural women as equal stakeholders in India’s journey toward a robust and equitable agrarian future.

Keywords: Rural Women, Women empowerment, Agrarian transformation, New India

SCREENING OF NEW HYBRID CITRUS ROOTSTOCKS FOR SALINITY AT EARLY SEEDLING STAGES UNDER GREENHOUSE CONDITIONS

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The citrus industry in arid areas is largely constrained by the salinity of irrigation water and soil. This study was conducted to determine how six novel citrus hybrid rootstocks will respond to salinity at the seedling stage. Three different NaCl concentrations, 0, 2, and 5 g l-1, were added to the half-concentrated Hoagland solution (corresponding to 1.3 (control), 4 and 9 dS m-1, respectively). Three-monthold seedlings grown in greenhouse conditions and transplanted in plastic pots were used. After two months of stress, different responses from the rootstocks and salt levels were observed. The addition of NaCl to the irrigation solution considerably decreased the fresh and dry weight and leaf chlorophyll content. Additionally, the proline content, soluble sugar, and the leaf chloride content increase with the increase in salinity. Our findings demonstrated that the hybrid H6 is salt-sensitive, accumulating a high leaf chloride level of 46.92 mg/g of dry matter and a low chlorophyll content of 1.12 mg/g of fresh matter associated with signs of leaf toxicity, leading to poor fresh and dry weight. Although hybrid H2 is thought to be salt-tolerant, it accumulates 38.88 mg/g of dry-matter leaf chloride and 1.72 mg/g of fresh-matter chlorophyll content.

Keywords : Citrus, hybrid rootstock, chloride, salt stress, NaCl

EVALUATION OF NEW MARKERS THAT CAN BE USED IN BLACK CUMIN PLANT

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The black cumin plant is one of the important medicinal and aromatic plants in the Ranunculaceae family. It is used for some diseases in the Middle East and intensively in Iran. It is important to know the genetic resources of valuable medicinal and aromatic plants. Characterization of genetic resources in populations helps both the protection of genetic resources and the breeding studies to be carried out. Today, with the development of technology, molecular DNA markers are used intensively and come to the forefront in characterizing genetic resources. Although morphological data are used, they are insufficient to characterize a population due to the effects of environmental conditions and can be misleading. However, since DNA molecular markers are not affected by environmental conditions and time, they provide more accurate information and reach more precise results. Since there is no complete sequence data for most medicinal and aromatic plants, a limited number of DNA markers could be developed. In this study, minisatellite markers showing universal properties were studied for the first time in the black cumin plant. In line with the findings obtained, it was concluded that these molecular DNA markers can also be used in characterizing the black cumin plant.

Keywords: Minisatellite, *Nigella sativa*, Marker

SYNTHESIS AND EVALUATION OF SILVER NANOPARTICLES FROM ETHANOLIC LEAF EXTRACT OF *TRIDAX PROCUMBENS*.L

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ABSTRACT

In recent science Nanotechnology is a burning field for the researchers. Nanotechnology deals with the Nanoparticles having a size of 1-100 nm in one dimension used significantly concerning medical chemistry, atomic physics, and all other known fields. Silver nanoparticles were synthesized using aqueous extract of *Tridax procumbens* leaves, and silver nitrate. XRD, SEM, FTIR, Optical absorption were measured and analyzed. The synthesized AgNps exhibits lowest energy absorption band at 400 nm. Synthesis of Nanoparticles may involve various routes including physical, chemical and biological approaches. Traditionally these are manufactured by wet chemical methods which require toxic and flammable chemicals. Nanoparticles thus formed are confirmed and characterized by using UV-Visible Spectroscopy, SEM, FTIR, Zeta Analysis, XRD measurements.

Further, these green synthesized Nanoparticles showed bactericidal activity against multidrug-resistant human pathogenic bacteria. The AgNps formed were found to have enhanced antimicrobial properties and showed zone of inhibition against isolated bacteria (Escherichia coli) from garden soil sample. In totality, the AgNps prepared are safe to be discharged in the environment and possibly utilized in process of pollution remediation. AgNps may also be efficiently utilized in agricultural research to obtain better health of crop plants as shown by our study.

