



BOOK OF ABSTRACTS

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International Conference on Science and Technology (ICST-23) Bhakkar

Editor Inchief: Dr. Azhar Rasool

Editors: Dr. Muhammad Kabir, Dr. Sadaf Javaria

Co Editors: Dr. Javed Iqbal, Dr. Sadaf Shakoor

Composing & Designing: Ms. Musarrat Rasheed

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Table of Contents

Introduction About Conference	14
Organizing Committee	15
Effect of Tungsten carbide Nanoparticles on Pulmonary Toxicity: A Systemic Review	20
Cyclooxygenase Inhibitory Activity of secondary metabolites from <i>Medicago laciniata</i>	20
Evaluation of anti-bacterial activity of isolated compounds from parthenium hysterophorus	20
photoluminescent investigation of terbium doped $\text{Li}_6\text{Y}(\text{BO}_3)_3$ Phosphors	
Intelligent e-Learning System for Adaptive Learning and Course Recommendations Using Multi-Agent Approach and Deep Reinforcement Learning	21
Photoluminescent investigation of terbium doped $\text{Li}_6\text{Y}(\text{BO}_3)_3$ Phosphors	21
Enhancement of lab-grown beef cultured meat by genome-edited livestock cells	22
Opportunities and challenges for large-scale production and market adoption of cell-cultured lab-grown meat	23
Influence of meat consumption on creatinine levels and kidney health, and the potential remedy of aloe vera juice	23
Evaluation of cell type dependent transfection efficiency of nanocarriers	24
Study of hematological and biochemical changes in children suffering from measles in district Bannu	25
Antileishmanial potential of plant extracts and isolated compounds from <i>Anchusa arvensis</i>	26
Efficacy of <i>Metarhizium anisopliae</i> against wheat aphid species in field conditions	26
Tea saponins as surfactants and its potential role in food; a concurrent review	26
Evaluation of Diversity of Aphids in Agro-Ecosystem in Relation to Changing Environment	27
Chlorpyrifos Residue Analysis in Cottonseed Oil	27
<i>Asparagus gracilis</i> : A Source of Natural Antileishmanial Compounds	28
Purification of natural cyclooxygenase-2 inhibitors from the fruit of <i>olea ferruginea</i>	29
Nexus of Animal Health and Global Well-being: Challenges and Pandemic Preparedness	29
Reducing the Air Pollution by Using Different Emerging Techniques; A Mini Review	29
Consequences of neglected skincare, exploring the pathogenesis of diseased & damaged dermis; a critical review	30
Water contamination by pesticides & the assistance of nanotechnology in their degradation; a critical review	31
Balancing safety and ethics in artificial intelligence	31
Effect of Loneliness on Quality of Life and Life Satisfaction among married and unmarried women	32
Economic and Nutritional Value of Sesame Seed Cultivation: Unveiling the Hidden Treasure of the Plant World; a critical review	32
Effects of Lactic acid on skin	33
The Impact of microplastic pollution on aquatic life.	34
Ecological Effects of Wind Storm on Different plant species in Thal Desert Bhakkar; a critical review	34
Water Depletion by Anthropogenic Activities, its Effects & Solutions; a critical review	35
Ozone layer depletion in Stratosphere by Environmental Pollution, its impact on Human Life and its Solution	35
Harsh climatic conditions of Bhakkar and their solution	36

