2nd Global Science Technology & Management Conference

06-07 May, 2024
Layyah (Southern Punjab) Pakistan

Organized by

The University of Layyah & Evolution (Pakistan)

<u>In Collaboration with</u>

GC University Layyah Campus, Govt. Graduate College Layyah, Govt. Graduate College for Women Layyah, The Physio College Multan and The Applied Zoological Society of Pakistan

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ISBN: 978-627-7502-13-3

BOOK OF ABSTRACTS
Global Science Technology and Management Conference (GSTMC-24) Layyah
Editor In Chief: Dr. Sadaf Javaria
Editors: Dr. Azhar Abbas Khan, Dr. Zeshan Hassan, Dr. Tahira Abbas, Dr. Umbreen Shahzad
Co- Editors: Dr. Sadia Anjum, Dr. Hassan Raza, Dr. Nida Ilahi, Ms. Umama Fatima Iqbal

Composing & Designing: Ms. Musarrat Rasheed

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Conference Fields

- Agriculture & Animal Sciences
- Biological & Chemical Sciences
- Computer, Physics & Numerical Sciences
- Commerce & Management Sciences
- Food Technology & Nutritional Sciences
- Pharmacy & Allied Health Sciences
- Social Sciences & Languages

Introduction

About Conference

2nd Global Science Technology and Management Conference (GSTMC-24) which is scheduled to take place on **06-07 May, 2024** in the city of **Layyah, Southern Punjab of Pakistan** Jointly organized by **Evolution (Pakistan) and The University of Layyah, In Collaboration with ORIC, University of Layyah, GC University Faisalabad Layyah Campus, Govt. Graduate College for Boys Layyah and Govt. Graduate College for Girls Layyah.** GSTMC-24 will offer researchers, delegates and scholars an incredible chance to interact with each other and share their experience and knowledge of technology application.

The goal of **Global Science Technology and Management Conference (GSTMC-24)** is to provide a stage for researchers and practitioners from academia and business to deal with state-of-the-art advancement in their respective fields.

GSTMC-24 will offer participants to interact with industry experts on the recent challenges in scientific research and associated areas. Leading researchers will share their incredible research findings and tools that they use to achieve better results. This international conference on multidisciplinary research and education is bound to generate a number of new ideas and

experiences that participants, irrespective of who they are (Experienced scientists, seasoned professionals or young scholars at the early stages of their careers), can derive and make use of in some form of another, towards the advancement of their careers. For those looking to spread awareness of their incredible research findings and other work, they will also have the chance to present their papers and articles.

Objective of the Conference

Global Science Technology and Management Conference (GSTMC-24) is revolves around bringing Science Technology and Management research areas synchronically on an individual platform. This conference will draw collectively research fellowships from diverse fields in untidiness, to share their research findings and latest ideas. The main intention of this conference is to integrate interdisciplinary inquiry to deliver the best applications.

Global Science Technology and Management Conference(GSTMC-24) , one of the most meticulous specialist conferences of its kind in the academic world, has been specially devised to present technological and additional assistance to intensify investigation and innovative enterprises, disseminating groundbreaking experimental outcomes, as well as innovative magazines/papers.

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Moazzam Faiz, PLS, Layyah

ABSTRACTS

Oilseed Proteins:A Way Forward to CombatProtein Energy Malnutrition in Pakistan

Muhammad Sibt-e-Abbas[1*], Umar Farooq[1], Muhammad Shahbaz[1], Shabbir Ahmad[1], Nida Firdous
[1]*Department of Food Science & Technology, Faculty of Food & Home Sciences*
MNS-University of Agriculture Multan, Pakistan
[*]**Corresponding Author Email:** sibte.abbas@mnsuam.edu.pk

Protein Energy Malnutrition (PEM) remains a critical public health concern in Pakistan, particularly among vulnerable populations such as children and pregnant women. This abstract explores the potential of oilseed proteins as a promising avenue to address PEM within the country. Pakistan, despite being an agrarian economy, faces challenges in ensuring adequate protein intake among its populace. With a growing population and limited resources, innovative solutions are imperative to combat malnutrition effectively. Oilseed proteins, derived from sources such as sesame, canola, and sunflower, possess a rich nutritional profile, comprising essential amino acids crucial for human health. These oilseed proteins have the potential as sustainable alternatives to traditional protein sources. Moreover, the feasibility assessment of these oilseed proteins has justified their incorporation into the local diet, considering cultural preferences and dietary habits prevalent in Pakistan. The utilization of oilseed proteins offers several advantages in addressing PEM. Firstly, these proteins are abundant in essential amino acids, particularly lysine and methionine, which are often deficient in diets based on cereals and pulses. Secondly, oilseed cultivation presents an opportunity for economic empowerment of smallholder farmers, contributing to poverty alleviation and food security. Additionally, the processing of oilseeds into protein-rich products can promote agro-industrial development, fostering economic growth in rural areas. Furthermore, the potential challenges and constraints associated with the adoption of oilseed proteins, including technological barriers, market dynamics, and consumer acceptance can be met through proper awareness among the masses. In conclusion, the integration of oilseed proteins into nutrition interventions holds significant promise for mitigating PEM in Pakistan. By harnessing the nutritional potential of oilseeds and fostering an enabling environment for their adoption, Pakistan can take decisive strides towards achieving sustainable development goals related to nutrition and food security.
Keywords: Protein Energy Malnutrition, Oilseed Proteins, Food Security, Economic Empowerment, Protein Intake

Analysing Usage Trends: Social Networking vs. Knowledge-Sharing Platforms in Layyah

Nehdia Rizvi[1]
[1]*Government Graduate College for Women, Layyah*

This study explores the usage patterns of social media platforms and knowledge-sharing habits among residents of Layyah District, Pakistan, encompassing both rural and urban areas. A survey of 123 individuals was conducted to analyse demographic characteristics, including age, gender, and educational backgrounds. Findings revealed that a majority of participants (61.5%) were aged 18-35, with a slightly higher representation of females (52.8%) than males (47.2%). Notably, university students comprised the largest demographic group (60.2%), followed by postgraduates (18.7%), college students (17.9%), and school students (3.3%).

Analysis indicated a significant preference for social networking platforms over knowledge-sharing platforms. Facebook emerged as the most popular platform, utilized by 86.2% of respondents, followed by Instagram (76.4%), Snapchat (51.2%), and TikTok (48%). In contrast, knowledge-sharing platforms such as Reddit, Brainly, AskYahoo, and Quora exhibited lower usage rates, ranging from 10.7% to 27%.

These findings underscore the dominance of social networking platforms among Layyah residents, highlighting implications for information dissemination, online interactions, and social connections within the community.
Keywords: Layyah, Pakistan, Social media, Knowledge sharing, Demographic analysis

Total flavonoid content and antioxidant potential of three varieties of Pakistan date seed

*Muhammad Khalid Saeed, Naseem Zahra, Sadaf Javaria, Asma Saeed, Qurat-ul-Ain Syed and Syed Hussain Imam Abidi

[1]*Food and Biotechnology Research Centre, PCSIR Laboratories Complex, Ferozepur Road, Lahore-54600, Pakistan*

[2]*Institute of Food science and Nutrition, Gomal University, Dera Ismail Khan, Pakistan*

Corresponding Author Email**: ***rosefbrc1@gmail.com

Background: Due to multiple health properties, polyphenols receive increasing attention as a potential nutritional therapeutic agent against several chronic diseases. Date palm (*Phoenix dactylifera* L.) is a fruit bearing tree with a lot of prospects. Dates seeds are deemed of the most important waste of date industry representing very important economical resources and at same time may cause environmental problem if it is accumulated considerably in the nature. These pit/byproducts are made up of nutritional and medicinal potentials and new studies reported that dates seeds have high level of phenolic compounds, flavonoids, antioxidants, dietary fibers higher than those are reported in flesh part.

Methodology: The study included preparing alcoholic and aqueous extractions of date seed powder of Dhaki, Khadhrawi and Desi date seed three varieties estimating its total contents of flavonoids by aluminum chloride method and then studied its antioxidants activities by DPPH and reducing power (RPA) assay.

Results: The results showed that total contents of phenolic compounds are ranged from 30.16±0.16–47.11±0.30 mgQE/g for the methanolic extract and 22.80±0.12 –34.12±0.20 mg QE/g for aqueous extraction. Indeed, alcoholic and aqueous extract of Dhaki, Khadhrawi and Desi date seed powder give antioxidation activity (% Inhibition) are ranged from 35.46±1.80–78.40±3.50% for methanolic extract while % inhibition (DPPH) was 20.46±1.35–62.55±2.90 % at concentration 1mg/ml. In RPA assay the reduction strength is ranged from 0.598±0.03–1.65±0.08 for methanolic extract while for aqueous extract 0.364±0.02–1.27 ±0.05 at concentration 1-5 mg/ml.

Conclusion: Therefore, it can be concluded that date seed extracts can potentially be used as an alternative source of natural antioxidant.

Keywords: date seed powder, flavonoids, antioxidants

Exploring the Molecular Phylogeny of Anuran Species in the Kohat District

Abida Yousaf[1], Irum Gul[1], Muhammad Shehzad[1]

[1]*Department of Zoology, Kohat University of Science and Technology, Kohat*

Amphibians are a diverse and fascinating group of vertebrates that inhabit both aquatic and terrestrial ecosystems around the world. They play essential roles in ecosystems as predators, prey, and indicators of environmental health.Identification of species by examining only morphological characters is difficult and may result in misidentifications. Modern amphibian taxonomy relies heavily on molecular taxonomy and phylogeny.In the present study,weelucidate the genetic divergence based on the mitochondrial data 16S rRNA gene of anuran within the families Bufonidae (313 bps of sequence) and Dicroglossidae (345 bps of sequence) in the district of Kohat, Khyber Pakhtunkhwa, Pakistan. The specimens were collected from selected sites mainly including wetlands, croplands, orchards, and human settlements. The field survey was conducted in the evening (17:00-21:00) and morning (07:00-10:00). Maximum likelihood and Bayesian methods were employed for phylogenetic analysis.A total of 25 specimens were collected belonging to two families. The findings confirmed the taxonomic status of Asian Common Toad or Black-spined Toad (*Duttaphrynus melanostictus*), and Skittering Frog (*Euphlyctis cyanophlyctis*) in Pakistan. This research created the initial thorough, time-calibrated phylogeny of the genus *Duttaphrynus*and *Euphlyctis*which clarified species complexes in these generaconcerning Pakistan.

Keywords:16S rRNA, Kohat, *Duttaphrynus*,*Euphlyctis*, Skittering Frog.

Environmentally benign silver/Magnesium oxide nanocomposite preparation and its potential use for anti-bacterial activity and phenol red photo-degradation

Iqra Ayaz[1], Dr Muhammad Bilal[1], Dr Javed Ali [1]
[1]*Department of Chemistry, Kohat University of Science & Technology (KUST), Kohat-26000, Pakistan*

Corresponding Email **bilalhej@gmail.com** **Cell #: 0334-8458949**

Nanotechnology is the most active zone of material sciences investigation, and the manufacturing of nanoparticles (NPs) is quickly rising internationally. Researchers employ bio nanotechnology approaches to create nanoparticles and nanomaterials that are both environmentally benign and cost-effective. Eco-friendly technique with little or no cost and numerous uses in biotechnological, agricultural, and environmental domains. In this study AgNPs were successfully produced for the first time through the utilization of an aqueous leaf extract from *thelypteris noveboracensis* in a 0.4mM solution of silver nitrate. Initially, the synthesis of AgNPs was assessed by observing changes in the color of the reaction mixture, followed by thorough examination and characterization using UV-Vis spectroscopy. Confirmation of the biosynthetic synthesis of AgNPs was achieved through the detection of a surface plasmon resonance (SPR) maximum absorption peak at 420 nm in the UV-Vis absorption spectroscopy analysis. Furthermore, antibacterial efficacy against multidrug-resistant human infections was demonstrated by these biosynthesized nanoparticles. silver nanoparticles and nanocomposite show maximal antibacterial activity. The silver nanoparticles were incorporated into MgO to reduce the band gap, resulting in the successful preparation of a silver-doped MgO nanocomposite. The photocatalytic efficacy of the produced nanocomposite photocatalyst was evaluated by monitoring the degradation of phenol red (PR) dye in an aqueous solution. A maximum of photocatalytic breakdown of PR was reached during 80 minutes under direct sunlight. To the best of our knowledge, this is the first study to use silver dopped MgO nanocomposite produced from *thelypteris noveboracensis* as a photocatalyst for effective PR dye degradation.

Strongyloides papillosus in smallruminants: Prevalence, risk factors, and health impacts in district kohat

Muhammad Muneer[1], Kalim Ullah[1]
[1]*Department of Zoology, Kohat University of Science and Technology, Kohat*
Khyber Pakhtunkhwa, Pakistan
[*]**Corresponding Author Email**: muneerkt175@gmail.com

Strongyloides papillosus plays an important role in causing anemia and a severe threat to the health of small ruminants. Although this cross-sectional study aims at determining the effect of *Strongyloides papillosus* on hematological and biochemical parameters in small ruminants in the district of Kohat. There were 100 sheep and 100 goats observed at the Campus Veterinary Research Institute Kohat from June 2023 to August 2023. Out of which, 19 sheep (19%) and 17 goats (17%) were found positive for *Strongyloides papillosus* infestation. Adults (>12 months) were significantly more susceptible to *Strongyloidespapillosus* infection as compared to youngones (≤ 12 months).Season (month July) and gender female(sheep and goats)were the risk factor thatinfluenced the highest prevalence of *Strongyloides papillosus* infection in small ruminants. Tenapparently healthy sheep and goats (control group) that were negative for *Strongyloides papillosus* infestation were selected and subjected to hematological and

biochemical investigations, and they served as a healthy control group. Sheep and goats positive for *Strongyloides papillosus* infestation were selected as the infected group, with 10 positive cases. There was a significant ($p<0.05$) decrease in the red blood cells (RBC), hemoglobin (HGB), hematocrit test (Hct), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), red cell distribution width (RDW-CV), platelet count (PLT), and mean platelet volume (MPV), whereas there was a significant ($p<0.05$) increase in white blood cells (WBC), Alanine aminotransferase (ALT), and alkaline phosphatase (ALP) in infected animals. While blood urea nitrogen (BUN) and total cholesterol (TCHO) were not significantly ($p > 0.05$) different between the control and infested sheep and goats.

Keywords:*Strongyloides papillosus*, Small ruminants, Nematodes, Hematological Biochemicalparameter, Risk factors

Analyzing User's Sentiments Towards Artificial Intelligence (AI) Tools Using Advanced NLP Models

Zoraiz Elya[1], Saima Hassan[1]

[1]*Institute of Computing, Kohat University of Science and Technology, Kohat, Pakistan*

This study examines public opinion towards AI tools using Twitter's data. It analyses over 500,000 tweets using a combination of advanced Natural Language Processing (NLP) models, such as DistilBERT and RoBERTa, and the rule-based VADER model. Individual tone/sentiments about AI tools are classified into positive, negative, and neutral categories employing polarity detection. The results indicate that RoBERTa performs exceptionally well with an accuracy of 95.36%, whereas DistilBERT and VADER reach an accuracy of 93.42%, and 93.74%, respectively. Furthermore, word clouds and other visual reports are excellent sources of information about the dominant sentiment categories. The study emphasizes the importance of understanding public perceptions of AI for ethical development and responsible implementation of these emerging tools.

Partition Dimension of Generalized Hexagonal Cellular Networks and its Application

Rabnawaz Bhatti[1], Muhammad Kamran Jamil[1], Muhammad Azeem[1], and Prasanna Poojary[2*]

1Department of Mathematics, Riphah International University Lahore, Pakistan

2Department of Mathematics, Manipal Institute of Technology Bengaluru, Manipal Academy of Higher Education, Manipal, India

[*]**Corresponding Author Email:** poojary.prasanna@manipal.edu

The notion of partition dimension was initially introduced in the field of graph theory, primarily to examine distances between vertices. The local partition dimension extends this idea by incorporating specific conditions into how vertices are represented. In graph theory, it is customary to represent the partition dimension of a graph as $pd(G)$. Network localization, on the other hand, is the process of precisely determining the position of nodes within a network concerning a selected subset of nodes, called the locating set. The smallest size of its locating set is used to represent the locating number of a network. The generalized hexagonal cellular network provides an innovative framework for network planning and analysis. In our study, we investigate the partition dimension of a generalized hexagonal cellular network and provide a rigorous proof of its exact partition dimension. Hence, our approach ensures the distinct recognition of each node within a generalized hexagonal cellular network. Additionally, we explore the utilization of the metric dimension in flood relief camping by the National Disaster Management Authority (NDMA) Pakistan during floods in 2022. NDMA established relief camps and relief centers with unique codes to rescue humans and animals.

Image- based Guava plant Disease detection using multi fusion approach

Nabiha Komal[1]
[1]*NCBA & E Multan Campus*

Guava stands out for its unique sweet taste and high dietary fiber content, making it a nutritionally beneficial food choice. Packed with an array of essential nutrients, guava stands as a vital source of various vitamins. Its nutritional composition offers multiple health benefits, such as diabetes management, blood pressure regulation, thyroid function improvement, scurvy prevention, and relief from gastrointestinal issues like diarrhea and dysentery. In agriculture, the health of plants is critically important, influencing crop yields and, consequently, global food security. Plant diseases represent a significant threat, causing considerable economic impacts annually. This underscores the urgency for early and accurate disease detection and diagnosis. This study focuses on the precise classification and detection of seven predominant guava leaf diseases (Anthracnose, Leafspot, Mummification, Red Rust, Rust, Canker, Wilt) using Machine Learning (ML) methodologies. We propose an innovative fusion approach for ML models, integrating several robust algorithms—K-Nearest Neighbors (KNN), Support Vector Machines (SVM), Artificial Neural Networks (ANN), and Random Forest—into a unified and enhanced framework through a meta-learner. This sophisticated method aims to accurately diagnose and categorize various guava leaf diseases, seeking to notably improve disease management in the agricultural sector. Moreover, we employ data pre-processing and augmentation techniques to refine the data quality and expand the dataset, thereby enhancing the training efficiency of our approach. Our findings reveal that the proposed ensemble model surpasses other ML models, achieving a remarkable accuracy of 97.32%. This study not only offers a significant contribution to plant disease management but also paves the way for advanced agricultural practices through the application of machine learning.

Biodegradation of polystyrene by fungal strain isolated from dumping sites of Bahauddin Zakariya university

Aimen Fatima[1], Humera Nazir**[*1]**,
[1]*Department of Microbiology and molecular Genetics,Bahauddin Zakariya university Multan, Pakistan.*

Polystyrene is a very rigid plastic, and it is available for use in both crystalline and foamed form. It has a vast variety of uses in many industries that include packaging, building, and transport of material. Polystyrene is a synthetic polymer that can persist in nature as a solid waste for longer periods of time Polystyrene disposal is one of the greatest problems faced by the environment today, as its vast amounts remain non-degradable. Biodegradation of polystyrene in natural environment is a very time taking process. This study was to examine the process of biodegradation of polystyrene and to find different ways to catalyse this process. For this purpose, the ability of certain fungi to use polystyrene as a carbon source was tested to degrade the polystyrene efficiently. Microorganisms were isolated from decaying polystyrene foam and cultured on the Sabouraud Dextrose Agar (SDA) to only get those that could grow with polystyrene for a longer period. A specific colony of fungus was selected from the multiple colonies and tested for its ability to degrade polystyrene. After 30 days of incubation, the results were investigated through Fourier Transformed Infrared (FTIR) spectroscopy. The peak 3744.72 cm-1 from the control group was reduced to 3321.20 cm-1 in the experimental plate showing structural changes.

The outcomes included abrupt changes in the weight of polystyrene films and structural changes in it. The result suggested that the isolated microorganisms had the ability to degrade polystyrene. However, the biodegradation was quite slow. The peaks in the FTIR graphs showed that there were several structural changes occurring in the film. The peaks 2365.34 cm-1 and 2307.57 cm-1 corresponding to alkene group were reduced to 908.64 cm-1 showing clear results of degradation. Some fungal growth was also seen on the plastic film. The overall results of the experiment advocated that the isolated fungal strains used polystyrene as their carbon source and hence they could be used for the biodegradation of polystyrene in the natural environment.

High Fat Diet Leads Towards Obesity and Hematological and BiochemicalChanges in Rabbits Blood Parameters

Saima Noor[1]*, Najam unnisa[1],Irum Habib[1], Nimra ghani[1] ,Muhammad zafar[1,] Inam ul Allah[1]
[1]*Department of Zoology , Government Girls College No. 2 ,Dera Ismail Khan ,KPK, Pakistan*

Prevalence of obesity worldwide has reached pandemic proportions. Despite the increasing evidence in the implication of phenolic compounds in obesity management. Olive oil (OO) and mulberry leaves (MLP) have a large number of phenolic profile. Effects of OO and MLP (Morus alba L.) on glucose and lipid metabolisms in high- fat (HFD)and high-fat sucrose diet- induced .The purpose of this study was to investigate the antiobesity effect of combinational MLP and OO and determine the influence of the diet on hematological and serum biochemistry of the growing rabbits .The experimental diet had include control diet, HFD, HFD+OO, HFD+MLP, and HFD+OO+MLP, in treatment 1,2,3,4 and 5 respectively with two rabbits pretreatment and for ten week feeding trial .after the feeding trial ending , were collected the blood sample from each rabbits through ear vain using a sterilized disposable syringe .Test were conducted in the laboratory .All the hematological parameter measure while the WBC ,Mid%, Gran #, MCV, MCHC, value show a significance difference $p<0.05$, the serum analysis of the study show that significance difference in Blood glucose fasting level ,S. Albumin , Cholesterol , LDL and Triglycerides the value $p<0.05$,and have no significance difference in ,the Blood urea, S. Creatinie ,S. Bilirubin ,S.Salt, S. Protein and HDL level .In serum Post Hoc test the cholesterol level and HDL and triglycerides have a HFD the least significance with control group, HFD+OO group ,HFD+MLP group, $p<0.05$,blood glucose fasting of HFD have significance with control group and HFD+OO+MLP group , S. Albumin of HFD have significance difference in all groups .The results suggest that both OO and MLP benefit for health, as they respectively decreased weight without need for administration of a low- calorie diet, and also good effect on the hematological and serum parameter of the rabbits.

Keywords: obesity, olive oil, mulberry leaves, hematology, serum, rabbit, high fat diet

Weapon Surveillance and detection system using Yolo-NAS: A novel approach to public safety

Muhammad Waqas Khaliq[1]
[1]*Institute of Computing, Kohat University of Science and Technology*

A paradigm shift in the globe is the deepening apprehension of public safety in crowds demands the invention of modern weapon surveillance and detection methods. This paper offers a new weapon monitor and detection system named YOLO-NAS-based Weapon Surveillance and Detection System (WSDS). The system is powered with advanced deep neural network technology and contemporary computer vision algorithms that allow for faster, more accurate weapon detection, overcoming issues like partial or full occlusion and spatial resolution limitations. The study aims to provide a theoretical foundation by presenting the object detection concept in computer vision, explaining the YOLO-NAS architecture, and investigating the methods utilized by real-time monitoring systems. The methodology will involve: data gathering from multisource, dataset preparation, the training of the YOLO-NAS model, and the performance evaluation by the use of metrics such as precision, recall, and mean average precision. The YOLO-NAS structure embeds existing surveillance cameras, utilizing the central processor to execute dynamic detection thereby triggering the alarm system to activate the response routine immediately. The study measures the capacity, tailoring, and the fitness of system to the public and utilities such as schools, shopping areas, and transit stations. The results and findings part presents the effectiveness of the method and makes a comparison with those that have been mentioned before. The author will discuss how this solution reshaped current practices in the area of public security. The paper concludes with the identification of the project's limitations providing recommendations

for improving these and stress on the fact that the WEAPON SURVEILLANCE & DETECTION SYSTEM based on YOLO-NAS let us move to a new level of modern weapon surveillance systems.

Synthesis and characterization of Dialkyl Tin(IV) poly methy methacrylate composites for antibacterial application

Jawairya noor[1,] Shaukat Shujah[1] , Muhammad Sajjad[1,] Mubashir Hussian[1]
[1]*Department of Chemistry, Kohat University of Science & Technology (KUST), Kohat-26000, Pakistan*
[*]**Corresponding Author Email:** jjawairyanoor@gmail.com

In the current study, a [O, N] donor ligand (6E,N'E) -N'-(2-(2-hydroxy-5-methoxyphenyl) ethylidene)-6-(2-(2-(2-hydroxy-5-methoxyphenyl) ethylidene) hydrazinyl) hexanehydrazide was synthesized by the reaction of adipic dihydrazide with 5-methoxy salicyldehyde in ethanol. A series of three diorganotin (IV) derivatives of these compounds have also been synthesized in good yields by refluxing the compounds with the appropriate organotin (IV) chlorides in dry toluene and ethanol for 7-8 hours. The synthesized compounds were characterized by a variety of spectroscopic techniques, including UV-Visible, FTIR, and NMR (^{1}H, ^{13}C). The spectroscopic investigation was used to check the structure, coordination mode of the ligand, and geometry of the tin in the synthesized ligand and complexes. All the synthesized complexes with [O, N] donor ligand maintain their geometry as trigonal bipyramidal both in solution and solid state. The composites of synthesized complex with PMMA (Poly methyl methacrylate) were then prepared. The synthesized organotin IV PMMA composite showed high effectiveness against bacteria. Antimicrobial activity of these polymers was performed by agar well method and disc diffusion method. All polymers were showing good activity against different microbes.

Keywords: Oxygen Nitrogen Donor Ligand, Organotin (IV) complexes,Dialkytin-PMMA composite, Antibacterial Activity.

Seroprevalence of brucellosis in small ruminants of district Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan

MehnazMunawar[1,] Muhammad Fahim Ullah Khan[2], Muhammad Zarar Khan[3], Bushra Khalil[4], Inam Ullah[5]
[1]*BS Zoology Govt Girls Degree College No.2 Dera Ismail Khan*
[2]*Lecturer in Clinical Medicine and Surgery, FVAS, Gomal University, Dera Ismail Khan*
[3]*Department of Theriogenology University of Veterinary and Animal Sciences Lahore*
[4]*BS Zoology Govt Girls Degree College No.2 Dera Ismail Khan*
[5]*Department of Zoology, Sub Campus Gomal University Tank, Khyber Pakhtunkhwa Pakistan*

Brucellosis is the fatal disease of large and small ruminants worldwide. Due to this disease heavy economic losses occur every year in the world. This study aimed to investigate the prevalence and risk factors of Brucellosis among small ruminants in Dera Ismail Khan District, KhyberPakhtunkhwa, Pakistan. A total of 100-blood samples were collected from suspected and healthy goats and sheep in seven different areas of the district, including Diyal, Parova, CVH, Dahotar, Muryali, Diwala and FVAS dairy farm at Gomal University. Brucellosis was confirmed through Rose Bengal Plate Test (RBPT). The results showed that there was significant difference in the prevalence of Brucellosis between different areas of D. I. Khan. The highest seroprevalence rate was observed in Diyal village, with 23.06% of animals testing positive for Brucellosis using RBPT. Parova had the second-highest seroprevalence rate at 16.66%. Dairy Farm, CVH, Dahotar, Muryali, and Diwala Basti had no positive RBPT cases. Overall, the seroprevalence rate across all areas was 8%. The highest prevalence of Brucellosis was 23.06% in Diyal as compared to other areas of D. I. Khan. There was no significance difference in the prevalence of Brucellosis between male and female animals. There were significantly higher Brucella positive cases reported in goat as

compared to sheep in district D I khan. Finally in conclusion, brucellosis is highly present in goats as compared to sheep and risk factor also affect the sero-prevalence of brucellosis in sheep and goats in district D I Khan.

Key words: Seroprevalence, Brucellosis, Goats, Sheep, D.I. Khan, RBPT Test.

Therapeutic potential of Mango leaves powder against diabetes mellitus

Raheela Akram[1], Noshaba Fiaz[1], Misbah Batool[1], Arwa Iqbal[1]
[1]*Institute of Food science and technology (Govt. College university Faisalabad Layyah campus)*[1]
[*]**Corresponding Author Email: bajwaraheela786@gmail.com**

Diabetes mellitus is a metabolic disorder occurs due to hormonal deficiency of insulin. Awareness of the diabetes mellitus is necessary however the person with balanced diet and sugar level are less likely to be diabetic. Mango leaves powder is more effective in controlling the sugar level in blood. As the leaves are rich with mineral, antioxidants and also regulate the ability of cells to absorb insulin also helps to increase sufficient insulin production. So it reduces the weight and maintains blood pressure. In this experiment the subjects showed a remarkable reduction in blood sugar level as compared to the person who only followscounseled diet and medication. But its regular use may cause a lot of body weight loss, flushing out of stomach digestive disorders and stomach ulcer. That's why it needs a less work so it can be used with regular diet and don't cause any adverse effects on diabetic person.

Key words: Mango leaves powder,diabetes mellitus, counseled diet, insulin,medication.

Silent Scars: Exploring the Dynamics of Peer Victimization-Related Unexpressed Agony on University Students in Lahore, Pakistan

Mudasar Ali Nadeem[1], Kiran Ikram[2]
[1]*Department of Sociology, Government College University Faisalabad*
[2]*Department Sociology, Lahore College for Women University*

Peervictimization is recognized as a profound and enormous social problem globally and nationally because of its worst consequences including social isolation, low self-esteem and poor social well-being. It is a repeated activity of abuse and violence by a peer or group for coercion of power verbally, emotionally, socially and physically. The present study aims to explore the experiences of peer victimization among university students including the patterns, sources and consequences. Peer relationships and their importance in an individual's life are inevitable. The term peer victimization is commonly labelled under bullying, harassment such as physical, verbal, or psychological repetitive abuse. The research laid its foundation in the interpretive paradigm thus conducted using qualitative research methods. For said purpose, 12-15 in-depth interviews were conducted with young adults (18-25) using a purposive sampling technique. The data was analysed using thematic analysis. The findings of the study suggest that sources of peer victimization among university students are physical appearance, trends following, financial status and power display. The findings of this research can be used by student counsellor of the institutions in designing policies where victimization and bullying cannot stop the social inclusion of every individual or students in the learning and well-being collectively.

KEYWORDS: Peer Relationship, Peer Victimization, Bullying, Social Well-being, Social Adjustment, Social Exclusion.

Assessing the potential of sorghum as a biomass cropfor biofuel production in Pakistan

Asif Ameen[1]
[1]*Plant Physiology Section, Agronomic Research Institute, Ayub Agricultural Research Institute, Faisalabad 38850, Pakistan*
Correspondence: Email: asifameen2007@gmail.com

Sorghum has recently gained attention as biofuel feedstock among numerous candidate energy crops. This study evaluates the morpho-physiological attributes, biomass productivity and chemical composition, and theoretical ethanol yield of ten sorghum cultivars grown under the agro-ecological conditions of Dera Ismail Khan during the growing season of 2019. Cultivars included nine synthetic varieties and a hybrid, previously all cultivars were being cultivated for the purpose of forage and grain production. Results revealed that cultivars differed significantly in morpho-physiological characteristics (i.e., plant height, stem diameter, flag leaf area, chlorophyll content, and photosynthesis rate), fresh and dry biomass yield, biomass nutrient contents (i.e., nitrogen, phosphorus, and potassium), energy related attributes (i.e., soluble sugar, cellulose, hemicellulose, lignin, ash, total carbohydrates), and theoretical ethanol yield ($p<0.05$). Cultivars Sorghum-2011, YSS-42 and YS-16 performed superiorly among all tested cultivars in terms of plant growth, biomass yield and quality, and theoretical ethanol yield ($p<0.05$). Hybrid cultivar SX-17 proved best for the biomass soluble sugar contents, while cultivars Sorghum-2011 and YSS-42 were superior in providing lignocellulosic biomass for conversion to bioethanol. These findings provide important insights for the researchers to select material in their breeding programs for varietal improvement.
Keywords: Morpho-physiology, Biomass accumulation; Biomass quality; Energy related attributes; Total carbohydrates; Theoretical ethanol yield

Employing the capabilities of explainable artificial intelligence for deciphering and making prognostication regarding lung cancer

Muhammad Asif Mehmood[1], Muhammad Adnan[1]
[1]*Institutes of Computing, Kohat University of Science and Technology*

The prognosis and diagnosis of medical conditions have been transformed by the introduction of Artificial Intelligence (AI) into healthcare systems. The application of Explainable Artificial Intelligence (XAI) approaches in oncology, and specifically lung cancer, has great potential for improving prognostic and diagnostic accuracy. In order to provide a better understanding of the course of the disease and the effectiveness of treatment, this research investigates the possibility of using Explainable Artificial Intelligence (XAI) approaches to interpret complex patterns found in lung cancer data. Through the clarification of Artificial Intelligence (AI) models' decision-making process, Explainable Artificial Intelligence (XAI)not only offers significant insights into the characteristics that influence forecasts but also improves openness and confidence in prognostication powered byArtificial Intelligence (AI). This paper provides an in-depth analysis of the current literature and approaches in order to clarify the progress, obstacles, and future directions of utilizing Explainable Artificial Intelligence (XAI)to interpret and predict lung cancer.
Keywords: Artificial Intelligence (AI), Explainable Artificial Intelligence (XAI), Prognostication, Forecasting.

Identification of Guava Species using CNN Model

Anza Riaz[1]
[1]*National college of business administration and economics Multan campus*

The identification as well as the categorization of plants plays a key role in understanding, protecting, and maintaining biodiversity. Classifying plants using the traditional method is complex because it involves a high level of skill and experience. Classifying plant leaves is a difficult task due to the existence of similar characteristics in several plant species. In the present day, machine learning has been replaced by deep

learning in the field of image processing research. This paper proposes an automated system for identifying plant species based on leaf characteristics. Using a deep convolutional neural network, this task is completed with greater accuracy. The CNN architecture proposal classifies the Guava as follows: Golden Guava, Multani Sada Gola, China Gola, Black Guava, Hyderabadi Safeeda, Sadda Bahar Gola, Strawberry Pink Gola, and Larkana Surahi. The dataset consists of 800 images organized into eight classes, with 100 images per type. The images were captured on the agricultural land in Pakistan. The proposed CNN obtains a classification accuracy of 96.25%. The proposed study could play a significant role in the early and accurate identification of guava varieties, and it would also be beneficial for the national economy's export quality measures.

Significance of Nanoparticles to Optimization ofMitigating Heat Transfer Deterioration in Upward Flow of Supercritical Water via Wavy Tube

Bagh Ali[1]

[1]*School of Mechanical Engineering and Automation, Harbin Institute of Technology, Shenzhen 518055, China*

[*]**Corresponding Author Email:** bagh@hit.edu.cn

To address the issue of Deteriorated Heat Transfer (DHT) in upward flow of Supercritical Water (SCW), the effectiveness of wavy geometry is investigated through numerical analysis. The obtained results of wall temperature in the smooth channel are compared with experimental data, yielding satisfactory agreement. The impact of different proportions of wavy channels on wall temperature is examined. A Thermo-Hydraulic Performance Evaluation Criterion (PEC) is proposed, utilizing dimensionless parameters Nu/Nu0, f/f0, and PEC = (Nu/Nu0)/(f/f0)1/3 to assess the performance of the studied geometry. The findings indicate that the wavy channel mitigates and delays DHT downstream, resulting in a 200 K reduction in temperature peak. The average PEC is improved by 60% when employing a wavy geometry with a 0.5 mm amplitude (A). It is concluded that the laminarization of the cross-sectional velocity profile caused by buoyancy-induced flow is counteracted by the wavy section, which restores the velocity profile to its normal state through the nozzle acceleration effect. Furthermore, the nozzle acceleration enhances Turbulent Kinetic Energy (TKE) in the boundary layer, thereby promoting turbulent heat transfer.

Evaluating effects of different planr based extracts and their combinations against *Aedes aegypti*

Shahid Majeed[1*], Abdur Rahman[1],Hamid Bashir[1],Rashad Rasool Khan[1],Muhammad Sufian[1],Rao Muhammad Sajid Shareef, Muhammad Shahid Zafar, Amna Ishaq[1], RameenJavaid[1], Sana Iftikhar[1], Rabia Akbar[1], Waqar Sattar[1]

[1]*Department of Entomology, University of Agriculture Faisalabad, Pakistan*

[*]**Corresponding Author Email:** shahid.majeed@uaf.edu.pk

Mosquitoes are significantly important in public health as they transmit many vector-borne diseases likedengue fever (DF), malaria, and filariasis to millions of people worldwide. Although there is no effective vaccination for the prevention of dengue, avoiding mosquito bites is one method to control mosquito populations. Due to the extensive uses of synthetic repellent, mosquitoes established resistance against them. The plant-based extracts are used as an alternative to targeted insecticides. Therefore, current study aimed to examine the oviposition-deterrent, larvicidal and repellent efficacy of plant-based extracts Clove (*Syzygiumaromaticum*),Cinnamon (*Cinnamomum verum*),Lemon (*Citrus limon*),Orange (*Citrus sinensis*), Onion (*Allium cepa*), Garlic (*Allium sativum*),Lemon grass (*Cymbopogon citratus*),andAloe vera (*Aloe barbadensis*)against *Aedes aegypti* under laboratory conditions. To observe the oviposition deterrence, the extract-treated filter papers were provided to the females for oviposition and after 48-hours, the number of laid eggs was counted by using an eyepiece lens. For evaluating the larvicidal efficacy of extracts, the extracts were dropped in a measured amount (2ml/L) in a plastic box containing twenty *Aedes*

aegypti larvae. A number of dead larvae were counted after 24 hours of application. To observe repellency, the prepared extracts were applied in a specific amount on hand and treated hand was exposed to the twenty adult females present in the mosquito cage and a number of attracted and repelled adults were counted every minute for 1 hour. According to the results, maximum repellency was observed by clove, and lemon peel extract compared to other botanical plants. However, lemon, clove, garlic, onion, and garlic with lemongrass provedto be the best oviposition deterrent. While, clove, lemon peel, orange and lemon peels, and lemongrass combination were effective against the mortality of *Aedes aegypti* larvae.The establishment of plant-based products against *Aedes aegypti* could lead to an innovative approach to managing mosquito populations and disease dispersion.

Keywords: *Aedes aegypti*, Plant-based extracts, Behavioral bioassay, Oviposition deterrent, Larvicidal, Repellent.

Detection and Analysis of Toxic Particle Exposure in Sugar Mills: Implications for Worker Safety and Environmental Health

Eman Noor[1]

[1]*Department of Chemistry: Govt. Girls Graduate College Layyah*

The objective of the study was to figure out the level of pollutant particle exposure in sugar mills and to investigate the effects of it not only for workers' safety but also for the ecological health. The goal was to trace and quantify the pollutant, examine workers' exposure route and measure ecological impacts. The second task was to define and evaluate existing safety standards and provide proposals of rules and guidelines to mitigate risks associated with the exposure to radiation.The research was carried out in a multi-method style that involved including sections such as site measurement, sampling, and analyses in the sugar mills. Mechanism was focused on assessing the concentration of ambient air and also identifying the constituents of the particles from the solid waste processing. Data gathering comprised employee interviews to find out whether they look favorably upon safety precautions and health problems associated with the working environment.Initially, observations yielded significant levels of bad pollutants including dust, silica and organic matter at the sugar factories. Maintenance personnel, particularly station operators, grinding, and packing stations were all exposed to elevated particle loads in a dusty atmosphere with a concentration that exceeds the set safety limits. This analysis established the link between the particular particles and the health consequences of people who worked at these facilities. Also, soil and water contamination testing made assessment of environmental hazards possible, primarily around sugar mill sites.The results demonstrated the high necessity of more demanding safety standards and control systems aimed to ensure lower exposure and pollution levels in sugar mills, both for the environment and for workers. Moreover, there were additional actions taken to ensure that workers and other stakeholders became aware about current possible health risks. This was a crucial factor to ensure occupational healthiness in the manufacturing industry.These mentions marked out the full menagerie of matters ranging from industrial health and environmental management within the sugar industry and the necessity of proactive remedies to safeguard human health and ecological integrity.

Key Words: Sugar mill, air pollution, water pollution, toxic particles, heavy metals,worker safety and environmental health.

The Contribution of the Mediterranean Germplasm Genebank to Genomics and Transcriptomic Research

Diana Lucia Zuluaga*, Emanuela Blanco, Anita Morgese, Domenico De Paola, Giacomo Mangini, Pasquale Luca Curci, Gabriella Sonnante

Institute of Biosciences and Bioresources, National Research Council (CNR), Via Amendola 165/A, 70126 Bari, Italy

***Corresponding Author E-mail:** diana.zuluaga@ibbr.cnr.it

The Mediterranean Germplasm Genebank is the plant seed collection housed at the Institute of Biosciences and BioResources (IBBR) of the Italian National Research Council (CNR). In total, this genebank comprises over 59,000 accessions representing 870 species across 203 genera and 39 families of herbaceous plants. Numerous samples have been collected over more than 50 years of activity and from different locations, primarily within the Mediterranean region.

The principal aim of the Genebank is the conservation of genetic resources spanning a wide range of crops relevant to Mediterranean agriculture, with particular emphasis on endangered agro-ecotypes. Seeds preserved in this collection are regularly utilised by IBBR researchers, as well as by other scientists through collaborative efforts. Besides the seed collection, IBBR also keeps a field collection of *Cynara cardunculus* (globe artichoke).

Thanks to this valuable resource, our research group has recently undertaken numerous investigations in the fields of genomics and transcriptomics, dedicating significant effort to analysing the relationships among varieties of some crop plants. Genetic diversity has been analysed in *Vigna unguiculata* and *Phaseolus vulgaris*, while a genome-wide SNP variation has been explored in a *Cynara cardunculus* collection. These studies were conducted using the genotyping-by-sequencing (GBS) approach, which enables rapid development of high-throughput SNPs for germplasm analysis. Additionally, our research group has acquired substantial expertise in the study of genomics, miRNomics and transcriptomics of *Triticum turgidum* ssp. *durum*, particularly in understanding the transcriptomic response of this species to nutrient deficiency and abiotic stress factors.

From Farm to Table: Comparative Analysis of chicken egg incubation during Natural and Artificial incubation processes

Muzdalfa Amin[1], Uzma Kareem[2], Irum Habib[3], Najam un Nisa[3], Inam Ullah[3, 4]*

[1]*Department of Zoology, Faculty of Basic Sciences, University of Agriculture Dera Ismail Khan, Dera Ismail Khan, KPK, Pakistan.*

[2]*Institute of Microbiology, Faculty of Veterinary and Animal Sciences, Gomal University, Dera Ismail khan, KPK, Pakistan.*

[3]*Department of Zoology, Government Girls Degree College No.2 Dera Ismail Khan, KPK, Pakistan.*

[4]*College of Wildlife and Protected Areas, Northeast Forestry University, No 26, Hexing Road, Harbin 150040, P.R.China*

***Corresponding Author Email:**inamullah3554@gmail.com

The research study was conducted in District Dera Ismail Khan in KP province of Pakistan. The City D.I.Khan is situated in the south eastern part of Province of KP, Pakistan. The research targeted the comparative analysis of chicken egg incubation during natural and artificial incubation process. The research was conducted on desi species of chicken commonly found in Dera Ismail khan. Experiments were performed on eggs and embryos of the domestic chicken (G. Gallus), White Leghorn variety. The hens were fed the same diet of standard chicken feed (88%) complemented by other protein sources, vitamin and mineral supplements. Eight eggs from one hen was taken and put in the incubator at the temperature (T) of 38 °C and 60% relative humidity. Another batch of 8 eggs from the other hen were put under a broody chicken. Both natural and artificial, the eggs were observed keeping in mind four parameters; chicken egg size, water loss, change in color and embryonic stages of the eggs. The results of the research study found insignificant changes in the size of the eggs during both incubation processes. Thus it was concluded that the type of incubation does not affect the size of eggs. The researcher found significant changes in the weight of eggs during both incubation processes. During natural incubation process it was found that the decrease in weight of the eggs was quite significant. When the weight decreased, from day 4 to day 15.In summary, artificial incubators are useful in emergencies, when you are hatching eggs from a breed that won't set, when you want to hatch large numbers of eggs, or when you want to hatch at times when no hens are broody. Artificial incubators can only imitate nature. The hatch rate is considerably lower for artificial incubators than for natural

incubation. Artificial incubators can often only hatch 60-80% of the eggs, while hens can usually hatch 90-100%. Artificial incubators are very different from natural incubation. It is extremely hard to keep the temperature steady. Artificial incubators are very sensitive, and even a slight touch could make the temperature way off. Either way, it is also almost impossible to exactly recreate the temperature and natural conditions that the hen creates. Natural incubation and artificial are both good ways to incubate eggs, but neither way is completely concrete. You can't expect all of the eggs to hatch, and even if they do hatch, they may not survive. Chicks and eggs are very fragile creatures, and require a lot of care and responsibility. But if you're careful and patient, you may have some new chicks on your hands!

Key words: Natural incubation, Artificial incubation, chicken eggs.

Application of Food Technology for Optimal Nutrition and Food Safety

*Asma Hassan[1], Khizar Hayat[2], Zaiba Manzoor[1]

[1]*Department of Human Nutrition & Dietetics,The Physio College, Multan, Pakistan.*

[2]*Department of Food Science and Technology, MNS- University of Agriculture, Multan, Pakistan*

[*]**Corresponding Author Email:** *asmahassan786pk@gmail.com*

Consumers' decisions on what meals to eat are getting more and more influenced by their worries about nutrition and health. Rising public interest in food supply will create new opportunities for product creation, along with rigorous research and technical advancements in the field of food science. Both the European Union's (EU) regulation on health claims and the World Health Organization's (WHO) Food-Based Dietary Guidelines are crucial in limiting public access to information about a healthy diet and expanding the variety of foods available to consumers. The food industry might contribute by creating fewer high-calorie items and reducing processed food's concentration of table salt, extra sugars, partially hydrogenated oils, and short-chain fatty acids. The main areas where the development of a new framework for these issues is being driven by food science and technology. Dietary recommendations based on food include approaches for food storage, nutritional restoration and fortification, and food physics the evolution of healthy designer foods and functional foods. Food industry professionals frequently employ food safety and quality audits for a range of goals, including evaluating management systems, acquiring certification to particular food safety and quality standards, inspecting the condition of facilities and goods, ensuring legal compliance, and more.The production of fewer high-calorie products and the reduction of processed food's. The law of the European Union (EU) on health claims might be helpful. Food physics, procedure of food storage and protection, nutrient renovation and enrichment, and the creation of health-focused designer foods and functional foods are the main areas where food science and technology are being pushed to develop a new substructure for these food-based dietary instructions.Food industry professionals frequently employ food safety and quality audits to achieve a range of objectives, including as assessing management systems, obtaining certification to particular food safety and quality standards, examining the condition of facilities and goods, assuring legal compliance, and so on.

Keywords

Designer foods, Hydrogenated,Short chain fatty acids,Evolution.

Thermal characteristics for the flow of Williamson hybrid nanofluid ($MoS_2 + ZnO$) based with engine oil over a streched sheet

Asmat Ullah Yahya[1]

[1]*Department of Mathematics, KhwajaFareed University of Engineering and Information Technology, Rahim Yar Khan, Pakistan,*

The result for enhanced heat transfer to manage increasing heat density of miniature and several other technical processes have urged to analyze thermal transports of hybrid nanofluids. Molybdenum disulfide (MoS_2) and Zinc oxide (ZnO) are hybridized as a very dilute homogenous mixture in the bulk engine oil. The flow of this colloidal fluid with heat transfer occurs through pours medium over a stretching sheet. Moreover, an invariant magnetic field, thermal dissipation, and the heat source are incorporated. Theoretical formulation resulted as, set non-linear partial differential equations. To obtain a numerical solution, similarity transform is hired to yield corresponding ordinary differential equations. Computational software Matlab is availed to run the code for the Runge-Kutta method with shooting technique. A deep insight into the problem is inspected by varying the inputs of the dependent functions influential parameters. It is perceived that the flow speed is hindered by the growing inputs of parameters of magnetic field and porosity. It also comes to know that the velocity $f'(\eta)$ becomes slower with augmentation of φ_2 but the temperature rises. A suitable range of the emerging parameters is tried to observe the variation of physical quantities such as skin fraction facts, velocity, local Nusselt number, and temperature of the fluid.

Understanding How Corn Silk Can Help: A Review Using Modern Analytical Methods

*Sana Zafar[1],Sonia Rasool[1], Noshaba Fiaz[1]
[1]*Department of Food Science and Technology, Government College University Faisalabad, Layyah*

This set of articles uses modern techniques like GC-MS and LC-MS to examine current research on corn silk and its potential medical applications. Technologists have discovered significant bioactive substances in maize such as phenolic acids, fatty acids, terpenoids, flavonoids, and polyphenols. These nutrients decrease cholesterol, manage blood pressure, and increase immunity among other health advantages. The study also looks at Thailand's agricultural environment, where maizewhich has historically gotten little attentionis now being researched. Significant phenolic and flavonoid content appears in water-extracted corn silk (Craw) and 50% ethanol-extracted corn silk (Rcs50), showing desirable characteristics including antioxidant and anti-aging actions. A comprehensive understanding of the active ingredients is provided by high-performance liquid chromatography (HPLC) analysis. Improving the extraction of bioactive materials from maize silk with an emphasis on flavonoids and antioxidant ability is the subject of another area of research. These results highlight the nutritional potential of corn grains and point to possible uses in the food and pharmaceutical industries.
Keywords: Corn silk extractsBioactivityHET-CAMCytotoxicityMolecular docking, Maydis stigma; bioactivity; enzyme inhibition; Design of Experiment, corn silk; chemical constituents; pharmacological effects
Corresponding author: sanarai1214@gmail.com

Fermentation in food products

*Eman Arshad[1], Noshaba Fiaz[1], Misbah Barool[1]
[1]*Department of Food Science and Technology, Government College University Faisalabad, Layyah*
***Corresponding Author Email:** emanarshad2213@gmail.com

Fermented foods became an important part of the diet. Fermentation has been associated with many health benefits. The two principal advantages of food fermentations over other processes are to add flavor and increase shelf life to prevent spoilage. Fermented foods are yogurt, cheese, sauerkraut, bread, apple cider vinegar, and etc. Some kinds of microorganisms which are involved in that fermented foods are lactobacillus bulgaricus, streptococcus thermophillus, bacillus. Fermented fish is a common food in the orient and may have the first product made by fermentation. Flavor is especially important in vegetable diets based on bland foods such as rice. Shoyu is the best known Oriental food fermentation, and it is very widely used as flavoring agent. Fermented foods may reduce the risk of hypertension and heart diseases and help in digestion. These foods add tang and zest to your meals and are an

excellent addition to a healthy diet. These foods provide many health benefits such as anti- oxidants, anti-microbial, anti-fungal. Blending ancient wisdom with modern technology, new and refined forms of fermentation are arising which could help to future proof our food system and minimize it's environmental effect.

Keywords: Fermented foods, shelf life, fermented fish, bland foods, anti-microbial.

Characterization and identification of peanut allergens

*Urwa Arshad[1], Noshaba Fiaz[1], Misbah Batool[1]

[1]*Department of Food Science and Technology, Government College University Faisalabad, Layyah*

[*]**Corresponding Author Email:** urwaarshad4416@gmail.com

Peanut is a nutrient-rich popular food. However, it has been estimated that 1%- 2% of the world's population are allergic to peanut which can cause serious allergic reactions. The purpose of this study was to investigate and understand the specific proteins in peanuts that cause allergic reactions. Peanut allergy can cause a severe reaction called anaphylaxis. Peanuts are a common food allergen. The increased prevalence of peanut food allergy in recent years has led food processors to be more proactive in their responsibility for preventing peanut contamination by implementing good manufacturing practices (GMP) and allergen control programs. Peanut allergy occurs when your immune system mistakenly identifies peanut proteins as something harmful. Methods of reducing peanut allergic potential are physical methods, chemical methods and biological methods. Most people with a peanut allergy need to avoid all products that could contain even trace amounts of peanuts. Palforzia (peanut allergen powder) is the new treatment for peanut allergies. Peanut allergies can currently be managed by avoiding peanut consumption and carrying emergency medications like epinephrine. However, ongoing research is exploring potential treatments for peanut allergies. Conclusion of the peanut allergy is the majority of children with peanut allergy remain allergic indefinitely and are at high risk for accidental ingestion. The prevalence of peanut allergy increased 3.5- fold over the past two decades reaching 1.4 -2% in Europe and the United States.

Keywords: Peanut, Allergen, GMP (Good manufacturing practices), Anaphylaxis, Epinephrine

Enhancing Climate Resilience in Pakistan's Agriculture and Food Sectors

Iqtidar Hussain[1] and Zuhair Husnain[2]

1. Department of Agronomy, Faculty of Agriculture, Gomal University, Dera Ismail Khan, KP-Pakistan.
2. Department of Agronomy, PMAS Arid Agriculture University, Rawalpindi, Pakistan

email: zuhair@uaar.edu.pk

[*]**Corresponding Author Email:** iqtidarhussain453@yahoo.com

Climate change poses a significant threat to global, regional, and local food security. Disruptions in food availability, reduced access, and compromised quality are likely consequences. In Pakistan, the agricultural sector is already experiencing adverse effects due to climate change. Key factors include rising temperatures, altered precipitation patterns, extreme weather events, and water scarcity. Notably, crop yields have declined by 4% to 10% across all food crops. Cereals like wheat, maize, and rice have seen losses of 5% to 15%, while fruits, vegetables, and sugar crops have also been affected. Oil seeds and legumes have experienced losses of 5% to 7% and 4%, respectively. To address these challenges, this study integrates climatic, agricultural, and energy data. Enhancing systematic climate observation programs is crucial for informed decision-making. The focus is on developing strategies to mitigate and adapt to climate change's impact on food security and energy demands in Pakistan, ensuring preparedness against natural catastrophes in vulnerable areas. As we navigate this critical issue, collaboration among policymakers, researchers, and communities becomes essential to safeguarding our future food supply.

Examining Pea Hull Fiber (PHF): Deciphering Its Nutritional Value and Health Effects

*Sonia Rasool[1], Noshaba Fiaz[1]
[1]*Department of Food Science and Technology, Government College University Faisalabad, Layyah*
[*]**Corresponding Author Email:** soniarasool1997@gmail.com

The nutritional value of Pea Hull Fiber, with particular focus on its high concentration of dietary fiber, polyphenols, and isoflavonoids, which all contribute to a variety of physiological benefits for human health. Pea Hull Fiber is recognized as an ideal dietary fiber element due to its low caloric content, limited fermentation capacity, favorable filling abilities, and moderate taste profile. The review conducts a rigorous examination of the existing literature, providing detailed insights into the health and performance benefits of Pea Hull Fiber use. It focuses on a non-invasive method of fortifying food with dietary fiber to help with constipation in the elderly. The six-week intervention with finely processed pea hull fiber resulted in a significant rise in bowel motions among hospitalized elderly individuals. Those with a low baseline frequency saw a noticeable rise, as well as a considerable decrease in the use of prune-based laxatives. The study indicates integrating a moderate amount of finely processed fiber into diets significantly improves bowel regularity in elderly people. Another study investigates the beneficial effects of adding pea hulls into bread at up to 10% as a valuable source of dietary fiber. It also preserved the bread's white color, likeness to regular wheat bread, and acceptable physical and sensory characteristics. This comprehensive analysis brings together findings from many studies to provide an in-depth understanding of the nutritional benefits and practical applications of Pea Hull Fiber in boosting human health and well-being.
Keywords: Pea Hull Fiber (PHF), Dietary fiber, white bread, pea hulls, Physical properties.