Keywords: Silver nanoparticles; FTIR; SEM; Antimicrobial Activity ; *Tridax procumbens.*

USE OF VALUE-ADDED PRODUCTS FOR SUSTAINABLE CUISINE

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ABSTRACT

The use of high-value-added products plays an important role in the development of practical applications in the kitchen, as presentation comes to the forefront of today's culinary concept. Especially contributing fruit and vegetable wastes to the cuisine, designing new forms of presentation (foam, tuile), producing new products (vinegar, spices, essential oils), preventing food waste, and transforming wastes into economic value is very critical. Wasted fruit and vegetable peels (onion, citrus, etc.) have many specific properties. These wastes are rich in anthocyanins (cyanidin, delphinidin, malvidin, etc.), various phytochemicals (phenolics, organic acids, sugars, pigments), thickeners (pectin), and antioxidant and antimicrobial compounds (essential oils). Value-added products also contribute to the shaping of various types of cuisine. Especially in molecular cuisine, it increases the texture, nutritional value, and visual power of the products. For example, fruit juices can be presented as gel or capsule instead of water, and shells can be used with different decor decorations. In this study, the potential applications of value-added products in kitchens were evaluated. The products formed from these waste-based ingredients will offer new experiences to the gastronomy world.

Keywords: Fruit and vegetable waste, molecular cuisine, sustainable cuisine

DETERMINATION OF SOME MORPHOLOGICAL, PHYSIOLOGICAL AND COLOR VALUES OF NATURALLY GROWNING DANDELION (*Taraxacum montanum)* PLANT COLLECTED FROM VAN LAKE AROUND

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ABSTRACT

Introduction and Purpose: Dandelion (*Taraxacum montanum*) is a perennial herbaceous plant with yellow flowers, belonging to the Asteraceae family, which grows naturally in April and May on field edges, meadows and roadsides. Although the flower petals are yellow, the plant is called "dandelion". Although it is known as "acıgunek", "guneyik", "çıtlık" and "arslandisi" in Anatolia, the most commonly used name is "radika".

Materials and Methods: In 2023, *Taraxacum montanum* was collected from its natural environment around Van Lake in the Eastern Anatolia Region. In this study, plant height, stem width, leaf length and width, nitrogen balance index, chlorophyll, flavonol and anthocyanin contents and leaf color values as L*, a*, b*, Chroma and Hue were determined in *Taraxacum montanum* species which is naturally distributed in Van province. Plant height, stem width, leaf height and width, nitrogen balance index (NBI), chlorophyll, flavonol, anthocyanin content, as well as color values of leaves were determined as L*, a*, b*, Chroma and Hue values.

Results: Plant height 23.00±2.65 cm, stem width 0.43±0.15 cm, leaf height 18.33±3.79 cm, leaf width 5.17±2.75 cm, nitrogen balance index (NBI) 55.33±15.73 dual index, chlorophyll 21.70±2.07 dual index, flavonol 0.48±0.12 dual index, anthocyanin content 0.04±0.02 dual index, color values were determined as L*39.91±1.58, a*-12.37±0.65, b* 20.78±1.45, Chroma 24.19±1.58 and Hue 120.79±0.43 leaves.

Key Words: Colour value, Nitrogen Balance index,*Taraxacum montanum*,

MANAGEMENT OF MICROPLASTIC POLLUTION IN SOILS: MITIGATION STRATEGIES AND REMOVAL TECHNIQUES

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Abstract

The durability, high performance, and low cost of plastics made them an indispensable part of modern life; however, this also led to serious environmental problems. A significant portion of the plastics produced are directly or indirectly released into the environment and become integrated into nature. Over time, these plastic wastes break down into smaller fragments, turning into microplastics and becoming persistent in the environment. In agricultural soils, microplastics accumulate over time through practices such as the use of sewage sludge, irrigation with wastewater, plastic mulching, polymer-based fertilizers and pesticides, and atmospheric deposition. The microplastics affect various physical, chemical, and biological properties critical to soil functionality, posing threats to plant growth and, ultimately, agricultural productivity. The high surface area of microplastics enables them to adsorb harmful components such as organic pollutants and heavy metals, increasing their persistence and bioavailability in the soil. Recent studies on the negative effects of microplastics on plant growth and their potential risks to food safety have increased rapidly. Since microplastics can persist in the natural environment for long periods without degrading, they are easily ingested by organisms and accumulate throughout the food chain. Consequently, studies on methods to mitigate the adverse effects of microplastics in soils have gained importance. Depending on the type and amount of microplastics in the soil, several mitigation methods have been proposed, including the use of biochar, a carbon-rich material to improve soil structure, the adoption of good agricultural practices, and the replacement of plastic mulch with natural plant residues or biodegradable mulches. In addition to reducing the impacts of microplastic pollution, various methods such as pyrolysis, hydrolysis, biological degradation, and ultrasonic mechanical degradation have been explored for the removal of microplastics from soils. This review focuses on strategies to mitigate microplastic pollution accumulating in agricultural soils.