International Conference on Science & Technology (ICST-23) Bhakkar

Chief causes and outcomes of water defiling and slumping occurring globally and consequences on forthcoming future; a critical review	37
Edible coating and food shelf life, special emphasis on the evaluation of chitosan-based nano emulsion blended with clove oil on postharvest preservation of strawberry fruit at various temperatures	37
Local vegetation of Thal desert: <i>Tamarix dioica</i> adaptation to local vegetation and its economic impacts; a critical review.	38
The interplay of carbon dioxide emissions and forest degradation: a vicious cycle	39
Characterization and optimization of probiotic bacteria encapsulation efficiency via sodium alginate-based encapsulation	39
Causes and Repercussions of urbanization on environment; a critical review.	40
Deficiency of rainfall due to lack of plantation, it's drastic consequences and change in local weather conditions	40
Acid rain and its deleterious effects on environment	41
Oceans in Crisis: The Growing Threat of Plastic Pollution	42
Biomolecular Harmony: Understanding Life's Choreography	42
The influence of sugar mill wastes on local plant development; a critical review	43
Economic Impact of Agriculture in Pakistan; the major problems in Pakistan's Agricultural practices and their solution	44
Global warming as a public health crisis all over the world: a critical review	44
Destructive impacts of environmental pollution on roadside plants; a critical review	45
Epigenetics, A savior of plants against abiotic stress	45
Ionic liquids and their applications in medicine and pharmaceuticals	46
Unveiling the Profound Impact of Chromosomal Deviations on Human Health and Development: A Mini Review	46
Effect of elicitors on the suspension cultures of <i>Ginkgo biloba L.</i> for terpene trilactones and flavonoids production	47
Agrobots: why develop; Beneficial role	48
Synergistic Interactions between Humans and Wildlife, Potential for Enhancing Ecological Chains and Ecosystem Resilience	48
Conservation of Biodiversity; the Importance of Protecting and Preserving Various Species and Ecosystems to Maintain Ecological Balance	49
Revolutionizing Urban Agriculture: The Promises and Hurdles of Tissue Culture	49
Synthesis of Novel Sultam derivatives through Transition Metal Catalyzed Late-Stage C-H Bond Functionalization	50
The Healing power of plant therapy Or Simple Path to Wellness	50
Effect of population explosion on the Natural Resources and their solution; A Critical Review	51

International Conference on Science & Technology (ICST-23) Bhakkar

Antioxidants	51
Chemical composition and selected biological activities of the essential oil from <i>Nepeta lagopsis</i> Benth.	52
Green Synthesis of Metallic Nanoparticles and Their Potential Applications to Treat Cancer	52
Gastrointestinal issues and natural healing	53
Nutritional and therapeutic properties of camel milk	54
The effects of environmental degradation on wildlife; critical a review	54
Food preservation and food packaging, recent developments, and future challenges	55
Management of resources with increasing population	55
Oxidative stress and Inflammation in metabolic syndrome	55
Plant Disease Detection and Management in the Era of Emerging Technologies	56
Deforestation and its control to make the Environment healthy	57
Effects of Polluted Water on the Growth of Plants and their Solution	57
The Energy Transition: Exploring Renewable Solutions for a Sustainable Future	58
Argan tree cultivation can address climate change and assist viable development, A Critical Review	58
Role of soil organic Matter in soil fertility and plant health; critical review	59
Causes of Acid Rain and its Effects on the Health of Plants and its Solution	59
Medicinal and economic review on <i>Eucalyptus camaldulensis</i> and its effect on agriculture crops and water: Critical review	60
Exploring the Hidden Alliances: Plant-Microbe Symbiosis Unveiled	60
Black Soldier Fly (<i>Hermetia illucens</i>), A novel insect as a tool for organic waste management	61
From Impact to Innovation: Mitigating Environmental Damage with Green Technology	62
Quantum Entanglement in Quantum Networks for Secure Communication: A Mini Review	62
Effects of polluted water on agriculture and its solution; A Critical Review	63
Electronic garbage and the disposal of electronic garbage	64
Increase in Global Population: Causes, Effects and Plans for Future	64
Causes and effect of Overpopulation on Biodiversity and Conservative	65