BERT-GPT Fusion for Accurate Accent Classification in English

Faaiz Mateen Paracha[1], Muhammad Adnan[1], M. Irfan Uddin[1]
[1]*Institute of Computing Kohat University of Science and Technology Kohat, Pakistan*
[*]**Corresponding Author Email:** faaizparacha552@gmail.com

The importance of accurate accent classification is vital for various applications including speech recognition and language teaching. The wide use of Large Language Models (LLMs) has beenobserved recently for complex tasks such as accent classification, text classification and sentiment analysis. However, in the context of accent classification capturing the complexities of non-native accents and distinguishing them from native accents is critical. Therefore, we investigate the effectiveness of utilizing BERT (Bidirectional Encoder Representations from Transformers) and GPT (Generative Pre-trained Transformer) models for accent classification in English speech data. In this research, weprimarily focused on the extraction of Mel Frequency Cepstral Coefficients (MFCCs) to represent the audio features. Furthermore, we integrated the BERT-GPT model to classify accents, focusing on non-native English speakers. Our scope paves in different linguistic backgrounds, including Arabic, Pushto, Dutch, Russian, and Spanish, as well as native English speakers from the USA, Canada, and the UK.
The research was carried out using a speech accent archive data sethosted by George Mason University on Kaggle, and during comprehensive experimentation and evaluation, the results suggest promising outcomes in accent classification. The BERT-GPT fusion approach exhibits robust performance in distinguishing between different accents. These findings contribute to advancing the understanding and application of transformer-based models in linguistic studies. The findings show the substantial significance of leveraging advanced NLP techniques for accent analysis and recognition.
Keywords—*BERT,GPT,MFCC, effectiveness*

A comparative study of bee pollen, *Aloe vera,* and commercially available ointment on the treatment of freckles

Hiba Aziz[1], Syed Ishtiaq Anjum[1], Saeed Ahmad Khan[2]
[1]*Department of Zoology, Kohat University of Science and Technology, Kohat, Khyber Pakhtunkhwa, Pakistan.*
[2]*Department of Pharmacy, Kohat University of Science and Technology, Kohat, Khyber Pakhtunkhwa, Pakistan.*
[*]**Corresponding Author Email:** hibaaziz166@gmail.com,

ABSTRACT: Freckles are hyper-pigmented skin lesions, presenting a common cosmetic concern and affecting the beauty and confidence of a person.Several commercial products are available to treat freckles but due to their chemical nature, they affect the skin adversely.For centuries, Bee pollen and *AloeVera*have been used as natural antioxidants. This study hypothesizes that bee pollen and Aloe vera haveameliorative effects and may help in the removal of these skin lesions. To test this hypothesis, the current study aimed to design and formulate *Aloe Vera* gel and bee pollen to investigate theirameliorative effect on freckles.The samples of Bee pollens were collected from the KUST apiary and *Aloe Vera*fromthe local garden. An ointment of bee pollen and *Aloe Vera*wasprepared by using the Vaseline base (paraffin), 2% Aloe vera gel, 1% pollen grain tincture, and vitamin E as a preservative. Overall four diverse formulations A1, A2, A3, and A4 were prepared using different concentrations of pollen grains, *Aloe vera* gel, and Vaseline base.Thirty patients (30 females) were divided into two experimental groups;Group Awas treated with ointment prepared, and Group B was treated with commercial ointment having formula magnesium ascorbyl phosphate 5% for four weeks.Five patients out of each group were controls and received only a cream base. Physical characteristics of herbal ointments, such as color, odor, smoothness, and grittiness, were recorded. It was observed that herbal ointment showed compliance with the parameters of acceptable ointment. The formulation A4 presented significantly ($p<0.05$) better results compared to the standard drug and a marked decrease in dark spots was observed compared to the standard drug. Moreover, the formulations didn't show any allergic reaction, itching, or redness on the skin of patients. These findings highlight the potential of bee pollen and Aloe Vera as effective and safe alternatives for freckle treatment.

Keywords: Bee pollen, *Aloe vera,*Freckles,Ointments, Melanin, Hyperpigmentation.

Snthesis and characterization of antimicrobial coating from epoxy resins and diimide basedphenolics

Kulsoom[1], Naila khalid[1],Ah~~a~~tarambibi[1]
Department of Chemistry, Kohat University of Science & Technology (KUST), Kohat-26000, Pakistan
[*]**Corresponding Author Email:** nailakhalid@kust.edu.pk

Diimide based phenolics were synthesized *via* amine catalyzed imide formation by treating pyromellaticdianhydride with*o/p* amino phenol and 6-FDA with amino phenol as curing agents for epoxy resin. Imide based phenolicswere synthesized via amine catalyzed imide formation by treating phthalic anhydride with *o/p* aminophenol. The synthesized curing agents were characterized by spectral and CHN analysis and used as curing agent for digycidyl ether of bis-phenol-A (DGEBA). Five polymers aresynthesized by the treatment of 3Diimide based phenolics and 2 imide based phenolics with epoxy Resin DGEBA by using NMPas Solvent.Thesynthesizedpolymers werecharacterizedbyFourierTransformInfrared(FTIR)spectral analysis. Antimicrobial activity of these polymers was performed by agar well method and disc diffusion method.All polymers were showing good activity against different microbes.

KEY WORDS:
Diimides based phenolics, Imides based phenolicsand antimicrobial coatings,

Antibacterial Activity of *Koi Fish* Skin Mucus Against *Staphylococcus aureus*

Maryam Almas[1], Abdul Wahab Khan[2], Faheem Ullah[1], Qasim Khan[1], Kainat Babi[1], Noor Muhammad[1,] Nawab Ali[1.]
[1]*Department of Biotechnology and Genetic Engineering, Kohat of University of Science and Technology (KUST) Kohat 26000, Khyber Pakhtunkhwa, Pakistan.*
[2]*Department of Zoology, Kohat University of Science and Technology (KUST), Kohat, Pakistan*
[*]**Corresponding Author Email:** zakirullah5060@gmail.com

The fish industry is one of the food industries with the fastest rate of growth in the world. The immune system of fish continuously protects the body from diseases and provides protection. The primary components of fish's innate immune system are their skin and mucus membrane, which actively fight against infectious agents from the moment of initial contact. Due to the presence of numerous antimicrobial proteins, fish mucus functions as a powerful mechanical, physiological, and biochemical barrier. The antibacterial activity of mucus seems to be a promising target for the creation of novel therapeutics to cure different infections in both fish and humans. *Koi fish* (*Cyprinus rubrofuscus*)is a kind of freshwater fish that is particularly liked by people in general because of their attractive colored forms. It is well known that overuse of antibiotics and other antimicrobial drugs has several adverse effects, including the development of antibiotic-resistant bacterial strains which are harmful issues for humans, making some infections practically incurable. Globally, bacterial diseases are the most common cause of human deaths. *Staphylococcus aureus* is one of the common bacterial pathogens that causes various types of infectious diseases. The bactericidal activity of fish skin mucus extracts was determined using the agar well diffusion method. On each side of the well zone of inhibition (mm) was measured for the assessment of the bactericidal effect of fish mucus. Different concentrations of crude fish skin mucus (50µl, 100µl, and 150µl) were used and the zone of inhibition was 20mm, 22mm, and 24mm. The same concentrations of diluted skin mucus of fish were also used to check the antibacterial activity that gave a zone of inhibition and was 17mm, 20mm, and 22mm. The result showed that crude skin mucus extract has high antibacterial activity as compared to diluted extract against *S. aureus.*
Keywords: *Koi. Fish*, Skin mucus,S*taphylococcus.aureus*, Antibacterial activity.

Medicinal Significance of *Fagonia cretica*

*Khizar Hayat[1], Umar Farooq[1], Afshan Shafi, Muhammad Usman[1], Muhammad Usama Mubarak[1]
[1]*Department of Food Science and Technology, MNS- University of Agriculture, Multan, Pakistan*
[*]**Corresponding Author Email:** kizarhayat36@gmail.com

For centuries, botanical remedies have been used for human disease management because herbal medicines contain extensive biological and therapeutic activity, higher safety margins and lower pricing they are much sought after for primary healthcare in both developed and developing nations. Family *Zygophyllaceae* is represented by 25 genera and 240 species confined to tropical, subtropical, and warm temperate, most often in dry areas of the world. All plants of this family and particularly genus *Fagonia* (*Fagonia cretica* L.) are of great interest to pharmacists as preliminary pharmacological studies proved that these plants have efficient medicinal potential for the treatment of broad-spectrum health disorders ranging from skin lesions to lethal cancer. *F. cretica* L. possesses highly significant bioactive compounds such as glucoside, flavonoids, Saponins, triterpenes and pharmacological activities. Extensive literature survey revealed that *F. cretica* L. is quite well reported plant in terms of ethnobotany, phytochemistry and pharmacology. Strong scientific evidence regarding to this rare plant in terms of antimicrobial, anti-inflammatory, antioxidant (neuroprotective and anticancer), antihaemorrhagic, antithrombolytic and antipyretic activities suggest this plant to be investigated in clinical trials. Successful clinical trials for yet unsatisfactorily treated disorders (human breast cancer is one of the best examples) may provide an opportunity to develop cost-effective but promising remedies contributing towards betterment of humanity.
Key words; Therapeutic, Lethal cancer, Pharmacology.

ناول "بالوں کا گچھا "میں اوہام پرستی کے مباحث

Discussions of illusionism in the novel "Ball Ka Gachha".

Nageena Shaheen[1]
[1]*BS-Urdu, Govt. Graduate College Layyah*

Khalid is an award-winning novelist, storyteller and poet of modern times. They wrote stories about what they found in life and the things that influenced them the most. He wrote only two novels in his lifetime. He self-published his first novel in the name of "Kani Nikah" in 1991. And the second novel "Baalu Ka Guchha" was published in Aaj issue number 72 in 2017. He wrote a collection of stories titled "Journey of the Birds" in which he wrote stories for children. A long story of his was published under the title "Sain Mosam". Both his novels deal with almost the same topics. Kani Nikah is written on the subject of rituals like "Kani Nikah" found in the cities of Attock, Chakwal, Khushab and Sargodha districts. The story begins with a character named Baba Ali who introduces us to the Kani Nikah ritual. The novel "Balu Ka Guchha" is written on the subject of illusionism. The victim of which is not only Pakistan but the entire subcontinent. The author has exposed the real evils of the society by presenting a negative character like Peer Noor Sharif in the novel. Among the main characters of the novel are Khalid, Gulnazi, Boba, Gadao, Peer Noor Sharif and his friends etc. Khalid is the main character of the novel who is a brilliant student of the ninth class who introduces the unreal ritual called "Baalu Ka Gachha" in a town like Jhawarian and rids the town of this illusion. The author has brutally presented the truth of the secret behind this ritual found in the town of Jhavari.

خالد طور جدید دور کے انعام یافتہ ناول نگار، کہانی کار اور شاعر گزرے ہیں. زندگی میں انھوں نے جو کچھ پایا اور جن چیزوں نے ان کو سب سے زیادہ متاثر کیا انھوں نے ان پر کہانیاں لکھ ڈالیں. انھوں نے اپنی دور حیات میں صرف دو ناول لکھے. پہلا ناول "کانی نکاح" کے نام سے 1991میں خود شائع کیا۔ اور دوسرا ناول "بالوں کا گچھا" آج کے شمارہ نمبر 72 میں 2017 میں شائع کروایا۔ ان کی کہانیوں کا ایک مجموعہ "چڑیوں کا سفر "کے عنوان سے لکھا جس میں بچوں کے لیے کہانیاں لکھیں. ان کی ایک طویل کہانی "سائیں موسم" کے عنوان سے شائع ہوئی۔ ان کے دونوں ناول تقریباً ایک ہی موضوعات سے متعلق ہے۔کانی نکاح میں ضلع اٹک، چکوال، خوشاب اور سرگودھا کے شہروں میں پائی جانے والی" کانی نکاح" جیسی رسم کے موضوع پر لکھا گیا ہے۔ کہانی کی ابتداء بابا علی نامی کردار سے ہوتی ہے جو کانی نکاح کی رسم سے ہمیں آشنا کراتے ہیں۔ناول "بالوں کا گچھا" اوہام پرستی کے موضوع پر لکھا گیا ہے. جس کا شکار نا صرف پاکستان بلکہ پورا برصغیر ہے۔مصنف نے ناول میں پیر نور شریف جیسے منفی کردار کو پیش کرکے معاشرے کی حقیقی برائیوں سے پردہ اٹھایا ہے۔ ناول کے بنیادی کردارو میں خالد، گلنازی، بوبا، گداو، پیر نور شریف اور اس کے ملنگ وغیرہ ہیں۔خالد ناول کا مرکزی کردار ہے جو نویں کلاس کا ایک زہین طالب علم ہے جو جھاوریاں جیسے قصبے میں موجود "بالوں کا گچھا" نامی غیر حقیقی رسم سے آشنا کراتا ہے اور قصبے کو اس وہم سے نجات دلاتا ہے۔ مصنف نے جھاوریاں کے قصبے میں پائی جانے والی اس رسم کے پس پردہ راز کی حقیقت کو بڑی سفاکی سے پیش کیا ہے۔

Keyword: Khalid Toor, Baalu ka Guchha, Illusionism, Peer Noor Sharif, Jhawarian, Baba Ali, Journey of birds, Sain Mosam.

کی ورڈ: خالد طور ، بالوں کا گچھا ، اوہام پرستی ، پیر نور شریف ، جھاوریاں ، کانی نکاح ، بابا علی ، سائیں موسم، چڑیوں کا سفر

Synthesis and characterization f silver doed graphitic carbon nitride nanocomposite for the colorimetric sensing of uric acid

Noaman khan[1], Umar Nishan[1], Nawshad Muhammad[2]
[1]*Department of chemistry Kohat university of Science and Technology Kohat*
[2]*Department of Dental Material, IBMS KMU, Peshawar*
[*]**Corresponding Author Email:** khannomann4@gmail.com

Uric acid (UA), a metabolic derivative of purines, serves as a vital diagnostic marker for conditions like arthritis, gout, and leukemia. Accurate quantification of UA is critical for effective diagnosis and treatment. The Graphiticcarbon nitride (g-C_3N_4), being catalytic in nature, was used as a template for Ag-NPs synthesis as well as providing surface area (adsorption of analyte and ionic activity) for chemical reactions needed for sensing of uric

acid. Graphitic carbon nitride (g-C_3N_4) was synthesized from Melamine, followed by its doping with silver metal salt through calcinations. The synthesis of Ag- g-C_3N_4 nanocomposite was confirmed using FTIR, SEM, XRD, EDX, TGA, and UV-visible spectroscopy. FTIR showed characteristic peaks for gC_3N_4 and Ag- g-C_3N_4 nanocomposite, whereas SEM displayed the nanoporous morphology of the material. The rhombic prism crystal structure of g-C_3N_4 was revealed by XRD, and EDX showed the successful doping of Ag on g-C_3N_4. The Ag- g-C_3N_4 nanocomposite and 3,3′,5,5′tetramethylbenzidine (TMB) dye were employed as a new colorimetric sensing platform for uric acid sensing. The fabricated sensing platform detected uric acid with excellent sensitivity (LOD, 0.24 nM), a wide linear range (4–367 nM) with R^2 = 0.998, and very good selectivity. Comprehensive optimization experiments were performed, which demonstrated that the proposed sensor performs best at 4 mg of Ag- g-C_3N_4 nanocomposite, pH 6, a response time of 100 seconds. Furthermore, TMB and H_2O_2 concentrations of 12 and 8 mM, were respectively used. The proposed sensor successfully detected uric acid in real samples with outstanding sensitivity and selectivity.
Keywords: Gout; Ag- g-C_3N_4 nanocomposite; TMB; H_2O_2;colorimetric sensing.

Noninvasive material stressdetection using smart voting-based random forest

Tabinda Qudrat[1], Saima Hassan[1], Dr Beenish Fida[2]
[1]*Institute of Computing, Kohat University of Science and Technology, Kohat, Pakistan,*
[2]*Department of Obs & Gynae, KMU Institute of Medical Sciences, Kohat, Pakistan*.
[*]**Corresponding Author Email:** tabindaqudrat17@gmail.com

Maternal health requires the proactive identification and management of stress, given its potential significant impacts on both the mother and the fetus. This research presents a comprehensive study on the detection and analysis of maternal stress levels during pregnancy, employing advanced machine learning techniques to address the significant challenge of accurately predicting high stress levels in pregnant women. Despite the critical importance of early stress detection due to its potential adverse effects on both the mother and the fetus, existing models often fail to accurately predict high-stress levels, particularly in datasets with a low representation of such cases.

Our collected dataset comprises physiological and demographic data from 1027 pregnant women, incorporating a wide range of attributes like age, education, occupation, financial problems, location, trimester, previous pregnancies, blood pressure, heart rate, blood sugar, body temperature, sweating, whether the baby's sex is known, nervousness, family setup, and whether the pregnancy was planned. After labeling, the data revealed that 62.9% of the participants had a medium stress level, 33.3% had a low-stress level, and a minor 3.8% exhibited high stress levels, posing a significant challenge for predictive modeling due to the imbalanced nature of the dataset.

The performance of traditional machine learning models such as Gaussian Naive Bayes, Random Forest, and Decision Tree was evaluated, showing that these models achieved high accuracy on the medium and low-stress categories, they struggled significantly with the high-stress category due to its sparse representation. To overcome this limitation, we implemented a smart voting-based Random Forest approach, specifically tailored to enhance the model's sensitivity to the underrepresented high-stress category. This novel approach significantly improved the prediction accuracy for high-stress levels, thereby providing a more reliable and robust framework for maternal stress detection.

The findings highlight the importance of innovative machine learning strategies to address the challenges of imbalanced datasets, especially in critical healthcare applications like maternal stress monitoring, where accurate detection of all stress levels is paramount. Our study not only advances the understanding of maternal stress dynamics but also paves the way for developing more effective, real-time, and non-invasive stress monitoring systems, ultimately contributing to better maternal and fetal health outcomes.
Keywords:
maternal health, stress detection, machine learning algorithms, modified random forest,and smart voting.

A Comprehensive review on formulation of pickle from orange peel waste

*Zamaira Samman[1], Noshaba Faiz[1],Misbah batool[1],Mumtaz Husain[1],Sana[1]
[1]*Department of food science and technology,University of agriculture Faisalaba*
[*]**Corresponding Author Email:** zamairasaman12@gmail.com

Sweet orange peel (Citrus sinensis) is part of orange plant that contains essential oils. Orange peels carry health-promoting compounds such as vitamins, minerals, and flavonoids. First, it contains A, B6, and C. Vitamin C, in particular, can enable heart and digestive health, as well as anti-cancer protection. Orange peels contain flavonoids – like poly methoxy flavones (PMFs) and hesperidin – and other phytochemicals that are highly beneficial for your health. Flavonoids are antioxidant compounds that help prevent chronic diseases such as cancer and heart diseases. It also contains higher amounts of certain nutrients. A number of Agro-industrial by-products or wastes like citrus pulp, citrus meals, citrus seed meal, citrus molasses, and citrus peels are generated from fresh citrus after the main products of interest have been removed or extracted during processing or peeled for direct human consumption as in the case of developing countries. The waste utilization of orange peel is the most important aspect of this study. The Present Study was undertaken to prepare orange peel pickle by using different preservatives and to assess its shelf life and overall acceptability of pickle in sensory evaluation. The study was conducted to note down the efficacy of preservatives on the shelf life of pickles. Sensory evaluation was done in order to see the acceptability of the product for parameters color, flavor, aroma, texture, and overall appearance. In the first treatment, the pickle was prepared with sugar. In the second treatment, pickle was prepared with jaggery. The orange peel is considered as having certain vitalnutrients and having certain properties which make the gastrointestinal tract function well and it is excellent for the diabetic and heart patient as well. The citrus peels are divided into epicarp orflavedo and mesocarp or albedo. The flavedo is colored and is the outermost surface of the peel whereas the albedo is the white, soft inner layer of the peel.

Key words: Orange Peel, Preservation, Health effective, Waste utilization.

Sustainable Approaches in Food and Nutrition Sector to Foster Pakistan's Economic Growth

Ramsha Akram[1], Afshan Shafi[1], Umar Farooq[1], Aliza Batool[1], Muhammad Usama Mubarak[1]
[1]*Department of Food Science and Technology, MNS University of Agriculture Multan, Pakistan.*

Due to their rapidly expanding populations, South Asian countries are facing increasing issues in providing food, waterand energy.Countries have supported legislative initiatives to boost grain production, such as guaranteeing the price of rice and wheat and offering subsidies for energy and water.Although these incentives have improved the production of cereals, they have also raised the demand for energy and water, degraded the base of resources and increased the incidence of diseases associated to water.Agencies frequently operate in a disjointed and disconnected manner despite the innate links between the production of food, water and energy.Inadequate sectorial coordination and institutional fragmentation have led to an unsustainable resource use, affecting the region's long-term food, water and energy security. These issues have also made it difficult to achieve the Sustainable Development Goals (SDGs).In addition to encouraging resource overuse, free water and cheap power have also resulted in underinvestment in energyand water-saving techniques and technologies, preventing crop diversification and widespread agricultural growth in accordance with comparative advantages.In order to transition from a more intensive use of water and energy to a more sustainable and efficient use of resources, there has to be greater policy coherence among the three sectors.The nexus approach can improve comprehension of the sectors' interdependencies and fortify cooperation between them.To coordinate the activities of many players and enhance complementarities and synergies among the three sectors, however, a significant change in the decision-making

process is needed, one that takes a holistic approach and develops institutional arrangements.For handling the nexus difficulties and coordinating across sectors, a framework is recommended.

Keywords: energy security, grain production, synergies.

Synthesis and Characterization of Ferrocene Reinforced Composites of Diglycidyl Ether of Bisphenol AResin

[1]*Shahzad Hussain,[1]Naila Khalid,[1]Ahtaram Bibi, [1]Muttahir khan

[1]Chemistry Department, Kohat University of Science and Technology, Kohat 2600,Pakistan

[*]Corresponding Author Email: sh808256@gmail.com.pk

Current investigation is based on the synthesis of ferrocene reinforced composites of diglycidyl ether of bis-phenol-A: 4,4-diaminodiphenyl methane (DDM) with various loadings of ferrocene (1-5%). Effects of various ferrocene loadings on the tensile strengths, glass transition properties and thermal properties of ferrocene reinforced epoxy–DDM composite materials are studied. The synthesized composites were characterized by Fourier Transform Infrared (FTIR) spectral and X-ray diffraction analyses. FTIR spectral analysis indicated the redistribution of intermolecular hydrogen bonds between polymer chain and hydroxyl (-OH) of polymer chains and development of bonding interaction between ferrocene filler and –OH groups of polymer matrix. Effects of various loadings on the thermal properties have been studied *via* thermo gravimetric analyses. From which linear relationship was observed between amount of filler ferrocene and thermal stability. Ferrocene fillers affected flame retardant properties of the composites, 3 %loadingsofferrocenebasedcompositesexhibitedmaximumflameretardantproperty.Inshort,this research paper explore sthermally resistance and flame retardant properties of the epoxy polymer-ferrocene composites.

Designing nutritional foods for sports performance and recovery

Nida Firdous[1*], Fareena Jamil[1], Aliza Batool[1], Umar Farooq[1], Shabbir Ahmad[1], Muhammad Sibt-e-Abbas[1], Muhammad Usman[1]

[1]Department of Food Science and Technology, Faculty of Food and Home Sciences Muhammad Nawaz Sharif University of Agriculture Multan

[*]Corresponding Author Email: nida.firdous@mnsuam.edu.pk

Functional foods, often referred to as nutraceutical foods, are food products that have been enhanced with bioactive ingredients or bioactive chemicals that have been chosen for their potential health advantages above and beyond basic nutrition. When included in a balanced diet, these items are intended to offer physiological advantages and foster general well-being. To promote energy metabolism, muscle function, and recovery processes, it looks at the activity of particular bioactive substances, functional components, and nutrient formulations. In the formulation of nutraceutical foods, including the addition of protein mixtures, amino acids, antioxidants, omega-3 fatty acids, and other targeted nutrients. It examines the data supporting their effects on physical activity efficiency, muscle protein synthesis, immunological response, and inflammation control. It also investigates any synergistic effects that can result from mixing different bioactive substances in nutraceutical food products.Personalized nutrition strategies, the use of novel ingredients and delivery systems, the incorporation of plant-based and sustainable sources, and the integration of gut health and microbiome considerations are all emerging themes in the design of nutraceutical foods for sports performance and recovery. These trends attempt to improve the bioavailability and efficacy of bioactive compounds, provide alternate options for different dietary preferences, and optimize nutrient absorption and utilization through gut health optimization. To verify the effectiveness, safety, and usefulness of these products, it emphasizes the necessity of well-planned clinical trials and athlete-specific investigations.

Keywords: Nutraceutical foods, Athletes, Protein, Physical activity

Achallenge fortheagriculture, foodand nutritional sciences isglobalhunger

*Zaiba Manzoor[1], Khizar Hayat[2], Asma Hassan[1]
[1]*Department of Human Nutrition & Dietetics,The Physio College, Multan, Pakistan.*
[2]*Department of Food Science and Technology, MNS- University of Agriculture, Multan, Pakistan*
[*]**Corresponding Author Email:** *zeebamanzoor05@gmail.com*

The issue of hunger, which still affects hundreds of millions of people globally, has been debated for many decades. Inspite of various measures to lessen it, the hunger problem is becoming worse. Increased competition for natural resources, climate change and natural disasters, poverty, illiteracy, and disease are all threats to food security. Scientists must collaborate to increase agricultural and food productivity, technology, nutrition, and education in order to find effective solutions to address hunger and malnutrition. In the developing world, there has been a decline in hunger since 2000. The total rate of hunger in developing countries has decreased by 27%, according to the 2015 Global Hunger Index (GHI).However, the world continues to have a serious hunger problem. The GHI ratings for this report are based on a new, updated methodology that replaces the child underweight indication from prior years with child stunting and child wasting. One of the three components of hunger that the GHI formula measures is child under nutrition, and this change takes into account the most recent research on the best markers for this condition. A crisis level of food insecurity, which is an alarming situation in which more over 690 million people are chronically hungry, will have affected 135 million people by the year 2020.The global hunger index estimates that almost one-third of the world's countries are dealing with significant or alarming circumstances. It is reassuring that countries have improved from their incredibly concerning situation since 2012—which was more than 17% in 2000. Due to COVID-19, the chance of poverty increased globally, rising from 26% in 2019 (before the epidemic) to 59% in 2020.Jobs and livelihoods in the food chain were also under jeopardy, to a degree of roughly 34% and35% respectively. Even while agriculture as a whole is becoming more sustainable, there must still be less food wasted and lost.

Keywords: starvation, poverty,illiteracy,Covid-19,GHI,andtheagriculturesustainability index.

Integrated Approach for Identifying Tick Species Infesting Cattle in Lakki Marwat: Morphological and Molecular Analyses

Qintara Habib[1], Shahid Niaz Khan[1], Mir Sadiq Shah[2]
Institute of Computing, Kohat University of Science and Technology, Kohat, Pakistan, Department of Zoology, University of Science and Technology,Bannu, Pakistan;
[*]**Corresponding Author Email:** sadiq.shah@ustb.edu.pk

Ticks infesting cattle present significant threats to both animal and public health as vectors of various diseases. This study employs a comprehensive approach combining morphological and molecular methods to identify ticks infesting cattle in the Lakki Marwat District of Pakistan. The ticks were collectedfrom 300 cattle and about 500 ticks were collected and brought to the Department of Zoology lab in Kust, Kohat. Through meticulous investigation, we explore the prevalence and distribution of tick species using stereo and inverted microscopy alongside 16S rRNA-based molecular analysis.Incorporating insights from a study on ticks in the Lakki Marwat District of Pakistan., we reveal the presence of mainly two ixodid tick species Hyalomma and Rhipicephalus. This multidimensional approach provides a robust foundation for understanding the diversity and distribution of tick species affecting cattle.This study holds significant implications for the management of tick-borne diseases in cattle, offering vital

insights for devising effective control measures. By reducing the disease burden on livestock and minimizing economic losses in the cattle industry, our research contributes to safeguarding both animal and human welfare.

Assessment and mitigation strategies for microbial contamination in eggs: currnt challenges and future directions

Talha Riaz[1] Fu Xing[1], Jin Yongguo[1], Md. Shabudden Ahamed[1], Zaiba Bibi[1] , Muhammad Moeid Khan[1], Tanveer Ahmad[2], Rabiya Riaz[3], Chen Zhong[4], Uzma[4], Muhammad Atiq Ashraf[5], Burhan Khalid[6], Mueed Ahmad[7],

[1]*College of Food Science and Technology, Huazhong Agricultural University, Wuhan, China*

[2]*National Institute of Food Science and Technology, University of Agriculture, Faisalabad, Pakistan*

[3]*Department of Chemistry, Government College Women University, Faisalabad, Pakistan*

[4]*School of Food Science and Engineering, South China University of Technology, Guangzhou, China*

[5]*College of Horticulture and Forestry Sciences, Huazhong Agricultural University, Wuhan, China*

[6]*College of Plant Sciences, Huazhong Agricultural University, Wuhan, China*

[7]*Medical and Bioinformatics Engineering College, Northeastern University, Shenyang, China*

This study looks at the difficulties, restrictions, and potential paths forward for determining and reducing microbial contamination in eggs. The research highlights the role that preventive measures have in lowering contamination, including thermal treatments and biosecurity controls. The obstacles that control strategies face are discussed, including those related to cost, feasibility, and practical application. Knowledge gaps and areas in need of additional research are noted, especially with regard to comprehending transmission channels and assessing cutting-edge control technology. Antimicrobial resistance and the introduction of novel diseases are emphasized as continuous concerns. Ensuring the safety of eggs becomes more challenging due to the globalization of supply chains. Advanced disease detection technology, improved biosecurity protocols, process optimization, risk-based strategies, and consumer education initiatives are among the suggested future prospects. Stakeholder cooperation and knowledge exchange are thought to be essential for advancement. The study indicates that the egg business can guarantee the production and consumption of healthy eggs by resolving these issues, highlighting the importance of further research in accomplishing this aim.

Keywords: Microbial contamination, Eggs, Control strategies, Biosecurity, Pathogen detection

Quasi-static analysis of axially symmetric radiating system in *f*(*R*) gravity.

Z Yousaf, M Z Bhatti[1], Farwa[1]

[1]*Department of Mathematics and Statistics, The University of Lahore, 1-KM Defence Road, Lahore 54000-Pakistan.*

In this talk, recently proposed notion of quasi-static evolution is discussed by means of generalized approach. For doing so, different criterion to characterize the corresponding evolutionary behavior of axial system within the influence of high curvature regimes are discussed. The formalism of such notions and their possible implications in studying the dissipative and anisotropic configuration will be deployed. A comparison-based analysis of the physical nature of various curvature factors on the propagating system will be exhibited as well.

Harnessing Microbial Diversity: Exploring Biotechnological Applications in Food Microbiology

Hafsa Fatima[1], Afshan Shafi[2], Umar Farooq[1], Hamid Majeed[2], Aliza Batool[1]

[1]*Department of Food Science and Technology, FF&HS, MNS-University of Agriculture, Multan, Pakistan*

[2]*Department of Food Sciences, Cholistan University of Veterinary and Animal Sciences, Bahawalpur, Pakistan.*

[*]**Corresponding Author Email:** 110fatimahafsaa@gmail.com

Researchers are still fascinated by the complex interactions that exist between microbes and the food business, since these interactions present a plethora of options to improve food sustainability, quality, and safety. The fields of food microbiology and biotechnology are explored, where the creative methods for utilizing microbial variety are being created to improve food production, preservation, and consumption. In this field, microbial fermentation is a cornerstone that demonstrates how raw materials can be naturally transformed into a diverse array of flavors, textures, and nutritional characteristics. By deciphering the metabolic pathways of microorganisms and adjusting fermentation conditions, scientists are discovering new approaches to optimize fermentation processes, guaranteeing uniformity, effectiveness, and creativity in products. Furthermore, an intriguing new direction in the creation of functional foods is the incorporation of probiotics and beneficial microbes into food matrices. Consuming these live bacteria has health benefits that range from stronger immune system performance to better gastrointestinal health. Scientists are creating probiotic strains with specific functions by using cutting-edge biotechnological techniques like genetic engineering and strain selection. This is opening the door for customized diet plans and focused medical interventions. The urgent need to reduce microbiological contamination and foodborne pathogens is driving the ongoing evolution of the food safety field. Promising strategies for improving microbial surveillance and control along the food supply chain include the use of biosensors, bio-control agents, and rapid detection techniques. Moreover, the development of precision microbiology allows scientists to understand the complex dynamics of microbial communities in food ecosystems, which helps with risk assessment and decision-making .A source of innovation and sustainability that becomes apparent as we traverse the complexity of today's food environment is the collaboration between food microbiology and biotechnology. We can open up new possibilities for flavor, nutrition, and safety in our food systems by utilizing the power of microbes, ensuring a more robust and healthy global food supply for future generations.

Key words: Microbes, Food Business, Food microbiology, Microbial Fermentation, Biotechnological Techniques, Contamination, Food Borne pathogens, Bio-control, Bio-sensor.

Tin oxide nanoparticles supported on talc as colorimetric sensor for uric acid

Kalsoom Jamila[1]

[1]*Department of chemistry Kohat University of Science and Technology*

The present work reports talc supported tin oxide nanoparticlesascolorimetric sensor for uric acid. Talc supported tin oxide nanoparticles were synthesized using sol-gel method and characterized by FTIR spectroscopy and XRD analysis which showed the characteristic peaks assigned to talc supported tin oxide nanoparticles. SEM analysis shows irregular wave like morphology of talc supported tin oxide nanoparticles. Talc supported tin oxide nanoparticles are used ascolorimetric sensor for uric acid. Different reaction conditions have been optimized to find the optimal performance of talc supported colorimetric sensor for uric acidsuch as; (a) pH (b) time of reaction; (c) temperature (d) loading capacity (e) concentration. The response time of the proposed method for the preparation of talc supported tin oxide nanoparticles was3 hours

Technological Innovation and Water Stress Reduction: Unlocking Sustainable Water Management Pathways

Muhammad Sajjad[1]&Sharafat Ali[1,2]

[1]*Department of Economics, Government Graduate College Kot Sultan, Layyah, Pakistan*

[2]*School of Economics, Jiangsu University of Science and Technology, Zhenjiang, Jiangsu, China*

[*]**Corresponding Author Email:** mhrsajjad94@gmail.com

In the face of climate change and its ensuing challenges, the global pursuit of sustainable development goals (SDGs) has become more critical than ever, particularly in addressing the pressing issue of water resource management and its sustainable utilization. The rapid advancement in technological innovation plays a pivotal role in mitigating and adapting to climate change, making it essential to investigate its influence on water resource management and conservation. This research endeavors to examine the impact of technological innovation on water stress, incorporating a comprehensive dataset spanning from 2001 to 2022 that includes both developed and developing nations. Through panel regression analysis, the study reveals a significant relationship between technological innovation and water stress. Intriguingly, it identifies an inverted U-Shaped Water Stress Kuznets Curve (WSKC) in the context of water stress and technological innovation. This finding indicates that in the initial phases of technological advancement, water stress may escalate. However, upon surpassing a critical level of innovation, a decrease in water stress is observed, suggesting that more advanced technological interventions lead to better water resource management and lower stress levels. These insights offer valuable implications for policymakers and governments, emphasizing the need to integrate technological innovation strategies with water management policies to effectively address water stress and contribute to the achievement of SDGs.
Keywords: Technological innovation; Water stress; Economic growth; Sustainability; Climate action

The Impact of Electric Power Transmission and Distribution Losses on Environmental Quality: A Dynamic ARDL-Based Evidence from Pakistan

Nigha Bi Bi[1]&Sharafat Ali[1*]
[1]*Department of Economics, Government Graduate College Kot Sultan, Layyah, Pakistan;*
[*]**Corresponding Author Email:** sharafat.ali.rana@gmail.com

The energy-environment nexus has become a major concern for experts, policymakers, and the governments, particularly as the shift towards renewable energy sources is seen as a critical way to cut down on pollution. Yet, the focus isnot solely on generating electricity; the way electricity is transmitted and distributed plays a crucial role and presents its own set of environmental challenges. This research aims to explore how losses in electricity impact environmental health, using the load capacity factor (LCF) as a measure. Employing dynamic ARDL methods and Kernel-based Regularized Least Squares (KRLS), the study examines the effects of electricity losses, foreign direct investment (FDI), economic expansion, and industrial activity on LCF in Pakistan over the period from 1981 to 2022. It finds that electricity losses significantly compromise environmental health by lowering LCF, whereas FDI has a positive effect. On the contrary, economic growth and industrial production have harmful impacts. The study also finds that a hypothetical 10% increase or decrease in electricity losses leads to respective decreases or increases in LCF, while a 10% hike in FDI benefits LCF. The KRLS analysis strengthens the findings from the dynamic ARDL approach, highlighting the critical role of efficient electricity transport and distribution in maintaining environmental sustainability.
Keywords: Energy-environment nexus; Electricity losses; Environmental sustainability; Load capacity factor; Foreign direct investment; Dynamic ARDL

Synthesis, Characterization and biological activities of new Schiff bases

Muhammad Adnan[1], Rukhsana Gull[1], Shuakat Ali[2]

[1]*Department of Chemistry KUST Kohat*
[2]*Institution of Chemical Sciences, University of Peshawar*

Three Schiff bases were synthesized through the reaction of primary amines with primary aldehydes, resulting in novel compounds. Specifically, the condensation of ferrocenyl aniline with terephthalaldehyde, terephthalaldehyde with methylaniline in a 1:2 and 2:1 molar ratio respectively, and methylaniline with methoxybenzaldehyde in a 1:1 molar ratio yielded these compounds. The structures of these condensation products (Schiff bases/ligands) were thoroughly characterized using Fourier-transform infrared (FT-IR) spectra, NMR spectra, UV–vis spectroscopy and elemental analysis.
Furthermore, these newly synthesized Schiff bases underwent screening for various biological activities, including antibacterial, antifungal, and antioxidant properties. Evaluation of antibacterial and antifungal activities was conducted through the disc diffusion method, while antioxidant activity was assessed using a UV–VIS spectrophotometer with 2,2-Diphenyl-1-picrylhydrazyl (DPPH) employed as the free radical source. The compounds showed moderate to significant activities.
Keywords: Schiff base/Ligand , Characterization , ferrocenyl aniline , methyal aniline , terephthalaldehyde , methoxybenzaldehyde , 2,2-Diphenyl-1-picrylhydrazyl (DPPH , anti-microbial activities.

The climate change and its impact on farm performance

Muhammad Umar Farooq[1]
[2]*Department of Economics University of Layyah*

In emerging economies like Pakistan, agriculture provides the bulk of the rural and nearby urban populations with their primary subsistence income. Despite its enormous economic contribution, it confronts serious problems brought on by climate change, including rising temperatures, floods, droughts, and yield losses. The current study farm level adaptive capacity of wheat and sugarcane farmer to climate change and its impacts on farm performance Punjab, Pakistan. This study based on primary data of wheat and sugarcane farmer conducted through face to face interview from district layyah and Faisalabad, Punjab province Pakistan. The study's findings imply that wheat and sugarcane producers were well conscious of climate change but did not adjust as a result for a variety of reasons. Changes in planting dates, crop varieties, and fertilizer types are among the main adaptive capacity measures used by wheat and sugarcane growers. Education, farming experience, access to agricultural extension services, and marketing data were other elements that had a big impact on farmers' adaptive capacity to climate change.Wheat and sugarcane production and net crop income are greatly and favorably affected by adapting wheat and sugarcane crops to climate change.

Comparative Analysis of Coal Biochar and Cow dung as Organic Supplements to Enhance Maize Growth in Fresh Water Irrigation Conditions

Muhammad Ameer Hamza[1], Muhammad Ahmar Amin[1*], Ali Zain[1]
[1]*Department of Soil Science, College of Agriculture.University of Layyah, Layyah, Punjab, Pakistan.*
[*]**Corresponding Author Email:** m.ahmaramin@ul.edu.pk

The climate change due to anthropogenic activities becoming serious threat to soil by increasing temperature in many parts of the world specially in third world countries. Increase in soil's temperature is great cause of many stresses just like heat or water stress. The parts of the world which have tropical to sub-tropical climate just like Pakistan are facing serious problem of water shortage due to climatic changes, for this purpose soil and water conservation is prime need of future through different amendments and techniques.A comparative experiment was

designed to check the Biochars (BCs)abilities prepared from different feed-stocksand cow dung manure with commercial fertilizer under fresh water irrigation pot trial at the research area of University of Layyah.The treatments were T_1Control (Without Biochar/cow dung manure), T_2NPK (recommended),T_3Cow dung manure (2%/pot), T_4Coal Biochar (CBC 0.5%/pot), T_5Coal Biochar (CBC 1%/pot). Each treatment was replicated three times (5*3=15). Soil with fresh water irrigation was collected, prepared for pot trial. Each pot was filled with 8kg soil/pot. Maize was grown as test crop. Fresh water irrigation was applied with different time intervals to maintain base saturation (up to 60%) throughout the experiment. The best results were observed in T4 as maximum number of mature plants with lush green leaves, strong stem and highest leaf area followed by T3 and T5 respectively which showed the best results of agronomic parameters after T4. The results indicated that BC and cow manure are one of the best choices for water conservation. Both (BC+ Cow manure) can be effectively utilized as soil and water conservation technique for improvement of soil's structure. After observing better results of BC and manure-based treatments, it can be concluded that both (BC and manure) can be suitable addition to as organic matter treatment to soil.

Writing ability assessment of undergraduate students at govt. graduate College Layyah

Rimsha Kanwal[1] Haleema Fareed[1] Hira Batool[1] Ishtiaq Ahmad[1]
1 Department of Applied Psychology, University of Layyah, Punjab, Pakistan
[*]**Corresponding Author Email: ishtiaqahmad@iub.edu.pk**

There has been a significant raise in the number of students who have enrolled for undergraduate degrees in Govt. Graduate College Layyah. However, the number of undergraduates who have successfully completed their degrees remains low due to high attrition rate. To address this problem, it is therefore important to investigate the critical factors that facilitate successful and efficient completion of the undergraduate degree. One key factor is the writing ability of undergraduate students as it is an essential skill for academic success. This research aims to assess students' readiness for undergraduate study in terms of writing ability from the perspectives of supervisors and supervisees. The study involved 16 students of Govt. Graduate College Layyah. Data were collected using questionnaires and semi-structured interviews. The results show that respondents perceived that supervisees were moderately ready for their undergraduate study with regard to their writing ability. This suggests that undergraduate students have adequate writing ability to cope with undergraduate study. Additionally, the independent t test results also show that there was a significant difference between the perceptions of supervisees and supervisors regarding undergraduate students' writing ability. It shows that supervisees think that they have a higher moderate readiness in their writing ability as compared to the supervisors. The results also show that students were less ready to write content with clarity and needed improvement in the quality of their argument. This has implications for enhancement of supervisory practices in terms of advancing approaches to further develop undergraduate students' writing ability that are essential for successful completion of their study.

Effects of foliar application of iron and zinc on wheat genotypes heritability of yield associated attributes and Biofortification of wheat genotypes

Muhammad Feroz[1], Muhammad Saqlain[1], Umar Farooq[1], Sami Ul-Allah[2], Zeshan Hassan[1], Asad Azeem[1*]
[1]*College of Agriculture, University of Layyah, Layyah, Pakistan*
[2]*Department of Plant Breeding and Genetics, Bahauddin Zakariya University, Multan, Pakistan*
[*]**Corresponding Author Email:** asadpbgpak@gmail.com (Asad Azeem)

Wheat is the most important crop in the world and major source of calories and nutrition. Over two billion people worldwide suffer from micro-nutritional deficiencies especially zinc and iron. Biofortification is an approach that has been proposed to be sustainable, reasonable, and easy to put into effect. The development of new cultivars with desirable characteristics is very important to check out the genetic variability in wheat germplasm. For that purpose

fifteen diverse wheat genotypes were evaluated in a couple of years study conducted between 2021-2022 and 2022-2023. These genotypes were combined with foliar-applied zinc sulfate and Iron sulfate (control, 0.5% of Iron, 0.5% of Zinc and 0.7% of Iron+ 0.7% of Zinc) under randomized complete block design. The box-plot study demonstrated a significant phenotypic variation in all evaluated traits, with yield and traits related to the Fe + Zn biofortification demonstrating the greatest variation. A significant ($P < 0.01$) relationship was found between grain yield and attributes linked to biofortification using correlation and path analyses. Interestingly, there was a statistically significant association ($r = 0.92$, $p < 0.01$) between grain yield and grain Fe + Zn concentration. The traits associated with Fe + Zn biofortification and yield have high broad-sense heritability (Hbs) values, indicating that additive gene action influences these traits, that can be adjusted in early segregating generations. Therefore, the study confirms the genetic heterogeneity in current wheat genotypes for the characteristics linked to Fe + Zn biofortification and yield, offering useful information for future wheat breeding program to combat micronutrient malnutrition in human population.
Keywords: PCA, Correlation, Path analysis, Fe + Zn Bio-fortification, Heritability

Application of carboxymethylcellulose in combination with essential oils nano-emulsions edible coating for the preservation of kiwifruit

Shahzad Zafar Iqbal*[a], Ali Haider [1], Fazal ur Rehman [1], Guihua Cui [2], Muhammad Waseem [2], Munawar Iqbal [3], Amin Mousavi Khaneghah[4]

[1]*Food Safety and Toxicology Lab, Department of Applied Chemistry, Government College University, Faisalabad, 38000, Punjab, Pakistan*

[2]*Department of Pharmacy, Jilin Medical University, Jilin, 132013, China*

[3]*Department of Chemistry, University of Education, Faisalabad Campus, Faisalabad, Pakistan*

[4]*Fruit and Vegetable Product Technology, Prof. Wacław Dąbrowski Institute of Agricultural and Food Biotechnology – State Research Institute, 36 Rakowiecka F St., 02-532, Warsaw, Poland*

The present research investigates the effectiveness of nano-emulsified coatings (C-1, C-2, and C-3) in preserving the kiwifruit at a temperature of 10 ± 2 °C with 90–95% relative humidity (RH) for a duration of 30 days. The nano-emulsions were prepared from varied concentrations of carboxymethyl cellulose (CMC) with different combinations of essential oils such as thyme, clove, and cardamom. Dynamic light scattering investigation with Zeta Sizer revealed that C-1, C-2, and C-3 nano-emulsions have nano sizes of 81.3 ± 2.3, 115.3 ± 4.2, and 63.2 ± 3.2 nm, respectively. The scanning electron microscopy images showed that the nanoemulsion of C-1 had homogenous spherical globules, C-2 had voids, and C-3 showed a non-porous structure with uniform dispersion. The X-ray diffraction analysis indicated that C-1, C-2, and C-3 nano-emulsion exhibited distinct crystallinity and peaks. The nano-emulsion C-1 had reduced crystallinity, while C-2 had lower intensity peaks, and C-3 had increased crystallinity. The results documented that compared to control kiwifruit samples, the samples coated with C-3 nano-emulsion have decreased weight loss, decay incidence, soluble solids, maturity index activity, ethylene production, total bacterial count, and increased titratable acid, and firmness attributes. The results of current research are promising and would be applicable in utilization in industrial applications.
Keywords: Nano-emulsions; Carboxymethyl cellulose; essential oils; Preservation; shelf-life; Kiwifruit
***Corresponding authors**: shahzad10542005@yahoo.com (S.Z. Iqbal)

Efficancy of silicon dioxide against sucking insect est complex on cotton crop under natural and semi natural conditions

Mariam Fatima[1],Muhammad Sufian[1],Muhammad Abrar-ul-Haq[1], Sukaina Hussain[1]

[1]*Department of Entomology, University of Agriculture Faisalabad, Pakistan*

*Corresponding Author Email: mariamfatima178@gmail.com

Sucking insect pests considered as serious economic pests of cotton crop worldwide and has recently become a significant concern in African and Asian countries including Pakistan. Due to increased resistance against prevailing management strategies, silicon (Si) considered as another option due its ability to increase plants resistance against biotic and abiotic stresses. In the current study, supplementation of silicon in cotton was assessed against sucking insect pests complex and its effect on pest biology. The experiments were carried out at the Entomological Research Farm (Young-Wala), Department of Entomology, University of Agriculture, Faisalabad. Silicon Dioxide (SiO_2) was applied 3 times using two application methods (foliar application and soil drenching). The 1st application was done 20 days after sowing then 2nd and 3rd was 15 days of interval. In Pot experiment all pots was be covered with nylon mesh and free choice method was also be used. The sucking insect pest's infestation was recorded. Field experiment were conducted using randomized complete block design (RCBD) layout with three replications. There were three concentrations and a control treatment. Finally, the collected data analyzed through statistica 8.1 for analysis of variance and means were compared through Tuckeys test. The results showed that the drenching application of silicon dioxide significantly reduced the sucking pest's population on cotton crop as compared to foliar application. The lowest numbers of adults were recorded (17.67) after the 3rd foliar application of SiO_2 at 800 ppm level as compared to other treatments. The numbers of nymphs were noticed as 23.67 adults/plant by the application of SiO^2 at 400 concentrations, which was significantly different from other treatments. The maximum decrease in jassid population was recorded (74.76%) by the application of silicon dioxide at 800 ppm concentrations as compared to other treatments. The lowest numbers of adults were recorded (17.333 adults/plant) after the 3rd drenching application of SiO_2 at 800 ppm level as compared to other treatments. Similarly, the lowest numbers of adults were recorded (1.00 adults/leaf) after the 3rd drenching application of SiO_2 at 800 ppm level as compared to other treatments. The numbers of white fly (eggs, nymphs), jassid (eggs and nymphs) and thrips (eggs and nymphs) was also greatly reduced by the application of silicon at 800 ppm concentration. It was concluded from study the drenching application is more suitable for sucking pest management on cotton crop and needs more field trials in future studies.

Keywords: Silicon Dioxide, Whitefly. Jassids,Thrips, Concentrations

Some studies on combination of varietal difference and insecticides against spodoptera frugiperda on maize crop

Sukaina Hussain[1], Mariam Fatima[1], Muhammad Sufian[1]

[1]*Department of Entomology, University of Agriculture Faisalabad, Pakistan*

*Corresponding Author Email::mariamfatima178@gmail.com

Spodopterafrugiperda commonly known as fall armyworm is a serious pest which can destroy the crops widely. Insecticides are used to control this pest for the protection of crops. The present research was carried out at Experimental Area of Department of Entomology, University of Agriculture, Faisalabad. Application of three different chemicals (EemamectinBenzoate+Lufenuron, Chlorpyrifos and Profenofos + Cypermethrin), were applied on three varieties of Maize crop for the control of fall armyworm. Research was carried out according to Split-Plot Randomized Complete Block Design (RCBD) with varieties in main plot, insecticides in subplots, having 3 treatments and a control, all replicated three times. Data of larval mortality was calculated from experimental fields with interval of 1,7, 14 and 21 days. Mortality caused by larvae were recorded and calculated into percentage. Minitab 18.1 softwere was used to analyse the experimental data. According to the findings, the untreated and pre-treated plots both had 8 larvae per count. After a one-day exposure time to fall armyworm, 6 larvae per count were reported in the maize variety Pearl treated with 250-330ml profenofos and cypermethrin, whereas 3 larvae per count were recorded in the field treated with 250-330ml profenofos and cypermethrin after a 21-day period of exposure.

After exposure to fall armyworm for 1, 7, 14, and 21 days, infestation was reported in maize variety Sahiwal Gold treated with 250-300ml concentrations of Emamectin benzoate and lufenuron 5 larvae per count were observed in the uncontrolled and pre-treated plots. After a one-day exposure period, 5 larvae per count were found in the treated maize variety Sahiwal Gold treated with 250-300ml Emamectin benzoate and lufenuron. After a 21-day fall armyworm exposure period, 4 larvae per count were found in the field treated with 250-300ml Emamectin benzoate and lufenuron. After exposure to fall armyworm for 1, 7, 14, and 21 days, infestation in maize variety Gohar 2019 treated with 1000ml concentrations of Emamectin benzoate and lufenuron. The untreated and pre-treated plots both had 10 larvae per count. After a one-day exposure period to fall armyworm, 7 larvae per count were recorded in the maize variety Gohar 2019 treated with 1000ml Emamectin benzoate and lufenuron, whereas 4 larvae per count were recorded in the field treated with 1000ml Emamectin benzoate and lufenuron after a 21-day exposure period. Chlorpyrifos had also showed the significant results. Integration of insecticides can prove significant results against *Spodopterafrugiperda* larval population.

Keywords: *Spodopterafrugiperda*,Eemamectin Benzoate, Chlorpyrifos, Profenofos, Cypermethrin

Phototactic and phagostimulatory behavior o four stored product insects using different light and food source

Mariam Fatima[1], Muhammad Sufian[1], Muhammad Ahmed Nawaz[1]
[1]*Department of Entomology, University of Agriculture Faisalabad, Pakistan*
[*]**Corresponding Author Email:** mariamfatima178@gmail.com

Post-harvest losses due to insect pests pose a significant challenge to the storage of grains and cereals, resulting in reduced quality and quantity of stored commodities. Traditional insecticide-based management strategies have adverse effects on non-target organisms and the environment. This study aimed to investigate the phototactic and phagostimulatory behaviors of four major stored product insects using different light and food sources. The research objectives include evaluating the phagostimulatory behavior of the insects towards various food sources and studying their phototactic behavior using light-emitting diodes (LEDs) of different intensities. The experiments were conducted in a controlled laboratory setting, employing a completely randomized design (CRD) with three replications. A specially designed pentagonal maze with multiple arms was utilized as the experimental unit. LED light sources of different colors (red, green, blue, white, and yellow) were employed, each connected to a 12V electric supply. Various food sources, including whole and crushed grains of wheat, corn, and rice, as well as their respective flours, were tested to assess the insects' phagostimulatory behavior. Two experiments were conducted. In the first experiment, phototactic behavior was examined at different distances, and the number of insects reaching the terminal ends in response to light sources was recorded after 24, 48, and 72 hours. The second experiment focused on phagostimulatory behavior, and the number of insects reaching the terminal ends in response to food sources was recorded at the same time intervals. Statistical analysis, including factorial analysis of variance, was performed using Statistica-10 software. The results showed that the red LED (610-760nm) consistently had the highest attraction rate of Triboliumcastaneum, with an average of 40.33 adults after 24 hours. The green LED (500-570nm) had a substantially lower attraction rate compared to the red LED, while the yellow LED (570-590nm) attracted fewer adults than the red LED but more than the green LED. The blue LED (450-495nm) had the lowest attraction rate among all the tested wavelengths. The white LED (400-700nm) had a moderate attraction rate, higher than the blue LED but lower than the red LED. Similarly, the red LED exhibited the highest attraction rate for Rhyzoperthadominica, followed by the yellow, green, and white LEDs. The blue LED had the lowest attraction rate. The yellow LED had the highest attraction rate for Sitophilus sureninemous, followed by the red, blue, white, and green LEDs in decreasing order. The white LED had the highest attraction rate for Trogodermagranarium, followed by the red, yellow, blue, and green LEDs in decreasing order. Regarding phagostimulatory behavior, flour wheat demonstrated the highest attraction rate for Triboliumcastaneum with 41.33 adults at all time intervals. Whole corn showed higher attraction rates for Rhyzoperthadominica. Similarly, crushed wheat had higher attraction rates for

Sitophilus sureninemus: 32.67 adults at 24 hours, 31.33 adults at 48 hours, and 28 adults at 72 hours and whole wheat exhibited the highest attraction rate for Trogodermagranarium: 40.33 adults at 24 hours, 33 adults at 48 hours, and 36.67 adults at 72 hours.

Keywords: Phototactic, Phagostimulatorybehavior, *Triboliumcastaneum, Rhyzoperthadominica, Trogodermagranarium, Sitophilus sureninemous.*

Relaunching a traditional durum wheat product: new cultivars and introgression lines identified for frike making in Turkey

Fethiye Özberk 1*, Fernando Martínez-Moreno 2, Ljiljana Kuzmanović 3, Carla Ceoloni 3*, **İrfan Özberk** 4

1 Akcakale Vocational College, University of Harran, Akcakale, Sanlıurfa, Turkey; fethiye@harran.edu.tr 2 CienciasAgroforestales, University of Seville, Citra de Utrera km1, Seville, Spain; fernan@us.es

3 Department of Agricultural and Forest sciences (DAFNE), University of Tuscia, Viterbo, Italy; ceoloni@unitus.it 4 Department of Field Crops, University of Harran, Sanliurfa, Turkey; ozberki@harran.edu.tr

***Corresponding Author Email:** fethiye@harran.edu.tr (FO); ceoloni@unitus.it (CC)

Frike is an ancient and traditional food product prepared from early harvested whole wheat grain, particularly durum wheat (DW). For its many health beneficial effects frike is con-sidered a functional food. It is also a lucrative commodity, produced in various West Asian and North African countries and typically in South Eastern Turkey. However, no systematic assessment of the most suitable genotypes for frike production in the region is available. This study aimed to carry out such an evaluation, based on frike yield, quality traits, marketing price and profitability, on a set of 20 DW cultivars and DW-Thinopyrumponticum introgression lines (ILs). Results based on a field trial performed in Gölbaşı (Adıyaman, Turkey) in the 2021-22 season revealed the Turkish varieties Tüten-2002, Edessa, Artuklu and Perre, together with the R5 IL, to have the highest frike yields measured on 3 kg of roasted fresh spikes. The highest marketing prices were obtained by Turkish varieties Sariçanak-98, Burgos, Sümerli and Artuklu, along with the R112 IL, excelling in quality traits. Considering all parameters, the Turkish cultivars Artuklu, Firat-93 and Sariçanak-98, besides the R112 IL, resulted the most convenient genotypes for frike making, thus representing good candidates for maintaining cultural and genetic diversity in food production from a staple crop such as DW.