Keywords: Microplastic pollution, Mitigation strategies, Agricultural sustainability, Food Safety, Agricultural soils

PRODUCTION AND CHARACTERIZATION OF CARBON NANOTUBES FROM BIOCHAR UNDER MICROWAVE IRRADIATION

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ABSTRACT

Carbon nanotubes (CNTs) are widely used in a variety of fields to produce a diversity of products, including hydrogen storage systems, and field emitters. In the proposed study, CNTs synthesized via biochar under the microwave irradiation method. In this method, the combination of charcoal and ferrocene are used to synthesize CNTs from the biochar approach. Biochar samples for CNTs synthesis are made from pyrolyzed agro-industrial waste such as rapeseed cake, hazelnut hulls, wheat straw, and oat hulls at different temperatures. The biochar was produced from agro-industrial biomass. During experiments, 100g of biomass was placed in a microwave reactor. The samples were pyrolyzed at 400 °C to 600°C. SEM analysis was used to confirm the morphology of CNTs. SEM micrographs revealed the perfect structure of multiwall carbon nanotubes, while interlayers spacing was changed due to variation of catalysts and measured about 0.34nm. Further, the optical properties were examined by UV-visible spectroscopy. In the UV, one band is clear at 240 nm region due to resonance of nanotubes pi(π) electrons of carbon nanotubes. XRD was used to analyze the glassy structure of prepared CNTs under microwave revealed that the creation and growth of CNTs were mostly influenced by microwave irradiation and the ferrocene catalyst. The structure of CNTs was developed under microwave heating and in the presence of ferrocene catalyst. To research how nitrogen impurities adhere to CNTs, FTIR experiments were conducted in the 400–4000 cm-1 range. The sample's FTIR spectra exhibit prominent peaks that correspond to C-H and C=C, respectively.

THERAPEUTIC POTENTIAL OF SAREEHN (*ALBIZIA LEBBECK*) SEEDS EXTRACT AGAINST TOXIC EFFECTS OF GRAPHENE NANOSHEETS IN MORI (*CIRRHINUS MRIGALA*)

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Abstract

This research investigated the therapeutic potential of Sareehn (*Albizia lebbeck*) seed extract in alleviating graphene nanosheets (GNS) toxicity in *Cirrhinus mrigala* and addressed concerns about GNS effects on aquatic organisms. For experimental purposes, fish were collected and kept in the lab with all standard aquatic parameters maintained. During Phase I of the experiment, mortality rates were observed after oral GNS doses ranging from 0, 250, 500, 750, 1000, 1250, and 1500 mg/L, monitored at 96-hour intervals, resulting in an LC50 value of 121.37 mg/L. Three fractions of LC50 were made, including Fraction 1 (121.37 mg/L), Fraction 2 (60.58 mg/L), and Fraction 3 (40.45 mg/L). The medium fraction was used in Phase II of the experiment. The experimental groups included the Control (A) group with no exposure to GNSs and plant extract, Test Group B exposed to 60.58 mg/L of GNSs with no extract, Test Group C with 60.58mg/L of GNSs + 25 mg/L extract, Test Group D with 60.58mg/L of GNSs + 50 mg/kg extract, and Test Group E with 60.58 mg/L of GNSs + 75 mg/kg extract, with each group observed for 96 hours. Fish organ histology was assessed to show GNS impact: the liver histopathological changes included Pyknotic nuclei or karyomegaly, Atrophy, Acute Cellular swelling, melanomacrophage centers (MMC), hepatic vacuolation, sinusoid dilation, Hydropic degeneration, Necrosis, Perivascular degeneration were observed. However, Intestinal histology shows changes such as intestinal damage (Id), Collapsed Epithelial layer (CL), intestinal interior architecture damage (Ad), atrophy (A), bigger intercellular gaps, and Degenerated Goblet cells (DG). D: shows bigger intercellular space (IS) and kidney histology shows tubular necrosis (Tn), Severe Congestion (SC), tubular dilatation, Bowman capsule dilution (DBS), Destroyed Intestinal Integrity, Glomerulopathy (G), Hemocytic Infiltration (HI), hematopoietic tissue degradation, Vasodilatio (WL), Constricted NT lumen (CL). The therapeutic effect of Albizia lebbeck was also noted in mitigating GNS toxicity. High-performance liquid Chromatography (HPLC) analysis identified several bioactive components in Albizia lebbeck, including Ferulic acid, Chlorogenic acid, Gallic acid, P-coumaric acid, Quercetin, Caffeic acid, Sinapic acid, Kaempferol, oxalic acid, malic acid, Citric acid, Fumaric acid, Succinic acid, with Methylmalonic acid being the most abundant. The findings suggest that *Albizia lebbeck* seed extract offers protection against GNS toxicity in Cirrhinus mrigala, providing a potential solution for mitigating GNS-related environmental concerns.