International Conference on Science & Technology (ICST-23) Bhakkar

Efficacy of Topical Retinols in Acne Treatment: A Comprehensive Review	65
Crystal Field Theory (CFT)	66
Causes, impacts and solution of rapidly increasing environmental pollution in changing climate of Pakistan; A critical review	66
Chemistry, Pharmacology, Medicinal Property of Sage (<i>Salvia</i>) to Prevent and Cure illnesses such as Obesity, Diabetes, Depression, Dementia, Lupus, Autism, Heart, Disease and Cancer	67
Recent Applications of Machine Learning in Medicinal Chemistry	68
Stress Reducing Effect of Indoor Plants	68
Practical use of Bio luminance in Daily life, to reduce the use of light as possible at Night	69
Effects of fertilizer 'use on the natural nutrients of soil and crop yield; a critical review	70
Impacts of Invasive Plants on Soil Fungi and Implications for Restoration; a critical review	70
Impacts of invasive Species on Native Ecosystem: Ecological Consequences and Management Strategies	71
The fossils oil energy effects on the environment; A Critical Review	71
Toxicity profiling and antimicrobial activity of <i>Zea mays</i> husk mediated synthesis of zinc sulphide nanoparticles	72
A Transparent Partnership between Blockchain and the Environment; A unique review	72
Synergetic effect of dietary calcium and phosphorus on the growth performance and hematology of <i>Ctenopharyngodon idella</i>	73
Characterization of Genetic Variance in <i>Mystus seenghala</i> Populations of River Jhelum Revealed by Molecular Markers	73
Impacts of plastic pollution on the soil, water, animals and human life, critical review	74
Isolation, characterization, and cytotoxic activity of secondary metabolites of <i>euphorbia serpens</i> kunth against the human hepatocarcinoma cell	74
Prevalence and genetic characterization of <i>Toxoplasma gondii</i> active infection in cats of District Kohat	75
Antileishmanial and antioxidant activity of organotin (iv) complex of oxygen nitrogen donor ligand	76
Synthesis and characterization of azomethine-sulfone linked titania- nanocomposites as antimicrobial coating.	76
Kinetic Alfven waves in spin polarized quantum plasma	77
Impact of social anxiety and resilience on subjective happiness among adolescents	77
We live in need in years	77
Impact of <i>Melia azedarach</i> leaf extract on <i>Cyprinus Carpio</i> growth, Immunity, and hematological profile	78
Biodiversity loss and Species extinction due to environmental pollution and their Preservation; A critical review.	78

International Conference on Science & Technology (ICST-23) Bhakkar

Fundus Image Assessment Using Quaternion Valued Singular Decomposition Method	79
Phytoremediation an emerging clean and green technology for polluted environment. A concise review	80
A DFT computational design and exploration of the novel Perovskites for eco-friendly power production schemes	80
Sustainable Energy Storage; LC as Electrode Material	81
Functional Analysis of Phytochrome A and B1B2 variants in Tomato Under Heat Stress	81
Causes, effect and treatment of plant disease by using technology	82
Climate change and its effect on biodiversity: Mitigation and adaptation strategies	82
Challenges in international human rights law enforcement	83
Investigation of gamma-ray and neutron shielding characteristics of thallium-tellurite glasses using fluk monte-carlo code	84
The Role of Greenery in Climate Change Mitigation	84
Biodegradable Plastics: A Way to Reduce the Impact of Plastic Pollution on Environment	85
The Impact of Climate Change on Plant Adaptation Strategies	85
Static and Dynamic Properties of Bose-Einstein Condensate	86
Structural Refinement of Naturally Synthesized Cadmium Selenide Nanoparticles for Ablative Laser Propulsion Applications	86
Comparative Study of CdSe and CdO Nanoparticles Influenced by Laser Ablation Propulsion	87
A Coherent Analysis of Bessel-Riesz Operators Boundedness in Companato Spaces	87
The Japanese art of Bonsai tress	87
Global Climate Change, Its Impact on Plant Diversity, and Its Mitigation	88
Holography: Principles, Applications, and Future Prospects	89
Science and Technology	89
Environmental Pollution	90
Photosynthesis in plants: opening the secrets of nature's energy harvesting process	90
Feeding the World: Biotechnology and Genetic Engineering's Impact on Food Security	91
Causes and effect of Genetically modified Organism (GMO) Food on Human	92