Keywords: Early harvested grain; firik; functional food; frike yield and quality; Thinopyrum; tradi-tional durum wheat dish; Triticum turgidum; wheat-alien introgression

A Multi-Modal Discourse Analysis of Advertising Technology and its Effects on the Values and Beliefs of Pakistani Youth

Noor-Ul-Ain[1*]

[1] *Department of English, Women University Katchery Campus, Multan 60800, Pakistan*

***Corresponding Author Email:** noorulain8003@gmail.com

This study explores the adverse effects of advertising techniques used by Pakistani advertisers on the behavior of young adults. Intending to target the customer's interests and promote products, the companies utilize various distinctive strategies. A Multi-Modal Approach, employing Fairclough's (1989) 3D model was used to identify the techniques used by advertising companies to get consumers' attention. Fairclough's three-dimensional framework includes three levels of discourse: text, discursive, and social practices. Multiple advertisements reaching more than one million views on YouTubewere analyzed and found that Pakistan is one of those countries in which, a viewer's personality and behaviorare impacted by this negative illustration in advertisements, which may lead to dishonesty

and violence among them. Along with entertainment, the promoters encourage exhibiting women in opposition to Pakistani culture. Moreover, similar concepts were observed in the behavior of youth that is against Islamic ideology. The findings suggest that if advertisements are managed effectively while maintaining sophistication,the influences of this technology must beoptimistic and beneficial. In addition, Pakistani advertisers should promote their products keeping in view the Islamic ideologies and Pakistani culture so the young generation would keep themselves stuck to their religion and culture and avoid vulgarity. It is also advised to parents, teachers, and other adults to help young people understand and critically evaluate the messages that they see in advertising, and to promote healthy and elegant behaviors.

Keywords: Commercials, culture, Islamic ideology, religion, vulgarity

Comparative efficacy of different insecticide against alfalfa weevil (*Hyperapostica*G.

Mubasher Ahmad Malik[1], Muhammad Saqlain[1], Arfat-ul Hassan[1], Ahsan Mustafa[1] and Azhar Abbas Khan[1]

[1]*Departmant of Entomology, University of Layyah, Pakistan*

[*]**Corresponding Author Email:** malik2007entomologist@gmail.com

The present study was conducted to check the effect of conventional insecticide viz., Bifentrin (25EC) @ 100 ml, Lambda cyhalothrin (2.5c) @ 50 ml andEmamectin benzoate (Emamectin1.9 EC) with different mode of actions were tested against 2nd instar larvae of alfalfa weevil (*Hyperapostica*G) in laboratory condition at College of Agriculture, University of Layyah. The data regarding mortality was collected after 12h, 24h, 36h and 72h. Bioasay showed that all three insecticides gave good results as compared with control. But significantly highest mortality was found with the application of Lambda cyhalothrin andbifenthrin while the lowest mortality was found withEmamectin benzoate.Biopesticides, emamectin were remained comparatively safe for predators as compared with pyrethroidsbifenthrin and Lambda cyhalothrin

Keywords: Alfalfa weevil, major pest, insecticides, predator, population,

Analyzing the Impact of Environmental Conditions and Fungicide Application Methods on the Epidemiology of Early Blight in Potatoes: A Comparative Study

Zain Safdar[1],Hafiz M. Aatif[2], YasirAli[1*],Muhammad Nawaz[2],Mumtaz Hussain[1],Mohsin Iqbal[1],M. Sohail Fareed[1], Shakeel Ahmad[1], Muhammad Aqib Javed[1],Muhammad Akmal[1]

[1]Department of Plant Pathology, College of Agriculture, University of Layyah (31200), Pakistan

[2]Department of Plant Pathology, BahauddinZakariya University Multan, Pakistan

[3]Department of Agricultural Engineering, KhwajaFareed University of Engineering and Information 11 Technology, Rahim Yar Khan 64200,Punjab, Pakistan

[*]**Corresponding Author Email:** yasirali@ul.edu.pk

In order to compare the epidemics of late blight (LB) (*Phytophthorainfestans*) and early blight (EB) (*Alternariagrandis*) under various conditions of the environment and fungicide application treatments, three experiments were conducted in an Experimental Field at Hafiz Abad Research Station, University of Layyah. A randomized Complete Block Design (RCBD) was used in each experiment, consisting of two side-by-side trials. The design included five treatments and five replications. In trials 1 and 2, the potato plants (‘Kuroda’ cultivar) were infected with an isolate of *P. infestans* (A2 mating type) and four isolates of *A. grandis*, respectively, 30 days after planting. The application of fungicides started seven days after inoculation and was then repeated at intervals of both seven and fifteen days. LB and EB severity was evaluated weekly, and the area under the disease progression curve (AUDPC) was calculated for both diseases. The yield was determined by measuring the weight of the tubers from each plot after they reached maturity. The yield data was transformed into kilograms per hectare for each treatment,

and the percentage of loss was computed. The AUDPC analysis revealed that the severity of LB was higher than that of EB across all three environmental conditions, and this disparity was evident in the yield. Yield losses of up to 82% and 45% were induced by LB and EB, respectively. The impact of fungicides on both LB and EB, as well as the resulting production losses, varied according to environmental circumstances. This highlights the significance of using tools like a forecast system to assist farmers in determining the most appropriate time for fungicide treatment.
Key words: Late Blight, Early Blight, Environmental Conditions, Fungicide Treatment, Potato Yield Losses

Assessing chemical control for mitigating leaf rust impact on wheat

Mumtaz Hussain[1],Yasir Ali[1*],Hafiz M. Aatif[2],Muhammad Bashair[1], Umbreen Shahzad[3], Muhammad Shah Jahan[1], MohsinIqbal, M. Sohail Fareed[1], Mozam Ejaz[1], Samina Kanwal[1]

[1]*Department of Plant Pathology, College of Agriculture, University of Layyah (31200), Pakistan*

[2]*Department of Plant Pathology, BahauddinZakariya University Multan, Pakistan*

[3]*Department of Horticulture, College of Agriculture, University of Layyah (31200), Pakistan*

***Corresponding Author Email:** yasirali@ul.edu.pk

Worldwide wheat crops are at serious risk from leaf rust, which is brought on by the fungus *Pucciniatriticina* and affects both yield and quality. The purpose of this study was to evaluate the effectiveness of chemical control methods in reducing the effects of leaf rust on two wheat types, Sehar-06 and Dilkash-21. Four chemical treatments such as Tebuconazole, Difenoconazole, Propiconazole fungicides, and Mytinil 10EC were used in the investigation, which was carried out at the University of Layyah in Pakistan. Evaluations were conducted on disease characteristics such as severity, incidence, plant height, number of tillers per plant, and grain yield. Difenoconazole 10EC exhibited a promising level of success in lowering both parameters. Furthermore, a dose-dependent response was noted, emphasizing the need of accurate chemical dosage in the treatment of disease. Chemical treatments, especially Difenoconazole, showed significant effect on plant height and the number of tillers per plant, suggesting possible advantages for the general health and production of plants. Difenoconazole 10EC treatment significantly increased grain yield, highlighting the drug's efficiency against leaf rust. When wheat types were compared, it became clear that each responded differently to chemical treatments; Sehar-06, for example, showed usually higher disease control and production of grains. The results emphasize the value of precise and timely chemical applications as well as customized chemical management plans for certain wheat cultivars.
Keywords: Chemical control, Disease management, Leaf rust, Wheat

Controlling Ascochyta Blight in Chickpeas: The Role of Fungicides and Plant Extracts

[1]Samina Kanwal, *[1]Yasir Ali,[2]Umbreen Shahzad, [3]Muhammad Nawaz,[1]Ujala khalid,[1]Mohsin Iqbal,[1]Mozaim Ijaz[5],[1]Sumaira Gull,[1]Humeira Bibi, [1]M. SohailFareed, [1]Mumtaz Hussain

[1]*Department of Plant Pathology, College of Agriculture, University of Layyah (31200), Pakistan*

[2]*Department of Horticulture, College of Agriculture, University of Layyah (31200), Pakistan*

[3]*Department of Agricultural Engineering, KhwajaFareed University of Engineering and Information 11 Technology, Rahim Yar Khan 64200,Punjab, Pakistan*

***Corresponding Author Email:** yasirali@ul.edu.pk

The Ascochyta blight, a highly destructive disease affecting chickpeas, was successfully controlled by employing six distinct fungicides: Aliette, ThiovitJetMancozeb, Copper oxychloride, Thiram, and Captin at concentrations of 0.16%. Additionally, six plant extracts, namely Neem, Eucalyptus, Garlic, Ginger, Onion, and Clove, at concentrations of 9%, were utilized for this purpose. Alliette was shown to be the most efficient fungicide (16%) in reducing disease incidence, followed by copper oxychloride (18%), Mancozeb (20%), Thiovitlet (23%), Thiram (27%), and Captain (29%). The study revealed that Neem plant extract exhibited the highest efficacy in reducing disease incidence, with a percentage of 52%. Eucalyptus followed this at 54%, Onion at 57%, and Clove at 59%.

40% ginger and 61% garlic. The present study demonstrates that using plant extracts and systemic fungicides containing sulfur can effectively manage ascochyta blight in chickpeas. To effectively prevent ascochyta blight in chickpea cultivation, it is recommended to include fungicides like Aliette and plant extracts like Neem in regular disease management programs. The usage amounts and frequency of these disease-control agents should be guided by consideration of ecological effects and agricultural sustainability.

Key words: Ascochyta Blight,Chickpea, Fungicides,Plant extract

Controlling Purple Blotch in Onions: The Use of Fungicides and Plant Extracts in Field Conditions

[1]Sumaira Gull, *[1]Yasir Ali, [2]Umbreen Shahzad, [3]Hafiz Muhammad Aatif, [4]Salman Ahmad, [1]Muhammad ZeeshanMansha, [1]MuhammadBashair, [1]Muhammad Shah Jahan, [1]Zain Safdar, [1]HumeraBibi,[1]Ujala Khalid, [1]Samina Kanwal, [1]Muhammad SohailFareed, [1]Shakeel Ahmad, [5]Aqsa Rehman

[1]Department of Plant Pathology, College of Agriculture, University of Layyah (31200), Pakistan

[2]Department of Horticulture, College of Agriculture, University of Layyah (31200), Pakistan

[3]Department of Plant Pathology, BahauddinZakariya University, Multan

[4]Department of Plant Pathology, University College of Agriculture, University of Sargodha, Pakistan

[5]Department of Soil Science, College of Agriculture, University of Layyah (31200), Pakistan

[*]**Corresponding Author Email:** yasirali@ul.edu.pk

A study was conducted at the Research Area of Plant Pathology, College of Agriculture, University of Layyah, to examine the efficacy of fungicides in managing purple blotch (*Alternariaporri*) disease of onion during the crop season of 2023. The objective was to evaluate the effectiveness of ten fungicides in controlling the disease and assess the performance of various plant extracts in controlling purple blotch disease in onion seed crops under field condition.Thefungicides(Chlorothalonil,Azoxystrobin,Mancozeb ,Zineb,Antracol,Trifloxystrobin,Copper oxychloride, Iprodione, Carbendazim, Control)were applied at 0.2%, three times at ten days intervals. Among fungicides, Azoxystrobinproved to be the most effective (29.59%) to reduce the disease incidence followed by Chlorothalonil (32.45%), Trifloxystrobin (36.95%), Copper oxychloride (40.91%), Antracol (45.95%), Mancozeb (50.41%), Zineb (54.31%), Carbendazim (57.95%), Iprodione(61.95%)over control (76.75%). Among plant extracts Neem proved most effective in reducing disease incidence (38.45%) as compared to followed by Ginger (45.95%), Dhatura (47.51%), Eucalyptus (49.15%), Garlic (51.69%), and Marigold (64.95%). Based on the study results, to effectively manage the purple blotch disease of onion, it is suggested to use a combination of Azoxystrobin fungicide and Neem plant extract due to their high efficacy in controlling the disease.

Keywords: Purple Blotch Disease, Onion Seed Crops, Fungicides, Plant Extracts, Disease Management

Evaluating the Impact of Different Nitrogen Levels and Mixed Cropping on Wheat Diseases and Their Association to Grain Yield

[*1]Muhammad SohailFareed,[1]Yasir Ali, [2]Umbreen Shahzad, [3]Salman Ahmad,[4]Muhammad Nawaz,[1]Mozaim Ijaz, [1]Humeira Bibi, [1]Mohsin Iqbal, [1]Mumtaz Hussain

[1]Department of Plant Pathology, College of Agriculture, University of Layyah, Layyah (31200), Pakistan

[2]Department of Horticulture, College of Agriculture, University of Layyah (31200), Pakistan

[3]Department of Plant Pathology, University College of Agriculture, University of Sargodha, Pakistan

[4]Department of Agricultural Engineering, KhwajaFareed University of Engineering and Information 11 Technology, Rahim Yar Khan 64200,Punjab, Pakistan

[*]**Corresponding Author Email:** sohailfareed80@gmail.com

Strip and leaf rust are major diseases that result in significant losses in wheat. The current investigation was carried out in the Research Area of Plant Pathology at the College of Agriculture, University of Layyah, to examine the effect of different nitrogen levels and intercropping on stripe and leaf rusts, as well as their correlation with grain yield, during the crop seasons of 2022-2023. The study involved an assessment of four distinct nitrogen levels,

namely N0 (0 kg ha^{-1}), N_1 (90 kg ha^{-1}), N_2 (180 kg ha^{-1}), and N_3 (270 kg ha^{-1}). Additionally, three different cropping regimens were examined, including mono-cropped wheat, mono-cropped fava beans, and intercropped wheat/fava beans. The disease severity of stripe and leaf rust exhibited an increase during both rating seasons, and the disease index was found to be more influenced by the application of nitrogen levels. Both diseases had a higher prevalence when the N_3 level was applied. Intercropping, with varying levels of N0 to N_3, resulted in a decrease in the occurrence of stripe rust by 5.8–41.76% and disease index by 9.56–40.76% compared to monocropping.Additionally, it raised the relative control effect by 6.67–45.23 and 10.27–43.65.1%. The effectiveness of intercropping with relative control was significantly impacted by the application of nitrogen (N_2) levels. The intercropping yield exhibited a significant rise of 27.23–48.67% as the nitrogen content increased, while the overall land equivalent ratio (LER) ranged from 1.45–1.49. The disease index and wheat yield exhibited a substantial negative correlation, with a correlation coefficient ranging from -0.678 to -0.864. This correlation was most pronounced at N_1. The control of nitrogen in intercropped wheat/faba beans has the potential to effectively manage stripe and stripe rusts effectively, hence enhancing wheat production. The maximum yield was achieved by intercropping at a rate of 180 kg ha^{-1} N_2.
Keywords: Disease Severity, Intercropping, Nitrogen Levels, Wheat Production,Yield

Exploring Resistance to Powdery Mildew in Peas and its Nutrient-based Control

Humera Bibi[1*], Muhammad Bashair[1], Yasir Ali[1], Umbreen Shahzad[2], Muhammad Shah Jahan[1], Sumaira Gull[1], Ujala Khalid[1], Mozam Ejaz[1], Samina Kanwal[1], M. Sohail Fareed[1], Mumtaz Hussain[1]

[1]*Department of Plant Pathology, College of Agriculture, University of Layyah (31200), Pakistan*

[2]*Department of Horticulture, College of Agriculture, University of Layyah (31200), Pakistan*

[*]**Corresponding Author Email:** humairaghafoor777@gmail.com

An emerging threat affecting major pea production in Pakistan is powdery mildew. The study aimed to evaluate the efficacy of the existing potent source in combating powdery mildew (*Erysiphe pisi*). The growth inhibition of pathogens was achieved with the use of six plant activators, namely salicylic acid, benzoic acid, citric acid, jasmonic acid, chitosan citric acid, fosetyl. Aluminium, as well as seven micronutrients (Zinc, Iron, Manganese, Copper, Boron, Molybdenum, Chlorine) and three macronutrients (N: P: K). On October 19th, 2023, seven different types were cultivated in the Department of Plant Pathology study area, located in the College of Agriculture at the University of Layyah. Weekly data on disease incidence was collected to evaluate the onset of resistance to this disease. The study's findings indicate that Peas-2009 exhibited resistance to *E. pisi*, as indicated by disease occurrences of 3.5% for each variety. The disease incidence of the winner was found to be 21.46%, suggesting a more resistant response. Three varieties, namely Azad (34.00%), Aleena (31.87%), and Peas meto (28.74%), exhibited a moderate level of susceptibility. A single variety, Sprinter, exhibited a sensitive response of 61.70%, while the remaining genotype, Meteor, displayed a high susceptibility of 71.76% to powdery mildew. The study's findings indicate that salicylic acid demonstrated the highest efficacy in reducing disease incidence, with a reduction rate of 15%. This was followed by jasmonic acid at 21.39%, chitosan at 26.73%, citric acid at 28.93%, fosetyl aluminum at 32%, and benzoic acid at 34.75%. Macronutrients and micronutrients resulted in a 9.45% and 12.56% decrease in disease incidence, respectively, compared to the control group (61.67%). Salicylic acid (SA) and macronutrients have shown significant efficacy as plant activators and nutrients in mitigating the spread of this pathogenic fungus.
Keywords: Powdery Mildew, Pea Production, Erysiphe pisi, Plant Activators, Disease Incidence Reduction

Management of Spinach AlternariaLeaf Spot Using Fungi and Plant Extracts: An Innovative Approach

[1]Ujala Khalid, [*1]MuhammadBashair,[1]Samina Kanwal,[1]Yasir Ali,[2]Umbreen Shahzad, [1]M.Shah Jahan, [1]Humera Bibi[4], [1]SumairaGull, [1]M.SohailFareed, [1]Mumtaz Hussain
Department of Plant Pathology, College of Agriculture, University of Layyah
[*]**Corresponding Author Email:** mbashair@bzu.edu.pk

Alternaria alternata caused spinach leaf spot disease, a significant issue impacting the health and yield of spinach crops.This study was conducted in the Lab of the Department of Plant Pathology, College of Agriculture, University of Layyah, to determine the vitro effectiveness of various fungicides and botanical extract agents against leaf spot disease. Azoxystrobin demonstrated the lowest levels of mycelial colony growth (19, 20, and 18 mm) at 100, 200, and 300 ppm concentrations. Subsequently, Cabrio Top (43.5, 32, and 20 mm), Carbendazim (32, 26.7, and 22.4 mm), Pyraclostrobin (42.5, 35, and 21.5 mm), and Antracol (42, 33, and 23 mm) were tested at different concentrations of 100, 200, and 300 ppm, respectively. In contrast, the mycelial colony growth of *A. alternata* was assessed at concentrations of 80 mm and concentrations of 100, 200, and 300 ppm. Aak exhibited the most minimal mycelia colony growth (44, 34, and 15 mm) at 5, 10, and 15% concentrations. The control group exhibited maximal mycelial colony growth (90.00 mm) in ginger (42.5, 33, and 20 mm), neem (48, 35.5, and 23 mm), and onions (56.4, 50.25, and 27.65 mm), while Eucalyptus (55.9, 56.4, and 33.45 mm) shown similar growth patterns.This study suggested that a combination of fungicides, notably Azoxystrobin and Carbendazim, and botanical agents like Aak and Ginger should be integrated into disease management strategies.
Keywords: Botanical extracts, fungicides, leaf spot, spinach, *Alternaria alternate*

Management Solutions for Garlic Dry Rot: A Comprehensive Study on the Use of Fungicides and Biological Control Agents against*Fusarium* Species

Mozam Ejaz[1*], Muhammad Bashair[1], Zain Safdar[1], Mumtaz Hussain[1], Yasir Ali[1], Mohsin Iqbal[1], M. Sohail Fareed[1], Samina Kanwal[1], Shakeel Ahmad[1], Muhammad Aqib Javed[1], Muhammad Akmal[1]
[1]*Department of Plant Pathology, College of Agriculture, University of Layyah (31200), Pakistan*
[*]**Corresponding Author Email:** mozamejazkhokhar@gmail.com

The objective of this study was to evaluate the efficacy of several fungicides and biocontrol agents (BCAs) against *Fusariumproliferatum*and *F. oxysporum*, which have been identified as the primary causative agents of garlic dry rot. The study aimed to assess the efficacy of these agents both *in vitro* and *in vivo*. The experiments involved the use of potato dextrose agar treated with chemicals or BCAs that were inoculated with certain strains of *F. proliferatum* and *F. oxysporum*. Before planting, garlic cloves were soaked in suspensions containing fungicides that exhibited the most beneficial effects *in vitro*. Subsequently, the cloves were soaked in a suspension of Fusaria before sowing. The *in vitro* experiments showed that Propiconazole + Prochloraz exhibited the highest level of inhibition against Fusaria growth, with a rate of 85%. This was followed by Tebuconazole at 77%, Prochloraz at 72%, difenoconazole at 69%, and fluquinconazole at 60%. Biocontrol agents (BCAs) showed significant efficacy in managing Fusaria, exhibiting a peak growth suppression rate of 80% when *Trichodermaharzianum* + *T. gamsii* were combined. The growth inhibition observed in the combination of *Trichodermakoningii*and *Trichodermaharzianum* was found to be 75%, whilst the combination of *Trichodermaviride*and *Trichodermaharzianum*exhibited the lowest growth inhibition, measuring 60%. The efficacy of bacterial biocontrol agents (BCAs) in controlling *F. proliferatum*and *F. oxysporumin vivo* was shown to be comparable to that of chemical products, with mean severity indices of 22% and 18% respectively. The *in vivo* findings confirmed the *in vitro* results, except *Trichoderma*, which exhibited the most negative results *in vivo*. Hence, the findings are initial but promising for possible application in the future. The *in vivo* findings were in line with the *in vitro* findings, except for *Trichoderma*, which exhibited poor results. Although very initial, the results showed potential for future field applications.

Keywords: Garlic, dry rot, fungicides, biological control agents, management

Synergistic effects antibacterial potential of selected sulpha drug loaded zinc oxide nanoparticles

Aamir Suhail
Kohat University of Science and Technology, Kohat-26000, Khyber Pakhtunkhaw Pakistan (2024)
***Corresponding Author Email:** suhailkhansuhailkhan766@gmail.com

Nanotechnology is a field of science and engineering that focuses on materials with dimensions on the scale of 100 nanometers or smaller. As nanotechnology advances, nanoparticles exhibit unique characteristics compared to bulk materials. The present study described the synthesis of zinc oxide nanoparticles through eco-friendly green process using *Nepeta lagopsis*exatract and sulpha drug loaded on synthesized zinc oxide and their antibacterial activity. The green synthesized zinc oxide nano particles were characterized by Fourier-transform infrared (FTIR) spectroscopy, X-ray Diffraction (XRD) and, Scanning Electron Microscopy (SEM). With the use of a UV-VIS spectrophotometer, the optical characteristics of iron oxide nanoparticles revealed an absorbance peak at 390 nm. FTIR studies confirm the presence of bio molecules and metal oxides such as the zinc oxide nanoparticles. The antibacterial activity were performed of synthesized zinc oxide nanoparticls alone and its inhibition zone is 26nm and sulpha drug loaded on synthesised zinc oxide and its inhibition zone is 30nmrepectively.This study reveal that the loaded sulpha drug were create more inhibition zone against gram positive and gram negative bacteria. In addition the present study were reveal to overcome the drug resistance problem.
Keywords: *Nepeta lagopsis* ,Sulpha drug(Septran),Drug loading.

Green synthesis, characterization of iron oxide nanoparticles using medical plant combinations, and their antibacterial activity

Farman khan[1]
[1]*Kohat University of Science and Technology, Kohat-26000, Khyber Pakhtunkhuwa Pakistan*
***Corresponding Author Email:** ch019fk@kust.edu.pk

Nanotechnology is a field of science and engineering that focuses on materials with dimensions on the scale of 100 nanometers or smaller.As nanotechnology advances, nanoparticles exhibit unique characteristics compared to bulk materials. The present study described the synthesis of iron oxide nanoparticles through eco-friendly green process using polyherbal recipes such as (*Mentha piperita*, *Camellia sinensis*, *Elettaria cardamomum)*, (*Ocimum basilicum*., *Mentha piperita*) and (*Punica granatum*, *Mentha piperita*) exatract and their antibacterial activity.The green synthesized iron oxide nanoparticles were characterized by Fourier-transform infrared (FTIR) spectroscopy, X-ray Diffraction (XRD) and, Scanning Electron Microscopy (SEM). With the use of a UV-VIS spectrophotometer, the optical characteristics of iron oxide nanoparticles revealed an absorbance peak at 410 nm. FTIR studies confirm the presence of bio molecules and metal oxides such as the iron oxide nanoparticles. The green synthesized nanoparticle from polyherbal recipes exhibited strong antibacterial activity against the *Escherichia Coli,Vibrio Cholera*. The iron oxide NPs which was obtained from combination-1, Combinantion-2 and Combination-3 have good zone of inhibiton against *vbrio cholera* 27nm, 26nm, and 16nm respectively which could be used as a potential antibacterial agent against bacterial disease.
Keywords: *Mentha piperita*, *Camellia sinensis*, *Elettaria cardamomum*, and *Punica granatum*, *Fusarium* oxysporum.

Impact of varying quantities of FYM and compost on canola crop growth and soil characteristics in connection to aphid infestation

Ahtisham Gul*
[1]*Department (Agronomy), College of Agriculture, University of Layyah*

Rapeseed, scientifically known as Brassica napus L. of the Brassicaceae family, is commonly referred to as F1 hybrid canola. This term encompasses the seed and oil produced by various cultivars of the rape plant, typically cultivars of either rapeseed (Brassica napus L.) or field mustard/turnip rape (Brassica rapa subsp. Oleifera, syn. B. campestris L.). Canola specifically denotes oilseed rape cultivars that yield seed oils containing less than 2% erucic acid (22:1) and meals with less than 30 mmol of aliphatic glucosinolates per gram. In the fiscal year 2023 (July-March), Pakistan imported 2.581 million tonnes of edible oil (including oil extracted from imported oilseed) valued at Rs 812.482 billion (US$ 2.462 billion). The total availability of edible oil during FY2023 (July-March) from imports and local production is estimated at 3.117 million tonnes. In FY2022, the area under rapeseed and mustard cultivation was 1260 hectares, with seed and oil production reaching 725 and 251 (000 tonnes) respectively. Presently, canola oil contains minimal erucic acid, 5% to 8% saturated fats, 50% to 62% monounsaturated fats, and 32% to 36% polyunsaturated fatty acids. Various characteristics of the canola plant, such as plant height, number of primary and secondary branches, number of pods, dry pod weight, straw, and seed yield, exhibit improvement with the addition of farmyard manure (FYM) during the crop's developmental stage. These organic amendments enhance soil physical, chemical, and biological properties, as well as soil fertility. Plant height, number of pods, dry pod weight, straw, and seed yield all benefit from the incorporation of FYM. Factors contributing to the low average yield (800-900 Kgha) of canola in Pakistan include insect pests, particularly aphids, which pose a significant threat due to the substantial losses they cause to the crop. Aphids not only damage canola crops through feeding and honeydew formation but also transmit viral diseases. In severe cases, losses can exceed 72% of the total crop potential. Pesticides like Actara are utilized for aphid control. Cultural practices play important role to minimize the aphid infestation in a number of crops and contribute considerable increments in farm produce. Cultural practices are essential in reducing aphid infestation in various crops and significantly boosting agricultural yields
Keywords: Compost, FYM , Aphid, growth , yield of Canola

Biology, predatory potential and growth parameters of the syrphid fly delayed on insecticide resistant population of Brassica Aphid

Mubasher Ahmad Malik[1], Arfatul Hassan[1], Murtaza Shah[1], Ahsan Mustafa[1]and Azhar Abbas Khan[1]
[1]*Departmant of Entomology, University of Layyah, Pakistan*
*__Corresponding Author Email:__ malik2007entomologist@gmail.com

The frequent use of chemicals insecticide causes insecticide resistance, side effects on non-target organisms and secondary pest outbreaks. Biological control by natural enemies, especially predators, is an eco-friendly strategy for suitable pest control in integrated pest management (IPM). Different chemical insecticide effect the predatory potential of natural enemies. In this study, first time we investigate the effects of sub-lethal concentrations of PyrethroidCypermethrin on the interaction between syrphid fly and Brassica aphid. We studied predation efficacy, biology and population growth parameters of syrphid fly, when susceptible and-resistant Brassica aphid are offered to syrphid fly, evaluating the effect of applying insecticides on the interacting species. The results showed that the mean total larval development duration, mean longevity of female/male, adult pre-ovipositional, and post-ovipositional periods were significantly disturbed when the predators were offered resistant aphids sprayed with sub-lethal doses, but not when the predator were offered susceptible Brassica aphid exposed to sub-lethal doses. We discuss how the effects of insecticides on predation may result in failures of biological control if natural enemy populations are not adequately managed, particularly for the management of insecticide resistant pest populations. Efforts to introduce biological control in integrated pest management (IPM) programs are also discussed.

Key words: Cypermethrin, integrated pest management (IPM), natural enemy

Exogenous application of potassium and silicon to improve the drought tolerance in chickpea

KashifRaza*[1],MuhammadAzam*[1],AbdulSattar,DanialAkhter[1],MuzamilJawad[1],
UmarFarooq[2],MuneebAkhtar[3],AbdulBasit[3],MuhammadAbdullahAsghar[3]
[1]*DepartmentofAgronomy,FacultyofAgriculture,UniversityofLayyah*
[2]*DepartmentofPlantBreedingandGenetics,UniversityOf Layyah*
[3]*Departmentof SoilScience,Universityof Layyah*
[*]**Corresponding Author Email:** muhammadazamgudara@gmail.com

Drought is one of the huge problems for crop productivity and also influence the yeild. It is a global problem and threatening theAgriculture. Potassium (K) considered to be a vital nutrient for plant. It plays crucial role in growth, development and other defense mechanism within plant body. The study examined the impact of potassium on the drought tolerance of chickpea seedlings through an analysis of growth, photosynthetic performance, osmo-regulation substance levels, and antioxidative enzymes under drought conditions. Drought stress negatively affected various aspects of chickpea seedlings, such as growth, water relations, photosynthesis, transpiration rate, chlorophyll content, and antioxidant activity.

Silicon has various applications, including mitigating the negative impacts of water-deficitstress.It promotes plant growth through enhancing seed germination, stabilizing cell membranes, facilitating carbon assimilation, improving plant-water relations, and aiding in osmotic adjustment. However, foliar application of potassium resulted in improvements in growth, water relations, photosynthesis, transpiration rate, chlorophyll content, and anteoxidative activity of chick pea plants under drought stress. Additionally, an increase in antioxidant enzyme activity and accumulation of osmoprotectants were observed under stressed conditions, particularly in chick pea plants treated with potassium.Inconclusion,foliar application of potassium helpe dmitigate the negative effects of drought stress on chickpea plants, demonstrating its effectiveness in enhancing drought tolerance.

Keywords: Shortage,Drought,Chickpea,Nutrients,ExogenousApplication, Silicon, Potassium, Tolerance, Stress, Water Relation and Growth.

The Impact of Dental Students' Resilience on Their Academic Achievement: A Co relational Study

Mahnoor Ahmed[1], Muqadas Aleem[1], Amna Bibi[1], Iqra Mushtaque[1*]
1 Department of applied Psychology BS 4th , University of Layyah, Pakistan
[*]**Corresponding Author Email:** iqra.fatima89@gmail.com

Background:
Resilience is the ability to overcome hardship. Behavioral and psychological therapy, when combined, can improve mental adaptability and reduce the symptoms of mental diseases while also fostering resilience. When students are under pressure, their motivation and performance suffer. Dental students may realize that working in a dental office and interacting with patients makes their employment uncomfortable. Pakistani dental students find it difficult to enjoy their time in school because they frequently experience severe and unanticipated hardship.
OBJECTIVE:
The purpose of this research is to assess the relationship between resilience and academic achievement among second-, third-, and fourth-year dental students at Multan University.
Methods:
The current study used a correlational research methodology with participants who were second, third, and fourth year dentistry students. There were 145 students enrolled in the dental program. Each and every student has

completed an informed consent form and provided demographic data. To assess academic resilience, the Academic Resilience Scale (ARS-30) was employed. I entered and assessed all of the gathered data using SPSS.

Results:

The 145 dental students from various fields had a mean age of 19.24±2.48 years, with 80 females (67.35%) and 65 males (32.65%) in the group. Professors in their second, third, and final year made up, respectively, 86 (43.88%), 50 (25.51%), and 60 (30.61%) of the total. For the ARS-30, we discovered a Cronbach's alpha of 0.714. The students' mean ARS-30 score was 74.19±8.85. Perseverance scored 35.58±4.19, negative affect and emotional response scored 19.45±4.27, and adaptive help seeking scored 19.15±4.55. Academic resilience and performance are positively correlated (r=0.774) in dental students.

Conclusions

Multiple studies have examined the correlation between academic resilience and success among dentistry students. The findings of this study indicate that dentistry students who possess strong academic resilience likely to perform more effectively in their courses.

Web based legal assistance platform

Muhammad Usama Shahid1, Muhammad Shan[1], Ali Hasnain[1]

[1]*The Physio College Multan*

Background: In our society, everyone is entitled to legal representation and defense as per the constitution. However, the sad reality is that only a select few actually have the means to access legal aid.This research aims to develop a web-based application for legal consulting services that intelligently addresses the community's legal aid needs.

Objective: The objective of this work are to democratize access to justice, make legal services more accessible, efficient, and provide cost effective transparent legal processes.The platform provides user registration, legal professional verification, initial consultations, document preparation, case management, feedback and ratings.

Methodology: The design of this application involves creating user requirements analysis,databases, user interfaces, detailed planning, design, coding, and processes. The web based online platform will be developed using advanced development tools and languages: HTML5, CSS3, and JavaScript for front-end interface. Secondly, PHP and SQL will be employed as backend.The features include user login and registration, lawyer discussion, case investigation, legal information search, and information management.

Conclusion: By developing this application, we can enhance access to legal aid within the community, encourage public engagement in addressing legal matters, gather data on legal issues, and improve the application's ability to access data from different sources.

Keywords: Legal Assistance, Real-time Chat, User-friendly, Accessibility.

Bridging borders: Global Collaboration for success in science, technology and management

Abdul Wasay khan[1], Noman Malik[1], Haris Qureshi[1], M. Faraz[1]

[1]*The Physio College Multan*

Background:

In today's increasingly interconnected world, the convergence of science, technology, and management transcends geographical boundaries, profoundly influencing the global landscape of innovation, competitiveness, and sustainable development. The proliferation of cross-border collaborations underscores the recognition that addressing complex challenges, from climate change to global health crises, requires collective efforts and knowledge exchange on a global scale. Extensive literature spanning disciplines such as economics, management, and international relations highlights the pivotal role of international collaboration in driving scientific advancement,

technological innovation, and effective management practices across diverse cultural, institutional, and disciplinary contexts.

Objective:
Against this backdrop, this paper sets out to explore the multifaceted dynamics of international science, technology, and management integration. The overarching objective is to elucidate the key drivers, challenges, and opportunities inherent in fostering cross-border cooperation and knowledge transfer. By synthesizing existing research, theoretical frameworks, and empirical evidence, the aim is to provide actionable insights for policymakers, business leaders, and researchers seeking to navigate and harness the transformative potential of global collaboration.

Methodology:
To achieve this objective, a rigorous methodology encompassing a comprehensive review of scholarly articles, case studies, and policy documents will be employed. Drawing upon established databases and repositories, the analysis will encompass a wide range of literature spanning the domains of science, technology, and management. Through systematic data synthesis and thematic analysis, the paper will identify common patterns, emerging trends, and best practices in facilitating successful international partnerships. Additionally, illustrative case studies and examples will be utilized to enrich the discussion and provide practical insights into effective strategies for fostering cross-border cooperation.

Conclusion:
In conclusion, this paper underscores that effective international collaboration in science, technology, and management necessitates proactive efforts to bridge cultural, institutional, and disciplinary divides. While challenges such as language barriers, divergent regulatory frameworks, and unequal resource distribution persist, the benefits of global collaboration in driving innovation, enhancing competitiveness, and addressing shared challenges cannot be overstated. Key enablers of successful integration include fostering a culture of openness and trust, cultivating cross-disciplinary communication channels, and leveraging digital technologies to facilitate knowledge exchange and collaboration. Embracing diversity and inclusivity, both within and across organizations, emerges as a cornerstone for unlocking the full potential of global collaboration and steering towards a more equitable and sustainable future.

Keywords:
International collaboration, Science, Technology, Management, Global innovation, Cross-disciplinary, Cultural diversity, Leadership, Governance, Digital transformation, Sustainability, Inclusive growth.

Maximum technology management; strategies for innovation in the digital era

Rabbia Khalid[1], Nouman Ahmed[1], Laiba Liaquat1, Zaynab Najaf1
[1]*The Physio College Multan*

Background:
In the dynamic landscape of the digital era, effective technology management has become a critical determinant of organizational success. Rapid technological advancements, coupled with shifting consumer demands, necessitate agile and forward-thinking approaches to technology management.. By understanding the challenges and opportunities inherent in modern technology management, organizations can position themselves to harness innovation and drive sustainable growth.

Objective:

This study aims to investigate strategies for maximizing technology management to foster innovation in the digital era. Through a comprehensive analysis of current practices and trends, the research seeks to achieve the following objectives:

1. Assess the key drivers and challenges shaping technology management in the digital era.
2. Identify effective strategies and best practices for optimizing technology management processes, resources, and projects.
3. Explore the role of technology leadership, organisational culture, and change management in driving innovation.
4. Examine methodologies such as Agile, DevOps, and digital transformation frameworks in enhancing technology management capabilities.
5. Provide actionable recommendations for organisations to enhance their technology management practices and leverage innovation for competitive advantage.

Methodology:
This research employs a mixed-method approach, combining qualitative and quantitative techniques to gather insights into technology management practices. Qualitative methods, including literature review and case studies, will be used to explore theoretical frameworks and real-world examples of effective technology management strategies. Quantitative methods, such as surveys and data analysis, will be utilized to identify trends and patterns in technology management practices across industries.

Conclusion:
In conclusion, effective technology management is indispensable for organizations striving to innovate and thrive in today's digital landscape. By embracing proactive strategies, fostering a culture of innovation, and leveraging emerging technologies, organizations can unlock new opportunities for growth and differentiation. The findings of this study underscore the importance of agility, collaboration, and strategic alignment in technology management, serving as a roadmap for organizations seeking to navigate the complexities of the digital era successfully.

Keywords:
Technology management, innovation, digital era, strategy, Agile, DevOps, digital transformation

Diabetes prediction machine learning algorithms

Iqra Liaqat[1], Muhammad Shan[1], Nimra Arif[1], Sofia Liaqat[1]
[1]*The Physio College Multan*

Background: Globally, over 500 million people are affected by diabetes, making it the most prevalent and deadliest non-communicable disease. Several factors contribute to the development of diabetes, including excessive body weight, family history, abnormal cholesterol levels, physical inactivity, and poor dietary habits. Diabetes is a widespread chronic condition with serious health consequences. Detecting it early can greatly benefit patients and reduce healthcare expenses. Diabetes presents significant health risks, and early detection can greatly benefit patients and reduce healthcare costs.

Objective: The project aims to develop a machine learning model for predicting diabetes based on patient attributes, achieving high precision in identifying at-risk individuals. It seeks to provide insights into prediction factors and create a dependable, transparent system for healthcare professionals.
Methodology: In this project, we will employ machine learning (ML) techniques to analyzed diabetes, employing various classification algorithms. A dataset comprising patient attributes like age, BMI, blood pressure, and glucose

levels serves as training data for model development. Dataset will be retrieved from online Kaggle repository. Data set cleaning, encoding, missing values removal are preprocessing steps. Training machine learning models such as LR, RF, SVM, DT with dataset ratio of 80% training, 20% validation. The model with highest evaluation accuracy will be used to calculate the probability that either person has diabetes or not.

Conclusion: The work aims to enhance diabetes prediction accuracy by providing valuable insights and fostering a dependable, transparent diabetes prediction system for informed healthcare decision-making.

Keywords: Diabetes prediction, machine learning, logistic regression, random forest, gradient boosting, healthcare, patient care.

Advancing healthcare through IOT; a wireless biotelemetry monitoring approach

Ashrah Ashiq[1], Muhammad Shan[1], Nimra Sabir[1], Areej Saeed[1]
[1]*The Physio College Multan*

Background: Over the past ten years, there has been a significant surge in research within the healthcare sector, particularly in advancing its technological landscape. Specifically, the Internet of Things (IoT) has emerged as a promising avenue, linking diverse medical instruments, sensors and healthcare experts to deliver top-notch medical care even in distant locales. This advancement has not only help patient safety but also cut down healthcare expenses, broadened the reach of healthcare services and streamlined operations across the healthcare landscape.

Objectives: The aim of this project is to create a wireless system equipped with sensors that can gather immediate and ongoing physiological data linked to the human body. This data will be utilized for continuous monitoring and will also be stored permanently for future reference.

Methodology: The utilization of proposed IoT framework in healthcare merges the benefits of IoT technology and cloud computing with medicine. It establishes protocols for transmitting patient data from various sensors, including those for blood pressure, body temperature, ECG, pulse rate, room temperature, humidity, oxygen level and medical devices. This data is then sent to a healthcare network through Wi-Fi technology equipped with a web-based remote platform for monitoring and analysis.

Conclusion: The study offers several benefits, such as reducing visit to the hospital, enhancing patient comfort and detecting health issues early. It aims to create a biotelemetry health monitoring system that is affordable and easy to use, ultimately improving patient care by allowing remote monitoring of vital signs and environmental factors.

Keywords: Health Monitoring, Remote Patient Monitoring, Real-Time Data and Wireless Sensor Network

Mediconnect; A comprehensive healthcare management system using flutter

Faneela[1], Muhammad Shan[1], Fraz Bilal[1], Nimra Sabir1
[1]*The Physio College Multan*

Background: The healthcare sector has several issues, including inefficient management systems, a lack of interoperability, and administrative procedures. These constraints frequently result in poor patient care and greater operating expenditures. As a result, there is an increasing demand for new solutions that expedite healthcare administration operations while adhering to regulatory requirements. In today's quickly changing healthcare scene, efficient communication and management systems are critical to providing high-quality treatment. Traditional methods can result in inefficiencies and problems with scheduling, record-keeping, and access to healthcare services.

Objective: Our key goals include implementing features such as appointment scheduling, medical record management, and online consultations.

Methodology: Flutter framework will be employed to develop a flexible cross-platform app to meet the objectives of this study. The system's structure will be designed and implemented utilizing the Flutter framework, allowing for cross-platform mobile development. Backend services will be built with Firebase to enable data storage, authentication, and real-time communication, Android Studio, and IDE use for coding. Our development strategy will follow agile approaches, which will ensure continuous feedback and iterative system upgrades

Conclusion: The intended study will provide smooth communication between patients and healthcare practitioners through simple and interactive user interfacesby implementing agile development approaches, the system remains responsive to changing user expectations and regulatory norms.

Keywords: Healthcare management, Flutter, appointment scheduling, medical records, and online consultations.

Amelenation of Arsenic Toxicity in wheat through application of zinc and vermi compst

DanialAkhtar[1],AbdulSattar,MuzamilJawad*[1],MuhammadYousef,MuhammadAzam[1],Kashif Raza[1],UmarFarooq[2], MuneebAkhter[3], AbdulBasit[3], MuhammadAbdullahAsghar[3].

[1]*Department of Agronomy,Faculty of Agriculture,University of Layyah*

[2]*Department of Plant Breeding and Genetics,University Of Layyah*

[3]*Department of Soil Science,University of Layyah*

***Corresponding Author email:** danialakhtar222@gmail.com

The current research demonstrates the phyto toxicity of arsenic (As) on wheat (Akbar) seedlings and the use of zinc sulphate and vermicompostpriortoapplication toalleviatethetoxiceffectsofAs.WheatseedlingsoftheAkbargenotype(Triticum aestivum L.) were cultivated in pot soil culture with eight different treatment combinations, including Control,Vermi compost @ 15 t.ha-1, ZnSO4.7H2O @ 20 ppm Zn, Vermi compost @ 15 t.ha-1 + ZnSO4.7H2O @ 20 ppm Zn, NaHAsO4.7H2O@30ppmAs,Na2HAsO4.7H2O@30ppmAs+Vermicompost @ 15 t.ha-1, Na2HAsO4.7H2O @ 30 ppmAs + ZnSO4.7H2O @ 20 ppm Zn, and Na2HAsO4.7H2O @ 30 ppmAs +Vermi compost @ 15 t.ha-1 + ZnSO4.7H2O @ 20 ppm Zn.Analysis of the data revealed that pots treated with arsenic @ 30 ppm exhibitedadecreaseinplantheight,leafarea,andshootdrymattercomparedtopots without arsenic treatment. Zinc @ 20 ppm and Vermi compost @ 15 t.ha-1 individually led to an increase in plant height, leaf area, and shoot dry matter. The treatment with the highest plant height, leaf area, and shoot dry matter in arsenic- treated pots was the onesupplemented withZinc @ 20 ppm andVermi compost @ 15t.ha-1,whilethelowestvaluesfortheseparameterswereobservedinpotswithout zinc and vermi compost supplementation.

Keywords: Vermicompost,Toxicity,Wheatseedling,Zinc,Pots,Genotypeand Arsenic

Investigate the effect of TOSVIT® and Azostar on growth and disease severity of *Allium sativa.*

Mubasher Ahmad Malik[1], Gozde Busra EROGLU[2], Sohail Dasti, Syed John Raza[1] and Azhar Abbas Khan[1]

[1]*Department of Entomology, University of Layyah*

[2]*Department of Molecular Biology and Genetics, Faculty of Science, Erzurum Technical University, Erzurum, Türkiye*

[*]**Corresponding Author Email:** malik2007entomologist@gmail.com

The G1 Garlic is considered excellent variety among all the grown varieties of garlic in Pakistan. It was introduced by national agricultural research council (NARC) in 2018. The NARC GI is good source of vitamins E, C and A. The G1 Garlic is prone to number of fungal diseases. Among these downy mildew and collar rot are most devasting one which causes yield losses up to 30%. In this study we tested the effect of TOSVIT ®(Kimitec Spain) and Azostar® (Azoxystrobin 7%+Propiconazole 11.7%) in sole as well as in combination on growth and disease

severity of NARC GI. under green house and field conditions. The highest leaf length width and disease free less shinny plant of NARC GI were observed in alone application of TOSVIT ® after 7, 14 and 21 days of application. Whereas, decrees in leaf length, width and shinning of NARC GI leaf were noticed in combined application of TOSVIT ® and Azostar. On the other hand alone application of Azostar showed shinning leaf with no change in leaf length and width. Further molecular studies will be evaluated to understand the mechanism for growth and disease control in Garlic.

Keyword: Tosvit, Azostar,

A upper left tosit+Azostar(100ml+50mlper tank), B below left Tosvit(100ml per tank), C Azostar(50ml per tank)

Impact of Covid-19 lockdown on children and adolescents life style and behavior, A cross sectional study

Nimra Sabir[1], Fraz Bilal[1], Nimra Arif[1], Muhammad Saddique[1], Farukh Fiyaz[1]

[1]*The Physio College Multan*

Background: Physical inactivity and a marked increase in sedentary life style is seen as an impact of Covid-19 lockdown on children and adolescents. Closure of educational institutes has led to decreased physical activity and increased screen time in children and adolescents. The one and most important thing to prevent from long lasting effects of this disaster is to be physically active and not adopting sedentary behavior from which we already suffering. Because the world will recover from coronavirus disease and will return towards normal life, normal activities will resumed. However, the physical inactivity and sedentary behavior pandemic will continue and will be more troublingly.

Objective: The main objective of this study is to calculate the impact of Covid-19 lockdown on children and adolescents and calculate physical activity decline and increased screen time.

Methodology: It is an analytical cross-sectional study in which convenient sampling technique is used. 205 students of age 7-18years included in this study. Global physical activity questionnaire (GPAQ) is used to collect data about physical activity in educational, travel to and from and recreational activities of vigorous and moderate intensity. Sedentary lifestyle and screen time is also calculated.

Conclusion: The statistical analysis shows Covid-19 lockdown has an impact on children and adolescents life style and behavior. Results were analyzed on SPSS 21.

Keywords: Sedentary life style, GPAQ, recreational activities, vigorous intensity.

Prevalence of carpal tunnel syndrome in smartphone users and association between CTS and smartphone using hours among housewives of Multan

Farukh Fiyaz[1], Nimra Sabir[1], Nimra Arif[1], Laraib Safdar[1], Noman Akhtar[1]
[1]*The Physio College Multan*

Background: Carpal tunnel syndrome is a prevalent medical illness that continues to be one of the most common causes of median nerve compression. The median nerve is compressed as it travels through the wrist under flexor retinaculum containing nine flexor tendon, causing CTS. Pain in the hand, numbness, and tingling median nerve distribution or all symptoms of the syndrome. Obesity. Pregnancy, genetic inheritance, repetitive wrist activities, and rheumatoid inflammation are risk factors for CTS.
Objective: To determine the prevalence of carpal tunnel syndrome in smart phone users and association between CTS and smart phone using hours among housewives of Multan.
Methodology: Observational Cross-sectional study was conducted using self-made questionnaire and by performing a special test, reverse phalens test in housewives. Non- probability convenient sampling used to collect data due to time limitation. Sample size was 219. Data analyzed by SPSS version 25.
Conclusion: The current study showed that there was high prevalence of carpal tunnel syndrome and there is positive association between CTS and smartphone using hours.
Keywords: Carpal tunnel syndrome, reverse phalens test, smart phone users, median nerve compression neuropathy peripheral entrapment syndrome.

Prevalence of Plantar fasciitis among high heel users in multan

Umaira Umar[1], Nimra Sabir[1], Farrukh Fayyaz[1], Ramna Zafar[1], Sunya Salah-ud-din[1]
The Physio College Multan

Background: Plantar fasciitis is a common condition characterized by pain and inflammation of plantar fascia .The goal of this study is to determine the prevalence of plantar fasciitis among high heel users with its possible associated factors (body weight and shoe heel height). Existing studies may not adequately address the height of heel and for how many hours the heels worn, and according to the weight of patient intersection, necessitating a focused investigation.
Objective: The aim of this study is to determine the prevalence of plantar fasciitis among high heel users in Multan.
Methodology: It will be cross sectional study**.** The targeted population for this study is the young females of Multan .the sample will be conducted through non-purposive sampling technique.The duration of this research is 6 months after the approval of synopsis .The sample size is 120. The inclusion criteria is age 20- 30years ,Gender females having heel pain, females using heels for more than 5 hours a day weight of user should be 55-65 kg. Exclusion criteria females who are currently pregnant any history of trauma, congenital bone deformity of foot. Past history of plantar fasciaits. The data will be collected through self-made questionnaire and NPRs scale. The SSPS version 2.0 will be managed and analyzed.
Conclusion: There may or may not be prevalence of plantar fasciitis among high heel users
Keywords: Plantar fasciitis, self-made questionnaire, NPRS Scale,

Prevalence of CTS and its association with prolonged working hours in freelancers of Multan

Muhammad Saddique[1], Nimra Sabir[1], Farukh Fiyyaz[1], Maria Munir[1], Sheraz Maqsood[1]

[1]*The Physio College Multan*

Background: It is true that using a laptop simplifies work for users. On the other hand, extended laptop use can lead to a number of health issues, including musculoskeletal ailments. The Carpal tunnel syndrome is the median nerve's local compression near the wrist.Common signs and symptoms include tingling in the hand and arm, frequently on both sides, burning, discomfort, numbness, and sensations like to electric shock. In October 2020 a study was conducted on Frequency of Carpal Tunnel Syndrome in Male Computer Users by Nimra Farooq et al which concluded that: In professional life computer users frequently use computers for 6 to 9 hours daily. Further it was found that 51% Prevalence of Carpal Tunnel Syndrome existed in Male Computer Users. This research will increase awareness about the health risks of excessive work among freelancers. Provide occupational health guidelines to promote better work habits.

Objective: The objective of this study is to assess the prevalence of the carpal tunnel syndrome and its association with prolonged working hours among freelancers of Multan.

Methodology: It is Cross-sectional studypopulation targeted will Freelancers of Multan sample will be collected through Non-Purposive Sampling technique. The duration of the research will be 4 months. The Sample size will be 120. TheInclusion criteria Age 18-45 Gender both male/female, Working Hours > 8 hours and Active from at least 1 year,Exclusion criteria: Recent hand surgeries and trauma, autoimmune disorders, Diabetes, Pregnancy. The Data will be collected through Boston CTS Questionnaire.Through SPSS version 2.0 data will be managed and analyzed.

Conclusion: There may or may be the prevalence of the carpal tunnel syndrome and its association with prolonged working hours among freelancers of Multan.

Keywords: Carpal Tunnel Syndrome, Boston CTS Questionnaire, Freelancers

Prevalence and Effectiveness of pressure ulcer prevention strategies in ICU (Intensive care unit) in Government and private hospitals of Multan

Esha Umar[1], Nimra Sabir[1], Nimra Arif[1], Ghulam Fatima[1], Shirin Faheim[1]
[1]*The Physio College Multan*

Background: Pressure ulcers are one of the most common problems faced globally in health care settings. Patients in the ICU are at increased risk of developing PI because of multiple pathophysiologic mechanisms.Pressure-relieving support surfaces (i.e. beds, mattresses, seat cushions etc.) are used to help prevent ulcer development.

Objective: The present study aims to determine the Prevalence and Effectiveness of Pressure Ulcer Prevention strategies in Intensive Care Unit in Government and Private Hospitals of Multan.

Methods: Observational study was conducted at govt and private hospitals of Multan. Non purposive sampling technique was used along with inclusion and exclusion criteria. Braden Scale, regular skin inspection,Feedback from healthcare professionals is used to assess a patient's risk of developing pressure ulcer.Using SPSS version 2.2 data will be managed and analyzed.

Conclusion: In conclusion, addressing the prevalence of pressure ulcers in ICU settings in Multan requires a multifaceted approach. By implementing evidence-based prevention strategies, both government and private hospitals can work towards reducing the incidence of pressure ulcers and improving patient care in the ICU.

Key Words: Prevalence, Pressure Ulcers, Pressure Injuries, Decubitus Ulcers, Intensive Care Unit

Prevalence of upper limb musculoskeletal disorders among physiotherapist in Multan

Aysha Sadeeqa[1], Nimra Sabir[1], Farrukh Fiyyaz[1], Shehrish Bashir[1], Shahnaz Bashir[1]
[1]*The Physio College Multan*

Background: Work-related musculoskeletal disorders encompass inflammatory and degenerative conditions resulting in pain and reduced function. These disorders are associated with work patterns Characterized by prolonged fixed body positions, repetitive movements, and concentrated force on Specific body areas like the hand or wrist, and a work pace that hinders sufficient recovery between Movements. Physiotherapists also experience a high prevalence of work-Related musculoskeletal disorders, exerting a significant impact on both their personal and Professional lives. Engaging in forceful and repetitive movements forms a substantial part of tasks in Physiotherapy, potentially exposing therapists to the risk of musculoskeletal injuries throughout their Careers. In January 2024, Danish Latif and his coauthor conducted a study on physical therapists of both Genders having clinical experience of greater than or equal to at least one year. Men, women, and People of all ages might experience shoulder pain. The purpose of the study is to ascertain the Prevalence of shoulder discomfort among physical therapists working in the twin cities of Islamabad and Rawalpindi.

Objective: The present study aims to determine the prevalence of upper limb musculoskeletal disorders among Physiotherapists in Multan.

Methodology: It will be cross-sectional study. Targeted Population will be all government sectors and private clinical physical therapists in Multan.Non-Purposive sampling technique will be used to collect sample. The duration of the research will be 6 months. The sample size will be 90. Inclusion criteria: Gender: Male, Females, Age: 26-40, Moderate pain in shoulder, elbow and hand from two months. Excluded criteria: Diabetes, Pregnancy, Autoimmune Disorders, any recent surgery or trauma. The data will be collected through Nordic Questionnaire and Numeric pain scale.