Key words: *Albizia lebbeck* seeds, Graphene nanosheets toxicity, *Cirrhinus mrigala*, Therapeutic potential

UNVEILING THE MOLECULAR COMPOSITION AND BIOLOGICAL PROPERTIES OF OLIVE BY-PRODUCT

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ABSTRACT:

The olive oil industry generates substantial quantities of by-products, which are often discarded despite their richness in bioactive compounds. This study aims to unveil the molecular composition of olive by-products through advanced chemical profiling techniques, including HPLC-DAD, to identify key phenolic and flavonoid compounds. These compounds were evaluated for their antioxidant and antimicrobial activities, showcasing their potential as natural agents for food preservation. Furthermore, the incorporation of these bioactives into food models was investigated to assess their efficacy in extending shelf life and maintaining quality.

The findings not only highlight the significant potential of olive by-products as sustainable sources of functional ingredients but also emphasize their role in reducing food waste and promoting eco-friendly approaches in food preservation. This research paves the way for innovative applications in the food and nutraceutical industries, addressing critical challenges in sustainability and resource utilization.

Keywords: Olive by-products, Bioactive compounds, Antioxidant activity, Antimicrobial properties, HPLC-DAD analysis.

THE EFFECT OF SULFUR FORMS APPLIED THROUGH SOIL AND FOLIAR ON FIBER QUALITY IN COTTON (*Gossypium hirsutum* L.) PLANTS

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ABSTRACT

Introduction and Purpose: The diverse uses of cotton make it one of the most important products in both the industrial and commercial sectors of global agriculture. In our region, cotton farming is carried out intensively. To achieve high yields, both macro and micro nutrient elements are applied to the soil and leaves in our region.

Materials and Methods: This study was conducted during the May-October 2023-2024 period. The study applied sulfur forms via soil and foliar methods.The experiment was carried out on a farmer's field in Gürpınar village, located in the Haliliye district of Şanlıurfa. The planting was done in the second week of May after field plowing. The trials were set up according to a randomized block design with four replications. The plot length was 12 meters, with 75 cm between rows and 10 cm between plants within a row, consisting of four rows. A 3-meter gap was left between the plots.

Results: The study examined parameters such as ginning percentage (%), 100-seed weight (g), fiber fineness (mic), fiber length (mm), fiber strength (g tex^{-1}). **Discussion and Conclusion:** In the study, statistically ($p<0.01$ and $p<0.05$), the cotton yield was found to be insignificant in both years; 100-seed weight (g) and fiber length (mm) were significant in the second year ($p<0.05$). Additionally, fiber fineness (mic) and fiber strength (g/tex) were significant in the first year ($p<0.05$). Although there were differences between years, it was observed that sulfur forms had an effect on fiber quality. The data obtained from the experiment were analyzed using the JMP 13.2 statistical software, and variance analyses were performed according to the randomized block design. Means were grouped based on the LSD (0.05) test.