International Conference on Science & Technology (ICST-23) Bhakkar

Lead free indium-silver and thallium-silver based double-perovskites for thermoelectric and photovoltaic applications: A first-principles study of structural, optoelectronic and thermoelectric properties	92
The Impact of Climate Change on Biodiversity (Both Natural and Managed)	93
Population Pressure: Unraveling the Environmental Consequences of Overpopulation, a rare review	93
Science in Media and Popular Culture	94
MINI SPY WIFI CAM ROBOT: Principle, Application, Working	94
Generation of Dynamical S-Boxes using Super Singular Elliptic Curve	95
Join the Green Movement and Stop Pollution	95
Obstacle Avoiding Robot: Principle, Application, Working	96
Triggered Surveillance Home Automation: Principle, Application, Working	96
Green synthesis of zinc oxide and Cu-Doped zinc oxide photocatalysts for degradation of methylene blue	97
Artificial Intelligence Advancements and Their Applications in Physics	97
Physics Beyond the Blue Planet: Space Exploration Unveiled	98
Reshaping Residences: The Confluence of Home Automation, Smart Gardening, and Solar Tracking	98
Cryptography (Application using matrices)	99
A Comprehensive floristic Review of Thal desert	99
A numerical method based on quadrature rules for Ψ -fractional differential equations	100
Physics in climates change	100
Development and Characterization of Different Concentration of Pear Based Bread	100
Inflationary Parameters and Swampland Conjectures in Various Scenarios of Gravity	101
Optical Coherence Tomography (OCT): Innovations in Medical Imaging	101
MXenes: The Emerging Two-Dimensional Materials for Multidisciplinary Applications	102
Quality Of Relationship, Impact of Social Media Usage & Marital Satisfaction in Married Couples	102
Finding the voltage and resistance of a circuit by using linear equations	103
Solar cells and Renewable energy resources	103
Balancing Chemical Equations (using matrices)	104

International Conference on Science & Technology (ICST-23) Bhakkar

Harnessing the Power of Physics in Medicine: A Comprehensive Review of Multifaceted Applications in Healthcare, with Emphasis on Advances in X-ray and MRI Technologies	104
A Neutrosophic Approach to the Transportation Problem using Single-Valued Neutrosophic Z Numbers	105
Traffic Flow (Application using matrices)	105
Electrical Networks using matrices	106
Reducing Plastic Pollution by Using the 3Rs Method and its benefits to combat Greenhouse Gas emission; A Mini Review	106
Levitating into the Future: High-Temperature Superconductors and Innovation	107
Cryptology (Application uses in data protection)	107
Computed Tomography	108
Nanoparticles and Nanomaterials	108
CdO nanoparticles enhanced laser ablation propulsion	109
Application of linear algebra in computer graphics	109
Technological Advancements in Agriculture: A Focus on Precision and Smart Farming	109
Nuclear energy	110
Young's double slit experiment	110
Antioxidant potential of ready to serve drink prepared using Roselle (<i>Hibiscus Sabdariffa</i>) extract	111
Statistical Analysis for Scientists and Engineers: A Comprehensive Overview	111
Mathematical Approach to Control the Infectious Diseases	112
Policy Approaches to Combat Deforestation	112
The Impact of Artificial Intelligence on Global Healthcare	113
Evolution of plants	113
Artificial intelligence (AI)	114
Properties and reactivity of plasmonic photocatalysts with Engineered interface	114
Linear Algebra's Transformative Role in Shaping Electrical Networks	115

International Conference on Science & Technology (ICST-23) Bhakkar

Impact of Perfectionism, Perceived Stress and Academic Performance among College Students	115
Objectification Leads towards Cosmetic Usage and Body Satisfaction	116
Perceived Social Support and Illness Perception in Cardiac Patients Mediating role of Psychological Morbidity	116
Topological Pumping in an incommensurate Aubry-André Harper Model	117
Impact of stigmatization, care giving burden and relationship adjustment in female schoolteachers	117
Impacts of Parental Bonding on Academic Performance and Self-Esteem of School Students	118
Impact of Mindfulness on Mental Toughness and Anxiety in University Teachers	118
Species Distribution Modelling of <i>Laudakia nupta</i> in Southern Khyber Pakhtunkhwa	119
Impact of perceived social support on life satisfaction and self-efficacy among young adults	119
Impact of loneliness and suicidal ideation on decision making among love failure young adults	120
Impact of emotional intelligence and personality traits on academic achievement among college students	120
Impact of Psychological Morbidity, Mindfulness, and Illness Appraisal in Diabetic Patients	120
Identification of Natural Compounds as Inhibitors of Pyruvate Kinase M2 for Breast Cancer Treatment	121
Self-Efficacy, Need for Achievement and Machiavellianism in Public Sector Employees	121
Gut Microbiota Physiological and Biochemical analysis and their role in diseases of district Kohat population	122
Quran offers a unique perspective on science and technology	122
A Novel Distachionate from <i>Breynia distachia</i> Treats Inflammations by Modulating COX-2 and Inflammatory Cytokines in Rat Liver Tissue	123

International Conference on Science & Technology (ICST-23) Bhakkar

Introduction About Conference

ICST-23 brings together scientists, researchers, civil society representatives, youth, journalists, Private Organizations representatives and Professionals in-person and online to discuss the science and technology, During the event, experts from around the Country gather to discuss a range of issues regarding Science & Technology Fields.