Conclusion: There is no Prevalence of upper limb musculoskeletal disorders among Physiotherapists in Multan.

Keywords: Musculoskeletal Disorders, Nordic Questionnaire, Physiotherapists

The radial side of wrist hurts; prevalence and awareness evaluation of de-quervaint's tenosynovitis among tailors in Multan

Dilawaiz Amanat[1], Nimra Arif[1], Fraz Bilal[1], Maheen Khan[1], Maryam Qasim[1]

The Physio College Multan

Background: The term "De Quervain's tenosynovitis" describes a condition characterized by tenosynovitis with stenosis around the radiostyloid process and affects the thumb abductor muscles. Fritz De Quervain first coined this term in 1895. The prevalence of this condition is increasing due to heightened occupational demands. Pain and swelling are the main symptoms, developing gradually over time. This study aims to fill the gap by investigating how common the condition is among male and female tailors in Multan and how much they know about it.

Objective: To determine the prevalence and awareness evaluation of De Quervain's tenosynovitis among tailors in Multan.

Methodology: It will be an observational cross-sectional study in which 140 subjects will be selected based on the inclusion criteria. Non-probability sampling technique will be used. The SSPS version 2.0 will be used for management and analysis.

Conclusion: Prevalence and awareness evaluation of De Quervain's tenosynovitis may be effective or may not be effective among tailors in Multan.

Keywords: De Quervain's tenosynovitis, NPRS, Finkelstein's test

Incidence of disc bulge against muscular weakness in patients with non-specific low back pain

Laraib Safdar[1], Nimra Arif[1], Noman Akhtar[1], Ahmad Qureshi[1], M. Zulfiqar[1]

[1]*The Physio College Multan*

Background: The research topic was "Incidence of Disc Bulge against Muscular weakness in patients with non-specific low back pain in Multan". Main focus of our research was to observe the incidence in between disc bulge and muscular weakness in patients suffering from non-specific lower back pain. The inclusion criteria were, patients suffering from non-specific lower back pain between the age of 20-40 and all the patients with any specific cause were excluded from the research.
Objectives: Objectives of our research included; identifying the incidence of non-specific low back pain due to disc bulge. To recognize the occurrence of non-specific low back pain due to muscular weakness, and to differentiate the causes of non-specific low back pain between disc bulge and muscular weakness.
Material & Methodology: Slump test and SLR were applied as diagnostic tests and Oswestry disability scale was used to identify the disability affecting the daily tasks of patients with non-specific low back pain.
Results: Results showed the incidence of disc bulge is high in age group of36-40 and incidence of muscular weakness is high in age group of 21-25. Results also showed that men are more affected by disc bulge than women.
Conclusion: The conclusion shows that the Incidence of disc bulge is higher than muscular weakness in people suffering from non-specific low back pain in the age of 20-40 years.
Keywords: Incidence, Disc bulge, Muscular weakness, non-specific low back pain

Dissection of wheat genotypes for heritability and genetic advance under potassium concentrations

Umar Farooq[1], Muhammad Asad Ullah[2], Muhammad Azam[3], DanialAkhtar[3], Muneeb Akhtar[4], Abdul Basit[4], Muhammad Feroz[1], Asad Azeem[1], Waqar Ahmed[1], Muhammad Abdullah Asghar
[1] *Department of Plant Breeding and Genetics, University of Layyah, Punjab, Pakistan*
[2] *Department of Plant Breeding and Genetics, Faculty of Agricultural Sciences, University of the Punjab, Lahore, Pakistan*
[3] *Department of Agronomy, University of Layyah, Punjab, Pakistan*
[4] *Department of Soil Science, University of Layyah, Punjab, Pakistan*
***Corresponding Author email**: umarfarooq.agrarian@gmail.com

Wheat, being the foremost cereal crop, holds paramount significance as a staple food globally. However, a variety of conditions in natural field settings can cause its yield to decrease. The production of cultivars is greatly aided by the genetic heterogeneity found in wheat germplasm, which makes it possible to choose and breed types with desired characteristics. The heritability and genetic advance of different traits under varying potassium concentrations were assessed in order to improve breeding programs. Five different wheat genotypes with three different potassium contents were arranged in a factorial combination in the course of the experimental design. The number of tillers, flag leaf area, thousand-grain weight, and grain yield were all significantly affected by genotype and potassium concentrations ($P < 0.01$), moreover, there was a noteworthy correlation between the two parameters($P < 0.01$). A positive correlation was seen between plant height, number of spikelets, spike length, flag leaf area, yield per plant, and 1000-grain weight, all of which have a direct and positive impact on yield. Genetic advance and broad-sense heritability were calculated to determine the degree to which changes in the traits under study can be transmitted on to future generations. Flag leaf area,number of spikelets per spike, peduncle length, and Plant heightamong the seven variables exhibited high genetic advance and high heritability values, suggesting an additive kind of gene action. This implies that these factors have a great deal of promise as target features for efficient selection in the creation of genotypes or varieties of wheat in response to potassium levels.

Analysis of the Impact of Digital Technology Innovation on Air Quality in Developed and Developing Economies

Farwa Rani[1*], Sharafat Ali[1, 2]
[1]*Department of Economics, Government Graduate College Kot Sultan, Layyah, Pakistan*

[2]*School of Economics, Jiangsu University of Science and Technology, Zhenjiang, Jiangsu, China*
[*]**Corresponding Author Email:** farwarani9701@gmail.com

The swift and groundbreaking advancements in digital technology innovation (DTI) and its widespread adoption underscore the need for an in-depth examination of its effects on air quality, highlighting the urgency to leverage DTI for climate action. This research delves into how DTI, alongside factors like green energy, economic growth, governance, and performance in economic and social rights (ESRP), influences air pollution. It utilizes panel data from 85 countries, both developed and developing, spanning from 2001 to 2022, and further analyzes subsets of 45 high-income countries and 50 countries categorized as upper-middle, lower-middle, and lower-income. Utilizing pooled regression analysis with Driscoll-Kraay standard errors (DKSE) and Generalized Least Squares (GLS), the findings reveal that DTI plays a significant role in mitigating air pollution. This conclusion is further supported by robustness tests using Panel-Corrected Standard Errors (PCSE) and quantile regression, with quantile regression indicating that the mitigating effect of DTI on air pollution intensifies at higher quantiles. Additionally, the study finds that green energy, effective governance, and enhancements in ESRP contribute to reducing air pollution, while economic growth tends to exacerbate it. These insights offer valuable guidance for evidence-based policy formulation and the promotion of sustainable development initiatives, emphasizing the environmental benefits of embracing technological innovation and its adoption.
Keywords: Digital technology innovation; Climate change mitigation; Green energy; Green governance; Socio-economic rights; Climate action

Flaxseed; A Functional Food for Polycystic Ovary Syndrome (PCOS)

Muhammad Usman*[1], Shabbir Ahmad[1], Muarif Rasool[2], Sibt-e-Abbas[1], Nida Firdous[1], Aliza Batool[1]
[1]*Faculty of Food and Home Sciences, MNS University of Agriculture, Multan, Pakistan.*
[2]*Department of Chemistry Women University of Multan*
[*]**Corresponding Author Email:** muhammad.usmanft@mnsuam.edu.pk

Polycystic Ovary Syndrome (PCOS) is a highly complex disorder that affects female reproductive and metabolic health due to hormonal imbalance. Production of androgen and estrogen hormone in excess causes anovulation and formation of multiple syst. The clinical symptoms of PCOS in female are hair growth on face and enlarged follicles that causes infertility in women. There is no proper treatment against PCOS, even sometimes medications cause harmful effects. That is why plants or herbal sources are considered best for treating PCOS. Flaxseed is a functional food with a rich source of linolenic acid, lignans and fibers with the best antioxidant and estrogenic characteristics. Studies have shown positive effects with doses ranging from 10 to 30 grams per day, typically for a duration of 12 weeks. However, the exact percentage of effectiveness can vary depending on individual factors and the specific symptoms being targeted. It offers potential benefits regarding PCOS, by reducing level of estrogen, inducing ovulation and prevention of syst formation. It is also suggested that flaxseed supplementation has the potential to improve metabolic, hormonal, and anthropometric parameters in women with PCOS. Flaxseed supplementation hasalso been found to decrease ovarian volume and the number of folliclesin polycystic ovaries potentially improving fertility outcomes. However, the exact mechanism of how flaxseed help in treatment of PCOS needed to be explore medically.It isalso suggested that due to the scarcity of high-quality studies, additional studies need to be conducted in order to derive a solid conclusion.
Key Words: Antioxidant, Estrogenic, Ovulation, PCOS, Flaxseed

Dietary assessment of patients with chronic kidney disease; A case study in Multan Institute of kidney diseases

Neha Naveed[1], Mamoona Ahmad[1], Atif Bilal[1], Nimra Ejaz[1], Fatima Majeed[1]
[1]*The Physio College Multan*

Quality of life has a direct relation to the nutritional status of the human body. Poor dietary habits can lead to the spreading of different diseases and make them chronic. This study particularly focuses on the dietary assessment of patients during different stages of chronic kidney disease and examines how socio demographic, clinical, and laboratory data influence it. There is limited data available about the correlation between the quality of life and health status of patients undergoing conservative treatment. In this study, fifty-five patients in stages 1-5 of chronic kidney disease and twenty in hemodialysis were observed. It has been observed that dietary habits have a direct impact on quality of life. Data was collected by the dietary assessment questionnaires and asking questions to patients separately in the kidney hospital of Multan for 1 month. The quality of life declined at every stage of kidney disease. A decline in the nutrition abilities, functioning, and nutrition summary component was noticed gradually as kidney disease advanced through its various stages. Elderly individuals showed lower performance on the nutritional component summary but the people with nutrition awareness showed higher performance on the nutritional component summary. Renal patients experience a reduction in the quality of life during the initial phases of the disease. In Conclusion, when proper nutrition and awareness are provided to the patients then their recovery process can take less time, their resistance against the disease can be increased also their life span can be improved along with the quality of life.

Keywords: Renal disease, Quality of life, Hemodialysis, Health assessment

Study of unvelling the impacts of zinc deficiency in children

Rida e Zainab[1], Mamoona Ahmad[1], Asma Hassan[1], Uswa Rasool[1], Talia Ahmad[1] , Mehrunisa Malik[1]
[1]*The Physio College Multan*

This research offers a thorough analysis of the importance of zinc for children's health, highlighting the critical functions that zinc plays important role in immunological response, cognitive development, and cellular growth. It draws attention to the widespread worry about zinc deficiency in children, which can result in major health consequences like weakened immune systems, limited growth, and trouble with cognitive development. The study emphasizes the critical function that zinc plays in growth and development by focusing on the connection between zinc deficiency and children's Body Mass Index (BMI). It talks about how important it is to consume zinc regularly, especially throughout periods of growth that are particularly important, like childhood, puberty, and pregnancy, because the body doesn't have a system for storing zinc. Many scientific studies highlight how crucial zinc supplementation is in reducing childhood mortality from common causes like pneumonia and malnutrition.A considerable proportion of children with acute infections and chronic disorders have higher Cu/Zn ratios and lower zinc levels, suggesting a risk of copper toxicity and zinc shortage, according to the narrative review, which covers studies on this relationship. Research indicates that measuring the Cu/Zn ratio may be essential for determining a child's oxidative, infectious, inflammatory, and nutritional condition.In light of the substantial risk of zinc insufficiency in low- and middle-income countries, future study on the prevalence, effects, and efficacy of zinc supplementation programs is warranted. The thorough analysis highlights the vital role zinc plays in children's health and the urgency of preventing and treating zinc deficiency on a worldwide scale.

Keywords: Cognitive development and zinc, zinc supplementation, Global health

Assessment of Mediterranean diet adherene among college

Saima Iqbal[1], Mamoona Ahmad[1], Asma Hassan[1], Rabia Bibi1, Fabia[1]
[1]*The Physio College Multan*

The Mediterranean diet has gained recognition for its potential health benefits, including reducing the risk of chronic diseases including cardiovascular diseases.However, its adoption among college students remains underexplored.This cross-sectional study aimed to assess the adherence to the Mediterranean diet among college students. A convenience sample of 50 students (20-25 years old,Male / Female) from The Physio College Multan completed a validated Mediterranean diet questionnaire (MDS) and provided demographic information in the localized area.Preliminarily findings indicate 8%of college students demonstrated high adherence to the Mediterranean diet, with an average MDS score of 12.5/100 scores.Notably, consumption of fruits, vegetables, whole grains, and olive oil was higher compared to red meat and processed foods. However, the intake of fish and legumes fell below the recommended levels.This study highlights both the potential and challenges of promoting the Mediterranean diet among college students. Strategies for increasing consumption of fish and legumes while reducing intake of red meat and processed foods are warranted to improve overall dietary quality and health outcomes like the lower risk of CVDs in this targeted college student population.
Keywords: Mediterranean diet, college students, adherence, dietary assessment, health promotion

Food Adultration in Pakistan; A grave danger to youth's health and well-being

Sidra Mahar[1], Mamoona Ahmad[1], Asma Hassan[1], Nimra Shahid[1], Aqsa Bibi[1]
[1]*The Physio College Multan*

Adulteration is the practice of using lower-quality substances to prepare a product for better sale by substituting lower-value or inactive ingredients for more helpful ones. These days, adulteration of food is widespread and indistinguishable. Food adulteration is a death threat for people that causes major health problems in Pakistan, especially for young people. In Pakistan, various consumables, including milk, fruits, vegetables, poultry, and meat, are adulterated with harmful substances like steroids, growth hormones, and artificial colors. This practice compromises the nutritional value of food and poses significant health risks, leading to diseases such as chronic respiratory infections, renal diseases, and hormonal imbalances, especially among young people. Surveys conducted by authorities reveal alarming findings regarding the prevalence of adulteration and its adverse health effects. Taking preventive measures can avoid adulteration. Consumers should avoid purchasing food from unhygienic establishments. The government should take the lead in launching initiatives to protect citizens' rights and detect food adulteration. Recognizing and implementing consumers' rights to safe food is crucial for national progress. Mandatory health education is recommended. All responsible individuals must act to safeguard our health and prevent food-borne illnesses, ensuring a better future for generations.
Keywords: Adulteration, prevalence, significant health risk, unhygienic establishments, food-borne illness.

Climate change impacts and adaptation strategies in Pakistan

Kashif Anwar[1], Mamoona Ahmad[1], Atif Bilal[1], Muhammad Rehman[1], Muhammad Fahad[1]
[1]*The Physio College Multan*

Climate change poses significant challenges to Pakistan, exacerbating existing vulnerabilities and impacting various sectors, including agriculture, water resources, health, and ecosystems. This abstract provides an overview of the climate change situation in Pakistan, highlighting its impacts and outlining adaptation strategies. Pakistan is highly vulnerable to climate change due to its geographical location, socioeconomic conditions, and reliance on climate-sensitive sectors. Increasing temperatures, changing precipitation patterns, and extreme weather events such as floods, droughts, and heat waves are becoming more frequent and intense, disrupting livelihoods and infrastructure. The agricultural sector, a cornerstone of Pakistan's economy, is particularly susceptible to climate change. Erratic rainfall and rising temperatures are affecting crop yields, threatening food security and exacerbating poverty in rural areas. The health sector is also under pressure as climate change contributes to the spread of vector-borne diseases,

heat-related illnesses, and malnutrition. To address these challenges, Pakistan has been implementing various adaptation strategies. These include enhancing water management practices, promoting climate-resilient agriculture through crop diversification and improved irrigation techniques, and strengthening early warning systems for extreme weather events. Furthermore, Pakistan is investing in renewable energy sources such as solar and wind power to reduce reliance on fossil fuels and mitigate greenhouse gas emissions. Sustainable urban planning and infrastructure development are also being prioritized to enhance resilience to climate change impacts in urban areas. Addressing these gaps is crucial for effective climate change adaptation and resilience-building in Pakistan. In conclusion, climate change poses multifaceted challenges to Pakistan, impacting various sectors and exacerbating existing vulnerabilities. Timely implementation of adaptation measures, coupled with international cooperation and support, is essential to mitigate the adverse effects of climate change and ensure sustainable development in Pakistan.

Keywords: Climate Change, adaptation Strategies, food Security, Sustainable development.

Insecticidal efficacy of Cabbage butterfly (*Pierisbrassicae)nucleopolyhedrovirus*

Mubasher Ahmad Malik [1] and GozdeBusra EROGLU [2], Irfatul Hassan [1]Azhar Abbas Khan and IkbalAgah Ince[2]

[1]*Department of Entomology , University of Layyah, Pakistan*

[2]*Department of Molecular Biology and Genetics, Faculty of Science, Erzurum Technical University, Erzurum, Türkiye*

[3]*Department ofMedical Microbiology, Acıbadem Mehmet Ali AydınlarUnivercity, Istanbul, Turkey*

Extensive use of synthetic insecticides has resulted in enormous environmental pollution and a negative impact on non-target insect species. There is dire need to develop eco-friendly alternatives like use of baculoviruses. Baculoviruses are further classified on the basic of occlusion bodies into two group granuloviruses (GVs) and nucleopolyhedroviruses (NPVs). In this bioassay, insecticidal efficacy of NPV isolated from *P. brassicae*against three important pest of brassicacae was investigated. The results of current experiment show that NPVhas very highinsecticidal activity, 100, 90, and 85% on the larvae of *P. brassicae*(Cabbage butterfly), *Helicoverpaarmigera* (American bollworm),) and *Trichoplusiani* (Cabbage looper),Results of this study indicate that PbNPVshas a potential use in the bio-control of noxious insects.

Key words: *P. brassicae*, *Helicoverpaarmigera*, Trichoplusiani, (NPVs)

New finding about interactions among nematode-plant-insect

Shokoofeh Kamali[1,2], Sepideh Ghaffari[1], Lukasz Stelinski[2]and Javad Karimi[1]

1 Department of Plant Protection, School of Agriculture, Ferdowsi University of Mashhad, Mashhad, Iran

2 Department of Entomology and Nematology, Citrus Research and Education Center, University of Florida, Lake Alfred, FL, USA

[*]**Corresponding Author Email:** *jkb@ferdowsi.um.ac.ir*

The first part of our story which was published as Kamali et al, 2021 (DOI: 10.1111/mec.16254) showed some evidence that *Meloidogyne* nematode triggered the immune plant defense in plant roots. Also, we found that beneficial nematode modulates plant immunity against *Meloidogyne* nematodes mainly via the active expression of some enzymes. Here we have more evidence about this story. We investigated the interaction among tomato (*Solanum lycopersicum*) to two groups of nematodes: plant parasite (*Meloidogyne javanica*) and entomopathogen (*Steinernemacarpocapsae*) along with a leaf-mining insect (*Tutaabsoluta*). There were eight treatments on the plant. 1.*Meloidogyne* nematode, 2.*Steinernemacarpocapsae*, 3. tomato leaf miner, 4. bot Meloidogyne and *Steinernema* nematodes, 5. both *Steinernema* and leaf miner , 6. *Meloidogyne* and leaf miner, 7, all three organisms, and 8. control plant. We sequenced the RNA from all treatments and analyzed those data. Here we will discuss those interactions. We will provide more robust information on how beneficial nematodes and parasitic nematodes are

interacting.We will discuss the effect of the presence of a beneficial nematode alone or in the presence of a harmful nematode, as well as during the activity of an herbivorous insect on the plant. The main discussions will be about important defense pathways in plants, such as pathways related to plant hormones and plant secondary metabolites. We also provide new evidence regarding the interaction between two nematodes and the possible effect of Ascarocide from *Steinernema* on root-knot nematodes and herbivorous insects. These data could be useful to extend our knowledge about the plant rhizosphere and ultimately could be useful for better understanding the system toward efficient plant protection strategies.

Keyword: microbial control; insect pathology; transcriptomic analysis; plant defense; entomopathogenic nematode

Comparative Evaluation of Vegetables Peel Biochar and Cow Dung as Organic Amendments for improving Mung Bean Growth under Sewage Irrigation Conditions

Kashifa Shabeer[1], Muhammad Ahmar Amin[1*], Amir Aziz[1]

[1]*Department of Soil Science, College of Agriculture.University of Layyah, Layyah, Punjab, Pakistan.*

[*]**Corresponding Author Email:** m.ahmaramin@ul.edu.pk

The world's population is increasing with rapid rate due to which natural resources are declining day by day ultimately poverty is increasing. With increasing poverty, rates of commodities are also increasing i.e. fuel prices which are basic need for irrigation of crops in third world countries like Pakistan. In Pakistan, huge number of crops are grown with sewage irrigation for being easy and large quantity available. This sewage water has many potential benefits but also its long-term permanent use is serious threat to human health. A comparative experiment was designed to check the biochars (BCs)abilities prepared from different feed-stocksand cow dung manure with commercial fertilizer under sewage irrigation pot trial at the research area of University of Layyah.The treatments were T_1Control (Without Biochar/cow dung manure), T_2NPK (recommended),T_3Cow dung manure (2%/pot), T_4Sugarcane straw Biochar (SSBC 0.5%/pot), T_5Sugarcane Straw Biochar (SSBC 1%/pot). Each treatment was replicated three times (5*3=15). Soil with fresh water irrigation was collected, prepared for pot trial. Each pot was filled with 8kg soil/pot. Mungbam was grown as test crop. Sewage irrigation was applied with different time intervals to maintain base saturation (up to 60%) throughout the experiment. The best results were observed in T4 as maximum number of mature plants with lush green leaves, strong stem and highest leaf area followed by T3 which showed the best results of agronomic parameters after T4. The higher amount of BC T5 showed comparatively low results of all agronomic parameters as compare to T4 and T5 but showed better results as compare to commercial fertilizer T2 and control. The results indicated that BC and cow manure increase crop quality and crop productivity as well. Also, the BC adsorb potential toxic elements (heavy metals) available in sewage irrigation, make these elements unavailable to plants reduces the negative effects of sewage irrigation on crop and soil. After observing better results of BC and manure-based treatments, it can be concluded that both (BC and manure) can be suitable addition to reduce the stress of compound fertilizers on soil by increasing crop yield and quality.

The Dual Edges of Growth: Technology, Economy, and Their Impact on Water Stress

Maimoona Shabeer[1], Sharafat Ali[1*]

[1]*Department of Economics, Government Graduate College Kot Sultan, Layyah, Pakistan*

[*]**Corresponding Author Email:** maimoonashabeer94@gmail.com

As the world grapples with the impacts of climate change, achieving sustainable development goals (SDGs) has become increasingly vital, especially in the realm of water resource management and sustainable use. The swift pace

of technological innovation is key in addressing climate change challenges, highlighting the importance of understanding its effects on managing and conserving water resources. This study aims to assess how technological advancements influence water stress, utilizing an extensive dataset covering the years 2001 to 2022 from countries at various stages of development. Using panel regression analysis, the research uncovers a noteworthy link between technological innovation and water stress, demonstrating the significant role technology plays in water sustainability. Additionally, the research validates the presence of a U-shaped Environmental Kuznets Curve, indicating that water stress diminishes at lower levels of economic growth but escalates at higher economic growth levels. This suggests that as economic growth intensifies, so does the strain on water resources, leading to negative effects on water availability in various economies. The findings offer valuable insights for policymakers, serving as a roadmap for efficient water management practices to safeguard water resources.
Keywords: Technological innovation; Water stress; Economic growth; Sustainability; SDGs

Serum ferritin positively correlates with the level of CRP and inverse correlates with lymphocyte count in Covid-19 patients

Muhammad Bilal[1], Fraz Bilal[1], Atika Yousuf[1], Nimra Arif[1], Nimra Sabir[1]
[1]*The Physio College Multan*

Background: The COVID-19 pandemic has spread to all over the world. Number of cases are accelerating every day.Medical resources in phase of this pandemic are not sufficient,there is an urgent need of seeking indicators for this disease and its prognosis .Serum Ferritin is primary tissue iron storage protein in liver and it is also an acute phase reactant protein .Here we aimed to assess the ability of serum ferritin in discriminating severe patients of COVID-19 along with CRP and lymphocyte derangement.

0bjective:

1) To determine the frequency of hyperferritinemia in patients of COVID-19 infection.
2) To correlate the high serum ferritin and C - reactive protein (CRP) level in patients of COVID-19 Infection.
3) To determine the frequency of low lymphocyte count in COVID-19 patients.

Methodology: This research will be conducted on 100 subjects of PCR confirmed COVID-19 patients.The research will be conducted in department of chemical of MIKD MULTAN. Non probability consecutive sampling will be used.Blood samples will be analyzed for serum ferritin, CRP and lymphocytes will be recorded on performa. A performa was designed with the help of supervisor. Ethical approval was sought from institutional review board. All the data collected was recorded on the performa. The data will be entered on SPSS version 23 and result will be analyzed.

Conclusion: One hundred (100) COVID-19 patients with PCR confirmed were included in the study (Table 1). The median age was 53 years (IQR=25-93), and 73 patients(73%) were male and 27% are females.In these 100 patients 68% are admitted in Isolation ward and 32% are admitted in Intensive Care Unit (ICU).Hyperserotonemia, elevated serum CRP and Lymphopenia were good markers which were raised in COVID-19 cases. There was weak positive correlation between serum ferritin and CRP and strong negative correlation between neutrophil and lymphocytes ($P< 0.001$).Severity of elevation of these markers are more in ICU cases than Isolation.
Key Words: Covid-19,Serum ferritin, CRP, lymphocyte and neutrophils.

Analysing the Digestibility of Red Palm Weevil on three different Biowaste Resources

Mubasher Ahmad Malik[1], Azhar Abbas Khan[1],Zeshan Hassan[1],Umbreen Shehzad[1], Longyu Zheng[2],Jeffery K. Tomberlin[3], Muhammad Imtiaz Rashid[4], Din Muhammad Zahid[1]
[1]*College of Agriculture, University of Layyah, Pakistan*

[2]*State Key Laboratory of Agricultural Microbiology, Huazhong Agricultural University, Wuhan, China,*
[3]*Departamnt of entomology,National Science Foundation Center for Environmental Sustainability Through Insect Farming*
[4]*Centre of Excellence in Environmental Sciences, King Abdul Aziz University, Jeddah, Saudi Arabia*
[*]**Corresponding Author Email:** malik2007entomologist@gmail.com

Currently, the food waste is being disposed via composting or landfill methods. The processes of compositing and landfilling are time consuming and costly, therefore, it is need to find innovative and environmentally friendly method to dispose organic food wastes. The use of insects as feed for Poultry, livestockand even human consumption has increasingly attracted considerable investigations in Pakistan and worldwide. In recent years, different insect species have been studied for their efficiency in converting various organic wastes and for producing valuable product. In the present study, larvae of red palm weevil *Rhyncoferrugineus* feed on three different biowaste resources such as rice, fruit wasteand sugarcane mud. After 14, 28 and 32 days, average weight and length of larvae of red palm was found to be higher in rice compared to other biowaste. It is hence concluded that rice biowate could be used for enhanced red palm weevil larvae biomass which could potentially be used in development of valuable products for industry,
KEY WORDS: Biowaste, *Rhyncoferrugineus*, valuable products,

Environmental Impacts of International Tourism, Policy Uncertainty, Renewable Energy, and Service Sector Output: A Panel Regression Analysis

Muhammad Amir[1*]&Sharafat Ali[1,2]
[1]*Department of Economics, Government Graduate College Kot Sultan, Layyah, Pakistan*
[2]*School of Economics, Jiangsu University of Science and Technology, Zhenjiang, Jiangsu, China*
[*]**Corresponding Author Email:** muhammadamir40.pk@gmail.com

The economic benefits of tourism and its role in economic development are broadly acknowledged. However, its growth also affects environmental sustainability. Furthermore, economic policy uncertainty (EPU) can negatively impact the environment. This research aims to explore how international tourism affects environmental sustainability, incorporating factors like EPU, renewable energy consumption (REC), and service sector output (SSO) within a panel data framework from 17 economies. Due to heteroscedasticity and autocorrelation in the data, the study employs various econometric techniques such as pooled ordinary least squares (OLS) with Driscoll-Kraay standard errors (DKSEs), generalized least squares (GLS), panel-corrected standard errors (PCSE), and quantile regressions to analyze the effects of international tourism on environmental sustainability. DKSEs and GLS help tackle heteroscedasticity and autocorrelation, while PCSE adjusts for these issues, and quantile regression assesses the variable relationships across different distribution points. The findings reveal that international tourism and EPU deteriorate environmental quality by escalating greenhouse gas (GHG) emissions. Conversely, SSO and REC are shown to lower GHG emissions, promoting environmental sustainability. To mitigate adverse environmental effects, the tourism industry is encouraged to implement sustainable practices, such as eco-friendly accommodations and renewable energy usage, alongside efforts to conserve biodiversity and local cultures. Tourists are also urged to adopt sustainable behaviors, like choosing green lodging options and supporting environmental initiatives. The study suggests the establishment of consistent trade regulations favoring green technology and renewable energy to alleviate EPU. It underscores the importance of global cooperation in fostering sustainable tourism practices to reduce the environmental footprint of the tourism sector.
Keywords: Tourism-environment nexus; Policy uncertainty; Renewable energy; Environmental sustainability; Panel regression

Self-Regulation and Academic Buoyancy as Predictors of Academic Burnout Among Married and Unmarried PhD Scholars: A Comparative Study

M.Faizan Hassan[1] Abbas Raza[1] Hasnain Iqbal[1] Noor Ul Ain Soomra[1]
1 Department of Applied Psychology, University of Layyah, Pakistan
[*]**Corresponding Author Email:** Noor Ul Ain Soomra, noorulainsoomra@gmail.com

Subject:
Abstract submission for Poster Presentation, Department of Applied Psychology University of Layyah. Layyah
The current study will examine the predicting role of self-regulation and academic buoyancy of the academic burnout among married and unmarried PhD scholars. Sample of married and unmarried PhD scholars will be include and age range is 26 years to 40 years old PhD scholars. Sample size will be calculated from G-power analysis and To elicit the findings self-regulation scale by (Schwarzer, Diehl & Schmitz , 1999) Academic buoyancy scale ABS by (Martin & Marsh, 2008) and Academic burnout scale by "Maslach burnout inventory student survey" (MBI-55) will be use. Descriptive statistics would be calculated. Pearson Product Moment Correlation Analyses will be computed to find relationship between self-regulation, academic buoyancy and academic burnout. Multiple Linear Regression Analyses will be carried out to analyze the predicting role of self-regulation and academic buoyancy in academic burnout. Mediation Analysis, Independent sample T-Test analyses will be conducted through SPSS 21 and PROCESS.

Rationale of the study

This study will conducted to check that how low self-regulation and academic buoyancy predict burnout in PhD married and unmarried scholars. Those who have high self-regulation and academic buoyancy will cope up from burnout. The present study will be conducted so as to probe and scrutinize relationship between these variables i.e. self-regulation, academic buoyancy and burnout in PhD married and unmarried scholars.

In Pakistan very few researches have been done on these variables in combination of variable and with this population. The researches in Pakistan have been done in different perspective. A research was done to study A research was conducted on Burnout and its Associated Factors in Medical Students of Lahore, Pakistan.(Muzafar, Khan, Asraf & Hussain, 2015) Another research was conducted to check the Impact of Self-Regulation Skills on Academic Performance of Young Children in Private Schools of Karachi(Kathawala, Bhamani, 2015). Another research was conducted on to check the Impact of Marital Status on Postgraduate Medical Students Research Activities.(Saeed, Farasat & Kamal, 2018).

It is important to keep in mind that PhD scholars although married or unmarried have to face a lot of problems in their academic life and may experience burnout. Besides this, in Pakistani mediating role of academic buoyancy has not been explored yet so it is necessary to fill the gap and conduct a research.

Objectives

- The objectives of the study to find out are self-regulation and academic buoyancy predicts academic burnout among married and unmarried PhD scholars.
- To assess a relationship among self-regulation, academic buoyancy and academic Burnout among married and unmarried PhD scholars
- Also assess the mediating role of academic buoyancy between self-regulation and academic burnout among married and unmarried PhD scholars.

Cyber-Bullying, Stress, Coping and Self-Esteem in Young Adults

Nairam Ramzan[1], Nazia Batool[1], Sawera Gull[1], Noor Ul Ain Soomra[1*]
1 Department of applied Psychology , University of Layyah, Pakistan
[*]**Corresponding Author Email:** nnoorulainsoomra@gmail.com

The current study aimed to identify the relationship among cyber-Bullying, stress, coping and self-esteem in young adults. Correlational study design was used with purposive sampling for data collection. An online survey method was used to collect data due to global pandemic Coivd-19 and *N=152* students of public and private universities from around the country participated in this study. Scale of Revised Cyberbullying Scale II (Topcu & Erdur-Baker,2018) α =.75,.92,Perceived stress scale (Sheldon Cohen,1994) α=.87, Coping Scale (Hamby, Grych, & Banyard,2013) α= .93, Rosenberg Self-Esteem Scale (Rosenberg,1965) α=.70, was used to assess the variables. Demographic sheet was also devised by the researcher. Descriptive statistics was calculated. Pearson Product Moment Correlation Analyses was computed to find relationship among cyber-bullying, stress, coping and self-esteem. Linear Regression Analyses was carried out to analyze the predicting role of cyberbullying, stress and coping in self-esteem,Mediation Analysis, was conducted through SPSS 21 and PROCESS. The findings of the study revealed that cyberbullying, stress and coping predicted self-esteem and whereas coping was a significant mediator between cyberbullying and stress. This study will be helpful for the students in highlighting the issue of cyberbullying and importance of coping which effect their self esteem.
Keyswords: Cyber-Bullying, Stress, Coping, Self-esteem.

Efficacy of different insecticide on the Host-Searching ability of the Aphid Parasitoid (Hymenoptera) on brassica Pests

Mubasher Ahmad Malik[1], Ahsan Mustafa[1], Murtza Shah[1], Arfatul Hassan[1] and Azhar Abbas Khan[1]
[1]*Departmant of Entomology, University of Layyah, Pakistan*
[*]**Corresponding Author Email:** malik2007entomologist@gmail.com

The indiscriminate use of conventional insecticides has developed resistance against Agricultural insect pest and further failures in the biological control of insect pests due to toxic effects onbenefical natural enemies. Insecticides with Neurotoxic mode of action indirect affect the natural enemies to find host pests. Here we checked the effects of sub-lethal concentrations of the new chemistry insecticide Imidachloprid, Clothianidin and Pyrethroidcypermethrin aphid parasitoid wasp Aphidius*Spp*and the Green peach aphid *Myzuspersicae*, Cabbage aphid*Brevicorynebrassicae* Linnaeus and Turnip aphid*Lipaphiserysimi*.We studied changes in host-searching and ovipositionbehavior through laboratory bioassays when susceptible and resistant brassica aphids are offered to parasitoid females, evaluating the effect of applying insecticides on the interacting species. The patch residence time, exploration, oviposition, and grooming were significantly disturbed when the parasitoids were offered resistant aphids sprayed with sub-lethal doses, but not when the Parasitoids were offered susceptible Brassica aphid exposed to sub-lethal doses. We discuss how the effects of insecticides on parasitism behavior may result in failures of biological control if natural enemy populations are not adequately managed, particularly for the management of insecticide resistant pest populations. Efforts to introduce biological control in integrated pest management (IPM) programs are also discussed.
Key words: Cabbage aphid, Green peach aphid, Turnip aphid, integrated pest management

Comparative study of multi-detection computed tomography and ultrasonography findings in blunt abdominal trauma in tertiary care hospital of central Punjab

Tehzeeb Nasir[1], Nabira Afzal[1], Nimra Arif[1], Khushbo Zehra[1], Muhammad Asif[1]
[1]*The Physio College Multan*

Introduction and Objective: Trauma is leading cause of death all over the world**.** Blunt abdominal trauma diagnosis is challenging due to non-specific symptoms and imaging difficulties. Ultrasonography (USG) is a non-invasive imaging modality despite its sensitivity and specificity, USG remains controversial compared to CT scans. Evaluating patients with blunt abdominal trauma (BAT) remains a resource-intensive area of trauma care. This is due to RTA, fall from height, assaults and bull horn injury

Methodology: The study's goal was to discover sensitivity and specificity of ultrasound and CT in BAT during the period of **June 2023 to August 2023** approximately two months a total of **78 participants** are included in this study. In this study we are calculating the sensitivity and specificity of USG and CT relationship with BMI, BATTS score in Tertiary Care Hospital of Central Punjab. All patients which were selected for this study were done with ultrasound and CT scan.

Conclusion: The most sensitive and specific diagnostic tool for evaluating the abdomen is CT, which helps physician determine the best course of treatment.

Keywords: Blunt Abdominal Trauma, Fast Scan, Computed tomography

Role of Doppler ultrasonography I the evaluation of lower limb insufficiency in diabetic and non.diabetic individuals

Muhammad Talha[1], Nabira Afzal[1], Nimra Arif[1], Maham Khan[1], Kiran Bibi[1]

[1]*The Physio College Multan*

Background and Objective: Lower limb vascular insufficiency causes vascular function to be diminished. Diabetes, chronic hypertension, hyperlipidemia, and other factors are among the primary causes of vascular insufficiency. Diabetes is a metabolic condition characterized by high blood glucose levels (hyperglycemia). Diabetes can cause peripheral neuropathy as well as other consequences such as ulcers and sores if left untreated. Due to its non-invasive and cost-effective nature, Doppler ultrasonography is regarded the first line imaging modality in evaluating vascular insufficiencies in diabetic and non-diabetic patients. The goal of our study was to use Doppler ultrasonography to precisely assess the vascular insufficiencies of the lower leg in diabetic and non-diabetic patients.

Methodology: This study was carried out after collecting data from diabetic and non-diabetic individuals who had undergone Doppler ultrasonography examination using a questionnaire that contained details about each patient's medical and exam history. A total of 47 individuals were studied, 37 of whom were diabetic and 10 of whom were not.

Conclusion: Doppler ultrasound plays crucial role in evaluation of lower limb vascular insufficiencies such as peripheral artery disease. Furthermore, due to its non-invasive nature it is used most commonly for early detection of vascular insufficiencies and for planning treatment.

Keywords: Lower limb vascular insufficiencies, Doppler Ultrasound, lower limb arterial insufficiency, Diabetic patients, and non-diabetic patient.

Selection of Canola (Brassica napus) based on agronomic and physiological responses for better growth under cadmium toxicity

Khalid Bilal[1], Nosheen Noor Elahi[1*], Muhammad Imtiaz[2]

1 Institute of Botany, Bahauddin Zakariya University, Multan, Pakistan

2 Soil and Environmental Biotechnology Division National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan

[*]**Corresponding Author Email:** kbmaitla@gmail.com

Cadmium (Cd) is one of the potential toxins for plants. It disturbs the physiological and biochemical processes in plants, resulting in poor plant growth and yield of crops. As the complete removal of Cd toxicity from soil is quite difficult,scientists are working on selecting such tolerant varieties. These varieties cannot only provide the optimum crop yield but also can play an important role in the removal of Cd from the soil. Considering the importance of canola, a current study was planned to screen the Cd tolerant, moderate, and susceptible canola variety. For that total, 15 varieties weresown in a hydroponic experiment using different toxicity levels of Cd, i.e., tap water (no Cd), 0.2, 0.4, 0.6, and 0.8 mg/L. Results showed that CON-II and CON-III performance was significantly better for improvement in shoot length, root length, seedling fresh and dry weight than sandal canola, rainbow, and Oscar at all levels of Cd toxicity. A significantly improved chlorophyll content also validated the better tolerance of CON-II and CON-III over sandal canola, rainbow, and Oscar. The highest antioxidant activity and electrolyte leakage at 0.8Cd was noted in AARI canola, Oscar, sandalcanola, and rainbow, which showed that these varieties were susceptible to Cd toxicity. In conclusion, CON-II and CON-III were observed as tolerant, sandal canola, rainbow, and Oscar were found susceptible while remaining as moderatecanola varieties against Cd toxicity. More investigations are suggested at the pot and field level to declare the best tolerant, moderate, and highly susceptible canola varieties again Cd.
Keywords: Heavy metals, Canola, Growth attributes, Antioxidant activity, Chlorophyll contents.

The Relationship between Typically Developing Siblings of Autistic Children and Their Academic Achievement, Self-Concept, and Psychological Adjustment

Laiba sadiq[1] Mehvish Mushtaq[1] Laiba Ali[1] Sidra tul muntaha[1]
1 Department of applied psychology, University of layyah, Pakistan
[*]**Corresponding Author Email:** Sidra tul muntaha, sidrak895@gmail.com

Objectives:
The current study examines the academic, emotional, and psychological outcomes of usually developing siblings of children with autism. It was assumed that the siblings of autistic children would likewise have negative outcomes. Autistic children have higher levels of academic success, self-esteem, and psychological adjustment when compared to their typically developing siblings. These children's mothers are more prone to experiencing mental health disorders such as depression, stress, and anxiety, and they originate from socioeconomically disadvantaged families. These qualities can predict the psychological adjustment, self-concept, and academic achievement of their typical siblings.

Methods:
The study employed a between-group design and utilized quantitative methods. The study had a grand total of 310 individuals. Out of the total participants, there were 22 children diagnosed with autism, 22 usually developing siblings, 22 moms, and 22 normal controls. All of them took part in the study together with their respective mothers. The degree of autism was assessed using the Child Autism Rating Scale (CARS). The cognitive abilities, perception of oneself, and psychological adaptation of the siblings were assessed using Raven's Progressive Matrices, the Piers Harris Self Concept Scale, and the Urdu translated version of the SDQ. The academic development of the siblings was evaluated by calculating the average of their two most recent outcomes. The Family Environment Scale (FES) was employed to assess the familial context, whereas the Depression Anxiety and Stress Scale (DASS) was utilized to gauge the psychological well-being of the moms. Path analysis, hierarchical regression, correlation coefficient, independent sample t test, and data were employed for data analysis.

Results
Autistic children showed much poorer psychological adjustment and self-concept compared to their regularly developing siblings. Mothers with children who have autism experience elevated levels of stress in comparison to mothers whose children do not have autism. Individuals who have siblings with autism are at a higher risk of

encountering psychological and emotional challenges, as well as behavioral and social issues. They may also face low self-esteem, social isolation, academic underachievement, reduced popularity, decreased enjoyment, and overall dissatisfaction with life. The psychological adaptation of siblings of autistic children is influenced by parental stress, rejection, and family discord. Path analysis reveals a significant impact of maternal depression and stress on the psychological adjustment, pro-social conduct, academic performance, and self-concept of siblings.

Conclusion

The level of control exerted by one's family has a significant impact on how one perceives oneself, while conflicts within the family have a considerable influence on one's psychological well-being and tendency to engage in pro-social conduct. Taking into account the cultural context of Pakistan, researchers, mental health specialists, and doctors evaluate the importance of these findings.

Unveiling the Nexus between Renewable Energy and Natural Resource Protectionin Developing Economies

Ushan Riaz[1*], Sharafat Ali[1,2]

[1]*Department of Economics, Government Graduate College Kot Sultan, Layyah, Pakistan*

[2]*School of Economics, Jiangsu University of Science and Technology, Zhenjiang, Jiangsu, China*

[*]**Corresponding Author Email:** uushnariaz@gmail.com

Protecting natural resources is a key goal within the Sustainable Development Goals (SDGs), serving as a cornerstone for achieving sustainability. Policymakers have been keenly analyzing factors that influence Natural Resource Protection (NRP) to develop policies and strategies grounded in solid evidence. A significant focus has been on the impact of Renewable Energy (RE) on NRP, though findings from previous studies on this relationship have been mixed. This research centers on examining the effect of RE on NRP in 22 developing countries, taking into account the potential nonlinear dynamics between RE and NRP. It also evaluates the influence of governance efficiency, financial technology, urbanization, and Foreign Direct Investment (FDI) on NRP. Additionally, this study investigates the NRP-Kuznets curve, which looks at the impact of economic growth on NRP. The research identifies issues such as cross-sectional dependence, heterogeneity, autocorrelation, and heteroskedasticity within the data, employing pooled regression with Driscoll-Kraay Standard Errors and Generalized Least Squares for econometric analysis. Findings indicate a U-shaped link between RE and NRP, with governance efficiency, financial technology, and FDI positively affecting NRP, whereas urbanization negatively impacts it. An inverted U-shaped relationship was found between GDP per capita and NRP. To confirm these findings' reliability, a Bayesian regression analysis was conducted. Based on these insights, the study suggests several policy recommendations to enhance NRP. It advises that policies should favor renewable energy and sustainable use of resources through incentives and investments. Enhancing governance, implementing environmental regulations, and engaging stakeholders are essential steps. Financial technology could support long-term sustainability investments, and sustainable urban planning could mitigate the negative impacts of urbanization. FDI should be directed towards achieving long-term developmental objectives and responsible resource management. Achieving a balance between economic growth and environmental conservation requires a comprehensive approach that encourages green growth and efficient resource use. The importance of policy integration and involving various stakeholders is also emphasized.

Keywords: Natural Resource Protection; Renewable Energy Transition; Governance; Financial Technology; Kuznets Curve; Sustainability

Morphological and molecular identification of Babesia ovis in small ruminants and its prevalence in district north Waziristan

WasimKhan[1,]Shehzad Zareen[1,]SaadUllahKhan[2]
Institute of computing, Kohat University of Science and Technology, Kohat, Pakistan Department of Biotechnology, saad@kust.edu.pk
[*]**Corresponding Author Email: shehzadzareen1@kust.edu.pk**

Babesiosis is a tick-borne disease that infects small ruminants worldwide, including; Pakistan, causing huge economic losses to the livestock industry, which contributes greatly to the country's GDP. The presents study was designed to document the microscopic and molecular identification of *BabesiaOvis* and its prevalence in small ruminants of District North Waziristan, KP Province, Pakistan. A total of 100 blood samples were collected in the study area. The samples were collected from the animals with variable age, both sexes, tick infestation and healthy. The collected samples were screened through microscopy followed by molecular confirmation through PCR in the Parasitology Laboratory of Kohat University of Science and Technology, KUST. The microscopic based examination shown 25%(25/100) *BabesiaOvis* found in sheep's. The molecular based prevalence was shown 38% (38/100) found in sheep's. The main factors that increased the prevalence of *BabesiaOvis* infection in the sheep were breed of the animal, presence of ticks, gender, seasonal pattern, acaridae treatment, and feeding method. The morphologically and molecularly identification of *Babesiaovis* in small ruminants and its prevalence has never been found in district North Waziristan, Pakistan. In order to identify effective control measures for Babesiosis in sheep.
Keyword: Babesiaovis, Microscopy, PCR, Prevalence, North Waziristan

Multi-attribute group decision-making algorithm based on intuitionistic fuzzy rough Schweizer-Sklar aggregation operators

Harish Garg[1], Amir Hussain[2], Kifayat Ullah[3]
[1]*Thapar Institute of Engineering & Technology (Deemed University), Patiala 147004, Punjab, India.)*
[2,3]*Department of Mathematics, Riphah international university, Lahore)*

The intuitionistic fuzzy rough set (IFRS) is a robust framework that plays a vital role in reducing the uncertainty from the extracted information from real-life scenarios. In this article, we proposed some aggregation operators (AOs) based on Schweizer-Sklar t-norm (SSTNrM) and Schweizer-Sklar t-conorm (SSTCNrM). These AOs include intuitionistic fuzzy rough weighted averaging (IFRSSWA) and intuitionistic fuzzy rough weighted geometric (IFRSSWG) operators for intuitionistic fuzzy rough values (IFRVs). The basic properties of the developed AOs are investigated and then applied to the multi-attribute group decision-making (MAGDM) problem. The variation of the obtained results is obtained by changing the values of the involved parameter in SSTNrM and SSTCNrM. Additionally, the obtained results are compared with those obtained by existing AOs. Furthermore, all the observations and results are presented graphically.

Molecular characterization of quinolone resisitance genesoqxa and oqxb in *Klebsiella pneumoniae* isolated from tertiary care hospitals of Peshawar, Khyber Pakhtunkhwa

Zullenourain[1,] Mubbashir Hussain[1,] Abdul Rehman[1]
Department of Microbiology, Kohat University of Science and Technology (KUST), Kohat 26000, Khyber Pakhtunkhwa, Pakistan.
[*]**Corresponding Author Email:** zullenourainkhattak786@gmail.com

Background: In developing countries like Pakistan, fluoroquinolones resistant strains of *Klebsiella pneumoniae* are posing significant challenges in treatment. There is a dire need of molecular surveillance of genes responsible for fluroquinolone resistance in *K. pneumoniae* strains. Understanding these mechanisms is crucial for developing effective strategies to combat the rising threat of antibiotic resistance in *Klebsiella Pneumonia* infections.

Objective: The study was aimed to detect fluoroquinolones resistance in Multi Drug Resistant*K. pneumoniae* isolated from clinical samples andto perform molecular detection of fluoroquinolones resistance genes *OQXA*and*OQXB*.

Methods:*K. pneumoniae* strains were isolated from clinical samples like urine, blood, sputum, pus from patients admitted in tertiary care hospitals of Peshawar, Khyber Pakhtunkhwa. Biochemical tests were performed for identification and antibiotic profiles were checked using disk diffusion method. Minimum Inhibitory Concentration (MIC) was done against levofloxacin and ciprofloxacin.Molecular detection of *OQXA* and *OQXB* genes was done by polymerase chain reaction amplification followed by sanger sequencing.

Results:A total of 30 *K.pneumoniae* strains were isolated. Among these 20 strains exhibited 100% resistance to the fluoroquinolone group (Ciprofloxacin, Levofloxacin, and Moxifloxacin) indicating an exceptionally high level of resistance. *OQXA*gene was detected in 10 of the strains and *OQXB*was detected in 3 strains. 7 strains were positive for both genes. Molecular analysisrevealed that multidrug-resistant (MDR) isolates carry fluoroquinolone-resistant mutations in the *OQXA* and *OQXB* genes.

Conclusion: Our study stresses the importance of comprehensive sequencing techniques to understand MDR genetic variability in *Klebsiella Pneumoniae*. This knowledge aids in formulating better antibiotic strategies for patients, crucial in combating antimicrobial resistance.

Keywords: fluoroquinolones, *K. pneumoniae*, multidrug resistant, *OQXA, OQXB.*

A Review of Biostimulants' Impact on Vegetable Production and Growth

Muhammad FaizanBashir[1], AbdurRehim*[2], Hafiz Muhammad Ali Raza[1],Qurat-Ul-Ain Raza[2], Muhammad Amjad Bashir[2],Kashif Ali Khan[1],Muhammad Ahmar Amin[1], FaizUl Hassan [3],Abdul Basit[1],Aqsa Rehman[1]

[1]*Department of Soil science, College of Agriculture, University of Layyah, Layyah, 31200, Pakistan*
[2]*Department of Soil science, Faculty of Agriculture Sciences and technology, Bahauddin Zakariya University Multan, Multan, 60800, Pakistan*
[3]*Institute for Environment and Development (LESTARI), UniversitiKebangsaan Malaysia (UKM), Bangi 43600, Selangor, Malaysia*
[*]**Corresponding Author Email:** abdur.rehim@bzu.edu.pk

Vegetables are a good source of healthy nutrients and thus are highly recommended for a human's daily diet. Vegetable demand has folded from 0.55 to 1.09 billion tonsfrom 1997 to 2017.To meet the increasing demand for sustainable agricultural practices and enhance crop productivity, the use of biostimulants has gained considerable attention. This review examines the effects of various biostimulants on vegetable growth and yield parameters, including plant growth, physiological processes, nutrient uptake, and yield attributes. Various studies have been reported to evaluate the role of biostimulants derived from natural sources, such as seaweed extracts, humic substances, amino acids, and beneficial microorganisms, to enhance plant growth and productivity. The improvements in crop yield could be associated with enhanced nutrient absorption, stress tolerance, and hormonal regulation. However, the mechanisms behind the positive outcomes need long-term experiments and further studies to elucidate specific dosages, application methods, and interactions with other agricultural inputs. Overall, this

review provides valuable insights into the potential of bio-stimulants as eco-friendly tools to enhance okra crop productivity while promoting sustainable agricultural practices.

Keywords: organic farming, agriculture, food demand, plant nutrition

Nexus of Natural Resource Rent, Technology Innovation and Financial Development: New Evidence from Resource-Rich Countries

Sadia Anjum[1]
[1]*Department of Economics, University of Layyah*

Natural resource is the majore lement for promoting the economic growth. Many studies have been conducting on the impact of natural resource rent on the financial development. This study examines the nexus between the natural resource rent, technology innovation and financial development is case of 17 resource rich countries by using the penal data from 1995to2021. This study applies the Levin, Lin & Chu (lv) test and IPS Im, Pesaran & Shin (IPS) unit root test to check the stationarity that shows that all variables are stationary at 1st difference. Penal ARDL method is used to check the relationship between the natural resource rent, technology innovation and financial development. Trade openness and economic growth are also used as explanatory variables. The results shows that natural resource rent are positively correlated with the financial development in the long run but in the short run the correlation between them is negative. The impact of technology innovation is positive for the financial development. When technology advancement increase in these countries it will increase the financial development. There is Co integration among these variables. Trade openness and economic growth also have a positive impact on the financial development. This study support the resource blessing theory. This study recommends the governments of the resource rich countries to adopt relevant policies regarding the efficient use of natural resources through technological innovations.

Keywords: Natural Resource Rent, Technology Innovation, Financial Development, Resource- Rich Countries, Panel ARDL Model

Optimizing anaerobic digestion conditions for sustainable biogas production in district kohat and molecular identification of methanogenic bacteria

Sahibzada Muhammad Hamza[1*], Niaz Muhammad[1], Abdul Rehman[1] ,Qazi Athar Ud Din
Department of Microbiology, Kohat University of Science and Technology, Khyber Pakhtunkhwa, Pakistan
[*]**Corresponding Author Email:** afridihamza308@gmail.com

Anaerobic digestion (AD) is a promising technology for converting organic waste into biogas, a renewable energy source. In this study, we have optimized AD conditions in District Kohat, Pakistan, to enhance constant biogas production, and to minimize its negative environmental impact of waste materials.

We have optimized various factors affecting AD performance, including substrate composition, temperature, and hydraulic retention time (HRT). By adjusting these parameters, we aimed to achieve efficient biogas yield.Results indicated that a balanced carbon-to-nitrogen (C/N) ratio, mesophilic temperature (around 35°C), and neutral pH were crucial for optimal biogas production.

Longer HRTs allowed better substrate degradation and methane generation.

To understand the microbial community responsible for biogas production, microbial community pattern through molecular analyses(16S rRNA genes) has been performed and results revealed the presence of diverse methanogens, including *Methanosarcina*, *Methanobacterium*, and *Methanococcus* species.These methanogens play a vital role in converting organic matter into methane during AD at optimized condition.Our findings will contribute to sustainable waste management practices in District Kohat.By optimizing AD conditions, we can enhance biogas yield, reduce greenhouse gas emissions, and can contribute to national economy.Understanding the methanogenic community structure can further help in bioreactor design and operation.

In conclusion, this study provides valuable insights into AD optimization and microbial dynamics, paving the way for more efficient and eco-friendly biogas production. Further research should explore additional factors and scale-up strategies for practical implementation.

Keywords: Aerobic Digestion (AD), Carbon to Nitrogen (C/N) Ratio, Hydraulic retention Time (HRT).

Environmentally benign silver/magnesium oxide nanocomposite preparation and its potential use for anti-bacterial activity and phenol red photodegradation

Iqra Ayaz[1], Muhammad Bilal[1], Javed Ali [1]
[1]*Department of Chemistry, Kohat University of Science & Technology (KUST), Kohat-26000, Pakistan*
[*]Corresponding Author Email: **bilalhej@gmail.com Cell #: 0334-8458949**

Nanotechnology is the most active zone of material sciences investigation, and the manufacturing of nanoparticles (NPs) is quickly rising internationally. Researchers employ bio nanotechnology approaches to create nanoparticles and nanomaterials that are both environmentally benign and cost-effective. Eco-friendly technique with little or no cost and numerous uses in biotechnological, agricultural, and environmental domains. In this study AgNPs were successfully produced for the first time through the utilization of an aqueous leaf extract from *thelypteris noveboracensis* in a 0.4mM solution of silver nitrate. Initially, the synthesis of AgNPs was assessed by observing changes in the color of the reaction mixture, followed by thorough examination and characterization using UV-Vis spectroscopy. Confirmation of the biosynthetic synthesis of AgNPs was achieved through the detection of a surface plasmon resonance (SPR) maximum absorption peak at 420 nm in the UV-Vis absorption spectroscopy analysis. Furthermore, antibacterial efficacy against multidrug-resistant human infections was demonstrated by these biosynthesized nanoparticles.silver nanoparticles and nanocomposite show maximal antibacterial activity.The silver nanoparticles were incorporated into MgO to reduce the band gap, resulting in the successful preparation of a silver-doped MgO nanocomposite. The photocatalytic efficacy of the produced nanocomposite photocatalyst was evaluated by monitoring the degradation of phenol red (PR) dye in an aqueous solution. A maximum of photocatalytic breakdown of PR was reached during 80 minutes under direct sunlight. To the best of our knowledge, this is the first study to use silver dopped MgO nanocomposite produced from *thelypteris noveboracensis* as a photocatalyst for effective PR dye degradation.