Keywords: Cotton, sulfur, fiber quality

POSSIBILITIES OF USING RENEWABLE ENERGY SOURCES IN LANDSCAPE STUDIES

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ABSTRACT

In recent years, increasing interest in environmental sustainability and energy efficiency has made the combined use of renewable energy sources in landscape design an important agenda item. Landscaping not only fulfills aesthetic and functional needs, but also serves the purpose of reducing energy consumption and conserving natural resources through environmentally friendly practices. Renewable energy sources such as solar, wind and biomass are used in various ways in landscaping projects, allowing solutions to be developed in harmony with the natural environment. The use of renewable energy sources in landscaping offers important opportunities to increase environmental sustainability and energy efficiency. In these studies, various renewable energy sources such as solar energy, wind energy, biomass and geothermal energy can be integrated without harming the aesthetic and functional characteristics of the natural landscape. Technologies such as solar panels and wind turbines support energy production in landscapes, while the use of biomass enables waste recycling and organic energy production. In addition, geothermal energy can be used for environmental heating and cooling, providing indirect benefits to landscape design. This study aims to provide innovative solutions in landscape design by examining how renewable energy sources can be integrated into landscape projects, their environmental benefits and their contribution to sustainable development goals.

Key Words: Energy; Landscape; Sustainability; Landscape Design

WHAT ARE THE CHALLENGES FACING EUROPEAN AGRICULTURE

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Abstract

The Common Agricultural Policy (CAP) continues to enjoy a large share of the European budget. If the CAP constitutes the first budget of the European Union, it is not no longer the budgetary colossus of the 1960s and 1970s. Its share of community spending has continued to decrease, reaching less than 40% today, compared to two-thirds at the start of the 1980s, with the cost of the CAP per capita being approximately 100 euros per year. In reality, the CAP retains its legitimacy and modernity intact: responding to the food challenge, both quantitatively and qualitatively. Put simply, it is a strategic European policy. The objectives of the CAP are enshrined in the Treaty on the Functioning of the European Union. The objectives of the common agricultural policy are set out in Article 39.1, in a wording identical to that of the Treaty of Rome in 1957. In sixty years, it is only the numbering which has changed. All the added values linked to its implementation on a European scale make the CAP a European policy of the future for the European Union. One must recall that the CAP is a founding and structuring policy for European construction, which must today respond to fundamental issues for the future of the European ideal: challenges of food security and health, as well as economic, social, environmental, and geopolitical issues. Such challenges will be explored in detail in this research paper.

Keywords: Agriculture, Common Agricultural Policy, European Union, Food Security, Geopolitics

VALUE ADDED OLIVE OIL PRODUCTION AND EXPORT OPPORTUNITIES: PROBLEMS AND SUGGESTIONS

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ABSTRACT

Introduction and Purpose: In recent years, the importance of olive oil production and consumption has continuously increased with the desire for a healthy, high-quality, longer life and the increasing interest in nutrition. On the other hand, it is of great importance to develop products with high added value by aiming to obtain higher income from the olive oil produced and to hold on to the market with the products developed. It is also important to be able to take place in the foreign market with branded and packaged products, to develop higher value-added products and to obtain permanent markets in terms of sustainable trade. This study aims to develop solutions for possible problems by focusing on the production and export opportunities of value-added products obtained and to be obtained from olive oil.

Materials and Methods: In this framework, a face-to-face questionnaire survey was conducted with 25 researchers, whose fields of study and expertise are olive, determined by purposive sampling, which is one of the non-probability based sampling methods. To interpret the findings, simple descriptive statistics such as arithmetic mean and percentage ratios were used. As a result, value-added olive oil products that are produced and can be produced are listed. It was determined that Turkey has shown a significant development in the production and export of value-added olive oil. On the other hand, it has been determined that there are some limitations in developing products to produce and export value-added olive oil.

Results: These constraints include; low scale efficiency due to the small size of the land in agricultural holdings where olives are produced in Turkey, traditional and protectionist

approaches of the actors involved in the production and marketing processes, difficulties in the development and adoption of relative innovations, unexpected and cyclical developments in national and international markets, drought and other climate change variables. As a result, it has been determined that it is important to develop an innovative, research and development approach with the participation of all stakeholders in the sector, to improve the level of awareness on climate change and to establish adaptation policies.

Discussion and Conclusion: In this framework, it is emphasized that the development of appropriate and dynamic public policy instruments can be highly effective incentives.