The goal of **ICST-23** 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.

ICST-23 will offer participants the opportunity 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 several 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.

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ICST-23 ABSTRACTS

Effect of Tungsten carbide Nanoparticles on Pulmonary Toxicity: A Systemic Review

Muhammad Umer Farooq Mujahid¹

¹University of Health Sciences, Lahore

Background: Acute or chronic nanoparticle contact is the primary health risk, particularly while working. The pulmonary system is among the major entry points for nanoparticles, making it a plausible site for nanoparticle aggregation. Tungsten exhibits genotoxicity independent of dose with a lack of inflammation.

Objective: Nanotoxicological research has witnessed a vertiginous rise recently. This review aims to systemically review the effect of tungsten carbide nanoparticles on Pulmonary Toxicity.

Materials & Methods: This article employs systematic evaluation criteria. Thus, the selection criteria for the systematic review were developed after the finalization of the leading search terms. Inputting complete keywords into Google Scholar and other databases yielded 12084 articles. Google Scholar found 2509 entries for grey literature. During the preliminary inspection, 10034 of 10087 were eliminated. According to the PRISMA rules, 53 papers qualified for the study, but 29 were excluded, leaving 24 for the examination.

Results: It was shown that human lung epithelial cells exhibited clear chromatin condensation, loss of organelle integrity, a significant rise in the number of vesicles, and splitting of extracellular lysosomes after exposure of U397 Cells to Tungsten Carbide Nanoparticles. All of these things are manifestations of damage to cells. The cytotoxicity of nano-WC suspension has been verified using an LDH assay on living cells.

Conclusion: A drop in W6+ might reduce damage to cells and increase cell viability, indicating that W6+ was cytotoxic. Moreover, a reduction in W6+ via the ion chelator (EDTA-2Na) minimizes cytotoxicity, indicating that W6+ discharged from nano-WC is a potential reason for cytotoxicity.

Keywords: Nanotoxicity, Tungsten Carbide Nanoparticles, Pulmonary Toxicity

Cyclooxygenase Inhibitory Activity of secondary metabolites from *Medicago laciniata*

Uzifa Shinwari^{1*}, Mansoor Khan¹, Syed Majid Shah²

¹Department of Chemistry, Kohat University of Science and Technology, Kohat, Khyber Pakhtunkhwa, Pakistan

²Department of Pharmacy, Kohat University of Science and Technology, Kohat, Khyber Pakhtunkhwa, Pakistan

*Corresponding author's email: zefishinwari@gmail.com

Plants are a gift from the Almighty Allah and are used not just for food but also for treatment. The plant *Medicago laciniata*, often known as cut leaf medick, is a member of the Fabaceae family. It is a perennial herb that branches from the base. The plant was previously used as an antidiabetic, anti-inflammatory, and abortifacient. The most effective fraction evaluated against COX-2 enzyme was the *Medicago laciniata* ethyl acetate fraction. Inhibition percentage of this fraction was 70% in contrast to 82% for Diclofenac, a common standard drug. The existence of many compounds in this fraction could be the cause of the notable activity. In order to show the plant potential for reducing inflammation, the current research was designed with the aim to isolate and characterize compounds from the bioactive ethyl acetate fraction and assess their Cyclooxygenase-2 (COX-2) inhibitory effect. The plant was collected, dried, and macerated to obtain the tested fraction. With the aid thin layer and a column chromatography, **U1** compound was purified with solvent system i.e; 2% ethyl acetate-*n*-hexane. Compound structure and COX-2 inhibition research is ongoing. The investigative attempt might result in the discovery of natural anti-inflammatory substances from *Medicago laciniata*.