Evaluating the Dynamics of Vegetation Range in Metropolitan and semi-urban Regions of Multan through GIS&RS Technique

Nazish Iftikhar [ab], Dr. Din Muhammad Zahid[ab], Muhammad Rashid [c], Muhammad Talha Imtiaz [be], Sabica Naz[d]
[a]*Department of Forestry and Environmental Sciences, Layyah University*
[b] *Department of Forestry and Range Management, Bahauddin Zakariya University Multan*
[c] *Punjab Forest Department, Pakistan*
[d] *Department of Wildlife Ecology and Conservation, University of Florida, Gainesville FL USA*

[e]School of Environment, Northeast Normal University, Changchun, 130024, China

Urbanization is adetrimental factor in earth because it alters land use patterns, which inevitably creates drastic changes in the climate. Unplanned changes in urban areas are creating disturbance in developing countries and degraded the land simultaneously. Urbanization in Pakistan leads to problem concerning climatic, physiographic and edaphic elements, which exacerbate degradation and deforestation. The proportion of vegetation, agriculture, waterbodies, barren land, and built-up areas was determined by analyzing the land use and land cover (LULC) and their modification using Geographic Information System and remote sensing techniques. The varied cover of vegetation, agricultural crops, bare land, and constructed areas in Multan's urban and semi-urban areas were all found using the QGIS 3.26 version because using the supervised classification of USGS Earth Explorer Landsat 8 and 7 images in comparison to one another is a successful approach to evaluating changes in the targeted region from 2010 to 2021. The main focus of our study is on the evaluation of the various land use land cover (LULC) kind and their geographical positioned in the research area. We also used GIS and remote sensing to depict the changes in vegetation cover over the last ten years and identified the spot and magnitude of these changes. The findings of the study indicated that in 2021, the land cover of water bodies, bare land, cultivating crops, cover of trees, and constructed area was approximately 2.39%, 16.69%, 31.85%, 3.80%, and 45.22%, respectively, while in 2010, the land cover was 12.61%, 3.67%, 21.80%, 33.89%, and 27.88%. Furthermore, the selected research area of built-up region elevated by nearly 19% between 2010 and 2021, while the total cover of trees decreased by 31%. This is thought to be the most noticeable shift and change detection in the targeted area of land cover. Water bodies are reduced by about 12%, while farmland areas are raised by 11%. Thus, there is a strong correlation between these changes and the sustainability of the climate, the balance of ecosystems, and the efficient use of the resources of the land.Thus, it can be considered that Multan has endured major modifications in land use. It is suggested that in order to preserve and protect the vegetation cover, an awareness campaign and effective approaches be implemented in the study area.

Impacts of Ecological Impairments on Life Sciences

Aqsa[1]
[1]University of Agriculture Faisalabad

Human beings are engaged in activities that cause environmental degradation, which in turn is diminishing biological activity and diversity in natural and human-made ecosystems. Consequently, destruction befalls the eco-systems and they in turn pours into our lives. Habitat erosion, air pollution, disease transmission from animals to humans, toxic residue accumulation, climate change and the ozone depletion are all changing the global environment. Through these changes, bodies and biological systems cyclically transform, a process, which is now at risk of eradicating a large number of living species. Loss of biodiversity in an ecosystem has a range of negative effects. One of such effects is the reduction of productivity of ecosystems, meaning that it starts to degrade, become less resilient to pressure and unable to preserve a healthy environment. Extinction of biodiversity does not only impede ecosystems to come back to their original state and have the capability of recovering but also it makes these ecosystems be incapable of functioning in balance. Due to climate change and human intercession thriving posse unchecked wildfires, floods and severe droughts mitigation which brought down ecosystems. Warming of water bodies have experienced a decrease in habitat, mainly for the cold-water fish. In the case of polar bears, decreasing amount of ice platforms that are ice algae as food depend on, results to decline in their population. The primary threats that currently imperil large non-migratory vertebrates include habitat decline and fragmentation, which are ultimately the cause of extinction of numerous local species. Air pollution and heavy metals are also environmental issues that have negative impacts on human health. Human activities have led to unprecedented prosperity, but also to the production of harmful substances that have caused environmental damage. Heavy metals, air pollutants, and non-native species invasions have caused harm to wildlife, while UV radiation has adversely affected amphibian

development. The interplay between the immune and reproductive systems is another complexity for wildlife health. Planetary boundaries provide a guideline for mapping anthropogenic damage to life-support systems, and several planetary support systems are already beyond their limits. We may be edging closer to a point of no return.

Synergistic Effect of Ozone, Microwave, and Sonication on The Quality of Sugarcane-Sea Buckthorn Blended Drink

Muhammad Nadeem[1], Sobia Tariq[1], Muhammad A. Shahid[2], Alaiha Asif[2], Rashad Mukhtar Bilal[3], Sadaf Javaria[4], Tahir Mahmood Qureshi[5]

[1]*Institute of Food Science and Nutrition (IFSN), University of Sargodha, Sargodha, 40100, Pakistan*

[2]*Horticultural Sciences Department, North Florida Research and Education Center, Institute of Food and Agricultural Sciences, University of Florida, Quincy Fl. 32351, United States of America*

[3]*Department of Horticulture, University of Sargodha, Sargodha, 40100, Pakistan*

[4]*Institute of Food Science and Nutrition (IFSN), Gomal University, DI Khan, KPK, Pakistan*

[5]*Department of Food Sciences, Cholistan University of Veterinary and Animal Sciences, Bahawalpur 63100, Pakistan*

Sea-buckthorn was collected from Gilgit Baltistan and transported to Sargodha.Fresh and pure sugarcane juice was purchased from the local shop at Sargodha and subjected to ozonation for specified time. Ozone processed sugarcane juice and fresh sea-buckthorn juice were blended according to the treatment plan. After the preparation of blended juices, sonication and microwave assisted pasteurization were performed. Processed blended juiceswerepacked in plastic bottles and stored at refrigerated temperature (4±2ºC) and subjected to Physico-chemical, microbiological, and sensory evaluations. The highest total phenolic content was observed in T_3 (689 µg GAE/mL), and T_{0-} expressed the least value for phenolics content (416 µg GAE/mL). The highest mean value was obtained at 1st day of storage (695 µg GAE/mL) and the lowestafter 120th day of storage (464 µg GAE/mL). The maximum flavonoids content was found in T_3 (1096±262 µg CE/mL). The highest flavonoid content was noticed in fresh juice (1195±380 µg CE/mL) the lowest after 120th day (777±280 µg CE/mL). T_3 has the maximum antioxidant capacity (1903±56 µl AAE/mL). The highest antioxidant capacity was found at 1st day of storage (1919±82 µl AAE/mL), the lowest at 120th day of storage (1338±506 µl AAE/mL). T_3 exhibit the maximum DPPH radical scavenging activity (4402±327 µmol equivalent of Trolox 100 mL) while T_{0-} exhibited the least DPPH activity (3831±449 µmol equivalent of Trolox /100mL). The maximum DPPH mean value was noticed at start of study (4604±304 µmol equivalent of Trolox /100mL). Least DPPH value was found after 120th day (3487±346 µmol equivalent of Trolox /100mL). The minimum total plate count (1.71±0.12 Log_{10} CFU/mL) was found in T_3, while T_{0-}indicated the maximum total plate count (1.84±0.09 Log_{10} CFU/mL). The least plate count was found at 1st day of storage (1.64±0.08 Log_{10} CFU/mL) and the maximum at 120th day (1.93±0.04 Log_{10} CFU/mL). The sensory assessment revealed that the highest scores for sensory aspects like color, flavor, texture, and overall acceptability was acquired by the treatment T_3.

Formulation development and In-vitro evaluation of dermatological gel containing combination of medicinal plants

Muhammad Khurram Waqas[*1], Saher Mubeen Arshad[2]

[1]*Institute of Pharmaceutical Sciences, University of Veterinary and animal Sciences, Lahore, Pakistan*

[2]*Institute of Pharmaceutical Sciences, University of Veterinary and animal Sciences, Lahore, Pakistan*

[*]**Corresponding Author Email:** *khurram.waqas@uvas.edu.pk, Tel.:00923336378490*

Non-repeated combination matrix of *Aloe vera* gel powder, neem extract, black seed oil and tea tree oil was developed to find synergistic effect against *Propionibacterium acnes*.
Non- repeated combination matrix of 11 formulations were made by using *Aloe vera* exudate powder, neem extract, black seed oil and tea tree oil. Carbopol 940 was used as gelling agent, methyl paraben and propyl paraben as preservatives and sodium hydroxide as neutralizing agent. Antimicrobial activity against *Propionibacterium acnes* was determined by well diffusion method. Doxycycline (antibiotic) was used as positive control and solvent (dimethyl sulfoxamide) was used as negative control. Zone of inhibitions of all formulations were determined. From this non repeated combination matrix, all combinations showed satisfactory zone of inhibition against P. acne in comparison to marketed antibiotic Doxycycline but the combination of 11th formulations was considered enough satisfactory against p. acne because its zone of inhibition was 2.2mm which is comparative to doxycycline zone of inhibition that was 2.3mm. So it can be concluded that 11th formulation can be used as therapeutic alternative to marketed Doxycycline against p. acne in patients suffering from acne vulgaris disease

Keywords: *Propionibacterium acnes,Aloe vera,Black seed,Tea tree,Neem*

Comparison of two Different Multiplex CRISPR/Cas Strategies Cotton Leaf Curl Virus (CLCuV) in *Nicotianabenthaimana*

Faiza Nasim[1], Aftab Ahmad[1]
[1]*Department of Biotechnology and Food Sciences, University of Layyah*

Begomoviruses infect many plant species including economically important crops worldwide. In Pakistan, the Cotton leaf curl virus (CLCuV) (a begomovirus) affects cotton plants causing significant loss to the economy of this agriculturally based country. Conventional approaches for resistance management have not been successful to tackle the emerging and rapidly evolving plant viruses. Over the last decade, the Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) CRISPR/Cas9 system has been used by biologists in various fields. The dominance of CRISPR/ Cas over ZFNs and TALENs lies in its targeting multiple genes with simplicity and simultaneously because of its multiplex ability. In the present study, we successfully demonstrated the use of CRISPR-Cas9 system to suppress disease symptoms of cotton leaf curl disease (CLCuD) caused by a whitefly transmitted begomovirus. We use the CRISPR/Cas9 system in NicotianabenthamianaDomin (a model plant) to develop resistance against CLCuV. Transient assays of CLCuV infectious clones and CRISPR-Cas9 constructs were performed in 3-4 weeks old Tobacco (Nicotianabenthamiana) plants by agroinfiltration. An interesting facet of the study was the comparison of two constructs (pHSE401 and pKSE401) with regards to their efficacy in the virus inhibition. The pKSE401 vector contained a Cas9 nuclease and two guide RNAs (gRNAs), one targeting the Replication associated protein (Rep) gene and the other targeted the βC1 gene of the Betasatellite. The vector pHSE401 had only one sgRNA that targeted the (Rep) gene. Both genes that are intended to be targeted play important roles in the replication of CLCuV. Plants infiltrated with pKSE401 exhibited a delay in the development of the symptoms of the disease and showed lower virus titres. Our proposed multiplexing approach gave efficient results of the resistance in the model plants, and the results in this communication may be extended to the CRISPR/Cas9 based editing of cotton plants.

Keywords: CRISPR-Cas9, ZFNs, TALENs, CLCuV , Gene Editing**,**

Child marriage on women health and education: A qualitative study of suraj miani tehsil multan, Pakistan

Gulshan Ara[1], Kamran Ishfaq[2] , Saliha Hayat Khan[3]
[1]*Department of Sociology, The Women University Multan.*

[2]*Department of Sociology, Bahauddin Zakariya University Multan*
[*]**Corresponding Author Email:** Salihahayat321@gmail.com

Marriages are considered one of the most important traditions in Pakistan culture to start a family and reproduction process. Marriage of young girls less than 18 years of age is a human rights violation. Pakistan comes in a list of countries where the rate of girls' child marriage is very high due to several reasons including deeply entrenched traditions and customs, poverty, lack of awareness, and access to education.

Objectives: This study was intended to investigate causes that trigger child marriage and what are their consequences on girl's education, physical and mental health

Methodology: This study uses a qualitative research approach. The primary data was collected through in-depth interviews and case studies in Suraj Miani Tehsil Multan by purposive sampling technique. The researcher selected 12 females who were married below 18 years of age and were facing health-related issues. Data was analyzed by using a thematic analysis approach.

Findings: The findings of this study reveal that poverty, illiteracy, tradition, and gender inequality are the main reasons for child marriage in Pakistan. Moreover, this study also shows that child marriage directly affects a girl's education and physical and psychological health.

Suggestions: Therefore there should be more awareness and spread of knowledge and commitment from governmental and non-governmental organizations to decrease girl's child marriage in Pakistan. Moreover media should spread awareness in society regarding the negative consequences of girl's child marriage to eliminate the practice in Pakistan culture.

Keywords: Young girls, depression, Illiteracy, poverty, cultural traditions, gender discrimination, inequality, physical health.

Association of yield contributing traits in upland cotton (*Gossypiumhirsutum* L.)

Attiqa Saleem[1], Amir Shakeel[1]
[1]PGRI, NARC Islamabad
[2]*UAF Faisalabad*

Cotton is an important cash crop which provides raw material to textile industry. High yielding cultivars are need of the hour to fulfill the requirements. Yield is a complex quantitative trait which is associated with other traits. To have knowledge about yield associated traits has gained importance. Current study was conducted to study association among yield contributing traits in upland cotton. For this purpose, 20 genotypes were sown in randomized complete block design with 2 replications in research area of department of plant breeding and genetics, university of Agriculture, Faisalabad under field conditions. Data were recorded at maturity for different traits including plant height, number of monopodial branches per plant, number of seeds per boll, boll weight, seed index, lint index, seed mass per boll, lint mass per boll, total number of bolls per plant, seed cotton yield per plant and lint percentage. Data were subjected to analysis of variance to check significance among different genotypes. Genotypes were significantly different. The data were analyzed by correlation, Principal component and cluster analysis. Basic parameters like maximum or minimum value, standard deviation, standard error of mean and variance were calculated. Plant height, number of monopodial branches per plant, number of seeds per boll, boll weight, seed index, lint index, seed mass per boll, total number of bolls per plant, seed cotton yield per plant and GOT% showed high heritability with high genetic gain. Seed cotton yield was significantly and positively correlated with number of bolls per plant, lint mass per boll, seed mass per boll, seed index and lint index. First principal component showed 44.4%, second component showed 20.6% third component showed 13.3% and fourth component showed 10.3% of total variation. Cluster analysis revealed that cluster 2 and 3 showed maximum (81.54%) similarity. Correlation analysis provided the association among different traits. PCA and cluster analysis showed the genetic diversity among cotton genotypes.

Key words: Association, yield contributing traits, PCA, seed cotton yield , Upland Cotton, correlation,

Metagenomic exploration of bacterial extremophiles for industrially important enzymes

Muhammad Nughman[1], Hassan Khan[1], Kainat Ali Zulqarnain[1], Noor Muhammad[1], Farman Ullah Dawar[2], Nawab Ali[1]

[1]*Department of biotechnology & genetic Engineering, Kohat University of Science & Technology, Kohat 26000*

[2]*Department of Zoology, Kohat University of Science & Technology, Kohat 26000*

[*]**Corresponding Author Email:** nawabali_1857@yahoo.com, 00923443035006

Extremophiles are organisms capable of surviving in extreme environmental conditions such as extreme pH levels, extreme temperatures, higher salt concentrations, and high pressure. Metagenomics exploration has gained significance interest in recent years due to its ability to investigate environmental microbial communities that are challenging to cultivate. The present study aims to investigate the bacterial diversity of Pakistani extreme environment for the industrially important enzymes. For this purpose samples were collected from different extreme environments i.e., salt mine, hot spring and desert. Whole genomic DNA was extracted and sequenced, and metagenomic assembly was constructed using MEGAHIT software. For bacterial diversity and functional annotations blast search were conducted across different databases like Micro NR, CAZy, and CYPED. Bacterial diversity were analyzed and it was observed that total of 56 bacterial classes and 1486species were identified. Then bacterial species were dominated by *Acinetobacterbaumannii, Acinetobacterpittii, Alcaligenes faecalis, Aneurinibacillusmigulanus, Bacillusamyloliquefaciens, Bacillusanthracis, Bacilluscereus* and many others. The carbohydrate active enzymes were identified to be 45.6% glycoside hydrolases, 24.3% glycosyl transferases, 14.7% carbohydrate esterases, 1.8% polysaccharide lyases, then 8.7 carbohydrate binding modules and 4.9% auxiliary activities. The prominent carbohydrate active enzymes were pectinases, proteases, lipases, xylanases, and cellulases. The cytochrome p450 engineering (CYPED) database identifies different CYP families and superfamilies such as CYP450, CYP 116, CYP 71 and CYP 51. From our study we conclude that extreme environments of Pakistan have diverse bacterial communities capable of producing different enzymes, which have potential applications in different industries such as food processing, leather, brewery, paper processing and many others.

Keywords: Extremophilic bacteria, metagenomics, enzymes, industries, databases

Effect of population explosion on the Natural Resources and their solution; A Critical Review

Ansar Abbas[1]*, Muqadas Batool[1], Azhar Abbas[1]

[1] *Deportment of Botany, Govt. Graduate College Layyah (Affiliated with BZU Multan), Punjab, Pakistan.*

[*]**Corresponding Author Email:** ansarabbas8297@gmail.com

The population of living organisms, especially humans, is increasing; on the surface of the earth day by day is approximately 8 billion and is expected to be 10 billion in 2050.This is the most important cause of destitution and destruction of the environment. The aims and objectives of this critical review are to explore the importance of natural resources and their destruction by anthropogenic activities, mainly by increasing population. The natural resources such as air, land, water, vegetation, etc. are in a very critical situation due to population explosion. As population growth and natural resources are directly linked with each other. All organisms on the earth take food and fulfill all other necessaries from the natural resources present in the environment. An increasing population demands more food, a place to live, fuel, wood and all other resources. This demand has interrupted the balance of natural resources as created by nature and causes many environmental problems corresponding with land degradation. The human population growth has increased the burden on the natural resources. In developing countries like Pakistan, the human growth rate is very high due to which the natural resources are not enough, and

people have to face many problems like poverty, pollution, inequality, etc. As the population is increasing, the place for living is shortening and people cut down the trees and forest for the construction of homes and living which causes deforestation. It disturbs the natural balance as set by nature. If population growth continues to increase at the present rate situations will be out of our hands.

So, the current growth rate of the population should be controlled, and a balance must be maintained between the population and the natural resources. The government institutes/universities should promote education, especially to the women, and inform them about the deficiency of natural resources and the crises due to overpopulation such as poverty, hunger, longing, disorders, etc.

Keywords: Overpopulation, nature disturbance, poverty, deforestation, inequality

Conservation of Biodiversity; the Importance of Protecting and Preserving Various Species and Ecosystems to Maintain Ecological Balance

Muqadas Batool[1*], Ansar Abbas[1]
[1] *Department of Botany, Govt. Graduate College Layyah (Affiliated with BZU Multan)*
Punjab, Pakistan
[*]**Corresponding Author Email:** muqadasbatool690@gamil.com

Biodiversity is a wide variety of living organisms in a limited area on the surface of the earth. Due to several reasons, biodiversity is very important. In the maintenance of ecological balance, biodiversity plays an important role. Each species has its role in biodiversity. For example, oxygen produced by plants is necessary for all living organisms. Similarly, many pollinator insects play a crucial role in pollination and reproduction. Biodiversity gives many services to human beings such as cleaning of air, soil fertility, and climate regulation. It is also necessary in cultural aspects. Many cultures around the world are related to the natural surroundings of the ecosystem. The variety of the species is a charm of the ecosystem. It gives natural beauty to the environment. Natural beauty gives inspiration and enjoyment to people.

Unfortunately, the ecosystem is facing severe loss of biodiversity due to man- made activities. Human beings are the destroyers of biodiversity. Due to the loss of biodiversity, we can face many problems such as pollution and climate change. There is also habitat destruction occurring in the ecosystem which causes loss of biodiversity.

We should conserve biodiversity to conserve the natural environment. We can save biodiversity in different ways such as establishing a biodiversity-friendly environment. We can save biodiversity by establishing protected areas such as national parks and natural reserves. We should promote conservative activities to conserve biodiversity. There should be the implementation of laws to protect biodiversity. Moreover, awareness campaigns are also important for protection. Illegal trade of wildlife should be prohibited. We should highlight the significance of biodiversity and come to know why biodiversity is important. Hence, we can secure a suitable future by securing biodiversity.

Keywords: biodiversity, ecosystems, conservation, climate, pollination, invasive species

Efficacy of extract derived from some indigenous herbs against wheat aphid (Homoptera:Aphid) under field condition

Natasha Hassan[1] and Syeda Aneeza Ubaid[2]
[1]*Department of Botany, The University of Layyah, Pakistan*
[1]*Department of Entomology, The University of Layyah, Pakistan*
[*]**Corresponding Author Email:** natashahassan2510@gmail.com

Wheat, (*Triticum aestivum* L.)is one the important staple crops of Pakistan and is cultivated in almost every part of the country. It is an important source of protein, minerals, starch, lipids, fibers, vitamin B and vitamin E. Wheat is a major ingredient in many food products such as bread, crackers, biscuits, pastries, cakes, etc. Aphid infestation causes the rolling of the wheat flag, trapping emerging heads and awns that result in poor pollination. Wheat production is reducing due to pest attacks, but aphid attack in the early growing stages of wheat is very injurious for the crop. One variety of wheat Dilkash-2020 was sown in the research area of The Islamia University of Bahawalpur on 23 November 2022 with the line sowing method. The experiment was conducted in a Randomized Complete Block Design (RCBD) with three replications. The field was divided into 18 plots of equal size (3×5 m). The row-to-row distance was 30 cm. The Population of aphids was recorded weekly in the morning from 15 randomly selected tillers from 15 plants of each plot. The population of natural enemies was also observed in the field. Five different botanicals were used to analyze the efficacy of these botanicals. Neem leaves and seed (*Azadirachta indica*), garlic (*Allium sativum*), eucalyptus (*Eucalyptus* globulus) and Tobacco (*Nicotiana tabacum*). These botanicals were collected, dried, and ground through the electrical grinder. The 5% solution was prepared. The extract was applied with the help of a knapsack sprayer. The neem leaf and tobacco show excellent results against the wheat aphid. The data was subjected to statistical analysis using Analysis of variance (ANOVA) and the mean was separated by the Least Significance Difference (LSD) test at 5% probability level. The plant based insecticides can control the aphid attack on wheat. Neem leaf extracts and tobacco gave excellent results for controlling of wheat aphids. The yield of these plots was good compared with the other treatments and control plots. The grains are healthy and good in size. The yield can be increased by controlling an aphid attacks on the wheat with the help of these environment safer natural insecticides.

Keywords: Aphid, Botanicals, Wheat, yield

Wound healing potential of mulberry leaves conjugated Znonanoparticles in Diabetic mice

riffat Iqbal[1] , Ayesha khan[1]*

[1]*Department of zoology, Government college university Lahore*

[*]**Corresponding Author Email:** ayeshakhan1070@gmail.com

Background:

Diabetes mellitus can be defined as high blood sugar level in the body. In diabetic condition our body is unable to successfully regulate blood glucose level and this high blood sugar level can also affect the immune system which disturb the healing system. Wound healing consists of different phases to repair the damaged skin and these phases consists of complicated processes. Most widely used modern technology is the nanotechnology that is very helpful in medical field. Nanotechnology is used to produce many nanoparticles and these nanoparticles are used to treat the wounds in diabetic patients. Because in diabetes mellitus the risk of chronic wounds is much higher.

Methodology:

In order to study this disease and for the treatment of disease we collect samples from Layyah for production of nanoparticles. Mulberry leaves were collected for production of the zinc nanoparticles. Zinc nanoparticles were producedby using zinc acetate dihydrate and bioactive ingredients of mulberry leaves extract. These ZnO nanoparticles (average size range is 30.8nm) were created quickly, easily and sustainably. X-RD), SEM, UV-Vis, FTIR, EDX is used to analyze Zinc nanoparticles.

Alloxan monohydrate was used to induce the diabetes in albino mice then after this, healing property of znO nanoparticles was checked by using it on wounds of diabetic mice and these wounds were produced on the skin of

diabetic mice by using biopsy punch. After that, to treat the diabetic injured mice, Vaseline petroleum jelly was used as a base to prepare ZnO nanoparticles ointment and this ointment is used to heal the wounds.

Results:

A histological investigation was completed, and the results showed that wounds healed after 15 days of therapy. Zno nanoparticles ointment healed wound completely and give better results as compared to local ointment.

Conclusion:

Through this research work we concluded that wound healing potential of mulberry leaves conjugated with ZnO nanoparticles in diabetic mice is much higher than others and the healing potential of these nanoparticles is also very good.

Keywords: Mulberry leaves, Diabetes, ZnO nanoparticles, wound healing, diabetic wound,

Assessing Groundwater Quality and Its Impact on Soil and Plant Nutrients: A Case Study in Layyah, Pakistan

Sammar Abbas[1],Kashif Ali Khan[*1],Mir Sujaul Islam[2],FaizUl Hassan[2], Hafiz Muhammad Ali Raza[1], Muhammad Bilal Khan[5], Muhammad Ahmar Amin[1], Muhammad Tanveer[1], Rab Nawaz[4],Muhammad Tahir Akbar[5],Mohamed Said[6]

[1]*Department of Soil science, College of Agriculture, University of Layyah, 31200, Pakistan*

[2]*Institute for Environment and Development (LESTARI), UniversitiKebangsaan Malaysia (UKM), Bangi, 43600, Selangor, Malaysia*

[4]*Department of Earth Sciences and Environment, Faculty of sciences and Technology, UniversitiKebangsaan Malaysia (UKM), Bangi 43600, Selangor, Malaysia*

[5]*Soil and Water Testing Laboratory, District Layyah, 31200, Pakistan*

[6]*Erciyes University, Graduate School of Natural and Applied Science, Faculty of Agriculture, Department of Field Crops, Kayseri, Turkiye*

[*]**Corresponding Author Email:** kashifali@ul.edu.pk

The quality of irrigation water has a significant impact on soil quality and availability of nutrients for plants. A field study was conducted in the district Layyah, Pakistan, to investigate the quality of ground water and its impact on soil quality and plant nutrient availability. A total of 70 water and 427 soil samples were collected from different locations of peri-urban area of Layyah. Out of 70 water samples, 77.14% water samples were fit, 2.85% were marginally fit and 20% were found unfit for irrigational purposes, assessed on the base of electrical conductivity, sodium absorption ratio, and residual sodium carbonate. Furthermore, among the 427 soil samples, 84.07% were found sandy loam, 11.70% loam, and 4.21% clay textures. Similarly, electrical conductivity (ECe) values were recorded below the normal range (< 4 dS m^{-1}), soil samples 94%, with only 5.85% exceeding the normal range. The pH of 88% of the soil samples was less than 8.5, while the pH of the remaining 11.57% was higher. The content of organic matter in 67.91% of soil samples was low (<0.86%), 14.75% was medium, and only 17.33% was sufficient (>1.29%).Low levels of phosphorus were found in 66.27% of the samples, medium in 12.17%, and sufficient in 21.54%. Available potassium levels were low in 25.05% of the samples, medium in 51.99%, and adequate in 22.95%. Farmers can use marginally suitable or unsuitable water to grow salt-tolerant crops like wheat, sorghum, and barley, as well as fruit trees like guava. Additionally, degraded soils are suitable to grow Eucalyptus and Acacia for lumber and fuel, as well as A-triplex spp. for grazing.

Keywords: Groundwater irrigation; Soil quality; Plant nutrients; Salt-tolerant crops

Unlocking Teacher's Innovative Behavior with Idiosyncratic Deals. The Parallels Mediating Models of Pakistan Universities.

Khalil Nasir Khan[1]
[1]*Department of Management Science University of Layyah & Lincoln University College Malaysia*

Abstract: In the recent decade, After the COVID-19 pandemic, the education sector has seen many technological and infrastructural changes. So, it also impacts teacher's innovative performance and energy levels. This present study influences idiosyncratic deals on the innovative work performance of university teachers in Pakistan. The attitude of performing wells mediates between innovative work performance and idiosyncratic deals. Furthermore, cognitive dissonance has also mediated the role between innovative work performance and idiosyncratic deals. The present study data are collected from 392 university teachers for further results and interpretations. The result indicates that idiosyncratic deals have a significant influence of idiosyncratic deals on the innovative work performance of teachers. Cognitive dissonance partially negative influences idiosyncratic deals and innovative teacher performance. Moreover, the attitude toward performing well partially positively influences idiosyncratic deals and innovative teacher performance. The cognitive theory supports study to boost the teacher's positive energy while performing their responsibilities. This study is helpful for academic institution regularities and policy makers in the education sector of Pakistan.

Keyword: Idiosyncratic Deals, Cognitive Dissonance, Attitude Toward Performing Wells, Innovative Work Performance, University Teacher in Pakistan.

Enhancing Data Warehousing Performance: Leveraging Machine Learning Algorithms in Cloud Environments

Shahid Hassan[1], Saqib Hameed[1], M Fahad[1], M Mubeen[1]
[1]*CS & IT Department Thal University Bhakkar*

This research paper explores the optimization of data warehousing performance through the integration of machine learning algorithms in cloud environments. As organizations grapple with managing vast amounts of data from diverse sources, traditional data warehousing methods are proving inefficient. Leveraging the cloud infrastructure and machine learning algorithms offers a promising solution to address these challenges. This paper discusses the benefits of employing machine learning in data warehousing, categorizes various machine learning algorithms applicable to the domain, and provides real-world examples of organizations successfully implementing this approach. By analyzing the experiences of companies like Netflix and Uber, insights are drawn into the effectiveness of utilizing machine learning in enhancing data warehousing performance.

Keywords: cloud, data warehousing, machine learning, algorithm

Effectiveness of dry needling on quality of life in knee osteoarthritis

Sania Naz[1], Nida Ilahi[1]
[1]*Physical Therapy Department, Government College University Faisalabad, Layyah Campus*

Background: Knee pain is a common complaint that affects people of all ages. Knee pain may be the result of an injury, such as a ruptured ligament or torn cartilage. Medical conditions including arthritis, gout and infections also

can cause knee pain. Knee osteoarthritis caused by injury, ruptured ligament, gout, and degenerative changes, joint space narrowing, and osteophytosis.

Objective: To determine the effectiveness of dry needling on quality of life in knee osteoarthritis

Methods: 72 diagnosed patients of osteoarthritis according to grade 1 to 3 of kellgren and Lawrence system, aged 40-60 years having knee pain for more than 3 months were split-up into two groups. Group A received dry Needlingwith Physical Therapy treatment. Group B get only Routine Physical Therapy treatment. A total of twenty-four sessions were performed during a period of 8 weeks (3 sessions/week) Data was collected by SF-36 Questionnaire form.

Results: The findings of study were found to be significant in both groups. The results of intra group analysis (Paired sample t-test) and intergroup analysis (Repeated measure ANOVA) obtained value is ($p< 0.05$) for quality of life. Mean difference for group A was more than group B.

Conclusion: It was concluded that routine physical therapy +dry needling is more effective in improving quality of life in knee osteoarthritis.

Key words: *Osteoarthritis, knee pain, dry needling, quality of life*

Evaluating the Bioefficacy of *Trichoderma spp.* Against *Colletotrichum orbiculare,* the Causal Agent of Anthracnose Disease in Cucumber

Sehris[1], Muhammad Anees[1]*

[1]*Department of Microbiology, Kohat University of Science & Technology, Kohat Pakistan.*

[*]**Corresponding Author Email:** Saherafridi585@gmail.com; dr.anees@kust.edu.pk

Background: Anthracnose caused by the fungus *Colletotrichum* orbiculare is one of the most significant diseases of Cucurbitaceae.It manifests dark sunken lesions on leaves, stems, fruits and even seeds. Chemicalfungicidesarewidelyused to treat anthracnose, but buildup of pathogen resistance has become a global concern.*Trichodermaspp.* may exhibit antagonistic activity against several phytopathogenic organisms including bacteria, nematodes and especially fungi, by inhibiting their growth either directly or indirectly by improving plant growth.

Aims and objectives: The aim of the present study was to isolate *C.orbiculare* from infected cucumber and toinvestigate the role of selected *Trichoderma* strains in controlling cucumber anthracnose by *in vitro* (using dual culture assays) and volatile inhibition assays.

Methodology: Macroscopic and microscopic morphological characteristics of *C. orbiculare* isolated from infected cucumber were observed after growth on PDA for 5 days at 28 ºC. Fungal colonies developed white, grey to brown dense mycelium. Conidia were hyaline, aseptate, straight and cylindrical to clavate. In dual culture assay both the plant pathogens and the biocontrol agent (*Trichoderma* strains) were inoculated on the same agar plates.**Results:** The results showed that *Trichoderma* strains had significant potential in controlling the tested pathogen (*C.orbiculare*). The biocontrol activity of *Trichoderma* strains was also evaluated using volatile inhibition assay, and it was observed *Trichoderma* strains inhibited the growth of *C.orbiculare*that may be because of different organic compounds released.

Conclusion: From this study, it was concluded that *Trichoderma* strains showed potential in inhibiting growth of *C. orbiculare* and may be used as biocontrol agent of anthracnose disease of cucumber.

Key words: Anthracnose; cucumber; Volatile inhibition; *Trichoderma;* biocontrol; C. orbiculare.

Environmental Policy Stringency and Environmental Quality in G19 Countries: A Bayesian Regression Approach

Hafiz Sajjad Hussain[1],Sharafat Ali[2,3], Sadia Anjum[1]

[1]*Department of Economics, University of Layyah, Layyah, Pakistan*
[2]*Department of Economics, Government Graduate College Kot Sultan, Kot Sultan 31650, Layyah, Pakistan*
[3]*School of Economics, Jiangsu University of Science and Technology, Zhenjiang, Jiangsu, China*
[*]**Corresponding Author Email:** sh1292662@gmail.com

The global community has been showing its commitment and introducing environmental policies to reduce Greenhouse gas (GHG) emissions. However, the achieving objectives of climate change mitigation policies is challenging without stringent implementation of these promulgated environmental policies. This study primarily focuses on the analysis of whether environmental policy stringency (EPS) contributes to GHG emissions reduction. The estimated model includes GHG emissions from the transport sector and examines the impact of environmental policy stringency on the former. In addition, the study also includes economic growth, green energy (GE), and environmental tax as control variables in the model. For this purpose, the study employs the Bayesian Linear Regression (BLR) approach to examine the panel data from G19 countries from 2011 to 2023.The BLR estimates reveal that EPS reduces GHG emissions which implies that stringent implementation of environmental policies contributes to climate change mitigation efforts. However, economic growth is revealed to exacerbate environmental degradation by increasing GHG emissions. Whereas, GE and environmental taxes help reduce GHG emissions in G19 countries. The findings of the study provide insightful guidelines for the policymakers to formulate strategies and policies and ensure their effectiveness in reducing environmental pollution and maintaining environmental sustainability.

Keywords: Climate action; Environmental policy; Air pollution; Economic growth;Green energy; Environmental taxes

Interactive effect of zinc and NPK activate antioxidant enzymes against charcoal rot disease, enhance growth and yield of *vigna radiate L.*

Kashif Ali Khan[1], Amna Shoaib[2],Abdul Basit[1],
[1]*Department of Soil science, College of Agriculture, University of Layyah, Layyah, 31200, Pakistan*
[2]*Department of Plant Pathology, Faculty of Agricultural Sciences, University of the Punjab, Lahore. Pakistan;*
[*]**Corresponding Author Email:** kashifali@ul.edu.pk

Charcoal rot disease caused by fungus *Macrophominaphaseolina*(Tassi) Goid is well-known, most destructive and wide-spread disease in decreasing mung bean production in arid to tropical regions of the world and in Pakistan as well. Pot experiments were conducted in green house with of Zn fertilizer with and without combination of NPK to investigate multilateral interaction of mung bean – *Macropphominaphaseolina* - fertilizers in terms of disease, growth, physiology and yield in *Vignaradiata*. Soil imported from Distt. Bhakkar, Punjab was sterilized, inoculated with *M. phaseolina*and mixed with three Zn levels (1.25, 2.50 and 5 mg kg^{-1}) and two NPK doses [recommended (1X: 22:57:30 kg ha^{-1}) increase dose (1½X: 33: 86: 45 kg ha^{-1})]. Results were compared with a negative control as well as with positive control inoculated with the *M. phaseolina*only. Results revealed that NPK with Zn found effective in managing charcoal rot disease by improving biological attributes through better coordination of antioxidants system for induction of resistance against disease. Although, the investigated health markers (total chlorophyll content and carotenoids) and stress markers (total protein content, catalase, peroxidase, superoxide dismutase and polyphenol oxidase) were changed to variable extents. The contribution of SOD and CAT activities with respect to NPK with Zn levels improved biochemical constituents in imparting resistance to desirable level. The current findings concludes that NPK in combination with Zn can be used as soil amendments in enhancing crop yield through charcoal rot disease management with lucrative source of income for the farmers.

Keywords: Zinc;systemic resistant, antioxidant enzyme, reactive oxygen species, Macronutrients, mungbean, charcoal rot

Comparative analysis of Gut microbial in indigenous and domesticated rabbits at district kohat

Momal Zhara[1*], Irum[1], Abdul Rehman[2]
[1]*Department of Zoology, Kohat University of Science and Technology, Kohat, 26000, Khyber Pakhtunkhwa, Pakistan.*
[2]*Department of Microbiology, Kohat University of Science and Technology, Kohat, 26000, Khyber Pakhtunkhwa, Pakistan.*

[*]**Corresponding Author Email:** Zahramomal170@gmail.com

The comparative analysis of gut microbiota composition between indigenous and domesticated rabbits in District Kohat. Total 5 stool samples were collected in which 3 samples were collected from local farm from domesticated rabbits and 2 samples were collected from indigenous rabbits from local wild area at district Kohat. Focusing on gut microbiota and identification, the results revealed similar microbial strains between indigenous and wild rabbit populations, with *E. coli* identified as the dominant species in both, using biochemical analyses followed by Berge's manual of identification and DNA extraction was performed using the Chelex method. Subsequently, 16S rRNA identification was conducted to investigate deeper into microbial composition. Additionally, the antibiotic susceptibility of these pathogens to *Azithromycin* (AZM) and *Clindamycin* (DA) was investigated. The results revealed that *E. coli* isolated from indigenous rabbits exhibited a mean inhibition zone of 17 mm when exposed to AZM, indicating susceptibility, while showing resistance to DA. Conversely, *E. coli* isolated from domesticated rabbits demonstrated a mean inhibition zone of 38 mm to AZM, indicating susceptibility, and 24 mm to DA.These findings highlight differences in gut microbiota composition and antibiotic susceptibility profiles between indigenous and wild rabbits in District Kohat. Further research is essential to understand the ecological and environmental factors influencing these differences and their implications for rabbit health and management practices in the region.

Key words: Gut microbiota, Indigenous rabbits, Wild rabbits, Molecular analysis, Chelex DNA extraction, *Azithromycin* (AZM), *Clindamycin* (DA), Comparative analysis, Microbial diversity

Characterization of plastic degrading bacteria isolated from waste dumping site in district kohat

Mubasher Khan[1*], Abdul Rehman[1], Muhammad Anees[1]
[1]*Department of Microbiology, Kohat University of Science and Technology, Kohat, 26000, Khyber Pakhtunkhwa, Pakistan.*
[*]**Corresponding Author Email:** *mubasherk410@gmail.com

Plastic waste presents a significant environmental menace, necessitating the exploration of eco-friendly remedies. This study focused on identifying and validating the efficacy of plastic-degrading bacteria, specifically Bacillus subtilis from the KUST University dumping site and *Pseudomonas aeruginosa* from the Jarma dumping site. Initially, microbial counts revealed substantial populations of heterotrophic bacteria. Subsequently, bacterial growth was confirmed in Minimal Salt Medium (MSM) broth over 12 days of incubation in a shaking incubator, with growth verified through optical density measurements. Following confirmation, 2×2 pieces of various plastics, including CSD plastic, synthetic polyethylene plastic, and biodegradable polyethylene plastic, were introduced into the broth cultures. The cultures underwent an additional 15-day incubation period to assess plastic degradation, with results indicating significant degradation of the plastics. For *Pseudomonas aeruginosa*, degradation rates were observed as follows: CSD plastic initial weight 0.156g, final weight 0.0534g (T=86.4%/A=0.063); synthetic polyethylene initial weight 0.0076g, final weight 0.0067g (T=98.8%/A=0.005); biodegradable polyethylene plastic initial weight 0.0082g, final weight 0.0073g (T=95.9%/A=0.018). Similarly, for Bacillus subtilis, degradation rates were observed as follows: CSD plastic initial weight 0.0190g, final weight 0.0222g (T=76.3%/A=0.118); synthetic polyethylene initial weight 0.0080g, final weight 0.0080g (T=99.8%/A=0.001); biodegradable polyethylene plastic

initial weight 0.0081g, final weight 0.0077g (T=89.1%/A=0.050). Among these plastics, the highest degradation rate was observed for synthetic polyethylene plastic, with *Pseudomonas aeruginosa* showing approximately 11.84% degradation and *Bacillus subtilis* exhibiting no growth. Conversely, the lowest degradation was observed for CSD plastic, where *Pseudomonas aeruginosa* degraded approximately 65.77%, and Bacillus subtilis exhibited approximately 17.05% growth.

Keywords: Plastic degradation, *Bacillus subtilis*, *Pseudomonas aeruginosa*, Environmental remediation, Biodegradable plastics

A Review Enhancing Soil Resilience: Sustainable Water and Soil Management in Climate Change

Mishal Kainat[1], Kashif Ali Khan[1*], Abdul Basit[2],Hafiz Muhammad Ali Raza[1],Areeba Batool[1] Muhammad Bilal Khan[5], Muhammad AhmarAmin[1] ,Irtaz Ali[1], Syed Hassan Raza Zaidi[1]
[1]Department of Soil science, College of Agriculture, University of Layyah, Layyah, 31200, Pakistan
[1]Department of agronomy, College of Agriculture, University of Layyah, Layyah, 31200, Pakistan
[2]Department of Agronomy, Engro Fertilizers Limited, Rahimyar Khan
[5]Soil and Water Testing Laboratory, District Layyah, 31200, Pakistan
[*]**Corresponding Author Email:** kashifali@ul.edu.pk

The world's population is growing rapidly, on other hands, concerns about depletion of natural resources and climate change are raising concerns about soil and water resources. The constituents of the hydrological cycle—precipitation, evapotranspiration, temperature, stream flow, ground water, and surface runoff—are impacted by climate change. The amount of soil and water that is available can fluctuate due to climate change. Increased floods and droughts as a result of these changes will have a major effect on the availability of soil and water resources. Changes in the climate have an impact on soil qualities and processes. Climate change consequently brings about changes in the two variables temperature and water that greatly influence the processes that occur in soils. Management of water and soil resources can aid in balancing the consequences of climate change. By employing sustainable soil management techniques, agricultural managers may be able to minimize the effects of these changes and manage their property to optimize soil health. These methods consist of replanting, controlling the water and nutrient cycles, and selecting appropriate crops. It is thought that increasing productivity and efficiency in the management of land, soil, and water requires the use of integrated climate-smart technologies and practices. Innovations in increasing water use efficiency, boosting soil health, and re-carbonizing soils were showcased during the event. In order to increase the resilience of agri food systems in the face of the climate crisis, a plan for managing water scarcity and fostering integrated resource governance was also explored. For instance, effective water utilization, judicious fertilizer use, reduced pesticide use, and improvements in soil health could lead to average crop yield increases of 80 percent. Ensuring a dependable and healthy water supply also depends on the sustainable management of ecosystems in source areas and upper catchments, such as mountains, grasslands, and forests. Supporting cutting-edge technologies like big data analytics, remote sensing, and precision agriculture are examples of governance initiatives that could improve the efficacy and efficiency of integrated soil and water management.

***Keywords**:* natural resources, climate change, soil health

Optimizing Lighting Climate: Enhancing Animal Welfare, Productivity, and Farmer Profitability

Khurshied Ahmed khan[1]

[1]*HATO Agricultural Lighting-G405-406 National Science & Technology Park, NUST, Sector H-12, Islamabad 44000 – PAKISTAN*

The influence of optimal lighting climate on animal welfare and productivity has emerged as a critical factor in modern agricultural practices. This paper examines the multifaceted relationship between lighting conditions, animal welfare, and farm profitability. By providing animals with appropriate lighting environments, stress levels decrease, leading to improved welfare indicators such as reduced aggression, healthier immune systems, and enhanced reproductive success. Moreover, optimized lighting positively impacts productivity, with studies demonstrating increased growth rates, higher milk yields in dairy cattle, and improved egg production in poultry.

Furthermore, the economic implications of implementing optimal lighting systems cannot be overstated. While initial investments may be required, the long-term benefits far outweigh the costs. Higher productivity rates translate into increased revenues for farmers, while concurrently reducing expenses associated with veterinary care and medication. Additionally, improved animal welfare can result in higher product quality, commanding premium prices in the market.

Ultimately, the adoption of optimal lighting climates represents a win-win scenario for farmers, animals, and consumers alike. By prioritizing animal welfare and productivity through thoughtful lighting management strategies, farmers can achieve greater profitability while fostering healthier and happier livestock populations.

Prevalence of mental stress among MBBS students of private medical colleges of Punjab, Pakistan

Sania Naz[1], Nida Ilahi[1]

[1]*Physical Therapy Department, Government College University Faisalabad, Layyah Campus*

This study was conducted to determine the prevalence of mental stress among undergraduate's medical students, as well as the relationship between mental distress and socio-demographic, personal, and academic-related variables. A cross-sectional research was used. K-10 questionnaire was used to collect information from 1200 MBBS students of private medical colleges in Punjab. Mental stress was found to be present in 74% of the 1200 students' studied. The majority of the study participants (18.6%) were under the age of 23. Males made up 52.2 percent of the study participants, while females made up 47.5 percent. 20.8 percent were in their first year of medical school, 19.6 percent in their second year, 18.3 percent in their third year, 18.8 percent in their fourth year, and 22.6 percent in their fifth. Students at private medical colleges, where the majority of the respondents are from the middle class, had a significant association with socioeconomic status as a contributing factor of stress ($p = 0.04$). The history of parental conflict was considered a stress factor by 51.1 percent of the participants. The study concluded that mental distress affects 76% of university students.

Keywords: *Mental stress, Psychological well-being, Socioeconomic, Work performance, Academic activities*

Role of Governance, Civil Liberties, Business Freedom, Trade and Tax Ratio in Attracting Foreign Direct Investment in Developing Countries

Muhammad Abbas[1], Bushra Tabbasum[2]

1. *Associate Professor, Air University Islamabad- Pakistan, Multan Campus.*
2. *MS Management Sciences Scholar, Air University Islamabad- Pakistan, Multan Campus*

[*]**Corresponding Author Email:** bushratabassum77@gmail.com

Foreign Direct Investment (FDI) plays a crucial role in driving economic growth in developing Countries Despite their pressing need for FDI to address capital deficits, access advanced technologies, and bolster domestic industries, many developing countries struggle to attract sufficient investment from other countries. This research aims to tackle this issue by examining the role of Governance, Civil Liberties and Business Freedom in attracting FDI. This study is conducted on three SAARC countries Pakistan, Sri Lanka and Bangladesh employing the data of 2002 to 2022 time-period. Panel Generalized Method of Moments technique has been applied for the data analysis. Key findings include positive impacts of Control of Corruption, Rule of Law, Voice and Accountability, Civil Liberties and Business Freedom; insignificance of Tax Environment, and a negative association of Trade Environment with FDI.The study's findings have the potential to empower developing countries with the knowledge needed to effectively harness FDI as a catalyst for their long-term economic advancement. Understanding these determinants in attracting FDI can help policymakers and stakeholders formulate targeted strategies to improve investment prospects in developing countries.

Keywords:FDI,Control of Corruption, Rule of Law, Voice and Accountability, Civil Liberties, Business Freedom

Determination of Physiochemical properties and sensory evaluation of goat milk cheese

Muhammad Yousaf[1], Sadaf Shakoor[1*], Muhammad Tuseef Asghar[1]
[1] *University of Agriculture Faisalabad, Sub Campus Burewala-Vehari*
[*]**Corresponding Author Email:** sadaf.shakoor@uaf.edu.pk

Goat milk cheese, renowned for its exceptional nutritional profile, boasts abundant proteins, vitamins, minerals, and superior digestibility relative to cow milk cheese. This investigation delves into the repercussions of diverse boiling temperatures on goat milk cheese's physiochemical and sensory attributes during a 28-day storage period. Initial pH values, categorized under distinct temperature treatments (T_0, T_1, T_2, T_3, and T_4), displayed variability, yet all treatments witnessed a consistent descent in acidity as storage duration progressed. The pH ranged from 6.34 (day 1) to 5.66 (day 28), indicative of an overall acidification process. Total solids content exhibited an ascending trajectory, advancing from 41.67 (day 1) to 42.95 (day 28), signifying progressive compositional alterations within the cheese matrix during storage. Acidity levels demonstrated oscillations, featuring mean values spanning from 0.66 (day 1) to 0.81 (day 28), elucidating the dynamic nature of cheese acidity. Distinctive alterations unfolded in color parameters (L*, a*, b*) over time. L* values (lightness) diminished from 41.38 (day 1) to 35.36 (day 28), indicating a shift toward darker hues. The a* value (redness) ascended from 1.57 (day 1) to 2.29 (day 28), signifying augmented redness, while b* values (yellowness) displayed an upward trend, reflecting increased yellowness. Ash content portrayed slight fluctuations but generally increased, ranging from 3.86% (day 1) to 3.25% (day 28).Protein content experienced a gradual decline, varying from 12.58% (day 1) to 11.07% (day 28), while fat content consistently decreased, with values ranging from 13.28% (day 1) to 12.19% (day 28). Sensory evaluations unveiled shifting aroma, taste, and flavor attributes, culminating in declining overall acceptability scores over time. In conclusion, this investigation underscores the pivotal role of temperature and storage conditions in preserving goat milk cheese's quality and nutritional characteristics. While certain parameters exhibited fluctuations during storage, others displayed consistent trends, emphasizing the dynamic nature of cheese attributes. These insights provide invaluable guidance for both the cheese industry and consumers interested in goat milk cheese's nutritional and sensory aspects. These results serve as a valuable resource for cheese manufacturers seeking to enhance product quality and meet consumer preferences in the ever-evolving dairy market.
Keywords: Goat Milk, Sensory Evaluation, Physiochemical Properties, Cheese

Whole exome sequencing and bioinformatics analysis of herediarty epilepsy in families from north Waziristan

Shah Qiaz[1*], Saadullah khan[1], Noor Muhammad[1]
[1]*Department of Biotechnology And Genetic Engineering, Kohat University of Science and Technology, Kohat, 26000, Khyber Pakhtunkhwa, Pakistan.*
[*]**Corresponding Author Email:** *shahqiaz63@gmail.com

Epilepsy is a neurological condition distinguished by recurring seizures. These seizures result from aberrant electrical activity in the brain. Epilepsy can present with a wide range of seizures, from little lapses of concentration or muscular tingling to severe and lengthy convulsions.Epilepsy symptoms can vary significantly based on the type of seizure and the specific brain region involved. Common symptoms and indicators of epilepsy include seizures (Generalized and Partial also known as focal seizures), aura, loss of consciousness, muscle stiffness or jerking, transient confusion or disorientation, uncontrollable movements, and loss of bowel or bladder control. Epilepsy can be caused by genetic factors or brain injuries such as trauma, tumors, or infections, leading to abnormal electrical activity in the brain, resulting in seizures. In some cases, the exact cause may remain unknown. Epilepsy has syndromic as well as non-syndromic phenotypic manifestationSyndromic epilepsy refers to cases where seizures are part of a recognized syndrome with specific genetic or structural abnormalities, often presenting with additional neurological or developmental features. Genetic mutations or alterations can be a primary cause of epilepsy.Epilepsy affects approximately 1% of the global population, with variations in prevalence across regions and age groups.Epilepsy prevalence peaks in early childhood and among the elderly, with rates highest at around age 5 and after age 65.Nine patients (40.91%) out of 22 have mutations in SCN2A, KCNQ2, ATP1A2, KCNMA1, and MECP2 that are either pathological (P) or likely pathological (LP), and two patients have variants in SCN1A and SCN2A that are caused by variants in VUS. According to the results of Sanger sequencing, seven(31.82%) of the patients have causal variations that were inherited either maternally or paternally, while three of the patients had de novo mutations. The adverse impacts of the mutations on the protein structures of KCNMA1, NPC2, and SCN2A have been verified by MD and molecular docking simulations.of the mutations on the protein structures of KCNMA1, NPC2, and SCN2A have been verified by MD and molecular docking simulations.

Keywords: seizures, lapses, de novo mutations, inherited, molecular docking simulations.

Identification of multidrug resistant bacteria from hospital settings and their control using euphorbia abysinica plant extracts

Syed Ali Abbas[1*], Abdul Rehman[1], Mubbashir Hussain[1]
[1]*Department of Microbiology, Kohat University of Science and Technology, Kohat, 26000, Khyber Pakhtunkhwa, Pakistan.*
[*]**Corresponding Author Email:** *syedaliabbas552@gmail.com

The emergence of multidrug resistant bacteria in hospital settings are medically very important as they caused various diseases, develop resistance against antibiotics and poses a significant challenge to public health worldwide. A comprehensive screening of various hospital surface and medical equipment's including, Human blood, urine, Stool, Wound pus, Environmental, Surgical instruments and Nasopheringial samples were collected from hospitalized patients admitted at different wards of Kohat Development Hospital (KDA) Kohat. Pathogenic bacteria were isolated using different selective and differential media, after isolation, identification conducted on morphologically and biochemically according to standard protocol. Antibiotic sensitivity assay were carried out for the isolated pathogenic bacteria through Kirby-Bauer method. The plant extract exhibited significant antimicrobial activity against multidrug-resistant bacteria. Notably, susceptibility testing revealed varying degrees of resistance among isolated strains. Stool samples yielded multidrug-resistant strains of *Shigella/Yersinia* with high resistance rates to beta-lactams, quinolones, and aminoglycosides. Nasopharyngeal specimens contained multidrug-resistant

Staphylococcus aureus, while blood samples harbored multidrug-resistant *Escherichia coli*. These findings underscore the urgent need for effective antimicrobial strategies in combating multidrug-resistant infections. Compliance with guidelines such as those established by the Clinical and Laboratory Standards Institute (CLSI) is essential in guiding treatment decisions and mitigating the spread of antibiotic resistance.