Key Words: Value-added olive oil, healthy and quality life, nutrition, export, sustainability

VALUE ADDED OLIVE OIL PRODUCTION AND EXPORT OPPORTUNITIES: PROBLEMS AND SUGGESTIONS

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Key Words: Value-added olive oil, healthy and quality life, nutrition, export, s

COMPOSITION OF ESSENTIAL OILS OBTAINED FROM THE PLANT (*Salvia virgata* Jacq.) GROWN IN DIFFERENT ECOLOGIES

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ABSTRACT

Introduction and Purpose: There are approximately 900 species of the *Salvia* genus worldwide. There are 99 species of the *Salvia* L. genus in Turkey; 51 of these species are endemic. The local name of S. virgata in Turkey is "yılancık" or "fatmanaotu" and is used in the treatment of wounds and various skin diseases. In addition, the brew prepared using the aboveground parts of this species is used to prevent blood cancer. This study was carried out by growing the salvia virgata plant, which has economic importance in Turkey, in different regions. The volatile oil composition was determined.

Materials and Methods: The materials in this study were obtained from Ankara University Faculty of Agriculture.The trial was conducted in Balıkesir, Çanakkale, Kütahya regions in 2017-2019. Since 180 plants were needed in the trial area, seedlings were grown in greenhouse conditions and considering the failures after transplanting to the field, 216 plants were transplanted to the trial area. Rooted seedlings were transplanted to the field as of April 2017.

The seedlings were given life water immediately after transplanting to the field. Field trials were conducted according to the randomized block trial design with 3 replications. The planting distance in the trial was 50x50 cm and there were 3 rows in each plot. The plot size was 1.75x5.00 = 8.75 m2. 24 plants were planted in each row and 72 plants in each plot). When we examine the trial years and long-term climate data of the trials we conducted in different locations; when the long-term data are taken into account, the lowest precipitation was recorded in the Kütahya location and the highest precipitation was recorded in the Balıkesir location among the 3 locations where the trials were conducted.

Results: It is a study to evaluate the essential oils of *Salvia virgata* Jacq. species depending on ecological factors according to the two-year results of the essential oil composition. In the study conducted in three different regions; Carvacrol, β-Ylangene, Bicyclogermacrene, phytol were identified only in Kütahya, γ-Terpinene, α-Thujone, Linalool, Linalylacetate in Balıkesir, Viridiflorol compound was identified only in Çanakkale.The highest essential oil ratio was determined as 0.05% in Çanakkale. Considering that the essential oil components also differ according to ecological factors, it would be beneficial to conduct more studies on different Salvia species from different locations.

Key Words: Essential oil, Different Region, Volatile Components

USE OF A HYDROGEN EXTRACTION METHOD FOR THE EXTRACTION OF PHYTOCHEMICALS

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ABSTRACT

Plants are a rich source of phytochemicals, which are bioactive compounds that benefit human health. Phytochemicals play an important role in forming plants' distinctive color, aroma, and flavor. Moreover, these phytochemical compounds have antioxidant, anti-inflammatory, antimicrobial, antifungal, anticancer, antidiabetic, and antihypertensive properties. Several extraction techniques can be employed to recover these compounds from the plant materials. Hydrogen-rich solvent extraction is a novel method that our team has developed. The results of recent reports demonstrated that the extraction of phenolic compounds and antioxidant activity was enhanced when a hydrogen-enriched solvent extraction method was used for various plant materials, such as tomato peel, green apple peel, orange carrot peel, lemon peel, red cabbage leaves, red beet, olive leaf, pomace oil, and propolis products were processed. Furthermore, it was established that the extraction of phenolic compounds, organic acids, reducing sugars, antioxidant activity, pigments, and vitamin C content was enhanced by using a hydrogen-rich solvent to process cowslip (*Primula veris* L.) flowers. In these reports, it has been observed that molecular hydrogen, which demonstrates selective antioxidant properties, plays a significant role in increasing phytochemical compounds by exerting a synergistic effect with compounds present in plants. The use of molecular hydrogen (H_2) in the extraction of phytochemical compounds has been shown to have no adverse effects on products or the environment, while also improving the quality of foods and enhancing food safety.

Keywords: Phytochemicals; Extraction; Molecular hydrogen; Antioxidant