Keywords: *Medicago laciniata*, Secondary metabolites, Cyclooxygenase Inhibitory Activity

**Evaluation of anti-bacterial activity of isolated compounds from parthenium hysterophorus
photoluminescent investigation of terbium doped Li₆Y(BO₃)₃ Phosphors**

Farah Deeba^{1*}, Mansoor Khan¹, Syed Majid Shah²

¹Department of Chemistry; ²Department of Pharmacy, Kohat University of Science and Technology, Khyber Pakhtunkhwa, Pakistan

*Corresponding author's email: farahdeeba083@gmail.com

Plants can produce a wide variety of bioactive molecules and a rich source of pharmaceuticals. Plant extracts and phytochemicals with antimicrobial properties have immense potential to control plant and animal diseases. Plant-derived antimicrobials represent a huge untapped source of drugs, even though they have great remedial and efficacy in the treatment of infectious diseases. The purpose of this study is to isolate compounds from methanolic extract of *Parthenium hysterophorus* and to evaluate their anti-bacterial potential against bacterial strains *Escherichia coli* and *Pseudomonas aeruginosa* causing bacterial diseases. The plant was collected from District Kohat and dried under shade at 25°C, and the ground obtains a fine powder for extraction. 30g of Shade dried plant powder was macerated in methanol for 7-14 days (about 2 weeks). The filtrate was then evaporated by rotary evaporator under reduced pressure and controlled temperature thus obtained crude extract. Current results confirmed the presence of pure compounds through Column chromatography and thin layer chromatography. Further characterization of pure compounds will be done including NMR, FTIR and UV etc.

Keywords: Anti-Bacterial, *Parthenium hysterophorus*, pure compounds

Intelligent e-Learning System for Adaptive Learning and Course Recommendations Using Multi-Agent Approach and Deep Reinforcement Learning

Samina Amin^{1*}, M. Irfan Uddin¹, Wali Khan Mashwani²

¹Institute of Computing, Kohat University of Science and Technology (KUST), Kohat 26000, Pakistan.

²Institute of Numerical Sciences, Kohat University of Science and Technology (KUST), Kohat 26000, Pakistan.
(walikhan@kust.edu.pk)

*Corresponding author's email: Samina Amin (kustsameena@gmail.com)
(kustsameena@gmail.com, irfanuddin@kust.edu.pk)

With the rapid innovation of information technology, e-Learning (EL) has promptly become a necessary platform for knowledge acquisition. The surge of Massive Open Online Course (MOOCs) forums, including edX, Udemy, Udacity, and Coursera, etc. are the recent innovations of this EL development. Many students in the modern era of technology rely heavily on EL education. Finding relevant study materials on the internet might be difficult due to their size and dynamic nature. Students frequently find it difficult to locate appropriate content that fits their learning requirements. To address these challenges, it is necessary to develop an intelligent learning system using the multi-agent approach, which automatically tracks the factors, which influence learning in various EL scenarios and then updates recommended course content from one learner to the next. Furthermore, this paper aims to propose a novel EL system using Deep Reinforcement Learning (DRL) based algorithm Deep Q Network (DQN) with multi-agent capability for adaptive learning and recommend the most suitable course content. The course contents are recommended to the learner based on their preferences, interests, and competency level. The experiments are conducted by designing an environment based on states (learners) and actions (courses). The suggested DQN model is rigorously trained across 1000 episodes, and it is then assessed using the major evaluation metrics namely precision, hit rate, recall, Normalized Discounted Cumulative Gain (NDCG), and f1-score. The experimental findings demonstrate that the proposed DQN achieved better performance in terms of average precision, NDCG, hit rate, recall, f1-score, and precision of 0.956, 0.932, 0.972, 0.5, and 0.66, respectively. This study is inspired by the need for smart learning to make the students independent learners by limiting information overload and avoiding frustration and disengagement in EL scenarios.

Keywords: Deep reinforcement learning; multi-agent; adaptive learning; e-learning; MOOC; recommender system.