Keywords: Multidrug-resistant bacteria, Hospital-acquired infections, Antibiotic resistance, Pathogen isolation, Anti-microbial efficacy

Exploring the antibiofilm potential of *Alkanna tinctoria* extract against clinical bacterial isolates

Syed Muntazir Hussain[1*], Abdul Rehman[1], Mubbashir Hussain[1]
[1]*Department of Microbiology, Kohat University of Science and Technology, Kohat, 26000, Khyber Pakhtunkhwa, Pakistan.*
[*]**Corresponding Author Email:** *muntazirhussain332@gmail.com

Biofilms are microbial accumulations where microbes adhere to the surfaces of both living and nonliving objects. Crucially, biofilms shield microbes from environmental stressors and bolster their resistance to antimicrobial therapies. Research on biofilms and eradication techniques is crucial in medicine. With antibiotics losing effectiveness against multidrug-resistant biofilm-forming bacteria, finding new antimicrobial agents to halt biofilm growth is urgent. The ongoing quest for alternative and safe treatments has turned to naturally derived substances from plants, known as phytomedicines. Phytomedicines encompass compounds such as flavonoids, terpenoids, lectins, alkaloids, polypeptides, polyacetylenes, phenolics, and essential oils obtained from medicinal plants. Identifying unique antimicrobial drugs capable of inhibiting biofilm development is therefore essential. Nanotechnology has emerged as a promising field with diverse roles in science and technology. Nanoparticles are gaining traction as alternative antimicrobial agents for addressing antibiotic resistance issues. In this study, we evaluated the potential of *Alkanna tinctoria* plant root extract in synthesizing silver nanoparticles (AgNPs) and characterized them using UV-visible spectroscopy, X-ray diffraction (XRD), and Fourier transform infrared spectroscopy (FTIR). The antibacterial properties of the synthesized nanoparticles were assessed using the disc diffusion method to determine the minimum inhibitory concentration against biofilm-forming bacteria *Pseudomonas aeruginosa* and *Staphylococcus aureus*. In antibacterial activity testing, *Vancomycin* and *N-acid* exhibited sensitivity against *S. aureus*, while *Levofloxacin* and *Gentamycin* showed moderate activity against P. aeruginosa. The zone of inhibition for *Vancomycin* against *S. aureus* was (24.96±0.25), and for *N-acid*, it was (20.96±0.05). Furthermore, *Levofloxacin* and *Gentamycin* against *P. aeruginosa* resulted in zones of inhibition of (17.06±0.12) and (15.7±0.04), respectively. Synergistic actions between AgNPs and antibiotics revealed maximum sensitivity of *P. aeruginosa* to *Levofloxacin*, *Ciprofloxacin*, and *N-acid*, whereas *S. aureus* exhibited minimum sensitivity, with (12.96±0.15) to *Levofloxacin*, (14±0.1) to *Ciprofloxacin*, and (12.86±0.15) to *N-acid*. Additionally, *Levofloxacin* exhibited significant activity against *P. aeruginosa* (28.03±0.25), *Ciprofloxacin* around (29.0±0.15), and *N-acid* (26.96±0.05).

Keywords: Biofilm, Antimicrobial agents, Phytomedicines, Silver nanoparticles, Antibiotic resistance

Therapeutic effects of myofascial release technique in addition to conventional physical therapy in patients with piriformis syndrome

Sania Naz[1], Nida Ilahi[1]
[1]*Physical Therapy Department, Government College University Faisalabad, Layyah Campus*

Background: The Piriformis syndrome is a condition leads to encroachment of the sciatic nerve in piriformis muscle, causing pain in buttock, reduced range of motion at hip joint, greater sciatic notch tender to touch, and radiating pain in back of thigh, calf and foot. The prevalence of the Piriformis syndrome as per the recent literature is 12-27% and low back pain is thought to be around 6% caused by the piriformis syndrome.
Objective: To compare the therapeutic effects of myofascial release technique in addition to conventional physical therapy on functional impairment in patients with piriformis syndrome.
Methodology: Sixty-six individuals with aged 25 to 45 years having positive FAIR test participated in this study. The study was conducted at Rehab max Physiotherapy and Sports Surgery Clinic, Layyah. Group A (Control) received conventional physical therapy, while Group B (Experimental) received myofascial release technique in addition to conventional physical therapy. The outcome measures was functional impairment (LEFS) collected at the baseline, 6th session, and 12th session. Data was analyzed using SPSS version 24.
Results: The mean age for participants was 35.99± 7.48 years. The within-group analysis showed a statistically significant improvement in functional impairment ($P<0.05$). The between group analysis showed myofascial release techniquein addition to conventional physiotherapy was found to be more effective in improvingfunctional impairment compared to conventional physical therapy group ($P<0.05$) at the 6th and 12th session.
Conclusion: Myofascial release technique in addition to conventional physical therapyshowed more significant results for functional impairment.
Key words: *Conventional physical therapy, functional disability, piriformis syndrome, sciatica*

Comparative analysis of organic and inorganic cultivation methods on the nutritional, phytochemical and biological properties of pleurotus ostreatus

Taskeen Zahra[1*], Muhammad Adnan[1], Imran Ali[1]
[1]*Department of Botany, Kohat University of Science and Technology, Kohat, 26000, Khyber Pakhtunkhwa, Pakistan*.
[*]**Corresponding Author Email:** taskeenzahra61@gmail.com

Mushrooms are gaining for their potential health benefits, going beyond their traditional nutritional value. Among them Oyster mushrooms are particularly promising due to their diverse properties. The study focuses on cultivating oyster mushroom on a novel substrate containing wheat straw (WS) and egg shell (E.S) at a ratio of 1:1 (w/w) to determine their effects on growth, composition, and consumer acceptance. Also investigate the improvement of spawn growth of Oyester Mushroom (Pleurotus ostreatus) using two different additives organic and inorganic. This experiment carried out during the winter season (October to December) 2023 at Kohat University of Science And Technology. The results revealed that, combinations of (WS+ES) by using two growth methods (organic and inorganic) and highlights the advantages of organic cultivation method in maximizing mushroom yield up to 600 g. Additionally analyzing the nutritional compositions such as protein, vitamins (B2,B9), Carbohydrates or minerals were observed in Oyster mushroom. **The elemental analysis showed the presence of Fe, K, Na, Ca, Mg, in the spectrum through Atomic** Absorption Spectrophotometry **(AAS) and flam photometry.** In this study, direct Optical emission spectroscopy detected biologically important elements, while GC-MS screening identified active compounds in Pleurotus ostreatus mushrooms. These mushrooms contain bioactive substances with documented medicinal properties, including polysaccharides, peptides, proteins, terpenoids, fatty acid esters, and polyphenols. These compounds found in both mycelium and fruiting bodies enhance immunity, reduce inflammation, fight bacteria, and act as antioxidants. Additionally, the ethanolic extract from Pleurotus ostreatus exhibited potent antibacterial and antifungal activity against various pathogens.
Key words: Spawn growth, Atomic Absorption Spectrophotometry (AAS), GC-MS, Anti-inflammatory, and Antioxidative.

Elucidating the responsiveness of wheat genotypes toward zinc application under drought condition

Asad ul Allah[1], Tanzeela Younas[1], Amna Qamar[1], Muhammad Abu Bakar Zia[1]
[1]*Department of Plant breeding and Genetics, University of Layyah*
[*]**Corresponding Author Email:** younastanzeela96@gmail.com

Wheat is an essential cereal crop and being used as staple food all over the world. Wheat production in field condition decreases because of various abiotic stresses including water stress. Zinc application stables cell membrane, regulates stomata and significantly improves water use efficiency and photosynthetic activity in water stress that trigger high performance of crop plant. Additionally, zinc interacts with plant hormones resulting in stimulation of antioxidant enzymes for invalidating drought effect. The experiment was designed to evaluate various wheat genotypes that can perform better through zinc application in increasing drought conditions and considered as better genotypes to the farmer communities so that the yield can be increased even in drought stress condition to overcome the vigorous increase of food demand. A field experiment was executed in farm area of UNIVERSITY OF LAYYAH having sandy loam soil during growing season 2021-22. The experiment was carried out in Randomized Complete Block Design that was replicated thrice. Eighteen wheat genotypes were used in the experiment. Soil application of different concentrations of zinc was applied and irrigation was skipped at heading stage. Data of various agronomic parameters was collected. Spike length and number of grains per spike were high positively correlated with yield (grain yield). Traits like plant height and number of grains per spike were found significantly correlated with yield. The effect of zinc application was positive and quadrate in nature. Yield and yield related components of wheat at later growth stages are highly raised through zinc application.

Keywords: wheat; drought; zinc; morphology; growth; grain yield

Evaluating the role of nitrogen application on growth, yield and nitrogen use efficiency of different millet genotypes

Tahira Taqveem Somra[1], Mubashar Hussain
[1]*Faculty of Agriculture Science and Technology, Bahauddin Zakariya University University Multan*
[*]**Corresponding Author Email:** tahirasomra@gmail.com

Pearl Millet is a staple grain and fodder crop in the arid and semi-arid regions of Africa and India, and a new grain crop in the USA. Nitrogen deficiency reported as one of the main yield limiting factor for pearl millet. Malnutrition is a serious issue now a day, nitrogen deficiency leads to stunted growth, chlorosis and flowering, fruiting, protein and starch contents are reduced. Nitrogen (N) increases vegetative part and grain yield so; a field trial was conducted at agronomic research area Bahauddin Zakariya University, Multan at July 3, 2020. Four pearl millet genotypes MP-24, CH-50, YBS-92 and Cholistani bajra were sown at the seed rate of 6 kg ha^{-1} on prepared field. Nitrogen, phosphorous and potassium were applied at the rate of 80, 60, 40 kg ha^{-1}. Urea, DAP and sulphate of potash were used as source for nitrogen, phosphorous and potassium respectively. Three distinct levels of nitrogen were applied e.g. 0, 45 and 90 kg ha^{-1}. Fertilizers and seeds both were applied by using hand drill machine. Whole phosphorous and potassium were applied at the time of sowing while N was applied into 3 doses. First dose was applied at sowing time. 2nd dose was applied with 2^{nd}irrigationand 3rd dose was applied with 3rd irrigation. The first irrigation was given to crop 10 DAS (days after sowing), and 2nd irrigation was given at 23-07-2020 and 3rd irrigation was applied at 13-08-2020. Weeds were controlled without the use of weedicides, manual hoeing was performed three times to minimize weeds and earthing up. The crop was harvested in October 2020. Results showed that nitrogen application had significant effect on plant height, panicle length, number of panicles per plant, thousand grain weight, grain yield, biological yield, harvesting index and economic average. Nitrogen application also improved leaf area index, leaf area duration, crop growth rate, net assimilation rate and specific leaf area.

Keywords: Pearl millet genotypesMP-24, CH-50, YBS-92 and cholistani bajra, seed rate 6kg ha-1, Fertilizers NPK

Climate Change and Agricultural Productivity in Pakistan: The Case of Two District of the Punjab Province

Muhammad Umar Farooq[1*], Sadia Anjum[1], Sharafat Ali[2]
[1]*Department of Economics, University of Layyah, Layyah 31200, Pakistan*
[2]*Department of Economics, Government Graduate College KotSultan, Layyah, Pakistan*
[*]**Corresponding Author Email:** umareconomist94@gmail.com

In emerging economies like Pakistan, agriculture provides primary subsistence for the majority of the rural population. Despite its enormous economic contribution, this major sector of the economy is prone to multiple challenges causes by extreme events including unprecedented floods, drought, and heatwaves due to climate change. Such unanticipated events result in crop yield losses. The current study evaluates the farm level adaptive capacity of wheat and sugarcane farmer to climate change and its impacts on farm performance in Punjab, Pakistan. The study is primarily based on primary data from the what and sugarcane farmers in district Layyah and Faisalabad obtained through live interviews. The findings of the study reveal that wheat and sugarcane producers are very concerned about climate change and its ramifications on agriculture productivity. In the wake of climate change, changes in planting dates, crop varieties, and fertilizer types are among the main adaptive capacity measures used by wheat and sugarcane growers. Education, farming experience, access to agricultural extension services, and marketing data are also the major elements that influence the farmer's adaptive capacity to climate change. Wheat and sugarcane production and net income are greatly and favorably affected by adapting wheat and sugarcane crops to climate change.

Keyword: Climate change; Adaptive capacity; Crop yield; Agricultural productivity; Sustainable agriculture

Insecticidal & Repellent Activity of Different Botanicals (Harmal, Haldi and Kalonji) Towards *Tribolium Castaneum*(Coleoptera: Tenebrionidae)

Muhammad Waqar Haider[1], Azhar Abbas[1], Muneer Abbas[1], Hassan Abdullah1
[1]*Department of Entomology, University of Layyah*

Tribolium castaneum is the most destructive insect pest of stored products. The heavy infestation of this insect pest causes massive damage to cereals both qualitatively and quantitatively. Many botanicals have been used against Tribolium castaneum (Coleoptera: Tenebrionidae) as they have insecticidal properties. This experiment was conducted to evaluate mortality and repellency effect of Harmal (Peganumharmala), Haldi (Curcuma longa) and Kalonji (Nigella sativa) against Tribolium castaneum on filter papers. Three different concentrations of extracts of each plant viz. 5.0%, 10%, 15% were taken after different time periods (24, 48, and 72 and 96 hrs.) from stock solution prepared. All concentrations of each botanical showed well effectiveness as repellent against Tribolium castaneum. Among these, the better result of repellency was observed in Haldi was maximum at 15% concentration. Mortality effect was maximum observed in Kalonji at 10% concentration after 96 hour was 83.33%. Other results of Harmal and Kortumba were also significant. Harmal depicted more toxic results after Kalonji at 5% and 10% concentrations respectively. Moreover, Harmal showed more repellent effect than toxicity. These results suggest that the plant extracts evaluated in this study may be useful in repellent and toxicant formulations against T. castaneum.

KEY WORDS: *Tribolium castaneum Cereals, Calongi, haldi, kortuma botanical*

Effect of Mulching of Crop Residue sand their Biochar on Carbon Sequestration along a Soil Profile in a Field Experiment

Huma Shahid[1], Tanvir Shahzad[1]
[1]*Department of environmental science, Government college university, Faisalabad*

Pyroly zing organic material sin acutely oxygen-depleted air yields a carbon-rich material commonly known as biochar. Biochar has been proposed and shown to be very useful for improving soil health as well as increasing the soil organic carbon (SOC) contents and stocks of soils. The latter advantage has been presented as a strategy of climate change mitigation via stabilization of bio char carbon in soils for long term. However, most of these studies were done in acidic and tropical soils. How does bio char , mostly derived from alkaline feed stocks, affect soil health indicators in calcareous soils has been little studied. Moreover, how does a biochar compare with its feedstock vis-à-vis influencing soil health indicators along a soil profile has been rarely studied. This study aimed to compare the influence of mulching of wheat or maize residues (crop residues, CR) and their biochars (crop-residue derived biochars, CRB) on soil health indicators along a soil profile up to 75 cm depth. A long-term field experiment has been set up for more than two years, where maize-wheat rotation is being followed. Before sowing every crop, 2 tons ha^{-1} of CR or biochar made from the same is mulched on the plots. Planted plots receiving no amendments served as control for mulching whereas CR or CRB mulched plots without plants served as control role for plant effect. I hypothesized that mulching of CRB would sequester more carbon in the soil as it persists in the soil for longer time. At 15-30 cm, In plots where CRB was mulched under planted treatment (CRB-P), the highest SOC was observed(0.71±0.020 %) followed by CR-P amended plots, while the lowest SOC was found in un-amended unplanted plots (NA-NP) (0.18±.00%)' Within the depth range of 30-45 centimeters, MBC was found to be highest in CR-NP treatment (0.32±0.050 mg C/kg soil) and lowest in NA-P treatment (0.24±0.00 mg C/kg soil). At 0-15, 15-30 and 45-60 cm depth the amendment of crop residues and crop residue biochar both increased the β-glucosidase and chitinase activity significantly, where as no significant effect of these amendments was observed on leucine amino peptidase activity. Overall results indicate that effects of CR and CRB varied across various soil depths, although both showed improvements in various soil health indicators. However, at this time scale (2 years), none of the two types of amendments can be distinguished as a clear winner. Therefore, it is recommended that the influence of CR or CRB should be studied for long term to clearly distinguish and elucidate their effects.

Genetic improvement of wheat (*Triticum aestivum L.)*lines for better iron content through genome editing

Asad Azeem[1*],Zeshan Hassan[1], Rizwana Maqbool[2,3], Sami Ul-Allah[4],Umbreen Shahzad[5]
[1]*Department of Plant Breeding and Genetics, University of Layyah, Layyah, Pakistan*
[2]*Department of Plant Breeding and Genetics,University of Agriculture, Faisalabad, Pakistan*
[3]*Centre for Advanced studies in Agriculture and Food Security, University of Agriculture, Faisalabad, Pakistan*
[4]*Department of Plant Breeding and Genetics, Bahauddin Zakariya University,Multan, Pakistan*
[5]*Department of Horticulture, University of Layyah, Layyah, Pakistan*
[**]**Corresponding Author Email:** asadpbgpak@gmail.com

Wheat is a staple food for atleast 1/3rd of world population owing to the micronutrients deficiency in wheat leads to serious health issues in human being, iron is one of them which is deficient in wheat and is responsible for serious disorders like anemia. Iron plays viral important role in development of living organism in case of its no availability to body leads to various hearth regarding complication. To improve the wheat grain with better iron content CRISPR/Cas9 technology was used to knockdown the effect of *TaHRZ1* gene which acts as a negative regulator of

iron in iron transport pathway. Knockdown of *TaHRZ1* gene improved the wheat varieties Akbar-2019,Anaj-2017, and Galaxy-2013 with high iron content and also improved iron availability for living organisms. These varieties were tested after knockdown the *TaHRZ1*gene, the iron content was improved in wheat grain which meliorated the iron deficiency in wheat grain. In CRISPR/Cas9 cassette both types of embryos (immature and mature) of high yielding varieties were used for tissue culture at 24 ◦C under 16 h light/8 h darkness regime. For CRISPR\Cas9 technique primers along with specific guide RNAs (sgRNA1, sgRNA2) of 20bp targeting the target site of gene with fewer off-targets were selected based on the web-based online bioinformatics tool. These sgRNAs were separately ligated into vector *pJCas9* to generate genome-editing vectors holding a single sgRNA. After launching plasmid (genome-editing vector) into *A. tumefaciens* bacterium strain competent cells so that positive clones will be scrutinized and used for Agrobacterium-mediated transformation in wheat. Mutation will be detected on the base of designed primer of *TaHRZ1* gene. Wheat plants having potential -edited gene will be selected for SDS-PAGE analysis and Sanger sequencing. In this study, CRISPR/Cas9 technology was used to target the specific site of *TaHRZ1* gene to get biofotified wheat having improved iron content which is essential for normal fumctioning. therefore, CRISPR/Cas9 utilization as editor tool in wheat disrupted *TaHRZ1* gene in wheat varieties (Galaxy-2013, Anaj-2017, and Akbar-2019) and improved iron content in wheat grain.

Key words: Iron improvement, CRISPR/Cas9, *TaHRZ1* gene, bioavailability, grain yield

Screening of Sorghum Germplasm Under Water Deficit Reveals Root Length Improves Drought Tolerance

Sadia Zainab[1], Saqlain Ahmed[1], Farwa Nadeem[1]
[*]**Corresponding Author Email:** sadiazainab51214@gmail.com

The global population is increasing daily, but there is a gap in food demand and supply for large populations. Many food industries are directly linked to livestock, so to increase livestock nutrition and population, we need a large amount of fodder. Sorghum is one of the most nutritious fodder, C4, bioenergy crops. Nowadays, water deficit conditions in many areas are common, and crops can't perform better under water stress conditions. So, an experiment was conducted with 10 sorghum accessions collected from NARC Islamabad. Sorghum accessions were grown under controlled conditions in CRD in the greenhouse. These varieties were sown with 3 replications for each accession, Accessions were sown in 4 rounds with 4 treatments 68,48,34 and 20 ml, respectively. 68 ml was the control treatment, and other water stress treatments were compared with the control treatment to see root length responses against stress. Under water stress conditions, data was taken with parameters such as fresh root weight, Fresh Shoot Weight, Dry Root Weight, Dry Shoot Weight, Root Length, and Shoot Length. Results revealed 9809, YSS-98, and NO-1632 accessions as drought tolerant among all other accessions. While NO-39501, Gomal Local, was the most drought susceptible variety among all other accessions.

Keywords: Sorghum, drought, treatments, root length

Diversity and distribution of butterflies (Lepidoptera) from Layyah district Of Punjab, Pakistan

Mehr-un-Nisa[1], Sana Rubab[2], Hafsa Latif[2], Malika Khalil[2], Fiaz Hussain[1,2], Azhar Abbas Khan[2]
[1]*Department of Zoology, Muhammad Ali Institute of Science and Technology, Layyah.*
[2]*Department of Entomology, Faculty of Agriculture, University of Layyah*
[*]**Corresponding Author Email:** hfiaz37@yahoo.com Contact No. 0305-7247660

Butterflies are not mere objects of beauty; they are an integral part of ecosystems and play essential roles in pollination, plant reproduction, and as indicators of environmental health. Present study was designed to observe the diversity and relative abundance of butterfly species found in District Layyah for which 8 localities namely: Muhammad Ali Institute of science and Technology Layyah, Sadiq Park, Family Park, Jinnah Park, Forest Area (Chowk Azam), Orchards, Cropped Area (Sunflower, Brassica) and Local Area (Residential Area) were selected for observations. Few collected specimens, more oftenly unknown species were brought in laboratory for identification and pinning in insect storage boxes. The data regarding different species and number of individuals for each specie were recorded fortnightly starting from 23rd February till end of May, 2023 and analyzed using descriptive statistics as well as Shannon and Simpson diversity indices. Results indicate that out of 500 specimens collected in total from all localities, 7 species of butterflies belonging to 3 families were more frequently observed. Maximum specimens were from Pieridae family i.e., 59.8%as compared to Nymphalidae (12.6%) and Papilionidae (4.6%), from where *Pieris brassicae* was the most abundant specie. Moreover, Forest area (Chowk Azam) was considered most diverse (SDI,5.96) followed by Muhammad Ali Institute (SDI,4.87) and Residential Area (SDI,4.71) respectively but the Cropped Area (SDI,3.21) was found as least diverse for butterflies' fauna. This study provided us awareness about the butterfly population fluctuations in changing environment and localities which may be helpful to devise conservation strategies for the beneficial fauna of the crops, trees and ornamental plants for the betterment of natural ecosystem.

Keywords: biodiversity; pollination; butterfly; abundance; species; ecosystem

Exploring the comparative predatory potential of lady beetle species under laboratory conditions

Qasim Raza[1], Muhammad Ibrahim[1], Iqra Batool[1], Fazeela Saleem[1], Fiaz Hussain[1], Azhar Abbas Khan[1]

[1]*Department of Entomology, Faculty of Agriculture, University of Layyah*

[*]**Corresponding Author Email:** hfiaz37@yahoo.com Contact No. 0305-7247660

Lady beetles comprise an ecologically and economically important group of insects that are also charismatic and well known to general public. In recent years, predaceous ladybird beetles have drawn considerable attention as biocontrol agents due to their ability to feed on large number of prey including aphids, mites, plant hoppers and whiteflies. Following prior identification of six lady beetle species from wheat and brassica crop in surroundings of Layyah, predatory potential of frequently observed (3 out of 6) lady beetles were evaluated in laboratory environment. For this purpose, wheat aphids were collected daily and provided to the individual lady beetle adults for feeding in petri dishes. Results of the consecutive ten (10) days observations indicate that maximum aphids were consumed by *Coccinella transversalisi.e.*,69 % aphid nymphs as compared to *Coccinella septempunctata* (59.8%) and *Cheilomenes sexmaculata* (53.4%). Likewise, maximum daily consumption and maximum average consumption in 24-hour observations was 42,42,35(out of 50 aphids provided daily) and 34.5,29.9,26.7 aphids for *C. transversalis*, *C. septempunctata* and *C. sexmaculata* respectively. Moreover, through increasing host density (up to 100 aphids) for one day experiment, the number of aphids consumed were also increased i.e., average/percentage aphid consumed were 93.3,87.3 and 53 aphids for *C. transversalis*, *C. septempunctata* and *C. sexmaculata* respectively. Findings of this study will be helpful in mass rearing of a successful biocontrol agent which may lead towards the sustainable pest management in future.

Keywords: biocontrol; ladybird; wheat; aphids; laboratory; predation

Mapping and Valuation of Ecosystem Services Provided by Machhu Plantation, District Layyah, Punjab.

Rida Batool[1], Gul Zareen Ghafoor[1]
[1]*Department of Forestry and Environmental Sciences, University of Layyah.*

Fossil fuel combustion, deforestation, land degradation and other human activities have been the major culprits in increasing carbon emissions, and they majorly contribute to global warming and climate change. Forests and woodlands are considered as one of the most important habitat types in the world, because they contribute to the sustainability of ecosystems. This study was conducted to assess the tree biomass and carbon stored in trees, and mapping and valuation of other ecosystem services provided by Machhu Plantation, District Layyah, Punjab. It is situated southwest of two left minors, between 30.8945° N and 71.2071° E. Field survey was done and about 20 plots (20 * 20 m) were made to assess tree carbon, soil, and leaf litter carbon. The data from this survey was analyzed later, through various allometric equations to estimate tree carbon stock. Valuation of ecosystem services was done using ArcGIS. A semi-structured questionnaire was administered to 50 residents, living in the vicinity of Machhu plantation. The findings for regulatory services showed that that total tree carbon for all the species of the Machhu plantation was 0.49 Mg/ha. Around 5.14 Mg/ha carbon is being sequestered by the given number of plants in Machhu plantation each year, and replacement cost of which is around 0.212 million rupees. The findings of the present study showed that around 13.7 Mg oxygen was being produced every year. Total monetary benefit value for carbon storage and carbon sequestration was reported as 2.54 Rs. millions and 0.212 Rs. millions/yr. respectively. The respondents marked clean air and climate mitigation as the most prominent ecosystem services, along with religious and spiritual services. The study can be helpful for decision and policy makers for sustainable management and monitoring of the site.

Keywords: Ecosystem services, tree biomass, tree carbon, total carbon stock, mapping, valuation, carbon sequestration, monetary value, replacement cost.

Monitoring of Pod borer (*Helicoverpa armigera*) damage and yield loss assessment with or without insecticidal exposure

Saqlain Arif[1], Masooma Ayoob[1], Ahmad Raza[2], Noor ul Hassan[1], Fiaz Hussain[1,2], Azhar Abbas Khan[1]
[1]*Department of Entomology, Faculty of Agriculture, University of Layyah*
[2]*Department of Zoology, Muhammad Ali Institute of Science and Technology,Layyah.*

[*]**Corresponding Author Email:** hfiaz37@yahoo.com Contact No. 0305-7247660

Gram Pod borer, *Helicoverpa armigera* is the most important insect pest of chick pea crop, causing an estimated loss of 328 million dollars annually in semi-arid tropics. Most of the economic damage by this pest is due to its feeding habit on flowers and pods, thereby causing extensive pod as well as seed damage, resulting in direct reduction of the crop yield. Present study was conducted to monitor the pod borer population and damage percentage in insecticide treated (recommended) and untreated plots. Initial results indicate that the mean number of pod borers/5 plants as 7.33, 22.66and mean percent damaged pods/5 random plants as 2.23 % (10.66), 8.16% (39.33) were recorded in treated and untreated plots respectively. Likewise, means of average number and percent damage/single plant were recorded as 1.46,4.53 and 0.46%,1.63% in protected(treated) and unprotected plots respectively. From the apparent difference in damage percentages, it could be predicted that prominent yield loss could happen in the unprotected chickpea field (will be observed on harvesting) as compared to the protected ones and/through application of insecticides on time this loss in yield could be avoided. Findings of this study will be helpful in timely monitoring and management of pod borer population to boost up the chickpea production leading towards the achievement of the dietary needs of increasing population and economic growth of Pakistan.

Keywords: Chickpea, loss assessment, yield, American bollworm, insecticides, untreated

Genetic analysis of the sequence variants causing intellectual disability in families from southern Khyber Pakhtunkhwa

Murad U Din[1], Kalim Ullah[1], SaadUllah Khan[2]
[1]*Depart of Zoology KUST Kohat*
[*]**Corresponding Author Email:** muradwazir45@gmail.com

Intellectual disability (ID) is a clinically and genetically heterogeneous disorder. It drastically affects the learning capabilities of patients and eventually reduces their IQ level below 70. The current genetic study ascertained one non consanguineous Pakistani family from North Waziristan. In this study, one non- consanguineous family, segregating autosomal recessive intellectual disability, were ascertained from North Waziristan. Familial-based sampling approach recruited two individuals affected with ID, and three unaffected members, including parents from the family. Blood samples were collected in EDTA Vacutainer tubes, and DNA was extracted using the standard phenol–chloroform method**.** Exome sequencing was performed for a paired-end library using the Nextera DNA Exome kit (Illumina Inc., USA) as per the manufacturer's instructions. Approximately 100 ng genomic DNA of an index patient (IV-5) was used for the enzymatic fragmentation, subsequently performing unique adaptors ligation (dual indexes) and exome enrichment**.** Exome sequencing data analysis and filtration of variants were performed using the exome analysis pipeline "Varvis" (Limbus Medical Technologies GmbH). The mean coverage of the data at 20X and 10X of the targeted bases was >92 and 96.6%, respectively. Two affected brothers (out of five siblings) were born from non-consanguineous healthy parents. They present with ID, dysarthric speech and speaking impairment. They also presenting with behavioral anomalies (impaired social skills and aggressiveness). The patients showed no seizures. The second patient presents with mild ID, dysarthric speech, and aggressive behavior..

Keywords: Intellectual disability, Intelligence Quotient, Blood sample, DNA, Exome sequencing analysis

Nexus between Globalization, Fiscal Decentralization and Environmental Degradation in OECD Countries

Qandeel Fatima[1]
[1]*Bahauddin Zakariya University, Multan, Pakistan.*
[*]**Corresponding Author Email:** qandeelfatima521@gmail.com

This study highlights the impact of globalization and fiscal decentralization on environmental degradation in OECD countries using panel data from 1995 to 2020. For data analysis, panel ADF test and panel ARDL model are applied to the data. The study showed that globalization is negatively and significantly related to the environmental deterioration in OECD countries. Similarly, expenditure decentralization is found to be a contributing factor to environmental degradation. In contrast, revenue decentralization is negatively and significantly related to environmental degradation. The variables population and energy use are also positive, while inflation rate is negatively related to the environmental degradation. The findings suggested that OECD countries must implement policies that curtail the adverse effects of globalization and fiscal decentralization on the environment.

Keywords: Globalization, Fiscal Decentralization, Environmental Degradation, OECD Countries

Herbal plants of Thal desert: a hidden treatise

Muhamma Tauseef Sultan[1], Iqra Baig[1], Adnan Amjad[1], Muhammad Usman Khalid[1], Ahmad Mujtaba Nauman1
[1]*BZU Multan*

*Corresponding Author Email: tauseefsultan@bzu.edu.pk

The urge to evaluate the medicinal potential of plants has increased due to finding the sources of alternative medicines in recent era. Majority of the plants contain natural antioxidants and phytochemicals being utilized in pharmaceutical industry. Thal dessert is considered as a unique habitat of herbal flora which offers a wide variety of indigenous plants, exhibits ethnobotanical diversity along with curative power with minimal harmful effects. Local herbalist in rural areas practice mainly herbal medicines to cure different health disorders. A variety of medicinally important chemical compounds including flavonoids, gums, saponins, steroids, triterpenoids and terpenes are effective against aches, sore eyes, night blindness, hair loss and baldness. The current research finding demonstrate that herbal plants of Thal dessert are invaluable asset for further research areas. A number of 120 medicinal plants were identified from the Thal desert with their known benefits against diseases. Nearly half of these plants are known to the local community and are utilized by them. 47% were used as fodder, medicinal & vegetable purposes. However, there are some research gaps which needs to be bridged by researchers. Local habitants present this precious flora to animals in form of fodder, or any other food. Moreover, medicinal plants in this region have slower growth. Over-harvesting may cause herb extinction from the particular areas. The complete baseline information and exploration of all medicinal plants helps to minimizing the exploitation risk and improved quality. Moreover, documentation of important medicinal plants of the specific region will help to improve community based management of the specific region.

Key words: Medicinal Plants; Phytochemicals; Fauna and Flora

Phyto-fabrication of silver nanoparticles for solar driven photocatalytic degradation of rhodamine b

Salwa Bibi[1], Shaukat Shujah[1*], Izhar ul Haq Ali Shah[1]

[1]*Kohat University of Science and Technology, Kohat-26000, Khyber Pakhtunkhwa Pakistan*

This research aims to synthesize silver nanoparticles using aqueous extract of *Centaurea iberica*, which will then be used in solar-driven photocatalytic degradation of rhodamine B. Metal nanoparticles have proved themselves to have a highly successful approach for addressing a wide range of disease-causing microbes, including those which are resistant to antibiotics. They are highly adaptable and are used in various fields, including medicine, pharmaceuticals, genetics, electronics, cosmetics, coatings, bio sensing, imaging, and environmental cleanup. Silver nanoparticles have gained significant attention for their unique attributes, such as optical features, electrical conductivity, chemical stability, and catalytic activity. Silver nanoparticles are synthesized using green method provides an environment friendly, cost-effective, rapid, non-pathogenic, and single-step technique. The *Centaurea iberica* plant is considered as a natural source. It is a prevalent herbaceous plant that is often distributed in the northern region of Pakistan. Previously, this specie has been reported to include flavones, steroids, fatty acids, volatile components, sesquiterpene lactones, and other terpenoids. The silver nanoparticle formation was verified by using UV-Vis spectroscopy. The UV-Vis spectrophotometer shows that the best absorbance peak of silver nanoparticle is at 402nm. The synthesis of AgNPs was optimized by varying the reaction parameters including temperature, pH, concentration and Time. A range of analytical techniques such as Fourier Transform Infrared (FTIR) analysis, X-Ray Diffraction (XRD), Scanning Electron Microscopy (SEM) analysis has been employed to characterize the synthesized AgNPs. The size of silver nanoparticles ranges from 30 to 80nm, and their morphology was discovered through SEM analysis. To substantiate the accuracy and reliability of the proposed analytical methods Photocatalytic degradation of RhB using AgNPs was optimized by varying the initial concentration of RhB, reaction time, temperature and pH where maximum photocatalytic degradation was found to be 91%. The investigation illustrates the attainment of substantial degree of degradation via Solar driven photocatalytic

degradation and Ag nanoparticles emerges as a promising and viable approach for treating RhB contaminated water. Over all, this research concluded effective, fruitful and good photocatalytic degradation of RhB utilizing AgNPs.

Keywords: *Centaurea iberica* plant, Characterization, Rhodamine B, solar-driven photocatalytic degradation,

Antimicrobial activity of *Azadirachta indica* and *Vachellia nilotica* mastic extract against *S. mutans* and *Candida albicans* isolated from dental plaques

Khalida zaryab[1],Niaz Muhammad[1]
[1]*Department of microbiology, Kohat university of science and technology Kohat*
[*]**Corresponding Author Email:** Khalidazaryab333@gmail.com

Introduction: Dental caries is an irreversible microbial disease of the calcified tissues of teeth which is characterized by the organic component of the tooth being destroyed and the inorganic portion of the tooth becoming demineralized, which frequently results in cavitation.

Objectives: The present study was carried out to evaluate the antimicrobial properties of *Azadirachta indica* and *Vachellia nilotica* extract against bacteria causing dental caries.

Materials and methods: The pathogenic bacteria such as *Streptococcus mutans,* and pathogenic fungus such as C*andida albicans* was isolated from dental caries. The organic extracts of *Azadirachta indica* and *Vachellia nilotica* were prepared using different solvents such as ethanol and distilled water and were screened for its antimicrobial activity by disc diffusion method.

Results: Among the organic extracts of *Azadirachta indica* and *Vachellia nilotica*, ethanol extract of *Azadirachta indica* showed strong antimicrobial activity against *Streptococcus mutans* with inhibition zone of 20 mm at 100 µg concentrations. Distill water extract of *Azadirachta indica* showed antimicrobial activity against *Streptococcus mutans* with inhibition zone of 16 mm at 100 µg concentrations. ethanol extract of *Vachellia nilotica* showed strong antimicrobial activity against S. mutans with inhibition zone of 18 mm at 100 µg concentrations. Distill water extract of *Vachellia nilotica* showed antimicrobial activity against S. mutans with inhibition zone of 15 mm. **Conclusion:** The results demonstrate that ethanol extract of *Azadirachta indica* has a strong antimicrobial activity and suggest that it can be useful in the treatment of dental caries.

Keywords: dental caries, phytochemicals, bioactive compounds, *Streptococcus* sp, Neem, well diffusion.

Optimization, development, and evaluation of topically applied gel loaded with unripe *Citrus reticulate* fruit extract

Aiman Jabeen[1], Saeed Ahmad Khan[1], Sajid Khan Sadozai[1]
[1]*Kohat University of Science & Technology*

Citrus reticulata, commonly known as mandarin or kinnow, belongs to the citrus family, one of Pakistan's main fruit crops. *Citrus reticulata* contains secondary metabolites such as polyphenols, phenolic acids, flavonoids, carotenoids, and limonoids that have been reported for their antioxidant properties, which neutralize free radicals that are responsible for causing numerous skin problems, inflammation, and the aging of the skin. These antioxidant compounds significantly reduce the risk of developing several chronic diseases, including cancer, diabetes, infections, aging, asthma, and cardiovascular diseases, and also have a prominent effect on wound healing. This study focuses on developing an optimized unripe *citrus reticulata* fruit extract-based gel formulation for topical application for various skin conditions. The antioxidant activity of unripe *Citrus reticulata* fruit extract in different

solvents (i.e. 50% Methanol, 50% Ethanol, and water at optimized conditions of temperature and time) was evaluated using 2,2-Diphenyl-1-picrylhydrazyl (DPPH) assay. The extract showing enhanced antioxidant activity was used for loading in Gel formulation. An optimized topically applied gel formulation of unripe *Citrus reticulata* fruit extract was developed using carbapol 940 as polymer and triethanolamine as pH enhancer. The physicochemical properties of the gel were determined including pH, viscosity, spreadability, and antioxidant activity. Unripe *Citrus reticulata* fruit extract in 50% Methanol at Room temperature for 1 hour showed greater antioxidant activity (IC50 = 23.761). This extract was used for incorporation in gel formulation. An optimized gel formulation with enhanced antioxidant activity, pH, Viscosity, and spreadibility was developed. In the future, this gel may be helpful for topical application for wound healing, anti-aging, anti-infective, prevention of skin cancer, etc.

Azomethine linked thiophene-reinforced titania nanocomposites of digilycidyl ether of bisphenol-a as anti microbial coating

[1]*Hafsa Tabassum, [1] Naila Khalid, [1]Ahtaram Bibi,[1]Niaz Muhammad,[1]Aafia Wahab
[1]Chemistry Department, Kohat University of Science and Technology, Kohat 2600, Pakistan
[*]**Corresponding Author Email:** hafsabschem2090@gmail.com.pk

The ongoing research work is composed of the synthesis of azomethine linked thiophene reinforced nanocomposites of diglycidyl ether of bis-phenol-A(DGEBA). Thiophene based azomethine linked additive (AD) was synthesized from thiophene-2-carbaldehyde and 4,4'-diamino diphenyl methane(DDM) and characterized *via* CHN elemental and spectral analysis. Epoxy amine polymer matrix was synthesized from DDM and DGEBA, loaded with various amount (1-4)% of AD and characterized *via* Fourier Transform Infrared (FTIR) spectral analysis. Thermal analysis reveals excellent thermal stability and appreciable antimicrobial activity in 4% reinforced thiophene based composites. Later on, it was further loaded with 1-5 % titania nanoparticles, and checked for thermal stability *via* TGA and antimicrobial activity against variety of bacterial and fungal strains. The synthesized titania nanocomposites were characterized by FTIR spectral and X-ray diffraction studies.All the synthesized thiophene reinforced titania nanocomposites exhibited excellent antibacterial as well as antifungal activity against *Escherichia coli,Staphylococcus lactis,Penicillium* and *Candida Albacins.*The synthesized materials could be used as antimicrobial coatings on variety of surfaces in future.

Genetic analysis of achondroplasia in family of district kurram

Tanvir Ahmed[1], Kalim Ullah Marwat[1], Saad Ullah Khan[1]
[1]Department of Zoology, Kohat University of Science & Technology, Kohat-26000 Khyber Pakhtunkhwa, Pakistan

Achondroplasia is the most prevalent kind of skeletal dysplasia in humans. It is an autosomal dominant genetic disorder. The estimated prevalence effecting at least 25000 people worldwide. There hasn't been much research on this disease in Pakistan, and further research is needed to fully comprehend the condition. In order to identify sequence variation, the goal of this work is to create allele-specific primers and its impact on the protein structure for transmissible achondroplasiain a particular family of specific north western area district Kurram Khyber Pakhtunkhwa Pakistan.

In this cross sectional a family of the achondroplasia was studied in which total three (4) members ware effected. Blood was collected from two (2) effected and four (4) normal members of the family. In this study the blood was collected in EDTA tube from the family. Genomic DNA was extracted from the blood (750ml) using the phenol chloroform method and whole exome sequence (WES) was performed. The WES data was analyzed and candidate variants were filtered out the segregation analysis using the sanger sequencing. Allele specific primers were

designed to amplify the target specific region through PCR. Insilico analysis was performed to analyze the pathogenicity of candidate variant.

TheWES analysis of the family identified a missense-mutation in GALNS gene at chromosome number 16. The nucleotide "C" is replaced by "T" at cDNA position 1175 (c.1175C>T) due to which the protein Alanine was replaced by Valine at position 392 (p.(Ala392Val)). The mutations were proven to occur together with the illness in a recessive phenotype using Sanger sequencing of the family. Several web-based bioinformatics applications verified the pathogenicity of the variants.

Key words: Achondroplasia , PCR, WES, GALNS, EDTA

Poly methyl methacrylate, polypyrrole and graphite nanoplatelets blending system preparation and their dielectric characterization

Mujahid Islam[1] , Muhammad Ishtiaq Jan[1] , Muhammad Iqbal khan[1]
[1]*Department of Chemistry Kohat University of Science & Technology, Kohat 2600Khyber Pakhtunkhwa, Pakistan*
Corresponding author Email; mujahidhumdard@gmaail.com whatsApp No: 03469886331

The polymer blend of polypyrrole (PPy) and poly methyl methacrylic acid (PMMA) was used as matrix for incorporation of graphite nanoplatelets as nanofillers by solution casting method in order to achieve nanocomposites with high dielectric constant. The structural, morphological and functional group analysis was carried out by X-ray diffraction (XRD), scanning electron microscopy (SEM) and fourier transform infrared spectroscopy (FTIR) which revealed that the heterogeneous granular morphology of the amorphous nanocomposites matrix is interconnected network of the exfoliated graphite nanoplatelets nanofiller. Dielectric spectroscopy was performed by impedance analyzer in order to evaluate the dielectric properties of PMMA/PPy and its nanocomposites. It is evident from the results that the dipolar orientational polarization is responsible for enhancement of dielectric properties which appears as prominent peaks at higher frequencies in various plots of dielectric variables achieved by introduction of graphite nanoplatelets along with PPy into a PMMA matrix. Thus, a high dielectric constant could be realized through interfacial polarization mechanism (Maxwell–Wagner– Sillars polarization (MWS)).

Species Distribution Modelling and Human-Wild Boar Conflict in the Southern Belt of Khyber Pakhtunkhwa

Inam Khan[1], Abdul Majid[1], and Muhammad Shehzad[1]
[1]*Department of Zoology, Kohat University of Science and Technology Kohat*

The wild boar is an important artiodactyl mammal, that belongs to the family Suidae; Genus *Sus*, is one of the most widespread mammal species in the world. Information on current and future potential distributions of Wild Boar is necessary and useful for strategic management actions and conservation plans. In the present study, we predicted the distribution of *Sus scrofa* (Wild boar) associated with different environmental variables, and human-wild boar conflict in Southern Khyber Pakhtunkhwa. We used 40 presence points of the species from the field data, and environmental variables were extracted from freely available sources. Questionnaire based survey were carried out for human-wild boar conflict in the study area. Results indicate promising predictive power for both high resolution models (30m) for *Sus scrofa* with area under curve (AUC) test analysis of 0.859, respectively. The MaxEnt analysis showed that highly suitable habitats were present in southern regions of Khyber Pakhtunkhwa. The final five variables used in analysis were (i) BIO1 Annual average temperature (56.5%) (ii) BIO4 Temperature seasonality (1.2%) (iii) BIO12 Average annual precipitation (4.3%) (iv) BIO15 Seasonality of precipitation (3.6%), (v) BIO17 Precipitation of the driest quarter of the year (5.4%), (vi) BIO19 Precipitation of the coldest quarter of the year

(23.6), and DEM (5.5%) were identified as the main environmental factors that affect the habitat distribution of *Sus scrofa*. Almost all of the area was estimated to be suitable area for *Sus scrofa*, respectively. The results obtained from the questionnaire survey indicate that nearly everyone in the study area is familiar with or has observed wild boars. However, the nature of their conflicts with wild boars varies significantly. Most respondents reported crop damage, while others mentioned injuries, livestock predation, and property damage as the primary forms of conflict. The study conducted in Southern Khyber Pakhtunkhwa sheds light on the distribution of wild boars and the ensuing human-wild boar conflicts. It recommends several measures for effective management in the region, focusing on habitat management in the southern regions could help mitigate conflicts, necessitating habitat restoration and conservation efforts. Lastly, continuous monitoring and research are essential to adapt management strategies based on evolving dynamics of human-wild boar interactions in the area.

Keywords: Wild Boar, Environmental Variables, Human-Wild Boar Conflict, MaxEnt Analysis, Khyber Pakhtunkhwa

Trimetallic Co-Doped Graphitic Carbon Nitride as a Colorimetric Sensing Platform for Dopamine Biomarker

Nazish Aslam[1], Umar Nishan,[1] Amir Badshah[1],

[1]*Department of Chemistry, Kohat University of Science & Technology (KUST), Kohat-26000, Pakistan*
Corresponding Email: nazishkhattak690@gmail.com

Abstract: Dopamine is a catecholamine which is released by neurons that are widely distributed neurotransmitters in the central and peripheral nervous system. It plays vital role in the function of brain, body fluids of mammals, cardiovascular, hormonal, and renal systems. Its normal range in human blood is 1.3–2.6 µM is in healthy individuals. Normally it supports vital functions such as focus, intuition, inspiration, blood pressure and fine motor activity. While abnormal dopamine concentrations in the body can cause a range of diseases such as Alzheimer's disease, Parkinsonism, epilepsy and pheochromocytoma etc. In the current study, Trimetallic co doped graphitic carbon nitride based biosensor was developed to monitor dopamine in blood serum samples from epilepsy patients. Different characterization techniques, were such as FTIR, SEM, TGA, EDX, elemental mapping, and XRD etc were used to characterize the prepared nanocomposite. In the presence of the fabricated Nano enzyme system, H_2O_2 can catalyze the oxidation of TMB with a transformation from colorless to blue-green color. This sets the platform for the sensing of the analyte (dopamine). The incorporation of dopamine to the sensor system results in the reduction of the oxidized TMB to TMB_{red} with an optical change from blue-green to colorless. The change was visible to the naked eye and confirmed through a UV-Vis spectrophotometer. The report on the fine-tuning of the fabricated sensor various essential parameters were such as the amount the mimic enzyme, H_2O_2, pH, time, and TMB were optimized. At room temperature and at pH 6 the proposed sensor response time was just 2 minutes for dopamine detection. The proposed sensor has been successfully applied to epilepsy, patients' blood serum samples for dopamine detection with a visible colorimetric change.

Keywords: Trimetallic co doped graphitic carbon nitride, TMB, dopamine, colorimetric sensor.

Synthesis, characterization, antimicrobial and antioxidant activities of newly synthesized guanidines

Sumaira Saleem[1], Rukhsana Gul[1] , Siraj ud Din[2]
[1]*Department of Chemistry, Kohat University of Science & Technology (KUST), Kohat-26000, Pakistan*
[2]*Department of Chemistry ,University of Science & Technology (USTB) Bannu, Pakistan*
[*]**Corresponding Author Email:** sumairasaleem707@gmail.com

Guanidine is one of the most versatile functional groups in chemistry; compounds containing this system have found application in a diversity of biological activities and in this research, the advances in the field of the synthesis of guanidines are presented. The guanidines were synthesized by employing a standard guanylation method, starting with the reaction of benzoyl-phenyl substituted Thioureas with 2,4-diflouro aniline in equimolar ratios, dissolving in DMF with two equivalents of triethylamine. The temperature was maintained below 5 °C using an ice bath and one equivalent of mercuric chloride was added to the reaction mixture with vigorous stirring. The ice bath was removed after 30 min and the mixture was stirred overnight. Progress of the reaction was monitored by TLC till completion. Chloroform (20 mL) was added to the reaction mixture and the suspension was filtered through a sintered glass funnel to remove HgS. The solvent from the filtrate was evaporated under reduced pressure and the residue was redissolved in CH_2Cl_2 (20 mL), washed with water. The solvent was evaporated; the residue was purified. The synthesis of more lipophilic guanidines is of interest due to their potential to easily cross cell membranes. Incorporating fluorine atoms in proximity to basic groups can influence the physico-chemical properties of guanidines, such as lipophilicity or basicity. This research specifically focuses on preparing new chloro and fluoro-substituted guanidines through the guanylation method, with the aim of enhancing their biological properties. The guanidine compounds can be used as anti-bacterial, antifungal and antioxidants. The synthesized guanidines were characterized by FTIR, UV-Vis and NMR spectroscopic techniques. Antimicrobial activities of theses guanidines were performed by agar well diffusion method and disc diffusion method. The guanidines having substituents at ortho and para position showed good antimicrobial activities while guanidines having substituents at meta position showed moderate antimicrobial activities.

KEY WORDS : Benzoyl phenyl guanidines, Lipophylic guanidines, Antimicrobial activities, Antioxidant activities.

Bactericidal role of epidermal mucus from koi fish against *Staphylococcus aureus*

Maryam Almas[1], Abdul Wahab Khan[2], Faheem Ullah[1], Qasim Khan[1], Hasfa Bibi[1], Kainat Babi[1], Noor Muhammad[1,] Nawab Ali[1.]

[1]*Department of Biotechnology and Genetic Engineering Kohat University of science and technology 26000, Khyber Pakhtunkhwa, Pakistan.*

[2]*Department of Zoology, Kohat University of Science and Technology (KUST), Kohat, Pakistan*

[*]**Corresponding Author Email:** zakirullah5060@gmail.com

The fish industry is one of the food industries with the fastest rate of growth in the world. The immune system of fish continuously protects the body from diseases and provides protection. The primary components of fish's innate immune system are their skin and mucus membrane, which actively fight against infectious agents from the moment of initial contact. Due to the presence of numerous antimicrobial proteins, fish mucus functions as a powerful mechanical, physiological, and biochemical barrier. The antibacterial activity of mucus seems to be a promising target for the creation of novel therapeutics to cure different infections in both fish and humans. Koi fish (*Cyprinus rubrofuscus*) is a kind of freshwater fish that is particularly liked by people in general because of their attractive colored forms. It is well known that overuse of antibiotics and other antimicrobial drugs has several adverse effects, including the development of antibiotic-resistant bacterial strains which are harmful issues for humans, making some infections practically incurable. Globally, bacterial diseases are the most common cause of human deaths. *Staphylococcus aureus* is one of the common bacterial pathogens that causes various types of infectious diseases. The bactericidal activity of fish skin mucus extracts was determined using the agar well diffusion method. On each side of the well zone of inhibition (mm) was measured for the assessment of the bactericidal effect of fish mucus. Different concentrations of crude fish skin mucus (50µl, 100µl, and 150µl) were used and the zone of inhibition was 20mm, 22mm, and 24mm. The same concentrations of diluted skin mucus of fish were also used to check the

antibacterial activity that gave a zone of inhibition and was 17mm, 20mm, and 22mm. The result showed that crude skin mucus extract has high antibacterial activity as compared to diluted extract against *S. aureus.*

Keywords: Koi Fish, Skin mucus, S*taphylococcus. aureus*, Antibacterial activity.

Exploring Electrochemical Characteristics of Novel Coordination Complex: Experimental and Theoretical Insights

Wajid Hussain[1], Habib Ahmad[2], Muhammad Ali[3], Umbreen Shahzad[1], Ghulam Meeladi[4], Muhammad Shahid Iqbal[1], Shahid Iqbal[5]

[1]*Department of Chemistry, University of Layyah.*

[2]*Center for Advanced Electronic and Photovoltaic Engineering, International Islamic University Islamabad.*

[3]*Faculty of Veterinary Sciences, University of Layyah.*

[4]*Northwest University, China.*

[5]*University of agriculture Faisalabad .*

[1]*Beijing Institute of Technology, Beijing, China*

[2]*University of Layyah*

[3]*University of agriculture Faisalabad*

[*]**Corresponding Author Email:**dr.shahid@outlook.com

The electrochemical properties of a coordination complex are compared in this article using both theoretical and experimental methods. Specifically, naphthalene diimide (NDI) ligand has been used to synthesize novel coordination complex [Ni(H_2L1)(DMF)] solvothermally. Complex's 2D polymer coordination structure was identified through structural characterization carried out by single-crystal X-ray diffraction (XRD), UV–visible spectroscopy, Density Functional Theory (DFT) and Hirschfeld surface analysis. In order to determine the complex's suitability as supercapacitor electrode materials, the electrochemical properties were examined using cyclic voltammetry (CV) and galvanostatic charge-discharge (GCD) analysis. A working electrode was thus constructed in 0.5 M $TBAPF_6$ electrolytes within a three-electrode cell configuration. The complex's gravimetric capacitance was found to be 214 Fg^{-1} with a voltage window of -2.5 to 1.0 V. Notably, the complex demonstrated exceptional stability, holding onto about 80% of their capacitance after 6000 cycles.Additionally, DFT studies were carried out to compare the experimental findings with theoretical study. The analysis was further enhanced by comparing theoretically calculated HOMO and LUMO levels with experimentally determined band gaps using Tauc plot and UV-visible spectroscopy. VASP software was used to evaluate the electrochemical performance, charge-discharge analysis, and cyclic stability. Moreover, Hirshfeld surface analysis, carried out with crystal explorer 17.5, helped to clarify elements like van der Waals radii and π-π stacking in the comparison of crystallographic data. To sum up, thCorrespondinis research offers a thorough analysis of the coordination complex's electrochemical properties, connecting theoretical understanding with experimental results.

Evolution of post antiretroviral therapy CD4 count and hematological profile of HIV patient in the Southern region of the KPK province of Pakistan

Sardar Ali Shah[1*], Malik Nawaz Shuja[1], Mubashir Hussain[1]

[1]*Department of microbiology, Kohat university of science and technology*

[*]**Corresponding Author Email:** Starmicrobiologist11@gmail.com

The human immunodeficiency virus (HIV) has posed a difficult challenge in the medical industry since its discovery in 1983. HIV weakens the immune system, contributing to acquired immunodeficiency syndrome (AIDS), identifying it as a serious hazard. Early detection of HIV is critical for improving the efficacy of antiretroviral therapies for people infected. The cornerstone of HIV diagnosis is laboratory testing, but understanding the clinical

and demographic characteristics of undiagnosed HIV-positive persons might help identify those at risk. Antiretroviral medicines, which primarily target HIV, are the cornerstone of treatment. Highly active antiretroviral therapy (HAART) entails delivering a combination of these drugs, usually three or four at the same time, to effectively combat the virus. In recent research of 200 HIV-positive patients, the necessity of early detection and comprehensive treatment options was emphasized. These findings emphasize the importance of strong screening programs and continuous research efforts to address the long-standing challenge posed by HIV/AIDS in contemporary healthcare.

Southern region of the KPK province of Pakistan was selected as study area and research period wasfrom 1st January 2023 to December 2023. Our study included a total of 500 patients. Children aged one-year-old to adult patients with a verified HIV diagnosis underwent clinical assessment, comprehensive hematological testing, and CD4 count testing utilizing flow cytometry. Patients were divided into various stages by WHO clinical staging. Every hematological parameter was examined for any association with disease progression.

Among a population of 500 individuals studied, 40% were found to have HIV infection. Among the 200 patients with HIV, 67% were male and 33% were female. In the male group, 11.9% had anemia before starting antiretroviral therapy (ART), with 9.7% recovering from anemia after treatment and 2.9% remaining anemic due to other reasons. Among the female group, 8 out of 66 had anemia before ART, with 6 recovering after treatment, one not showing improvement in hemoglobin levels, and one not following up on visits.

12.4% of female HIV reactive patients were presenting with suppressed CD4 levels (i.e. below 200 cells/mm^3)and all females' CD4 levels recovered after treatment. Before starting ART, 29 out of 134 males were presenting with suppressedCD4 while all were successfully recovered after treatment.

5.9% of HIV reactive patients had low platelet count before taking treatment and all patients recovered after treatment.

Anemiaand CD4 were the Most common abnormalities in HIV-infected people. Platelet count was the only least affected hematologicalparameter.The study highlights the need for improved screening programs, particularly in areas with high HIV prevalence, and proposes specialized outreach campaigns for both men and women to guarantee rapid diagnosis and treatment adherence. It promotes an integrated care model that encourages collaboration between HIV/AIDS and hematological specialists. It also emphasizes the significance of patient compliance with follow-up visits for continuous monitoring and prompt intervention.

Heterosis studies in upland cotton for seed cotton yield and yield-related components

Sana Khan[1], Asad Azeem[2 *], Zeshan Hassan[2], Sami Ul-Allah [3], Azeem Iqbal Khan[1]
[1]*Department of Plant Breeding and Genetics, University of Agriculture, Faisalabad, Pakistan*
[2]*Department of Plant Breeding and Genetics, University of Layyah, Layyah, Pakistan*
[3]*Department of Plant Breeding and Genetics,Bahauddin Zakariya University, Multan, Pakistan*
[*]**Corresponding Author Email:** asadpbgpak@gmail.com (Asad Azeem)

Cotton is one of the major fiber crops of the world, popularly known as “White Gold”. Cotton and its by-products play a crucial role in the economy of developed and developing countries. Several biotic and abiotic factors are responsible for low yield and poor fiber quality in cotton. Heterosis studies provide the basis for the development of hybrid combinations and their commercial consumption. The current research was conducted to investigate the degree of heterosis for seed cotton yield and yield-related components under an RCBD design that has four parents and six hybrids with three replications. Data were collected for plant height, sympodia/plant, monopodia/plant, number of fruiting nodes/plant, seed cotton yield/plant, node ratio, boll weight, GOT percentage, seed index,

micronaire, fiber length, fiber strength and number of bolls/ plant. Analysis of variance showed significant differences between parents and hybrids. The parents Debel and VH-330 demonstrated as the most effective for cross combination for the traits viz. plant height, boll weight and number of monopodial branches, seed cotton yield/plant, micronaire, fiber length, fiber strength, Got% and number of sympodial branches. The hybrids VH-330 × Debel, VH-330 × MS-DK and FH-444 × VH-330 exhibited significant and highest heterotic effects for yield and yield-related traits and fiber quality parameters. The estimates of broad sense heritability exposed that moderate heritability was observed between all traits. The value of GCV was less than the value of PCV, which means the influence of the environment is greater on all traits. These hybrids can be utilized to exploit yield and fiber quality parameters in future breeding programs.

Keywords:*Gossypium hirsutum* L, seed cotton yield, Heterosis, Heritability

Application os zinc on wheat (*Triticum aestivum*) genotypes to check the response under drought condition

Manahil Fatima[1], Muhammad Abu Bakar Zia[1]
[1]*College of Agriculture, University of Layyah*

Wheat (Triticum aestivum) is world most significant cereal crop (ranks 2nd in cereals) and staple food in the world. The history of wheat from about 10,000 B.C is an important part of history of Agriculture. Major source of starch and energy, vitamins, dietary fiber, and phytochemicals. Global consumption of wheat saw a slight increase over last year with just under 791 million metric tons in 2022/23,expected that about five million metric tons more will be consumed in 2024.So the need of wheat is increased yearly. Drought is a prolonged dry period in the natural climate cycle. It is slow-onset disaster characterized by lack of precipitation, resulting in a water shortage Drought can have a serious impact on, agriculture, economies and environment. This experiment was conducted to evaluate the response of different genotypes of wheat toward zinc under drought by applying RCBD method with three replications in field area. Total 18 genotypes used for experiment to check the result. The 18 genotypes are

CHKWAL-50, UJALA-2016, AKBAR-2019, SEHER-2006, JOHAR-16, GLAXY-2013, GHAZI-2019, FAISLABAD-2008, GOLD-16, ANAJ-17, FAKHER-E-BHAKKAR, MIRAJ-2008, SYN-50, AS-2002, BHAKKAR STAR, SUBHANI-2021, DILKASH-2021, PUNJAB-1996.

According to experiment AKBAR-2019 and FAISLABAD-2008 genotypes of wheat in application of zinc and drought shows good response. So the conclusion is these two varieties are good in these conditions.

KEY WORDS: Triticum, aestivum, Drought, Zinc

Genetic Evaluation of yield and yield related traits in non-BT Cotton (*Gossypium hirsutum* L).

Abu Al Hussain[1], Aqsa Mumtaz[12], Tariq Manzoor Khan[1]
[1]*Department of Plant Breeding and Genetics, Faculty of Agriculture, University of Agriculture Faisalabad, Faisalbad, Pakistan*
[2]*College of Agriculture, University of Layyah, Layyah, Pakistan*
[*]**Corresponding Author Email:** abuulhussain2016@gmail.com

Cotton is a fiber crop of immense economic importance cultivated in more than 50 countries. Pakistan, a chief cotton grower, is dealing with a substantial waning in the productivity of top cultivars of cotton owing to numerous obstacles. Yield-related traits are the most important determining factors of seed cotton and lint production. The evaluation of genetic variability facilitates in the selection of agronomically and genetically advantageous plants. Twenty cotton varieties were sown in May 2021, in two replications each involving three lines, under randomized complete block design (RCBD). Data on boll weight (g), number of bolls per plant, seed mass per boll (g), number

of seeds per boll, seed index(g), seed density (g/cm^3), lint index (g), lint mass per boll (g), lint mass per seed (g), lint Percentage (%), seed cotton yield per plant (g), seed volume per 100 seeds (cm^3), plant height (cm), number of sympodia per plant, and number of monopodia per plant was recorded. This research was carried out by adopting various methods of correlation and principal component analysis (PCA). For all yield-related attributes, the analysis of variance outcomes demonstrated substantial variabilities in the varieties. Number of bolls per plant possessed the maximum heritability estimate, at 93.67%, however seed cotton yield exhibited the smallest estimate of heritability, at 24.44%. Findings of correlation studies depicted that seed cotton yield had positive relationship with boll weight, bolls number per plant, seed mass per boll, seed number per boll, seed index, seed volume, number of monopodia, and number of sympodia per plant whereas it exhibited negative relationship with seed density, lint index, lint mass per seed, percentage of lint, lint mass per boll, and plant height. Four principal components (PCs) out of fifteen were demonstrated possessing the Eigen value larger than 1. These PCs resulted for 82.2 percent of the net variation among the cotton accessions in terms of several yield contributing parameters. PC-I illustrated the most substantial input to variation (38.2%) ensued by PC-2 (22.6%), PC-3 (11.6%), and PC-4 (9.6%).

Key words: Cotton, principle component analysis, genetic variability, yield related traits.

Estimation of genetic diversity for powdery mildew resistance, yield and yield related traits in pea under natural field conditions

Aqsa Mumtaz[12], Abu Al Hussain[1], Amir Shakeel[1], Asad Azeem[2]

[1]*Department of Plant Breeding and Genetics, Faculty of Agriculture, University of Agriculture Faisalabad, Faisalabad, Pakistan*

[2]*College of Agriculture, University of Layyah, Layyah, Pakistan*

[*]**Corresponding Author Email:** aqsamumtaz0841@gmail.com

Pea (*Pisum sativum* L.) is one of the most important pulse crops in terms of highnutritional profile compared to other legumes. But, it is highly threatened by Powdery mildew caused by *Erysiphe pisi* is one of most severe disease that impose serious losses in yield, seeds and pods quality worldwide. Understanding the natural occurrence and genetic difference of pea germplasm pathogen, tolerance is necessary for breeding pea powdery mildew resistant variety and disease control. The present study was conducted to investigate the 30 pea genotypes against powdery mildew under randomized complete block design (RCBD) with three replications. Data were collected for days to first bloom, days to 50% flowering, days to maturity, plant height (cm), inter nodal distance (cm), number of nodes per plant, number of pods per plant, pod length (cm), pod width (cm), number of seeds per pod, 100 seed weight (g), yield per plant (g) and powdery mildew disease severity (%). The results revealed that all genotypes exhibited significant differences for all the traits under study. The estimates of broad sense heritability revealed that high heritability was observed among all the traits and number of pods per plant exhibited maximum heritability. The dendrogram constructed from the genotypic data grouped 30 genotypes into three major groups. Cluster one was largest sub divided into two sub-clusters containing 13 genotypes followed by cluster two includes 6 genotypes that are similar to each other. Correlation analysis revealed that plant height, number of nodes per plant, number of pods per plant, pod length, pod width, number of seed per pod and 100-seed weight showed positive and highly significant correlation with the yield per plant. Path coefficient analysis showed that number of pods per plant and days to 50% flowering showed highest positive direct effect with yield per plant.

Key words: Peas, powdery mildew, yield traits, cluster analysis

Correlation and path coefficient analysis for yield and yield related traits of synthetic wheat germplasm

Aqsa Mumtaz[12], Abu Al Hussain[1], Sami Ul-Allah [3] ,Illays Raza[2]

[1]*Department of Plant Breeding and Genetics, Faculty of Agriculture, University of Agriculture Faisalabad, Faisalabad, Pakistan*
[2]*College of Agriculture, University of Layyah, Layyah, Pakistan*
[3]*Bahauddin Zakariya University, Multan, Pakistan*
[*]**Corresponding Author Email:** aqsamumtaz0841@gmail.com

Genetic diversity is crucial for any breeding program in order to improve yield and quality. The study was designed to evaluate the genetic variability and association among yield and related traits of synthetic hexaploid wheat to find the characters of greatest importance that might be used in wheat breeding program as selection criteria. For this purpose, thirteen Synthetic wheat genotypes were grown in fully irrigated condition at research area of Department of Plant Breeding and Genetics, University of Layyah, Layyah, Pakistan during the wheat season of 2022-23. Analysis of variancedepicted significant difference ($p<0.01$) among thirteen synthetic wheat genotypes for all the characters studied. Correlation analysis depicted that grain yield had highly significant and positive association by spike length, biological yield and thousand grain weight however non-significant positive correlation through plant height, number of tillers, number of spikelets and peduncle length. Path coefficient analysis dissected the correlation into direct and indirect effects and indicated that spike length (0.45) had maximum positive direct influence on grain yield followed via thousand grain weight (0.43). Among synthetic genotypes SYNTHETIC-46 and 49 recorded high mean performance for grain yield. Therefore, it is recommended that these traits could be measured as selection criteria for the improvement of wheat grain yield by using synthetic wheat genotypes in breeding program.

Keywords: Synthetic hexaploidy wheat, yield contributing attributes, Variability, path coefficient and correlation.

Comparison between efficacy of YouTube video tutorials and language learning apps for learning target language

Ayesha Noor[1], Ayesha Kousar[1]
[1]*Department of English, University of Layyah*

YouTubevideo tutorials and language learning applications are regarded as essential resources to enhance language skills and proficiency in language learners. This research explores the comparative efficacy of YouTube video tutorials and language learning apps i.e.Google Translator, LinguaLeo, etc.in the context of learning as a target language. This study examines variables including demographic, user involvement, understanding levels, learning habits, preferences, and difficulties through a thorough analysis using a survey approach. A 17-item based questionnaire was distributed to 135 undergraduate students of English studies at The University of Layyah, Layyah via Google form link. This research finds out the learning outcomes of the individuals engaging with these two popular language learning resources. However, results indicate that the level of acceptance of both platforms by assessing the strengths and limitations of the applications as well as video tutorials. The scales and answers range providean effectiveness of language learning strategies in the digital age. Consequently, focus of this study is on understanding how learners of a target language perceive and benefit from these platforms.

Keywords: *English language Learning, Technology, Mobile Apps, YouTube, digital learning*

The role of linguistics in artificial intelligence and human interactions

[1]M. Riaz Khan Dasti, [2]Muniba Qayyum, [3]Rabia Ghafoor, [4] Ramla Shahid, [5]Emaan Fatima
[1]*Department of English, University of Layyah, Pakistan*
[2]*Department of Education, Bahauddin Zakariya University Pakistan;*
[3]*Department of English, University of Layyah, Pakistan;*
[4]*Department of English, University of Layyah, Pakistan;*

*Corresponding Author Email: emanfatima335@gmail.com

Linguistics, the scientific study of language, serves as a fundamental pillar in the realm of artificial intelligence (AI), exerting a profound influence on the evolution and practical implementation of AI technologies in various domains. This research article embarks on an in-depth exploration of the intricate interplay between linguistics, AI, and human interaction, delving into the nuanced ways in which linguistic principles shape the design, execution, and assessment of AI systems. By drawing upon interdisciplinary insights from linguistics, computer science, and cognitive psychology, this article endeavors to offer a comprehensive synthesis of existing research while propounding innovative perspectives on the pivotal role of linguistics in the advancement of AI technologies and the augmentation of human-machine communication channels.Through a meticulous analysis of linguistic theories, computational models, and real-world applications, this article endeavors to illuminate the transformative potential inherent in linguistics, elucidating its capacity to redefine the landscape of AI development and human interaction paradigms. By critically examining the symbiotic relationship between linguistic principles and AI methodologies, this research aims to uncover novel avenues for harnessing linguistic knowledge to catalyze advancements in AI-driven technologies. Additionally, this article seeks to underscore the broader societal implications of leveraging linguistics in AI, including its impact on cultural discourse, ethical considerations, and the democratization of technology.Ultimately, by shedding light on the profound implications of linguistics in shaping the future trajectory of AI and human interaction, this research article endeavors to inspire further inquiry, foster interdisciplinary collaboration, and catalyze transformative innovations at the intersection of language science and artificial intelligence. Through a synergistic synthesis of theoretical insights and practical applications, this article strives to propel the discourse surrounding the transformative potential of linguistics, offering valuable insights into the dynamic interplay between language, cognition, and machine intelligence in an increasingly interconnected world.

Keywords: linguistics, artificial intelligence, natural language processing, human-machine interaction, computational linguistics, AI ethics.

Protective effects of green tea extract on chlorpyrifos induced toxicity in liver of male mice

Naila Riaz[1], Hafiza Hira Rubab[1], Faiza Zubair[1]
[1]*Department of Zoology, University of Sargodha, Sargodha, Pakistan*

Pesticides are considered as the most common toxicants to humans. Organophosphates are esters of phosphoric acid, initially used as chemical weapons during World War II. Contemporarily, they contribute 45% of pesticide global market. Chlorpyrifos is organophosphate insecticide used worldwide but its use is always a matter of debate and concern. It is recognized as endocrine disruptor, oxidative stress inducer and hepatotoxicant. Goal of current research was to examine the protecting effect of green tea extract against CPF induced pathological alterations in serum and liver of male albino mice. Experimental protocol lasted for 28 days and included 4 groups in which Group I was designated as the control group, while Group II received 20mg/kg sole GT extract, Group III was administered 25mg/kg CPF dose via gavage. Group IV received CPF followed by GT with 2 hour gap. All mice were anatomized after 28 days of treatment and blood sample were collected for Liver Function Test. Liver of all groups was also collected for histological preparations. Results of present study revealed that in CPF administered group body weight was significantly reduced ($P<0.05$) and wight of liver was significantly increased ($P<0.01$) as compared to control. Histological findings of liver in CPF group exhibited significant increase ($P<0.05$) in mean count of binucleated hepatocytes, loosening of hepatic tissues, necrosis in hepatic portal vein and highly significant increase ($P<0.001$) was noticed in cellular and nuclear diameter of mononucleated hepatocytes. Moreover, increase in mean serum level of Alanine Aminotransferase (ALT), Alkaline Phosphatase (ALP) ($P<0.01$) and reduction in mean serum Albumin ($P<0.05$), Globulin and Total Protein were also observed in CPF exposed group in comparison with the control group. In combine group (CPF+GT), green tea had induced attenuated effects in restoring liver

weight, total hepatocytes count and regenerating zones were also seen in cellular and nuclear diameter of hepatocytes and in hepatic portal vein. Similarly improvements were also noticeable in mean serum liver enzymes and proteins. The histological and serological findings confirmed rescuing potential of green tea against CPF induced hepatotoxicity.

Impact Of Muslim Religiosity On Well Being Of University Students

Mahnoor javed[1], Ayesha Bibi[1] Alisha Iqbal[1], Iqra Mushtaque[1]
[1]*Department of applied psychology, University of Layyah, Pakistan*
[*]**Corresponding Author Email:** Iqra.fatima89@gmail.com

This research aimed to investigate the impact of muslim religiosity on well being of university students.A total of (N=300) participants were selected from different departments of three different universities. There were 172 (57.3%) female and 128 (42.7%) male students.This study was quantitative with correalation research design. Purposive convenient sampling technique was employed for selecting participants.Two research instrument were used Muslim Religiosity Measurement Scale(Buzdar, 2017), Warwick Edinburgh Mental Well Being Scale (Brown & janmohammad, 2018). The data was coded and entered into MS Excel 2016 and SPSS 26.0 for the purpose of making analysis.Descriptive statistics, t test and Pearson Product Correlation were used to determine the hypotheses of the study.Result of research found that there is a significant positive correlation between muslim religiosity and well being. Scores of muslim religiosity showed that female university students have more muslim religiosity more than male university students.It is found that religiousity is positively associated with well being.This study contributes to the growing literature on religiosity and well-being, providing valuable insights for future research and applications.Research can contribute to the broader understanding of religiosity and its effects on well-being across different cultural and religious contexts. By highlighting the positive impact of Muslim religiosity on well-being, this study will empowers students to embrace and nurture their religious beliefs and practices.

Exploring the Dynamics of Literature: Unveiling the Nexus of Innovation and Creativity

[1]Sadia Bibi, [1]Kiran Ashraf, [1]M. Riaz Khan Dasti, [2]Muniba Qayyum
[1]Department of English, University of Layyah, Pakistan;
[2]*Department of Education, Bahauddin Zakariya University Pakistan*
[*]**Corresponding Author Email:** muniba.qayyum92@gmail.com

Literature, as a timeless reflection of societal ethos, continually adapts to the changing currents of human experience. In the contemporary context, characterized by rapid technological advancement and cultural flux, the traditional paradigms of literature are undergoing a profound transformation. This research endeavours to unravel the intricate relationship between literature, innovation, and creativity, traversing recent trends and empirical data to unveil the evolving landscape.In today's digital age, literature transcends its traditional confines, embracing innovative forms and platforms that redefine its boundaries. From e-books to interactive storytelling apps, digital technologies democratize access to literature, amplifying diverse voices and narratives. Social media platforms serve as fertile grounds for literary experimentation, fostering communities of writers and readers who engage in dynamic dialogue and collaboration.Moreover, the fusion of art and technology gives rise to multimedia storytelling experiences that blur the lines between literature, visual arts, and digital media. Augmented reality books, interactive fiction apps, and transmedia narratives exemplify the convergence of innovation and creativity, offering immersive experiences that engage audiences in new and unprecedented ways.At the heart of this transformative process lies the indomitable spirit of creativity, driving writers to explore uncharted territories and challenge conventional norms. Literary movements, such as speculative fiction and magical realism, push the boundaries of imagination, offering alternative perspectives on reality and society. Interdisciplinary collaborations between writers, scientists,

and technologists foster cross-pollination of ideas, catalysing innovation and pushing literature into uncharted territories.Through empirical analysis, this paper delves into the impact of innovation and creativity on literature's form, content, and reception. Surveys, interviews, and statistical data provide insights into the evolving preferences of readers, the changing landscape of publishing, and the role of creative writing education in nurturing literary talent.In conclusion, the transformative potential of embracing innovation and creativity in literature is undeniable. By embracing new technologies, pushing artistic boundaries, and nurturing creative talent, literature continues to evolve as a dynamic and inclusive medium of expression. As we navigate the ever-changing literary landscape, it is imperative to recognize the symbiotic relationship between innovation, creativity, and literature, harnessing their collective power to inspire, provoke, and illuminate.

Keywords: Literature, Innovation, Creativity, Narrative, Expression, Societal Dynamics

An Exploration of Challenges Faced by Teachers in Teaching English to the Multilingual Classrooms in Secondary Schools of Layyah, Pakistan

[1]Laraib Manzoor, [1]Saima Batool, [1]Iqra Nawaz, [1]Eman Fatima,
[1]Department of English, University of Layyah

In Pakistan, learning English as a second language is very important. The broad culturaldiversity of the country presents particular challenges for teachers assigned with teachingEnglish language. The difficulties faced by teachers of English in Pakistan's multilingualclassrooms are explored in this article. The main focus of the study is to investigate multiplechallenges along with their solutions that are feasible. The target population for this study wastwenty teachers who were chosen from secondary schools of Layyah which were public as wellas private. Data was obtained using a questionnaire. The basic percentage frequency approachwas used to evaluate the data. The results of the study showed that teachers in multilingualclassrooms encountered many difficulties. With a wide range of linguistic backgrounds, thepupils in the multilingual classrooms have various levels of proficiency. Effective instruction ismade more difficult by a lack of resources and inadequate teacher's preparation. The main issuesthat teachers deal with are large class sizes, imprecise evaluation and assessment, code-switching, parental engagement, sociolinguistic diversity, and limited use of English outside theclassroom. In their multilingual classes, teachers can significantly raise the standard of Englishlanguage instruction by putting these issues into practice and coming up with creative solutions.
Keywords: Teaching, Challenges, Multilingual, Secondary Schools, Language

Impact of Fintech adoption on Financial Performance of Commercial Banks; An Empirical Evidence from Pakistan's Banking Industry

[1]Abdul Rehman, [1]Farah Naz Naqvi.
[1]Department of Business University of Layyah
Corresponding Author Emails: abdulrehamn855@gmail.com,

Decades witnessed the economy's growth with the inoculation of Technology, especially in the financial sector. This paper proposes an examination of FINTECH adoption and its impact on the financial performance of the top seven commercial banks in Pakistan. The deductive approach of these studies leads us to use the quantitative strategy for data collection. Secondary data is collected in the panel form of seven banks. For measuring and explaining the financial performance of banks, are using ROA and ROE, Getting the FINTECH ADOPTION, determinants are ATM, Debit card, Mobile, and Internet Banking users. The data is set for the last thirteen years. SPSS 21 assesses the structural relation and operation panel regression model used to test the hypotheses. ATMs and mobile banking users had positive & highly significant effects and internet banking

had an insignificant effect on both ROA and ROE. And debit cards had insignificant relation with ROE but significant effect on ROA. Subjective measures that the FINTECH is a threat for banks or opportunities are lacking. This study contributes to the existing literature on Financial Technologies by perusing the bank's performance with the adoption of innovative FINTECH. The proposed framework testifies the FINTECH impact on the profitability of banks, which has been less explored by past studies. Subsequently, this examination looks to fill this gap in commercial banking in Pakistan.

Keywords: Technology Adoption, Financial Technology, IT Investment, Financial performance, Commercial Banks.

Effect of seed priming on various genotypes of chickpea(*Cicer areitinum*)under arid conditions

[1]Amna Qamar, [1]Tanzeela Younas, [1]Alamdar Hussain, [1]Muhammad Abu Bakar Zia
[1]Agriculture college, University of Layyah

Chickpeas also known as chana in Pakistan have been a staple food in our cuisine for age.They are packed with protein and fiber, making them a nutritious choice. In terms of global production Pakistan ranks among the top countries. Chickpeas are widely cultivated and enjoyed in many countries around the world. In Arid conditions different climatic problems we face which reduce the production of chickpea. In RCBD maintaining the row to row distance of 30cm and plant to plant distance 15cm by using the known genotypes like (Thal-2020,Bihal-2021, Bihal-2016, Star chana TG stricker and treated with different chemicals such as Boron, Neem, Aloevera Simple water and grown in these conditions In results we have seen that Bihal-2021, Bihal-2016 perform better with treatment of simple water, Boron and neem.

A novel hybrid transunet-visiontrans for mermodel for accurate glaucoma segmentation and classification in fundus images

Suhail Muhammad[1], Sana Ullah Khan[1], Muhammad Adnan[1]
[1]Instutitute of Computing, Kohat University of Science and Technology Kohat
[*]Corresponding Author Email: Suhail.khattak82@Gmail.com,

Glaucoma, a leading cause of irreversible blindness globally, is projected to affect 111.8 million people by 2040. Timely detection is crucial to prevent vision loss. Artificial Intelligence (AI), particularly Deep Learning (DL) and Vision Transformers (ViT), offers promising solutions to enhance glaucoma diagnosis. DL algorithms analyze eye scans, providing faster and more accurate results. Various studies showcase successful glaucoma detection using CNN-based architectures, achieving high accuracy. ViT models, leveraging self-attention processes, outperform CNNs, offering potential for medical diagnoses. However, challenges persist, including limited datasets for early-stage glaucoma and optic disc segmentation difficulties. This research aims to address these challenges by creating a clinical dataset, applying pre-processing techniques, and employing TransUNet for segmentation and ViT for classification. The proposed pipeline seeks to enhance diagnostic accuracy, offering a comprehensive evaluation through confusion matrices and Attention Maps, with potential improvements over existing techniques. The study underscores the importance of advancing AI applications in medical diagnoses, particularly for glaucoma detection.

Anaerobic Digestion of Animal and Crop waste for Biogas Production

Muhammad Muzammal Saeed*[1,2], Muhammad Anjum Zia[1,3,4], Aftab Ahamd[1], Muhammad Sarwar khan[5]

1. *Department of Biochemistry, University of Agriculture Faisalabad*
2. *Department of Biochemistry, University of Okara*
3. *Principal Office, UAF, Community College, PARS Campus, University of Agriculture Faisalabad*
4. *Director office, Punjab Bioenergy Institute, University of Agriculture Faisalabad*
5. *Centre of Agricultural Biochemistry and biotechnology (CABB) University of Agriculture Faisalabad*

[*]**Corresponding Author Email:** Muzammalsaeed143@gmail.com

Biogas specially Biomethane is now a choice of interest for the house hold as well as industrial usage. The utilization of Cattle and Crop waste for the Biogas production is becoming the subject of a lot more interest for the urban and industrial population including forms and town. It is not only reducing the waste management problem but also reducing the demand of Biogas. For this, Biogas Production plants are going to establish in many areas by the private and government bodies. To get a optimized and well utilizable gas production, it is required to assess which is the best Biogas production waste material and upon which quantity this is required in co-digestion. The present study is designed to address the following problem which includes the optimise biomethane production and assess the effect of different crop wastes and animal manure that will be used for digestion in the digestor plant and analyse the obtained volume of biogas produced in the result. The present work will share a brief review of previous studies that demonstrate the effect of different waste material, that are reportedly analysed in some digestor plants and recorded their effect on Biogas production. It will sum up most of digestible materials specially used in Pakistan's population. Further in addition to this the comparative analysis of these studies will also be a larger part of the present work. The following study will be helpful to deliver a strong message of utilising the idea of Crop and Animal Waste usage for the better production of Biogas at the local forms. It will also boost the interested researcher to further enhance the optimized method by using the recent techniques and technologies for the more and better production of Biogas for our local population.

Key words: Biogas, Anaerobic Digestion, Animal Waste, Crop Waste

The effect of religious affiliation on gathering wild plants in Jhelum District, Punjab, Pakistan

[1]Muhammad Majeed
[1]Department of Botany, University of Gujrat-50700, Punjab, Pakistan
[*]**Corresponding Author Email:** m.majeed@uog.edu.pk

The local population living in Jhelum District, Punjab, Pakistan comprises diverse, often marginalized, religious and linguistic groups. A field study about uses of wild food plants was conducted in the district. The field survey included one hundred and twenty semi-structured interviews in twenty-seven villages and we focused on six religious groups (Christians, Hindus, Sunni, Shia, Qadianis, and Sikhs). A total of seventy-seven wild food plants and one mushroom species used by the local population were documented and identified. The major part of the wild food plants were consumed as cooked vegetables and raw snacks. The comparative analysis of plant use among the religious groups indicated that wild food plants were roughly equally gathered and consumed and very few plant cultural markers (i.e. plants gathered only by one community) could be identified . Moreover, the field study confirmed that the documented local knowledge is under threat, and an analysis of potential contributing factors which might be the main cause of change is needed. The documented wild food plants play a significance role in the cultural and social life of the local communities, and the recorded traditional knowledge could be used to guide future development programs aimed at fostering food security and biocultural heritage.

Keywords: Ethnobotany; Wild Food Plants; Traditional Food; Religious Diversity; Punjab; Pakistan.

Anti-bacterial potential of bacteriocin isolated from *lactobacillus plantarum*

Faiza Zubair[1]*, Sonia Nazir[1], Naila Riaz[1], Saima Arshad[1]
Department of Zoology, University of Sargodha
[*]**Corresponding Author Email:** faiza.zubair@uos.edu.pk

Bacteriocins act as natural food preservatives. Food spoilage caused by microbial contamination was major issue. Many diseases were caused when food was ingested. Bacteriocins are chemical-free food preservatives. They are present in both bacteria either Gram-positive Gram-negative. For current studies *Lactobacillus plantarum* was isolated from cheese by serial dilutions and grown on nutrient agar served as source of bacteriocin. Agar well diffusion assay was used to study antibacterial activity against *Escherichia coli, Bacillus subtilis, Bacillus cerus* and *Staphylococcus aureus.* The zone of inhibition was measured to track antibacterial activity. Different range of temperature (40^0C, 60^0C, 80^0C, 100^0C and 120^0C), pH (3, 5, 7, 9 and 11) and concentrations (25mg/ml, 50mg/ml, 75mg/ml, 100mg/ml) of bacteriocin were investigated in relation to cell free supernatant (CFS) activity. Bacteriocin showed maximum antibacterial effect against *B. cerus* at 40^0C which is 2.53±0.15 and against *S. aureus* atpH 3 as 2.57±0.15 and *B.cerus* at concentration 100mg/ml which is 2.67±0.06. On the other hand, minimum antibacterial effect was shown by bacteriocin against *E. coli* at 120^0C as 1.87±0.06 and no effect was shown by bacteriocin at pH 11. At 25mg/ml concentration bacteriocin showed minimum antibacterial effect against *B. cerus* which is 0.93±0.15. The action of bacteriocin was compared with antibiotic Amoxil (500mg) as a positive control. Comparable results were observed.Mean values for zone of inhibition for variables under study were compared using one way ANOVA.The current study concluded that bacteriocin's heat stability makes it possible for the food industry to employ it as preservative of food and to prevent poisoning caused by *B. cereus* and other pathogenic strains.

Key words: antibacterial, bacteriocin, *Escherichia coli, Bacillus subtilis, Bacillus cerus* and *Staphylococcus aureus*

Fostering Social Homogeneity among University Students through Narrative Pedagogy

[1]Muniba Qayyum, [2]M. Riaz Khan Dasti, [3]Abdul Majeed, [4] Saira Tasleem
[1]*Department of Education, Bahauddin Zakariya University Pakistan;*
[2]*Department of English, University of Layyah, Pakistan;*
[3]*Department of Education, Qurtuba University of Science & Information Technology;*
[4]*Department of Education, , Bahauddin Zakariya University Pakistan*
[*]**Corresponding Author Email:** muniba.qayyum92@gmail.com,

This research delves into the effectiveness of integrating narrative pedagogy into university education to foster social homogeneity among students, marked by shared values, perspectives, and experiences, essential for a cohesive academic community. Narrative teaching methods offer a promising avenue for nurturing empathy, understanding, and mutual respect among students. Drawing from interdisciplinary literature, this study scrutinizes the theoretical underpinnings of narrative pedagogy and its potential to enhance social cohesion in university settings. Furthermore, it explores practical strategies for implementing narrative-based approaches in higher education classrooms. Findings indicate that the incorporation of narratives into teaching practices can augment students' social connectedness, cultural awareness, and inclusive attitudes, thus fostering a more cohesive and harmonious learning environment. By engaging in interactive storytelling exercises, reflective discussions, and collaborative projects, educators can facilitate meaningful dialogue and bridge cultural divides, promoting a sense of belonging and inclusivity within the academic community.

Keywords: social homogeneity, narrative pedagogy, university education, cohesion, empathy

Developing Moral Values among Undergraduate Students through Teachings of Literature: A HumanisticApproach

Muhammad Riaz Khan[1], Malaika Iqbal[1], Nadia Bano[1]
[1]*Department of English, The University of Layyah, Layyah.*

This paper discusses the concept of literature as a powerful tool for cultivating moral values among learners within an educational framework. The ultimate definition of literature remains debatable among critics on generic grounds. The paper argues that utilizing literature as a moral muscle in educational setting demands a better understanding of the potential of literature. In the similar vein, it unfolds the embedded layers of moral principles integrated in literary texts. This study adopts a qualitative method utilizing humanistic approach to examine the importance of fusing moral education into literary instruction. The findings of the study have elucidated that literature is a powerful tool in mobilizing affective as well as cognitive response. Moreover, it fosters larger values-based group discussions among undergraduate students while reflecting upon the faced ethical dilemmas. Additionally, it argues that literature offers learners an exceptional chance to discuss ethical conflicts and societal values in broader social and cultural contexts while enhancing critical thinking. The study then goes over prescribing teachers with useful techniques such as involving reading logs, semantic mapping and students' narratives while emphasizing upon both individual reader responses and grouping models. The study also suggests some generic prompts and pedagogical strategies to implement moral education in literary curriculum.

***Keywords*;** Literature, moral values, humanistic, approach, literary

Applying acombination of zinc and sulphur fertilizer enhance canola crop yield and seed quality across various tillage system

Ahtisham gul[1], Rimsha[1],Memona Gulzar[2],Farah Gulzar[3]
[1] *University of Layyah College of Agriculture*
[2]*College of Agriculture, Bahauddin Zakariya University*
[3]*Ripha International university*
[*]**Corresponding Author Email:** ahtishamgulla@gmail.com

"Micronutrient application and tillage practices play a crucial role in boosting the productivity of oilseed crops, particularly canola (Brassica napus L.). As most soils lack sufficient available sulfur (S) and zinc (Zn), supplementing these nutrients is essential for optimal and sustainable crop development. This study investigated the effects of two tillage systems (zero tillage and conventional tillage) combined with four micronutrient treatments (control, zinc application, sulfur application, and combined zinc and sulfur application) on canola crop growth, yield, and quality during the 2019-2020 and 2020-2021 seasons. The results showed that the combined use of sulfur and zinc under different tillage systems significantly impacted crop growth, yield, and quality parameters. Conventional tillage with combined sulfur and zinc fertilization yielded the best results, including maximum plant height, silique length, seed production, and grain yield. In conclusion, applying sulfur and zinc at 45 and 10 kg ha-1, respectively, to canola crops under conventional tillage practices is a sustainable approach to enhance crop growth, yield, and productivity.
Keywords: Sulfur nutrition, zinc, oilseed, tillage systems, weed biomass, protein contents, *Brassica napus*

AI advancement in radiology transforming chest X-ray reporting using deep learning

Muhammad Ghufran[1] **,** Shafiullah Khan1, Sana Ullah Khan1
[1]*Institute of Computing Kohat University of Science and Technology, Kohat-26000 Khyber Pakhtunkhwa, Pakistan*

*Corresponding Author Email: alyanyar@gmail.com

In the landscape of medical diagnostics, the interpretation of chest X-rays and CT scans by healthcare professionals plays a vital role in identifying various conditions. However, the manual generation of radiological reports poses challenges, particularly in underserved regions. This study explores the potential of automating the creation of comprehensive chest X-ray reports using advanced deep learning techniques. Leveraging the Indiana University Chest X-ray dataset, a deep-learning model will be trained to analyze images and generate descriptive reports. The proposed methodology involves associating each image with its corresponding report, pre-processing data, training the model, and evaluating report accuracy against ground truth. Metrics such as BLEU Score and ROUGE will assess the precision and grammatical accuracy of generated reports. This research aims to streamline and expedite the report generation process while maintaining diagnostic accuracy, thereby advancing healthcare technology and infrastructure on a global scale.

Accumulation of arsenic toxicity in wheat through application of silenum

Danial Akhtar[1], Muzamil jawad[1], Muhammad Azam, Muneeb Akhtar[1], Humaira Bibi, Warisha Tul Zahra,Rumman Fatima,Abdul Basit, Saqib Nawaz,,Muhammad Masab Khan,Muhammad Abdullah Asghar

Department of Agronomy,Faculty of Agriculture,University of Layyah

Department of Plant Breeding and Genetics,University Of Layyah

Department of Soil Science,University of Layyah

Department of Plant pathology,University of Layyah

*Corresponding Author Email: danialakhtar223@gmail.com

Arsenic affects plants by disrupting their growth and metabolism while selenium, an essential micronutrient has beneficial role in stress tolerance. Owing to the antioxidative capacity of selenium, it can counteract detrimental effects of arsenic induced stress in plants. The interactive influence of arsenate and selenate on the growth, arsenic and selenium accumulation, activities of non- enzymatic and enzymatic antioxidants, levels of ascorbate, α-tocopherol, total glutathione and activities of glutathione regulatory enzymes along with characterization and quantification of phytochelatins in growing wheat (Triticumaestivum L.) seedlings were investigated. Rate of arsenic accumulation was increased in arsenate treated seedlings while in seedlings treated jointly with arsenate and selenate, arsenic accumulation decreased. Arsenate stress resulted decrease in ascorbate and total glutathione contents, activities of the glutathione metabolism enzymes while significantly increased the levels of α-tocopherol and phytochelatins (PC2 and PC4), along with activities of ascorbate peroxidase and ascorbic acid oxidase in the test seedlings. The effects were more pronounced in roots than in shoots. Joint application of arsenate along with selenate was able to overcome the adverse effects caused by arsenic alone to variable extents by exhibiting significant alterations of all parameters tested, imparting better growth and thiol metabolism in the test seedlings. Our results conclude that application of selenium fertilizer in arsenic contaminated soil might be favourable to improve growth and defense ability in wheat against arsenic toxicity.

Keywords: Arsenate, Glutathione, Phytochelatins, ROS, Selenate

Significance of Literature in the Contemporary World

Insha Noor[1], Momina Asif[1], Eman Tehreem[1]

[1]*Department of English, University of Layyah*

*Corresponding Author Email: innocentmalikk1@gmail.com

In the contemporary era of science & innovation, literature is a most significant part of the modern society which reflects the human-self and serves as a primary source of entertainment despite all the technological advancements.It is being observed that literature offers a temporary escape and sense of belonging in enhancing lives during crucial times. Basically, literature is a valuable tool for learning and connecting with othersas it cultivates the taste, educate the sympathies, and enlarges the mind. It evokes emotions and provides insight into others' experiences, fostering empathy and understanding. Subsequently, it reflects cultural identity, encourages critical thinking and addresses basic concerns of the human beings.However, the contemporary literature allows the reader to engage in conversation with the writer to explore more ways in understanding the piece of writing for the wellbeing of the society.

Keywords: *Literature, Technology, Emotions, Learning, Empathy*

Impact of ChatGPTon the Students of EnglishLanguage

Maria Hameed[1], Anam Hassan[1]
[1]*Department of English, University of Layyah*
[*]**Corresponding Author Email:** mariahameed1243@gmail.com

The aim of this study is to present, based on the systematic review of the literature, an analysis of Chat GPT in education. For this purpose, the data has been obtained by reviewing the results of the studies published since the launch of this application at November, 2022 in the world of education (Web of Science,Scopusand Google Scholar). By using the qualitative methodology, the most significant data is presented. The results show that the impact of ChatGPT in the educational environment has a positive effect on the teaching-learning process. However, it has some limitations and drawbacks as well.The current research presents the way to use ChatGPT as a student for utilization of better learning.These findings provide us solid bases for future research and decision making regarding the use of ChatGPT in the educational context. The study strengthens and advancesChatGPT as a reliable writing tool, and has practical implications. With proper student training, ChatGPT proved to be a good feedback tool in writing classes. Future researchers can investigate the impact of ChatGPT on various specific genres and micro aspects of writing.

Keywords: *ChatGPT, artificial intelligence,education, impact, human like conversation, natural language processing*

Developing 21st Century Skills through STEAM Education

Muhammad Riaz[1] , Muhammad Arslan[1], Muhammad Irfan[1]
[1]*Department of English, University of Layyah*
[*]**Corresponding Author Email:** riazdasti@ul.edu.pk

The current research tries to explore the significance of STEAM (Science, Technology, Education, Engineering, Arts, and Mathematics) education in developing 21stcentury skills among the learners. Basically, STEAM education integrates arts and sciences to foster critical thinking, creativity, and problem-solving skills among the graduates. It developscritical thinkers, problem-solvers, and innovators which are equipped to succeed in various fields of the contemporary world. The article highlights the need of 21st century skills including digital literacy, critical thinking, and problem-solving, and how STEAM education can bridge the gap between the developed skills and those needed. By incorporating arts and sciences, STEAM education prepares students for the evolving demands of the workforce and ensures adaptability to evolve societal and technological landscapes.

Keywords: *21st century skills,STEAM education, Critical thinking, Digital-literacy*

Role of ICT in Language Learning

Rabia Ali[1], Sehrish Bano[1]
[1]*Department of English, The University of Layyah, Layyah*
[*]**Corresponding Author Email:** rabiawarrich0@gmail.com

ICT has a noticeable impact on the quality and quantity of the teaching-learning process. Specifically, ICT can improve teaching and learning through its dynamic, interactive, and engaging content. It also offers real opportunities for personalized instruction. By purposefully utilizing technology, students engage with authentic, compelling, and timely materials from the target culture. They develop interpersonal skills by interacting in real time via video, audio, or text with other speakers of the target language. ICT tools for teaching and learning cover a range of digital infrastructures such as printers, computers, laptops, tablets, etc., as well as software tools like Google Meet and Google Spreadsheets. These tools promote student engagement and enhance knowledge retention. When teachers integrate ICT into the classroom, students become more engaged in their work. ICT enhances learning in multiple ways and helps teachers make lessons more engaging and interesting.

Keywords: *ICT, Social media, Tools, Learning-process, Language-learning*

Developing Moral Values through Bacon's *Of Truth* &*Of Revenge* among the learners

Sadia Khan[1], Maryam[1], Adeela Naz[1]
[1]*Department of English, University of Layyah*
[*]**Corresponding Author Email:** nazadeelapk@gmail.com

The place of literature in the ELT classroom has been investigated by various scholars across languages. It is still a debatable issue but many are of the belief that it plays a vital role in the teaching-learning process. While, literature claims that poetic justice prevails in the end, while goodness and fairness are side-lined by the majority. In this scenario, the role of educational institutions is one of the greatest responsibility in producing such individuals who pose unwavering faith in humans as well as moral values. As we know that Bacon is one of the writers whose writing appeals the readers in a magnificent way as his self-conscious are relevant to the composition in terms of style, invention and concrete language. Thus, the present research tries to investigate that how Bacon's essays, *Of Truth* &*Of Revenge* make an initial investment in the moral development among the learners in English language classrooms. Basically, this is a step to streamline the role of literature in instilling moral values to save humanity from decadence.

Keywords: *Language-teaching process, Self-conscious, Moral development, Humanity*

Role of Technology in Literature Teaching-learning Process at Undergraduate Level

Sana Khadim[1] , Rubab Fatima[1]
[1]*Department of English, University of Layyah*
[*]**Corresponding Author Email:** sanachaudhary554@gmail.com

Digital technology represents a pivotal step forward in modern English education. It serves as a powerful tool in the process of language teaching as well as learning. By enriching the educational journey, technology empowers educators to refine their teaching techniques. This ongoing evolution continually simplifies language acquisition for students with teachers gravitating towards software-driven teaching platforms that enhances students'engagement in understanding the English language. The present research tries to investigate the innovative concepts that harness the latest advancements in science and technology. These innovations empower educational institutions to deliver subjects efficiently and with uncompromising quality. The study encompasses a comprehensive literature review which highlights the linguistic as well as technical aspects of the technology and a seamless integration with established teaching methodologies. The researchers elucidates the core scientific challenges which highlights the significance and potential ramifications of research objectives and hypotheses. Concluding with a set of actionable recommendations, the article aims to elevate teaching practices through the widespread adoption of emerging technologies.

Keywords: *Literature-teaching, Teaching-learning process, Digital technology,*

Socio-Cultural and Economic Constraints in Women Higher Education

Mehwish Iqbal[1], Muhammad Mumtaz[1]
[1]*Department of Education, University of Layyah*
[*]**Corresponding Author Email:** mumtazkhandasti@gmail.com

The objectives of the research study were to find out to investigate the social factors affecting the women higher education, to explore the cultural factors affecting the women higher education, to find out the economic constrains in the women higher education. The population of this study was all the male and female students studying in higher education at District Layyah. There were 335 male students as a population and 150 female students were selected as a sample of study. Both urban and rural female students studying in higher education were taken as sample of study. For data analysis, SPSS was used. The percentage and the average score were calculated. The data was analyzed using the frequency percentage and the average scoreof the data. For data analysis, the following scores were assigned to the responses usedin the Likert scale. After Data analysis, it was described the descriptive analysis of demographic factors like gender, residency, age group, current class level, fee structure,family income, siblings and parents' qualification. This study can be important for policy makers. The results of the study can provide the These study findings suggest that women at higher education as well as educational policy makers further need to focus on improving student's and teachers' professional interaction as well as capacities to further enrich their performance according to socio-cultural and economic constrains level. The descriptive analysis was statistically taken through SPSS, and all data collected through questionnaires was analyzed by calculating descriptive and inferential statistics. The study was taken in District Layyah only and post graduate students were surveyed after adopting the complete code of research. The results showed that parents' qualification and income were the important factors affecting on students especially women higher education. The study was important for policy maker to get good results in different institutions at different level by keeping key points as a pivot or basis of educational changes. Itis further recommended that there is an also need for the adding some trainings for teachers'

perception about students socio-cultural and economic constrains at primary and elementary levels for the better performance of students in studies.

Nativism in Abulhawa's *Against the Loveless World*

Muhammad Asif[1] , Muhammad Riaz[1]
[1]*Department of English, University of Layyah*
[*]**Corresponding Author Email:** riazdasti@ul.edu.pk

Palestinian literature underlies the category of postcolonialism, a vast phenomenon, which explores mainly oppression, violence and its effects especially nativism in the shape of displacement, resistance, exile, violence, nostalgia, crisis of identity, migration both forced and voluntarily. Abulhawa, an American Palestinian writer, in her debut novel *Against the Loveless World(2019)* has made an effort to describe the ground realities of Palestine and its natives.The present research entitled, nativism inAbulhawa's *Against the Loveless World (2019)*tries to explore how Abulhawa represents the issues of nativism raised due to the displacement/dislocation of the natives in the occupied territory and what tactics have been used by the natives of the land of Palestine to resist against the occupiers.The main purpose of the present study is to understand this notion through tracing out the different concepts of nativism such as resistance, displacement and crisis of self-image presented in novel.The present study highlights the role of displacement, trauma and memory in shaping lives of the characters in the novel. It has been focused here to determine diaspora's identity of protagonist Nahr and identity of other Palestinian characters as well. The investigation takes place in the theoretical framework by studying the various postcolonial theorists like Bill Ashcroft, Edward Said and Maxwell. For this purpose, a postcolonial term*; nativism*was applied by considering the postcoloniality model of Maxwell (1965) to explore the basic reasons of resistance and displacement including the sub factors such as alienation, transportation, migration, enslavement and intervention in the said novel. Hence, the violence and oppression has caused the crisis performing to self-identity which appeared as the primary reason of all the aspects which have been tried to investigate through the postcolonial notion of nativism. The findings of the research show the affected lives of the people of Palestine by uprooting them from their own land.

Keywords: *Identity crisis, Migration, Identity Reformation, Survival, Sense of Belongingnes*

The Concept of Good Governance as per Muslim's Ideology

Muhammad Ejaz[1], Muhammad Awais Qarni[1] ,Areeba Hassan[1]
[1]*Department of Public Administration & Governance, University of Layyah*
[*]**Corresponding Author Email:** ejazkhandasti@yahoo.com

The expression of *good governance* has been used in public as well as private sectors in the entire world. In context of the public sector, it is believed that the administrators must be highly professional who utilize his authority for the betterment of the society in a well-mannered way. As far as private sector is concerned, it governs the body and its constitution within the framework of the statue. However, the professional agencies embrace the values of integrity as well accountability to seek support in providing an independent viewpoint in all the matters relevant with the public and government. As we all know that every action taken by the authorities is only for the sake of public interests. Thus, they are regarded as the trustees of the public at large. Hence, the present research tries to investigate true concept of good governance as per the ideology of the Muslim world.

Keywords: *Good governance, professionals, public and private sector, integrity, accountability, Muslim's ideology, public interests*

The Concept of Alienation in Abulhawa's *Mornings in Jenin* & Dabbagh's *Out of It*

Muhammad Riaz[1], Sadia Khan[1], Fakhar Shahzad[1], Ayesha Kousar[1]
[1]*Department of English, university of Layyah*
[*]**Corresponding Author Email:** riazdasti@ul.edu.pk

Alienation means separation from some essential aspects of the nature as well as society. It elicits the feelings of powerlessness among individuals. As far as Palestinian writings and Palestinian issue is concerned it means being rootless from their own land either socially or psychologically. However, as per Marxist theories, alienation is the experience being distanced or estrange from the products of one's labor, and by extension from one's own sense of self due to the effects of capitalism. Subsequently, the current research aims at tracing out the concepts of alienation in Abulhawa's *Mornings in Jenin* and Dabbagh's *Out of It.*Both the works have been explored the sense of being alienated in a world which is known as their own native land, their roots belongs to that particular land but the native individuals of it areunder great disguise due to the control of the occupiers. For this purpose, the investigation takes place through a postcolonial model based on Maxwell's notion has been developed and applied to elaborate the concept of alienation of Palestinians in order to legitimize their resistance. The findings of the research show that the incidents of *al-nakba* and *al-naksa*affected the lives of the Palestinian individuals by uprooting them from their own land which indulges isolationin the hearts of Palestinians.

Keywords: *Palestinian literature, Alienation, al-nakba, al-naksa, Native land, Isolation, Rootlessness*

Developing 21st Century Skills through Literature

Muhammad Riaz Khan[1], Muhammad Mohsan[1], Muhammad Zeeshan[1]
[1]*Department of English, University of Layyah*
[*]**Corresponding Author Email:** muhammadmohsan1821@gmail.com

The 21st century has brought significant changes in almost all the areas of education. In the 1st half of the 21st century, education is characterized by various frameworks prepared by UNESCO, OECD, and P21. Such frameworks focused on skills which are necessary for the student of the 21st century. It has been witnessed that the rapid advances have been made to present diversity among the learners at undergraduate level. Hence, the role of education is even broader to equip the students with skills that will help them to flourish their present as well as future. The researchers agreed upon that all the students need critical skills for their lifelong learning and success. However, the present research intends to investigate the importance of teaching English Literature at undergraduate level in an age where learning is driven by integrated and usable knowledge as well as skills.

Keywords: *21st century skills, English literature, Criticalthinking, Communicationskills, Literature teaching*

Effect of seed priming techniques on the growth and yield of the wheat genotypes under arid Conditions

Tanzeela Younas[1], Amna Qamar[1], Alamdar Hussain[1], Abu Bakar Zia[1]
[1]*College of Agriculture, University of Layyah*

Wheat (*Triticum aestivum L.*) is a major crop of Pakistan. It is grown in different regions, including Punjab. Wheat is an essential staple food and a significant source of income for farmers. Pakistan is among the top wheat-producing countries in the world. There are few challenges that farmer face when cultivating wheat. One of the main challenge is the less production of wheat. Additionally, unpredictable weather patterns, such as drought and excessive rainfall also affect wheat cultivation. In RCBD, maintaining the Row to Row distance of 15cm and Plant to Plant distance of 5cm use the five famous varieties (Dilkash, Nishan-e-Bakhar, Anaj, Arooj 22 and champion) treated with different priming solutions like simple water, Nacl, gibberellic acid and compare the results with control. In results we see Dilkash and Arooj-22 perform better with priming material gibberellic acid and also with simple water.

Performance of selected wheat cross combinations through study of some morpho-physiological traits

Farwa Nadeem[1], Alamdar Hussain[1], Illyas Raza[1], M. Kashif[1], Sadia Zainab[2]

1. *University of agriculture Faisalabad*
2. *Department of PBG University of Layyah*

[*]Corresponding Author Email: farwan39@gmail.com,

Bread wheat (Triticumaestivum L.), king of cereals, belonging to the family poaceae. Wheat is a highly self-pollinated crop. Yield is the main breeding objective in any wheat improvement activity. The aim of maximum productivity through traits related to growth and development could be achieved by the maximum adaptation of plants in any environment. To check the heritability and association of yield traits, five crosses with their six parents named as 4th wheat yield consortium were analyzed under randomized complete block design in three replications. The data will be recorded for days to heading, days to maturity, plant height, tillers per plant, spike length, spikelet per spike, number of grains per spike, 1000-grain weight, grain yield per plant, excise water loss and relative water content, peduncle length and flag leaf area. These genotypes were significantly different for all traits. From heritability estimates, it was concluded that 4th wheat yield consortium YT4 × Khaista-2017 and 4th wheat yield consortium YT4 × Paisina-2017 performed better than other cross combinations having 99.8% and 99% heritability for excise water loss, relative water content and grain yield per plant. Results from genotypic correlation among excise water loss, relative water content number of grains per spike and grain yield per plant showed that 4th wheat yield consortium YT4 × Paisina-2017 performed better than any other cross. Results from path analysis showed that the 4th wheat yield consortium YT4 × Lu26S had highest value for direct effect of excise water loss, relative water content number of grains per spike and grain yield per plant. Results from all analysis concluded that out of five crosses the cross-combination 4thwheat yield consortium YT4 × Paisina-2017 was best performing cross combination that can be used for further breeding programmes.

Keywords: Wheat, Cross combinations, Morpho-Physiological Traits, yield

Impact of Parents' Socioeconomic Status and their Qualification on Students'AcademicAchievement at ElementaryLevel

Qaiser Abbas Jafri[1], Aqsa Khan[2], Shaheena Kanwal[2]

[1]*Department of Education, University of Layyah*

[2]*Department of Education, Institute of Southeren Punjab, Multan*

This study is conducted in Layyah District of South Punjab, Pakistan to explore the impact of socioeconomic status and qualifications of parents on academic achievement of the students at elementary level. It involves 46 boys and 55girlselementaryschools in TehsilLayyah, with a sample size of 581 students from 7th and 8th grade. The study includes 16 boys and 12 girls schools in Tehsil Layyah (148 students), 8 boys and 16 girls schools in Tehsil Karor

(125 students), and 22 boys and 27 girls schools in Tehsil Chobara (308 students). Data collection utilized a self-formulated questionnaire with 40 statements on a five-point Likert scale and statistical analysis was done by using SPSS. Results reveal significant difference in academic achievements based on socioeconomic status indicating a positive correlation between socioeconomic status, parental qualifications and academic performance. Students with a higher socioeconomic status revealed superior academic performance. The analysis also shows a significant relationship between socioeconomic status and academic achievement (p-value=0.000) at the 0.05 level of significance, with a strong correlation (r=0.734) between socioeconomic status and students' grades. This study provides valuable insights into the relationship between parental factors and students' academic performance in district Layyah. It suggests potential areas for further research, including exploring the impact of socioeconomic status on academicachievementacrossdiverseschoollevelsandinvestigatingtheinfluenceof parental skills and marital relationships on children's educational outcomes.

Foliar application of different growth promoting hormones on wheat crop and their effects on crop yield

Sajid Hussain[1], Muzamil Jawad*[1], Kashif Raza[1], Muhammad Aqib Tareen[1], Muhammad Afaq[1], Faisal raza[2], and Muhammad Umar[1]

[1]*College of agriculture, department of agronomy, University of Layyah, Punjab Pakistan*

[2]*Department of botany, DG Khan University, affiliated college karor, Layyah, Punjab, Pakistan*

***Corresponding Author Email:** muzamiljawad512@gmail.com

Leading crop simulation models used by a global team of agricultural scientists to simulate wheat production up to 2050 showed large wheat yield reductions due to climate change for Africa and South Asia, where food security is already a problem. Research trails was conducted to check the effect of different growth hormone on yield of wheat crop, because in current situation due to increase in population, we have to get maximum yield of staple crop by using minimum resources to meet the requirements of humans. Basically there was three treatments isabion, quants and MLE (moringa leaf extract) respectively are applied in 9 plots with the mingling of these hormone. isabion is a chemical with amino acid and peptide which promotes root growth and vigorous development of buds. Isabion is a result of transformation of natural collagen through a process that meets the highest standards of production and quality. Qantis is also bio stimulant and is combination of carbons, calcium and energy source carbohydrates, in the form of sugars and amino acids. MLE was prepared by myself (took leafs of moringa, freeze them at 5 centigrade for 10 hours and then grind them in grinder by using water is well). This promote wheat growth and productivity by affecting senescence and source sink relationship. The trial design was RCBD with the two verities Akbar and champion respectively. The variance was shown in height of plant and no of grains per spick as well because of application of isabion due to its good ingredients in this. The yield was very good because all three stimulants are applied smoothly and with fully guidance of supervisors. The results are also good but isabion remain incredible due to it has a capacity to absorb on the wheat when it applied. All them are good and have to use commercially for the good production of wheat crop.