Photoluminescent investigation of terbium doped Li₆Y(BO₃)₃ Phosphors

Muhammad Faeem*, Fawad Ullah*

**Department of Physics, Kohat University of Science & Technology, Kohat-26000, Khyber Pakhtunkhwa, Pakistan*

Revealing the hidden potential within luminescent materials stands as a crucial endeavor to propel modern technological advancements. This abstract embarks on a captivating journey into the realm of photoluminescence, with a special focus on the captivating attributes of terbium doped $\text{Li}_6\text{Y}(\text{BO}_3)_3$ phosphors. In my investigation entails meticulous scrutiny and comprehensive analysis, unraveling the intricate mechanisms governing their emission of photons. This research not only demystifies the core principles underlying photoluminescence but also lays the foundation for groundbreaking innovations in domains such as lighting, displays, and sensor technologies. In this study offers a thorough exploration of the photoluminescent characteristics exhibited by terbium doped $\text{Li}_6\text{Y}(\text{BO}_3)_3$ phosphors. These distinct luminescent behaviors hold significant potential across various applications within optoelectronic devices. My research is centered on unraveling the fundamental mechanisms underpinning the photoluminescence process, thereby enhancing our understanding of energy transfer and radiative transitions occurring within the crystal lattice. Through a comprehensive blend of spectroscopic analysis, material synthesis, and characterization techniques, basically provide insights into the efficiency and spectral attributes of the emitted photons. This study not only deepens our comprehension of terbium-doped phosphors but also offers valuable insights for designing improved luminescent materials with enhanced performance. The primary objective of the study is to unveil the foundational principles contributing to the luminescent attributes of these phosphors.

Keywords: Electronic structure photoluminescent properties $\text{Li}_6\text{Y}(\text{BO}_3)_3$: Tb^{3+} Phosphors, LED, Chromaticity, Emission, and X-ray

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Enhancement of lab-grown beef cultured meat by genome-edited livestock cells

Samran Khalid^{1*}, Ayesha Jahangeer¹, Abdul Mueez Ahmad¹, Syed Ali Hassan¹, Sumbal Raana¹, Muhammad Tanveer¹, Muqaddas Zahid¹

¹National Institute of Food Science and Technology, University of Agriculture Faisalabad, 38000, Pakistan

*Corresponding author's email: samrankhalid08@gmail.com

Lab-grown meat, also known as cultured meat or cell-based meat is produced by in-vitro cultivation of animal cells. Instead of raising and slaughtering animals, this meat is created by taking a small sample of cells and then cultivating these cells by using various techniques in a controlled environment. In this research transgenic bovine cells with increased proliferation and differentiation rates using Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) Cas9 gene editing were generated, resulting in noticeably better meat output yields. The myostatin and p21, two genes that, when knocked out, prevent muscle growth, were targeted by ribonucleoproteins, and transfected into isolated bovine myoblasts. The edited cells were single cell cloned, and sequencing was used to check for gene knockout. In 2D and 3D hydrogel cultures, the growth kinetics, alignment, expression of muscle

protein, and meat protein yields of edited clones were compared to those of wild-type cells. To facilitate the accelerated growth of altered cells, bioreactor settings were improved. Myostatin/p21 knockout bovine cell lines showed 1.5-2X increased proliferation rates and 1.3-1.5X increased differentiation rates compared to wild type ($p < 0.01$). By day 5, altered lines showed myosin-heavy chain and muscle-specific protein expression. With modified cells, edible protein output in 3D culture reached 25 mg/mL after 10 days, a 45% improvement over wild type. Whole genome sequencing revealed no off-target mutations. CRISPR-mediated knockout of myostatin and p21 accelerates cultured meat production by mimicking double muscling in cattle. This genome editing approach could enable major scale-up advancements in cultured beef, dramatically improving commercial viability.

Keywords: Bovine cells; Edited cells; Genome editing; Lab-grown meat; In vitro cultivation; Wild type cells

Opportunities and challenges for large-scale production and market adoption of cell-cultured lab-grown meat

Samran Khalid^{1*}, Abdul Mueez Ahmad¹, Ayesha Jahangeer¹, Sumbal Raana¹, Muhammad Tanveer¹, Sara Amin¹, Abuzar¹

¹National Institute of Food Science and Technology, University of Agriculture Faisalabad, 38000, Pakistan