Key words; food safety, growth hormone, isabian, quantas, MLE, senescence, source sink relationship, varieties, observations

Exploring The Effect of Synthetic Fertilizers on the Growth, Performance and Quality of Wheat

Sajid Hussain[*1,2], Muhammad Ramzan[*1], Sadia Afzal[1], Nabeel Arslan[1], Naseem Abbas[1] Ali Raza[1],Touseef Ahmad[1], Dilshad Hussain[1], Muhammad Sameed[1]

[1]*Department of Agronomy, Faculty of Agriculture, University of Layyah, Layyah, Pakistan*

[2]*Carbon Management and Sequestration Center, School of Environment and Natural Resources, 414B Kottman Hall, 2021 Coffey Road, Ohio State University, Columbus, OH 43210, USA*

[*]**Corresponding Author Email:** drsajidhussain@ul.edu.pk

The world is facingmany problems that are occurring day by day, by the change of climate. This is the really a big cause in decrease of productivity ultimately cause low yield which enhance the danger of food security. In the Asian countries which are under development like Pakistan their staple food is wheat but unluckily it's yield decreasing gradually due to many serious factors including inadequate supply of nutrients. According to recent reports the yield of wheat crop decreased up to 50% because of un-proper application of fertilizers. For the better improvement in increasing the productivity of wheat crop. A research trial was designed to investigate the integrated amount of nutrients on the quality and yield of wheat. The design was randomized complete block design (RCBD).The applied treatments were control,100%NPK (100:60:40), 125% NPK (100:60:40), 50%NPK (100:60:40)kg/acre along with 12 kg ha^{-1} Zinc in the form of zinc sulphate with 27% chelated zinc. The results including plant height, number of tillers, 1000 grain weight and grain yield obtained were found maximum and superior in experimental unit receiving maximum NPK and Zinc. While the quality traits among the seed were also higher in those experimental units which have maximum values of inorganic fertilizer and zinc. The result demonstrates that by the addition of macro-nutrients (NPK) with good ratio will make farmer wheat yield higher and more profitable. Similarly the BCR values for the treatment receiving 125% NPK (100:60:40) + $Znso_4$ were found 2.8:1.

Key Words: Fertilizer, N (Nitrogen), P(phosphorus), K(Potassium),Wheat, Yield, Quality

Analysis of antimicrobial effect of polyherbal formulations plants against multiple drug resistance enteropathogens

Nemrah hayat[*1], Nailaasmat[1] Nisar Ahmad[1] , Mubashir Hussain[2]

1. Department of Botany, Kohat University of Science and Technology, Kohat-26000

2. Department of Microbiology, Kohat University of Science and Technology, Kohat-26000

[*]**Corresponding Author Email:** nemrahhayat1999@gmail.com

Diarrheal disease remain a significant health challenge, particularly in regions with limited access to healthcare resources. In Pakistan, where diarrheal illnesses contribute to substantial morbidity and mortality, traditional herbal remedies offer a potential alternative for managing this condition. This study focuses on a polyherbal formulation comprising *Psidium guajava, Cymbopogon citratus, Plantago ovata,* and *Cinnamomum verum,* known for their traditional use in treating digestive ailments. Through scientific validation, this research aims to bridge the gap between traditional knowledge and modern evidence-based medicine. The selected plants formula were procured from local markets and subjected to methanolic extraction. Antidiarrheal assays were conducted against multidrug-resistant clinical isolates*Escherichia coli, Salmonella enterica*and*Shigella bodies* using agar well diffusion methods. Additionally, GC-Mass analysis was performed to identify the bioactive components of the polyherbal formulation. Results demonstrated significant antidiarrheal activity of the polyherbal extract against the tested pathogens. GC-Mass analysis revealed the presence of various bioactive compounds, indicating the formulation's potential therapeutic efficacy.

Keyword: Polyherbal formulation, *Psidiumguajava, Cymbopogoncitratus, Plantagoovata,* and *Cinnamomumverum,*Antidiarrheal activities, Phytochemical analysis.

Genetic Variability and Morphological Traits for Drought Resistance and Yield Enhancement in Wheat

Sami UlAllah[1], Sadia Zainab[1], Noor Ud Din[1], Shahzaib Saleem[1], Waleed Riaz[1],
[1]*PBG UL*
[*]**Corresponding Author Email:** sadiazainab51214@gmail.com,

Wheat (Triticumaestivum L.) is a crucial cereal crop globally, playing a vital role in food security and economic stability, especially in countries like Pakistan. However, the demand for wheat is rising due to population growth, necessitating a projected 50% increase in yields by 2050. This increase faces challenges, particularly from drought stress, which significantly impacts wheat growth, yield, and quality. Drought stress is particularly severe during critical growth stages like booting and anthesis, leading to yield losses and compromised grain quality. In Pakistan, where diverse climatic and soil conditions prevail, developing drought-tolerant wheat varieties is essential for sustaining agricultural productivity and ensuring food security. Environmental challenges, including drought, exacerbate the difficulties faced by wheat farmers, highlighting the need for drought-resistant varieties to maintain productivity. Galaxy-13, a drought-resistant wheat variety, has shown promise in mitigating the effects of drought stress on yield and water-related traits. Breeding programs focusing on enhancing drought tolerance in wheat, with an emphasis on traits like spike length, number of tillers, and spikelets per spike, can contribute significantly to meeting the rising demand for wheat products and ensuring agricultural sustainability in the face of environmental challenges. The research conducted during the 2022-2023 crop season underscores the importance of addressing drought stress in wheat cultivation and emphasizes the potential of drought-tolerant varieties like Galaxy-13 for breeding programs aimed at increasing yield stability and resilience.

Keywords: Wheat, Drought stress, Yield, Resistance

Unveiling the Pillars of Financial Stability:A Comprehensive Analysis

Ammara Munawar [1], Arooj Fatima[2], Shaheera Asghar[3]
[1]*Department of Business Administration, UNIVERSITY OF LAYYAH, Layyah, Pakistan*
[*]**Corresponding Author Email:** ammaramaher375@gmail.com

The aim of this study is to examine the complexity of financial stability, explain its principles and examine its effects on today's economy. Through an in-depth analysis it is aim to explore different aspects of financial stability, highlighting its important role in promoting sustainable development and reducing system risks. The qualitative approach will foster a better understanding of these dynamics by evaluating empirical data, theoretical frameworks, and policy efforts. A strong regulatory framework, effective risk management systems, transparent regulatory frameworks and flexible macroeconomic policies will become key elements supporting financial stability, which will be the focus of this research. Its goal was to reveal the synergy and integration of these elements, providing an understanding of how their combined power improves the overall business. This will also examine how the changing global economic environment, characterized by interconnectedness, is fostering an environment for financial security through emerging issues and trends. This research will be contributed to existing expertise by providing important insights into the determinants of financial stability and their impact on the right to design and implement. Overall, studies show that stable and balanced fiscal measures are needed to prevent risks and promote long-term economic growth.

Assessment of entomopathogenic fungi strains for a biological control against rhipicephalus microplus

Shahzeb, ShahidNiaz Khan[1], Mir Sadiq Shah[2]
[1]*Institute of Computing, Kohat University of Science and Technology, Kohat, Pakistan, Department of Zoology,*
[1]*University of Science and Technology,Bannu, Pakistan;*
[*]**Corresponding Author Email:** sadiq.shah@ustb.edu.pk

Ticks infesting cattle present significant threats to both animal and public health as vectors of various diseases.Rhipicephalusmicrophlus, a prevalent tick species in Bannu, acts as an ectoparasite primarily infesting small ruminants and capable of transmitting Theileria sp. and Babesia spp. In this study, we evaluated the pathogenic effects of both individual and combined infections of Beauveriabassiana and Metarhiziumanisopliae fungi on Rhipicephalusmicrophlus.The LC50 values calculated for ticks treated with B. bassiana, M. anisopliae, and a combination thereof were 5.7 x 10^4, 2.5 x 10^4, and 2.65 x 10^4 conidia per mL, respectively. Mortality rates ranged from 52 to 100 percent. Consequently, these results suggest a promising biocontrol strategy for Rhipicephalusmicrophlus. To keep in view the significance of biological agents, we strongly recommend investigating the resistance gene of the Rhipicephalusmicrophlus tick.

Species Distribution Modelling and Conflict with Humans of Wild Boar in the Southern Belt of Khyber Pakhtunkhwa

Inam Khan[1], Abdul Majid[1], and Muhammad Shehzad[1]
[1]*Department of Zoology, Kohat University of Science and Technology Kohat*
[*]**Corresponding Author Email:** inamkhan505@gmail.com

The wild boar is an important artiodactyl mammal, that belongs to the family Suidae; Genus *Sus*, is one of the most widespread mammal species in the world. Information on current and future potential distributionsof Wild Boar is necessary and useful for strategic management actions and conservation plans.In the present study, we predicted the distribution of *Sus scrofa*(Wild boar)associated with different environmental variables, and human-wild boar conflictin Southern Khyber Pakhtunkhwa. We used 40 presence points of the species from the field data, and environmental variables were extracted from freely available sources. Questionnaire based survey were carried out for human-wild boar conflict in the study area. Results indicate promising predictive power for both high resolution models (30m) for *Sus scrofa* with area under curve (AUC) test analysis of 0.859, respectively.The MaxEnt analysis showed that highly suitable habitats were present in southern regions of Khyber Pakhtunkhwa.The final five variables used in analysis were (i) BIO1Annual average temperature (56.5%) (ii) BIO4Temperature seasonality(1.2%) (iii) BIO12Average annual precipitation (4.3%) (iv) BIO15Seasonality of precipitation (3.6%), (v) BIO17Precipitation of the driest quarter of the year (5.4%), (vi) BIO19 Precipitation of the coldest quarter of the year (23.6), and DEM (5.5%) were identified as the main environmental factors that affect the habitat distribution of *Sus scrofa*. Almost all of the area was estimated to be suitable area for *Sus scrofa*, respectively.The results obtained from the questionnaire survey indicate that nearly everyone in the study area is familiar with or has observed wild boars. However, the nature of their conflicts with wild boars varies significantly. Most respondents reported crop damage, while others mentioned injuries, livestock predation, and property damage as the primary forms of conflict.The study conducted in Southern Khyber Pakhtunkhwa sheds light on the distribution of wild boars and the ensuing human-wild boar conflicts. It recommends several measures for effective management in the region, focusing on habitat management in the southern regions could help mitigate conflicts, necessitating habitat restoration and conservation efforts. Lastly, continuous monitoring and research are essential to adapt management strategies based on evolving dynamics of human-wild boar interactions in the area.

Keywords: Wild Boar, Environmental Variables, Human-Wild Boar Conflict, MaxEnt Analysis, Khyber Pakhtunkhwa

Molecular Phylogeny of the Genus Acanthodactylus from the Southern Region of Khyber Pakhtunkhwa, Pakistan

Kanwal Sajjad[1], Abdul Majid[1], and Muhammad Shehzad[1]
[1]*Department of Zoology, Kohat University of Science and Technology Kohat*
[*]**Corresponding Author Email:** kanwalsajjadktk@gmail.com

Acanthodactylus lizards are among the most diverse and widespread diurnal reptiles in the arid regions spanning from North Africa across to western India. The genus Acanthodactylus constitutes the most species-rich genus in the family Lacertidae, with over 40 recognized species inhabiting a wide variety of dry habitats. This study investigates the molecular phylogeny of this genus, based on the Cytochrome c oxidase subunit I (COI) gene for analysis. Visual encounter survey was used for specimen collection, followed by DNA extraction, PCR amplification and sequencing. Maximum likelihood method was used to construct phylogenetic tree. Notably, this research marks the new effort in applying COI gene analysis to the genus Acanthodactylus within Pakistan, filling a significant gap in scientific research. A total of 30 specimens were collected across the study area. Out of 30, six samples were successfully sequenced. Comparative analysis against the *Acanthodactylus boskianus* and the genus *Eremias* in Pakistan showcased a close genetic relationship, particularly with the species *Acanthodactylus cantoris*. We support most of the current taxonomic classifications and phylogenetic relationships, and provide genetic validity for most species. Moreover, this study represents the first-time calibration of molecular data within the genus Acanthodactylus in the region, enhancing our understanding of its evolutionary history.These findings hold promise for future molecular investigations, offering valuable sequences for further analysis and contributing to the broader understanding of reptilian phylogeny. To extend our understanding, it is recommended to conduct more comprehensive studies utilizing additional genetic markers, thereby elevating our knowledge of the evolutionary dynamics within the genus Acanthodactylus.

Keywords: *Acanthodactylus cantoris*, Southern Khyber Pakhtunkhwa, Visual encounter survey, Phylogeography, Taxonomy.

Trimetallic Co-Doped Graphitic Carbon Nitride as a Colorimetric Sensing Platform for Dopamine Biomarker

Nazish Aslam[1], Umar Nishan,[1]Amir Badshah[1],
[1]*Department of Chemistry, Kohat University of Science & Technology (KUST), Kohat-26000, Pakistan*
[*]**Corresponding Author Email:** nazishkhattak690@gmail.com;

Abstract: Dopamine is a catecholamine which is released by neurons that are widely distributed neurotransmitters in the central and peripheral nervous system. It plays vital role in the function of brain, body fluids of mammals, cardiovascular, hormonal, and renal systems. Its normal range in human blood is 1.3–2.6 μM is in healthy individuals. Normally it supports vital functions such as focus, intuition, inspiration, blood pressure and fine motor activity. While abnormal dopamine concentrations in the body can cause a range of diseases such as Alzheimer's disease, Parkinsonism, epilepsy and pheochromocytoma etc. In the current study, Trimetallic co doped graphitic carbon nitride based biosensor was developed to monitordopamine in blood serum samples from epilepsy patients. Different characterization techniques, were such as FTIR, SEM, TGA, EDX, elemental mapping, and XRD etc were used to characterize the prepared nanocomposite. In the presence of the fabricated Nano enzyme system, H_2O_2 can catalyze the oxidation of TMB with a transformation from colorless to blue-green color. This sets the platform for the sensing of the analyte (dopamine). The incorporation of dopamine to the sensor system results in the reduction of

the oxidized TMB to TMB_{red} with an optical change from blue-green to colorless. The change was visible to the naked eye and confirmed through a UV-Vis spectrophotometer. The report on the fine-tuning of the fabricated sensor various essential parameters were such as the amount the mimic enzyme, H_2O_2, pH, time, and TMB were optimized. At room temperature and at pH 6 the proposed sensor response time was just 2 minutes for dopamine detection. The proposed sensor has been successfully applied to epilepsy, patients' blood serum samples for dopamine detection with a visible colorimetric change.

Keywords: Trimetallic co doped graphitic carbon nitride, TMB, dopamine, colorimetric sensor.

Artificial intelligence integration in global technolohy management: Challenges and opportunities

[1]M. Riaz Khan Dasti, [2]Muniba Qayyum, [3]Soha Mustafa, [4.]Aelia Zainab, 5. Alisha Batool

Department of Education, BahauddinZakariya University Pakistan;
Department of English, University of Layyah, Pakistan;
[*]**Corresponding Author Email:** muniba.qayyum92@gmail.com

This research investigates the convergence of artificial intelligence (AI) and technology management on a global scale. It explores AI's profound impact on decision-making, resource allocation, innovation strategies, and operational efficiency across diverse industries and geographies. The study critically examines multifaceted challenges, including ethical considerations, data privacy concerns, workforce reskilling imperatives, regulatory frameworks, and socio-economic implications, offering actionable mitigation strategies. Conversely, it highlights AI's transformative potential for fostering innovation, enhancing competitiveness, addressing societal challenges, and driving sustainable growth. Through comprehensive analysis, real-world case studies, and empirical evidence, it elucidates how organizations can optimize processes, mitigate risks, and capitalize on emerging market trends through AI integration. Furthermore, the research explores AI's role in enhancing collaboration, driving digital transformation, reshaping business models, and promoting inclusive development. Ultimately, it underscores the importance of collaborative efforts among businesses, policymakers, academia, civil society, and international organizations to navigate AI's complexities effectively and drive sustainable value creation on a global scale.

Keywords: Artificial intelligence (AI), Technology management, Global context, Challenges, Opportunities, Innovation

Determining the efficacy of fungicides along amino acids to check the resistivity of wheat crop against rust attack in wheat

Sajid Hussain[*1,2],SadiaAfzal[*1], Dilshad Hussain[1], Muhammad Ramzan[1], Nabeel Arslan[1], Naseem Abbas[1], Muhammad SameedKhan[1], Touseef Ahmad[1], and Ali Raza[1]

[1]*Department of Agronomy, Faculty of Agriculture, University of Layyah, Layyah, Pakistan*
[2]*Carbon Management and Sequestration Center, School of Environment and Natural Resources, 414B Kottman Hall, 2021 Coffey Road, Ohio State University, Columbus, OH 43210, USA*
[*]**Corresponding Author Email:** drsajidhussain@ul.edu.pk

Wheat is grown worldwide for production system and significant proportion in whole agriculture system. During recent decade due to the abrupt changes in climate pattern our productivity decreasing day by day which enhance the risk of world food security. Wheat diseases particularly fungal diseases causing critical damages with significant economic losses. In developing countries like in Pakistan where staple food is wheat it's per acre yield declined due to many factors such as global warming, soil degradation and invasion of diseases. The current study aimed at investigating the impact of different fungicide products to enhance the immunity and productivity of wheat including growth and yield of wheat. A Randomized Complete Block Design (RCBD) was used for statistical

analysis at 5% probability level.To lessen the effect of rust at vegetative and reproductive stage of wheat. A well planned experiment was designed which had following treatment units Control, Netivo by Bayer Crop Sciences, tilt by Syngenta, Acrobat of FMC, and Yorker by Suncrop Sciences. The result showed that the (Tilt + Isabian) by Syngenta crop sciences showed outmost beneficiary results including resistance and immunity against rust and it also increase the growth and yield of wheat crop during both phases of life cycle. Use of (Tilt + Isabian) in combination enhanced the no. of seeds spike^{-1}, thousand weight of the grains along with the economic yield of wheat by 44, 14, and 24%, respectively than the control treatment. In crux, use of (Tilt + Isabian) might be a viable option to improve the productvity of bread wheat. The maximum BCR 2.5:1 was found in (Tilt + Isabian) as compared to 1.25:1 found in control. So it was concluded that (Tilt + Isabian) should be used as a preventive approach to control rust and as well as to enhance the productivity of wheat.
Key words: Wheat, Fungicides, Productivity, Nutritional Status, Quality, and Yield.

Evaluation of Growth Regulators on the Productivity and Quality of Wheat Under Semi-Arid Conditions of Punjab, Pakistan

Sajid Hussain[*1], Muhammad Sameed Khan[*1], Sadia Afzal[1], Muhammad Ramzan[1], Ali Raza[1], Touseef Ahmad[1], Nabeel Arslan[1], Dilshad Hussain[1], Naseem Abbas[1]

[1]*Department of Agronomy, Faculty of Agriculture, University of Layyah, Layyah, Pakistan*

[*]**Corresponding Author Email:** drsajidhussain@ul.edu.pk

As we know that the developing countries are facing severe food scarcity. The staple food of Asian countries including Pakistan is wheat. But unfortunately, the yield of wheat crop is not enough to meet the demand. The main reason is the application of traditional techniques of sowing wheat crop. An experiment was performed on rabi wheat cultivars in Hafizabad campus, University of Layyah, Punjab, Pakistan. The experiment was based on the foliar applications of different nutrients on different stages of crop. The experiment was based on three replications. The layout design was randomized complete block design (RCBD). The treatments include Control, spray of NPK at tillering stage (N_1), spray of NPK at booting stage (N_2), spray of NPK at milky stage (N_3), spray of amino acid + bio-stimulants at booting stage(N_4), spray of amino acids + bio-stimulants at milky stage(N_5) and boran spray(N_6).Statistically, significant results were found in those treatments which receive amino acids and bio stimulants at milky stage of the crop. The plant height, no. of tillers, 1000-grain weight biological yield and economic yield were significant in the said experimental units. The above mentioned treatments concluded that the yield of wheat crop enhanced upto 3.7 tons/ha than the actual (control) 1.7 ton/ha. The economic analysis shows significant results with the ratio of 1:2.5 which is very promotive and highly recommended to grow wheat with augmented supply of micronutrients at reproductive stage of the crop.

Keywords: Wheat, yield, foliar application, productivity.

Molecular characterization of fungal Pathogen Associated with Black Rot ofPumpkin

Sidra Hafeez[12], Luqman Amrao[1], Saba Aslam[1]

[1]*Department of Plant Pathology, Faculty of Agriculture, University of Agriculture Faisalabad, Faisalabad, Pakistan*

[2]*Faculty of Agriculture, University of Layyah, Layyah, Pakistan*

[*]**Corresponding Author Email:** sidrahafeez406@gmail.com

Pumpkin (*Cucurbita Pepo*) belongs to the *Cucurbitaceae* family, has higher nutritional value essential for food security. Pumpkin is an herbaceous vine and heat-sensitive plant, with a high concentration of active compounds like carotenoids, alkaloids and flavonoids. Black rotof pumpkin was first reported in Europe and United States in

1891. Small, water-soaked, dark-brown lesions appear and expand on fruit in severe cases. The infected leaf samples of pumpkin plants were collected from the vicinity of University of Agriculture, Faisalabad.Pathogen was isolated, purified on respective media, and morphologically identified by observing fungal growth pattern, growth color, spores shape, spores color, hyphal septation. For the confirmation of Koch's postulates, pathogenicity test was performed. Fungal genomic DNA was isolated by modified CTAB method and amplified Internal Transcribed Spacer (ITS) region using universal primers ITS1/ITS4. Phylogenetic analysis of amplified product revealed that *Didymella bryoniae* is associated with black rot of pumpkin in Pakistan.

Impact of Domestic Violence on Physical Health, Psychological Health and Social Life of women

Shajia Fatima[1]
[1]*Department of Education University of Layyah*
[*]**Corresponding Author Email:** fatimashajia4@gmail.com

A study on impacts of domestic violence on women was conducted. It was hypothesized that psychological health and social life of a woman is affected more as compared to physical health due to the domestic violence. This hypothesis was accepted. Moreover study focused on different forms of domestic violence committed against women namely physical violence, financial abuse, social and emotional violence. The results show that according to the opinion of people these forms of violence or abuse are common against women in our society; However people advocated the fact that only women are not the victim of domestic violence. A close ended questionnaire was used to get opinion of the people. A non-probability, purposive sample of N=173 comprising 49 married males and 124 married females, was taken. The sample was taken from the city of wahcantt. The data was analyzed by using SPSS. The average age of the sample was 35 years. This study will be helpful in making people understand all forms of domestic violence and its implications on social life as well as psychological and physical health of women.

Keywords: *domestic violence, physical violence, financial abuse, social violence, emotional violence.*

The effectiveness of foliar application of Zinc Sulphate on Antioxidant Defense mechanism, Productivity and Grain Quality of Wheat (*Triticum aestivum*)

Illyas Raza[1], Aqsa Mumtaz[1], Muntazir Mehdi[1], Mudassir Bashir[1], Junaid Zakaria Hashmi[1], M. Zain UlAbdin[1]
[1]*Agriculture College, University of Layyah*
[*]**Corresponding Author Email:** illyasraza810337@gmail.com,

Wheat serves as a fundamental dietary component in Pakistan and holds considerable importance within the nation's agricultural landscape. By incorporating zinc into wheat crops via foliar application, it's possible to combat diseases arising from zinc deficiency in food, especially considering widespread of wheat consumption as a staple in numerous nations. The field experiment was conducted in University of Layyah to check the effect of foliar application of zinc sulphate on ten different varieties at the same time. Treatment consisted of three zinc levels (control, 0.7% ,0.9%) in the form of Zinc Sulphate (10% Zn) applications were applied on various wheat varieties (Fakher-e-Bhakkar, Anaj-17, Dilkash, Akbar, Bhakar Star, Borlaug-16, Faisalabad-2008, Gold 16, Pakistan-13, Millet-11) at different growth stages (Booting and heading). This experiment was arranged in randomized complete block design. Results revealed that var. Akbar, Dilkash and Fakher-e-Bhakkar was best at 0.7% zinc application for more plant height, the number of spikelets, spike length, grain quality, 100-grain weight, biological and grain yield per plant as compared to other varieties and treatments. Antioxidants and nutritional quality showed variable behavior both on wheat varieties and zinc application. It is concluded that Akbar, Dilkash, and Fakher-e-Bhakkar was founded to be the most responsive cultivar at 0.7% zinc application for improvement in growth, yield related

traits and grain quality. So it is recommended for achieving maximum yield and yield related components and grain zinc contents of wheat under agro-climatic conditions of Layyah, Punjab Pakistan.

Keywords: Wheat,Zinc biofortification, grain quality,yield

Prevalence of post-traumatic stress disorder due to concussion and its association with its level of severity among footballers

Muhammad Noman Akhtar[1], Farukh Fiyaz[1], Nimra Sabir[1], Nimra Arif[1], Laraib Safdar[1]
[1]*The Physio College Multan*

Background: An anguishing event might cause someone to acquire post-traumatic stress disorder (PTSD), a mental health state. Concern over the frequency of post-traumatic stress disorder (PTSD) among football players, especially those who have had concussions, and its possible correlation with the severity of these injuries has grown in recent years.

Objective: To find the prevalence of post-traumatic stress disorder (PTSD) due to concussion and its association with its level of severity among footballers.

Methodology: A cross-sectional study was conducted among the footballers who had a concussion history. The study sample size was 141 footballers. Data was collected from Rivermead Post- Concussion Symptoms Questionnaire (RPCSQ) and Impact of Event Scale – Revised (IES-R) from selected population strictly meeting sampling selection criteria. SPSS version 25.00 was used to analyze the data.

Conclusion: This study had concluded that majority of the footballers had mild level of post- concussive symptoms and this post concussive symptoms causes mild level of post-traumatic stress disorder among footballers due to concussion. There was a significant association between post-traumatic stress disorder and post concussive symptoms severity.

Key words: Post-Traumatic Stress Disorder (PTSD), Concussion, Footballers, Prevalence, Severity, Traumatic Brain Injury (TBI)

Fabrication of manganese doped graphitic carbon nitride for colorimetric sensing of ascorbic acid

Raheed Ullah[1], Umar Nishan[1], Naeem Khan[1]
[1]*Dapartment of Chemistry, Kohat University of Science and Technology (KUST), Kohat-26000, Pakistan*
[*]**Corresponding Author Email:** raheedu164@gmail.com

Ascorbic acid (AA, also known as vitamin C) is a biological assistant factor and a vital antioxidant. It plays an important role in many biochemical processes. The maladjustments or deficiencies of the AA contents are associated with symptoms of some diseases, for instance, cancer and cardiovascular disease. In the present work, Manganese doped graphitic carbon nitride (Mn-g-C_3N_4) was prepared by a convenient hydrothermal route and are shown to possess oxidase-like catalytic ability. Different characterization techniques, such as X-ray diffractometry (XRD), energy dispersive X-ray (EDX), Fourier transform infrared (FTIR), and scanning electron microscopy (SEM), were used to confirm the prepared nanocomposite. They catalyze the oxidation of 3,3′,5,5′tetramethylbenzidine (TMB) by

dissolved oxygen to form a blue-colored product (oxTMB). AA can reduce blue oxTMB to colorless TMB. The fading of the blue color (measured at 652 nm) can be applied for quantifying AA in the range from 1 to 80 µM concentration range with a 0.16 µM detection limit and LOQ 0.53 µM and an R^2 0.99817, In addition, ascorbic acid was effectively detected in human plasma sample using the suggested biosensor. showed that Mn-g-C_3N_4 showed interesting applicability in biological areas due to its high stability, strong peroxidase-like activity, and ease of manufacturing.

Key words.Manganase doped graphitic Carbon,TMB,Ascorbic acid, Colorimetric Sensing

Antibiotics Resistance Patterns of Gram Negative Pathogens in Urinary Tract Infections among Patients in District Kohat: A Study on Aminoglycosides and Polymyxin B

Shaukat Khan[1], Waheed Ullah[1*]

[1]*Department of Microbiology, Kohat University of Science and Technology (KUST) Kohat, Khyber Pakhtunkhwa, Pakistan.*

[*]**Corresponding Author Email:** waheedullah@kust.edu.pk T: +92-3082021136 / 0336-9641180

Background: Urinary tract infection (UTIs) are a significant Global health concern, affecting around 250 million people annually and accounting for around 40% of all infections. With worldwide 150 million occurrences annually, UTIs are thought to be the second most prevalent form of infections. The *Enterobacteriaceae like Escherichia coli, Klebsiella pneumoniae and Enterobacter cloacae* are most frequently associated with UTIs. According to reports, around 85% of urinary tract infections obtained in the community and 50% of infections acquired in hospitals are caused by the most prevalent bacteria, Escherichia coli. These are pathogenic bacteria and can acquired resistant genes against various antibiotics.

Objective: This study aimed to isolate and identify Gram-negative bacteria from patients with infections of the urinary tract and to detect (mgrB) and (bla CTX-M) antibiotic resistant genes in Gram negative bacteria.

Methods: The patients with urinary tract infections who are hospitalized to KDA Hospital Kohat will have a mid-stream urine (MSU) samples taken through a sterile urine container. Samples were then transported to the Microbiology Research Laboratory for additional examination. Initially urine samples were inoculated on different nutrient media (Nutrient agar media, *MacConkey agar* media) and then incubated at 37℃ for 24 to 48 hours to get their colonies. After incubation, Gram-negative pathogens will be isolated through pure culturing techniques. Gram staining and biochemical characterization (TSI, catalase, oxidase, indole, citrate and urease test) will be perform for the identification of pathogens. Antibiotic sensitivity was determined using the disc diffusion method on Mueller-Hinton Agar plates, measuring the zone of inhibition.

Results: In urine samples which was collected from UTI patients, 12% and 9% of the isolates were identified as susceptible to *Klebsiella pneumoniae* and *Escherichia coli* respectively. Among these samples, pathogens are 100% resistant to streptomycin (aminoglycosides) and 80% to polymyxin B antibiotics respectively. The predominant resistant genes identified were mgrB and bla CTX- M which was detected in all of the isolates 100%.

Conclusions: This study demonstrates that urinary tract infections is a reservoir for multidrug-resistant Gram negative pathogens with high resistance rates observed against multiple antibiotics. The presence of the *mgrB and bla CTX-M* genes in all isolates highlights its significant role as a predominant antimicrobial resistance genes.

Keywords: Urinary Tract Infection, Antibiotic resistance, Global health concern, Gram Negative Pathogens

Combined effect of iron oxide nanoparticales and biochar on maize growth under chemium stress

Nargis Ara[1], Muhammad Jamil[1], Niaz Muhammad[1]

[1]*Department of Biotechnology, kohat university of science and technology, kohat*

Chromium (Cr) is a toxic heavy metal whose high concentration in soil badly affects plant growth, photosynthesis, and overall yield. Biochar and Iron Nanoparticales can strengthen the plant defense system against different abiotic stresses. This study examined the combined effect of Iron Oxide nanoparticles (Fe_3O_4 NPs) and Biochar, on Maize plants grown on chromium stress solution. Chromium stress reduced Maize growth, biomass, and chlorophyll contents by causing oxidative damage leading to overproduction of electrolyte leakage, and hydrogen peroxide. Iron Oxide Nanoparticales (Fe_3O_4 NPs) significantly improved plant growth, biomass, yield, and photosynthetic activity by enhancing the chlorophyll contents and alleviating oxidative damage. Application of Iron Oxide Nanoparticales (Fe_3O_4 NPs) also reduced the uptake and accumulation of Cr in the plants by increasing the bioavailability of micronutrients to the plant. The Iron Oxide Nanoparticales (Fe_3O_4NPs) decreased oxidative damage and enhanced the enzymatic and non-enzymatic activity in the plant to withstand Cr stress compared to the plants without Iron Oxide Nanoparticales (Fe_3O_4 NPs) treatments. The inoculation of Maize plants with the chromium stress further enhanced the positive impact of Iron Oxide Nanoparticales (Fe_3O_4 NPs) by transforming the toxic form of chromium (Cr^{6+}) into a less toxic form of chromium (Cr^{3+}).The Biochar and Iron Oxide Nanoparticales inoculation reduced Cr uptake by plants through adsorption of Cr ions, resulting in decreased chromium ion bioavailability. A 0.5% addition of biochar raised the soil's total organic carbon content by 23–30%. At chromium level 15 mg/kg, the foliar application of Iron Oxide Nanoparticales (Fe_3O_4 NPs) from 0.25 to 1M increased the total chlorophyll contents from 2.4 to 3.5. The application of *biochar* And Iron Oxide (Fe_3O_4 NPs) further enhanced the chlorophyll contents from 3.2 to 4.3, respectively. The current study suggested that combining effect of Iron Oxide (Fe_3O_4 NPs) and *Biochar* could be a viable strategy for reducing Cr toxicity and accumulation in Maize plants and most likely other plants.

Thiophene-Azomethine-Sulfone Linked Copper Oxide Nanocomposites: Synthesis, Characterization and Their Antimicrobial Activities

[1]*Aafia Wahab, [1]Ahtaram Bibi, [1]Naila Khalid, [1]Niaz Muhammad, [1]Hafsa Tabassum

[1]*Chemistry Department, Kohat University of Science and Technology, Kohat 2600, Pakistan*

Corresponding author Email: aafiawahab321@gmail.com.pk

Thiophene-incorporated sulfone-based composites integrated with copper oxide nanoparticles were synthesized and characterized *via* spectral analysis. The sulfone linked thiophene based additive (ST) was synthesized *via* condensation of 4,4'-diaminodiphenyl sulfone (DDS) and thiophene carbaldehyde. The polymer matrix and its composites were synthesized from diglycidyl ether of bisphenol A (DGEBA), DDS and ST (1-5, C1-C5) %. Each composite was checked for its thermal resistance, antimicrobial activity, and observed that composite C3 with 3 % additive exhibited relatively good antimicrobial activity and thermal stability. Therefore, C3 was used to prepare nanocomposites (NC1-NC5) by incorporation of 1-5 % copper oxide nano particles, characterized *via* spectral analysis and XRD diffraction. The study evaluates the influence of varying concentrations of copper oxide nanoparticles on the antimicrobial and thermal properties of the resulting nanocomposites. It was observed that the thermal stability increases linearly with the loadings of copper oxide nanoparticles. All the synthesized thiophene-copper oxide nanocomposites exhibited excellent antibacterial as well as antifungal activity against *streptomyces, bacillus subtilis, Candida albicans* and *Penicillium.*

The heterogeneous effect of technology and macroeconomic policies on financial market development

Farzan Yahya[1] Muhammad Waqas[2] Muhammad Hussain[3] Abdul Haseeb Tahir[4]

[1] *Nanchang Institute of Technology, Nanchang, China*
[2] *Jiangsu University of Science and Technology, Zhenjiang, China*
[3] *Xidian University, Xi'an, China*
[4] *Nanjing University of Science and Technology, Nanjing, China*
Corresponding Author Email: hussain.hed@stu.xidian.edu.cn Phone No: +92 3338830210

This study examines the heterogeneous effect of technological advancement, anti-monopoly policies, government transparency, and macroeconomic stability on financial market development. A panel data of 74 countries over the period 2007 to 2017 is selected. Based on simultaneous panel quantile regression (SPQR), the findings reveal that macroeconomic stability improves financial market development after the financial markets attain a certain level of efficiency (50th and 90th). Similarly, there is an asymmetric effect of antimonopoly policies on financial market development and a stronger effect is observed for intermediate markets. On the other hand, no significant effect of transparent government policy is indicated at any quantile. Lastly, the "noise trading" mechanism of technology advancement is demonstrated by SPQR estimations, especially for least and highly developed financial markets. These findings suggest that countries could attain financial market efficiency by implementing anti-monopoly policies so that corruption and bureaucratic power could be cramped effectively. Nonetheless, continuous monitoring is essential to sustain the value enhancing mechanisms for financial activities so that information asymmetry issues emerge from technology advancement and competition is avoided.

Keywords: "Financial market development" "Technological advancement" "Anti-monopoly policies" "Government transparency" "Macroeconomic stability" "Panel quantile regression"

Utilization of agricultural waste as construction material for sustainable development

Sajjad Ali Mangi [1], Shahid Hussain Channa [1], Sehrish Hafeez [1], Dildar Ali Mangnejo[1], Faheem Ahmed Soomro [2]
[1] *Department of Civil Engineering, Mehran University of Engineering & Technology, SZAB Campus Khairpur Mir's*
[2] *Executive Engineer (Civil), Khairpur Medical College, Khairpur Mir's*
Corresponding Author Email: Sajjad.nec@muetkhp.edu.pk

Agriculture plays very significant role in the socio-economic conditions of the country. Besides that, agricultural waste production is a global challenge and widely given serious attention. Researchers are intended to utilize agricultural waste as construction material and progressively being utilized because of growth in urbanization. To reduce environmental problems associated with agricultural waste, this study considered the utilization of agricultural wastes, such as sugarcane bagasse and rice husk into concrete to develop sustainable and environmental-friendly concrete. The sugarcane bagasse was processed through burning to get fine particles of ash and known as sugarcane bagasse ash (SCBA) and rice husk was also processed through brining to get the rice husk ash (RHA). This study considered 5% to 15% of SBCA and RHA individually to replace cement then combined use of both ashes as 10% to 30% replacement of cement. It was observed that the strength of concrete was reduced due to incorporation of SCBA and RHA individually and combined as cement replacement material cured up-to 90 days. This study concluded that the use of 5% SCBA and 5% RHA as cement replacement material individually and combined in concrete could deliver suitable outcomes for applications as construction material.

Keywords: Sugarcane bagasse ash, Rice husk ash, Cement, Compressive strength, splitting tensile strength.

Evaluate physicochemical parameters of water and its effect on aquatic life of River Indus

Muneeza Maheen[1], Najam un Nisa[2], Irum Habib[2*], Inam Ullah[2,3]

[1]*Department of Zoology, Faculty of Basic Sciences, University of Agriculture Dera Ismail khan, KPK, Pakistan*
[2]*Department of Zoology, Government Girls Degree College No. 2 Dera Ismail khan, KPK, Pakistan*
[3]*College of Wildlife and Protected Areas, Northeast Forestry University, No. 26, Hexing Road, Harbin 150040, P.R China*
Corresponding Author Email: aishatayyaba13@gmail.com

The present study aimed to evaluate the physico-chemical parameters of water and determine water quality which is marked as polluted and unfit for aquatic life of Indus River, Dera Ismail Khan, KPK. For this purpose, a four months' study was conducted from February to May 2023 on pre-selected three sampling sites i.e. SITE 1; Upstream (Himmat), SITE 2; Midstream (Shami Road) and SITE 3; Downstream (Parova) water of Indus River and samples were collected in sterilized bottle of polythene. Different physico-chemical parameters were determined to derive the water quality. The physico-chemical parameters such as Temperature (°C), pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Oxidation Reduction Potential (ORP), Total Hardness (TH), Calcium (Ca^{+2}), Magnesium (Mg^{+2}) Alkalinity and HCO_3 were monitored. The results revealed that physico-chemical parameters were recorded at all the sites. The means value of water quality parameters was recorded during each study months such as Alkalinity (171.5, 240.3, 196.6 and 254.03mg/L), total Hardness (423, 510, 400 and 643 mg/L), TDS (512, 692, 613 and 759mg/L) and Electrical Conductivity (795.66, 1052, 1115 and 1076µs/cm), Temperature (20.7, 23.8,29.5, and 35.2ºC), pH (7.46,7.56,7.53, and 7.3), ORP (-19, -30, -12, -18mV), Mg^{+2} (50.41, 82.62, 256.41 and 91.93 mg/L), Ca^{+2} (86.33, 68, 57.3 and 106 mg/L), Bicarbonate (209, 293.3, 240 and 310mg/L) respectively. The correlation matrix of water sample which shows very high positive correlation between HCO_3 and Alkalinity ($r=1.000^{**}$); TDS and EC ($r=0.959^{**}$); TH and TDS ($r=0.977^{**}$). While some water sample which shows negligible positive correlation between EC and Temperature (r=0.191); ORP and temperature (r=0.135); TH and Temperature (r=0.214); Mg^{+2} and Temperature(r=0.284); Ca^{+2} and Temperature (r=0.155); Alkalinity and Temperature (r=0.171); HCO_3 and Temperature (r=0.171); ORP and EC (r=0.060); Mg^{+2} and pH (r=0.067); Ca^{+2} and Mg^{+2} (r=0.032); Alkalinity and Mg^{+2} (r=0.019); HCO_3 and Mg^{+2} (r=0.019). Similarly, some low negative correlation is shown between ORP and pH (r=-0.425), while some negligible negative correlation is shown between pH and Temperature (r=-0.117); ORP and TDS (r=-0.050); TH and ORP (r=-0.155); Alkalinity and ORP (r=-0.184); HCO_3 and ORP (r=-0.185). The results of the water quality analysis revealed that the condition of water is unsuitable for aquatic life and human consumption due to addition of civic and industrial pollution. This issue needed to be resolved immediately with both public and private partnership.

Key words: Physico-chemical, Parameters , River Indus, Aquatic life, D.I. Khan.

The Impact of Personality Traits and Technology Self-Efficacy on Psychological Well-Being of Young Adults: Mediating Role of Facebook Addiction

Muhahammad Junaid[1], Adnan Sajjad[1], Muhammad Shahbaz[1] Ahmad Ali[1] *
Department of Applied Psychology - University of Layyah, 31200, Layyah. Pakistan
Corresponding Author: Ahmad Ali, sociologistlayyah@gmail.com

An individual's mental and emotional wellness is closely related to their physical health. The rise of social media addiction in recent years is a major threat to people's health and happiness. Objectives:

Therefore, the purpose of this study was to determine if Facebook addiction acts as a mediator between technology self-efficacy, psychological wellness, and personality factors.

A cross-sectional research approach was employed to enlist a total of 205 young individuals aged between 18 and 26 years. The Personality Big Five Inventory Questionnaire is a self-administered questionnaire that measures five personality traits: conscientiousness, agreeableness, extroversion, openness to experience, and neuroticism. The Technology Self-Efficacy Scale measured an individual's confidence and ability to use technology effectively. The level of Facebook usage in Bergen was assessed using the Facebook Addiction Scale. The Psychological Well-Being Scale assessed the level of mental and emotional health in adults. The hypotheses were tested using Product Moment Correlation and Bootstrapping techniques in SPSS and AMOS.

The outcomes validated the proposed model, demonstrating that conscientiousness, extraversion, agreeableness, and openness all counteract Facebook addiction. Furthermore, a clear positive link was found between psychological well-being and technological self-efficacy. Moreover, Facebook addiction negatively mediates the relationship between technical self-efficacy and mental health.

This study will be valuable for counselors who work with those addicted to social media, as it will provide insights into the specific personality types that are more susceptible to addiction and how this addiction impacts their overall well-being.

Effect of Compost and Peat Moss Growth and Flowering of Marigold (*Tagetes erecta* L.)

Usman Tariq[1], Zain Ul Abedin[1], Tahira Abbas[1], Umbreen Shahzad[1], Adnan Younis[2], Waqas Ahmad[1], M. Ammar Raza[1] and Umaima Amber[1]

[1]*Department of Horticulture, University of Layyah, Pakistan.*

[2]*Institute of Horticultural Sciences, University of Agriculture, Faisalabad, Pakistan*

Corresponding Email: drusmantariq@yahoo.com

Marigold (*Tagetes erecta* L.) is a widely cultivated ornamental plant used in landscaping, garlands, and cut flowers. The choice of potting medium is crucial for quality marigold flower production, as it must fulfill functions like providing water, nutrients, and gas exchange. This study aimed to assess the impact of compost and peat moss on enhancing soil properties and improving the growth and flowering of marigold. The research was conducted at the University of Layyah, Pakistan, from 2023 to 2024. Two marigold varieties, Inca Orange F1 and Inca Yellow F1, were grown in pots with six substrate treatments: silt (S), silt + peat moss (2:1 and 1:2), silt + compost (2:1 and 1:2), and silt + peat moss + compost (1:1:1). Morphological parameters, such as plant height, leaf number, and root-shoot ratio, as well as flowering characteristics, including flower number, diameter, and weight, were evaluated. The results showed that the treatment with compost and peat moss had a highly significant effect on plant growth and

reproductive performance. Maximum plant height was observed in both varieties under the silt + peat moss (1:2) treatment. Inca Orange F1 plants treated with silt + compost (1:2) produced the most flowers, while Inca Yellow F1 had the best results with silt + peat moss (1:2). The inclusion of organic amendments, particularly compost, likely provided additional nutrients that positively influenced the marigolds' overall performance. In conclusion, the application of organic growth substrates, such as compost and peat moss, effectively enhanced the measured plant characteristics, with compost yielding superior growth and flower parameters compared to peat moss. These findings emphasize the importance of finding the right balance and proportions of organic substrates to optimize the growth and flowering of marigold plants.

Keywords: Potting substrate, Compost, Peat moss, Marigold

Influence of Drought Stress on Growth and Flowering of Marigold (*Tagetes erecta* L.)

Usman Tariq[1], Umaima Amber[1], Umbreen Shahzad[1], Tahira Abbas[1], Adnan Younis[2], Waqas Ahmad[1], M. Ammar Raza[1] and Zain Ul Abedin[1]

[1]Department of Horticulture, University of Layyah, Pakistan.

[2]Institute of Horticultural Sciences, University of Agriculture, Faisalabad, Pakistan

Corresponding Email: drusmantariq@yahoo.com

Drought is a major abiotic stress that can significantly impact plant growth and productivity. This study aimed to evaluate the influence of drought stress on the growth and flowering characteristics of marigold (*Tagetes erecta* L.). A pot experiment was conducted using the Inca F1 variety, with four drought levels (T1: 7 days, T2: 10 days, T3: 12 days, and T4: 14 days) and a control (T0) treatment. The results showed that drought had a significant effect on various growth parameters. Plant height was maximized under the control condition (T0), reaching 21.5 cm, while the minimum height of 14 cm was observed in the T4 treatment (14-day irrigation interval). Root growth, as indicated by fresh and dry weight and root length, exhibited an increasing trend in the T4 treatment, suggesting improved root development under prolonged drought stress. The root-shoot ratio, an important indicator of plant health and stress avoidance potential, revealed that the overall maximum shoot fresh and dry weights were observed in the control condition (T0), with values of 7.31 g and 1.82 g, respectively. Among the drought treatments, T2 (10-day irrigation interval) performed better in terms of shoot fresh and dry weights. Regarding flowering characteristics, the maximum number of flowers was produced under the control condition (T0), indicating that regular irrigation had a positive impact on flower production. However, among the drought treatments, T2 (10-day irrigation interval) exhibited better performance in terms of flower production and flower fresh and dry weights, suggesting that a relatively longer interval between irrigation events can enhance flower development in marigold plants. These findings emphasize the importance of appropriate irrigation strategies in optimizing flower yield and quality in marigold cultivation, particularly under drought conditions. The T2 treatment (10-day irrigation interval) emerged as the most suitable compromise between plant growth, flowering, and water conservation.

Keywords: Marigold, Drought, Abiotic Stress

Phenotypic Characterization of Exotic Tomato Cultivars under Arid Conditions of Layyah

Mazhar Abbas, Muhammad Rizwan, Jawad Ali, Zeshan Hassan

Department of Plant Breeding & Genetics, University of Layyah, 31200, Layyah, Pakistan

Corresponding Author Email: zeshan.hassan@ul.edu.pk

Tomato is considered as a member of the family Solanaceae and its botanical name of tomato *Solanum lycopersicon*. It is among the most significant vegetable plants on the planet. Tomatoes are frequently used as a model in Plant Breeding & Genetics studies and its genome has already been sequenced. The tomato plant has numerous unique characteristics, including compound leaves, a sympodial branch, and juicy fruit. The majority of these characteristics are crucial for agronomy and cannot be examined in other model plant systems. In Pakistan, most of the tomato seeds are being imported due to less varieties being developed by the local Tomato breeders. The present study was conducted to for phenotypic characterization of Exotic Tomato cultivars under arid conditions of Layyah and their seeds were obtained from the Centre for Genetic Resources, The Netherlands. 15 cultivars were sown in RCBD design in walk in Plastic tunnel settings and compared to two local check varieties. The cultivar Cromco gave maximum yield potential per plant. The cultivar Nunhems Tucqueen has maximum no. of clusters per plant and no. of fruits per clusters, Allround also gave maximum no. of clusters per plant. The Muchamiel cultivar has maximum plant height. The cultivar Floradel has very good taste. The cultivar Pusa Ruby given very good attraction. The cultivar Muchamiel has good fruit width. The cultivar Tres Cantos Fito has good fruit length. In conclusion, most of the exotic cultivars were adapted to local conditions and substantial variation in numerous yield and yield related traits was observed which will help to develop a local tomato breeding programme.

Keywords: Tomato Breeding, Yield and Yield related traits, adaptability, variation.

Evaluation of Genetic diversity in cotton genotypes by using morphological traits

Sadia Zainab[1], Iqra Javed[2], Umar Farooq[3]

[1]*Department of Plant Breeding & Genetics, University of Agriculture Faisalabad, Pakistan*

[2]*University of Bradford United Kingdom*

[3]*University of Layyah, 31200, Layyah, Pakistan*

Corresponding Author E.mail: sadiazainab51214@gmail.com

Cotton is the most important crop for the fiber industry, it contributed 55% to export earnings. Cotton is a cash and fiber crop that runs the fiber industry of the whole world and contributes to national economy. Fiber industry is flourished by the production of quality cotton fiber. High production of cotton is needed to meet the demand and supply of cotton because of the increasing population. Breeder's efforts are continued to overcome this challenge. To improve export industry, we need to improve the fiber qualities of cotton along with high yield. An experiment on cotton was conducted for this purpose in field area at the University of Agriculture, Faisalabad under randomized

complete block design with two replications. And these genotypes were evaluated in the summer season 2020 at maturity through different parameters like plant height, number of bolls, sympodial and monopodial branches, boll size, lint weight, fiber length, seed weight, fiber strength, number of seeds per plant, fiber fineness and ginning out turn. Data were recorded for yield and fiber related traits. Collected data were analyzed statistically for analysis of variance and path coefficient analysis that used for assessment of relation of traits. Results from ANOVA revealed that genotypes exhibited significant differences for all traits. Correlation analysis revealed that lint weight positively correlated to sympodial branches and number of bolls per plant and negatively to number of seeds per plant. Path analysis results revealed highest direct effect of number of bolls and fiber fineness on lint weight. From all these analysis results revealed that CYTO-179 and CYTO-124 were best performing varieties among others for yield and J.S. was poor performing variety as compared to others.

Keywords: Cotton, Genetic variability, Fiber traits, yield

Distribution, Population, Habitat utilization, and threats to *Alectoris chukar* in district kohat

Arshad Iqbal[1], Shehzad Zareen[1], Abdul Rehman[2], Anam Bi Bi[1]
1Department of Zoology, Kohat University of Science and Technology, Kohat, KPK, Pakistan.
2Department of Microbiology, Kohat University of Science and Technology, Kohat, KPK, Pakistan.
Corresponding Author Email: arshad.kustian@gmail.com

The *Alectoris chukar*, renowned for its agile flight, is a prevalent game bird commonly inhabiting rugged terrains, demonstrating adaptability across various environments such as grasslands and open forests. This study investigates the population, distribution, habitat preferences, and threats to the *Alectoris chukar* in the study area district Kohat, KPK, Pakistan, during the time span of five months, from January to May 2024, through extensive fieldwork and questionnaire surveys. Data collection for this study involved two main approaches. Firstly, primary data was gathered through a questionnaire survey and on-site visits to the study areas. These visits were conducted during specific time intervals, in the early mornings from 4 to 7 AM and evenings from 5 to 10 PM, for the observation of habitat characteristics and the various activities within the study areas. Secondly, secondary data was obtained from existing literature sources. The whole study area were divided into four zones A, B, C, and D these zones were further divided into different localities. Total 246 Alectrios chukar were seen in four Zone. Highest number of Alectrios chukar were seen in Zone D 109 consisting of seven localities. Zone B had second highest number of *Alectoris chukar* 74 consisting of ten localities. 51 *Alectoris chukar* were seen in Zone C consisting of six localities. 12 *Alectoris chukar* were seen in Zone A consisting of eight localities. Alectoris chukar thrives in rocky terrain with shrubby vegetation, including Acacia arabica, Acacia modesta, Dodonaea viscosa, and diverse grass species. Threats such as overgrazing, grass cutting, landslides, hunting, shooting, capturing, digging, and road construction endanger the survival of Alectoris chukar by harming their habitats. Conserving Alectoris chukar in the study area entails protecting habitat, regulating hunting, managing predators, monitoring populations, engaging communities, and conducting research and conservation projects.

Key Words *Alectoris chukar,* food preference, distribution, population, threats

Exploring tolerable and sensitive canola varieties for cultivation with PB contaminated municipal wastewater by using irrigation dilution technique

Hafeez Ullah[1], Nosheen Noor Elahi[1*], Muhammad Imtiaz[2]

[1]Institute of Botany, Bahauddin Zakariya University Multan, Punjab, Pakistan [2]Soil and Environmental Biotechnology Division National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Punjab, Pakistan
**Corresponding author's email: nosheenilahi@yahoo.com*

Agriculture and food security are seriously threatened by water shortage, a worldwide problem that is quickly becoming more of a concern in many countries. By reducing water shortages and enhancing soil fertility by recycling nutrients and organic matter found in the wastewater, using municipal wastewater as an irrigation source offers the potential to address this issue. However, the high contamination of heavy metals in such wastewater is also a major concern for its usage. Despite ongoing efforts to treat municipal wastewater for agricultural use through physical, chemical, and biological methods, the use of dilution techniques remains a crucial area of study. It can minimize the toxic concentration of heavy metals in municipal wastewater via the dilution effect. In this regard, a laboratory screening experiment was conducted to determine the effectiveness of municipal wastewater irrigation (WWI) on the growth of 15 varieties of canola plants. The diluted WWI was applied at a rate of control (no wastewater and 1000 ml of tap water), 20%, 40%, 60%, 80%, and 100%. The findings showed that Punjab Canola and Dunkeld seedlings had the best growth outcomes at all irrigation levels. On average, 60% of WWI emerged as the optimal dilution for enhancing canola seedling's growth and minimizing stress caused by contaminations in WWI. CON-III and AC Excel were found to be more sensitive to stress, while Punjab Canola and Dunkeld showed resistance to 100% WWI. Further investigation under pot and field conditions is required to determine the best varieties of canola and to declare 60% WWI as the appropriate dilution for using municipal wastewater as irrigation.

Key words: Irrigation; Growth attributes; Antioxidants; Dilution technique; Canola.

Investigating *Lactobacillus* strains from *Apis mellifera* gastrointestinal tract as potential poultry probiotic

Sarwat Jabeen, Syed Ishtiaq Anjum[2], Abdul Rehman[2], Jadoon Khan[3]

[1]Deparment of Zoology, Kohat University of Science and Technology Kohat Khyber Pakhtunkhwa Pakistan;
[2]Department of Microbiology Kohat University of Science and Technology Kohat Khyber Pakhtunkhwa Pakistan ;
[3]Department of Health Technologies IQRA University Islamabad

Background: Microorganism with highest probiotic potential like Lactobacillus species catch one's attentions because of its tremendous functional properties, its active involvement in promotion of public health, improved digestion and boosting immune system. The gut of *Apis mellifera* contains a lot of probiotic microorganisms that could positively influence the gut microbiota of poultry chicken, contributing to improved nutrient absorption, digestion, immune system and overall health.

Aim: The current study aimed at Investigating *Lactobacillus* strains from *Apis Mellifera* Gastrointestinal Tract as Potential Poultry Probiotics

Methods: A total of 200 bees belonging to *Apis mellifera* species were collected. The whole gut (esophagus to rectum) were acquired with aseptic excision. Microbiological culture of the digestive tract samples was performed followed by phenotypic profiling, a preliminary detection bile and acid tolerance followed by probiotic potential on chicken gut in-vitro.

Results: The results obtained showed a total of three (03) isolates of *Lactobacillus* spp. including L. *salivarius* (11 colonies), *L. crispatus* (03 colonies), and *L. acidophilus* (63 colonies). Similarly, two (02) isolates belonging to *Enterococcus spp. including E. faecalis (04 colonies) and Enterococcus faecium (06 colonies) were also isolated and identified. The entire isolates showed greater probiotic potentials through various invitro tests. Additionally, the use of entire isolates on the gut of chicken for probiotic potential found marvelous results.*

Conclusion: Conclusively, this study demonstrates the safety and probiotic potential of all five *Lactobacillus* strains associated with gut of *Apis mellifera* which showed that these isolates are safe with much probiotic potential on gut of chickens. Future research ought to assess the possibility of improving growth of poultry chickens.