*Corresponding author's email: samrankhalid08@gmail.com

Cell-cultured meat offers huge benefits for sustainability because it eliminates meat production from animals that require long spans. The early breakthroughs in small-scale production have shown technical viability, but overcoming scale-up and affordability issues is necessary to reach the full potential. Innovative companies have displayed cultured beef, poultry, and seafood prototypes made from fish and animal cell lines. The current R&D focuses on bioprocess enhancements to boost protein production and cell density while reducing input needs. The construction of specialized large-scale cultured meat production facilities might start within a decade, because of considerable improvements in bioreactor efficiency and supply logistics. A major difficulty for large-scale production is scaling up bioreactors for industrial levels with cost-competitive output. To supply raw materials, growth factors, and nutrients in large enough quantities, an end-to-end supply infrastructure must be in place. The availability in the market is now constrained by production costs. The price barriers must be overcome to fulfill the sustainability promise of cultured meat. Additionally, regulatory structures that allow bringing novel foods to market must be established. The consumer acceptance of lab-grown meat is less because of various social, ethnic, and religious factors, so these problems must be addressed for the widespread acceptability of this meat. Despite all of these challenges, forecasts indicate that production costs will decrease 5-10 times, possibly providing cost parity with traditional meats. Technology development will probably be accelerated through strategic alliances across the food industry. By 2040, cell-cultured beef may account for 5-15% of the global meat market if public acceptance increases. Unlocking the full potential of this technology requires ongoing investment, solid strategic alliances, and favorable regulatory and governmental practices. If stakeholders continue to work to make cell-cultured meat commercially viable, it is likely to become a major source of protein for humans.

Keywords: Bioprocess; Bioreactors; Cell cultured meat; Growth factors; Lab grown meat; Traditional meats

Influence of meat consumption on creatinine levels and kidney health, and the potential remedy of aloe Vera juice

Sumbal Raana¹, Samran Khalid^{1*}, Ayesha Jahangeer¹, Abdul Mueez Ahmad¹, Syed Ali Hassan¹, Sara Amin¹, Muqaddas Zahid¹

¹National Institute of Food Science and Technology, University of Agriculture Faisalabad, 38000, Pakistan

*Corresponding author's email: samrankhalid08@gmail.com

Global meat consumption is very high because of its nutritional importance, serving as a rich source of vital proteins and micronutrients. Nevertheless, immoderate ingestion, particularly of red meat, has been linked to heightened creatinine levels due to its metabolic transformation during culinary preparation. Elevated creatinine levels can cause potential kidney strain or diminished renal function. The escalation of intraglomerular hypertension resulting from elevated dietary protein content can potentially precipitate renal impairment and proteinuria. Aloe vera is famous for its anti-inflammatory, antioxidant, and antibacterial attributes, and holds potential for reducing urea and creatinine levels. This remedial potential can be attributed to the presence of bioactive compounds, including polysaccharides and anthraquinones, which contribute to its therapeutic effects. In this study, four distinct treatments were meticulously evaluated. The first, a control group, assessed the effects of a balanced diet, serving as a comparative baseline. Subsequently, the high-meat diet group explored the effects of escalated meat consumption on creatinine levels and kidney function. The third treatment involved aloe vera supplementation, aiming to discern the protective role of this botanical agent. Lastly, the combined intervention group sought to investigate the potential of aloe vera to lessen the kidney strain induced by heightened meat intake. The creatinine level measurement tests were performed on the blood or urine samples of participants. The glomerular filtration rate (GFR) calculation and blood urea nitrogen (BUN) measurement were conducted to evaluate overall kidney function. The results showed that aloe vera supplementation could lead to reduced creatinine levels, reflecting its potential kidney-protective properties. By combining dietary, nutritional, and botanical dimensions, this study delves into the intricate symbiosis between meat consumption, creatinine levels, renal health, and the prospective utilization of aloe vera supplementation. As the nuanced effects of meat consumption on creatinine levels, the latent therapeutic role of aloe vera surfaces as a promising avenue for the management of kidney health, potentially mitigating the adverse impact of excessive meat consumption.

Keywords: Aloe vera juice; Creatinine levels; Kidney health; Meat consumption; Renal function

Evaluation of cell type dependent transfection efficiency of nanocarriers

Samia khan^{1*}, Zia Ur Rehman¹, Saad Ullah khan¹, Noor Muhammad¹

¹*Department of Biotechnology & Genetic Engineering, Kohat University of Science & Technology, Kohat 26000 Khyber Pakhtunkhwa, Pakistan*

*Corresponding author's email: samiaokz8991@gmail.com

Transfection, an important technique in modern genetic research and therapy, enables the introduction of foreign genetic material into eukaryotic cells, offering insights into cellular activities, disease processes, and gene therapies. This study explores the efficiency of transfection techniques, particularly focusing on two main categories: viral and non-viral vectors. Viral vectors utilize genetically engineered viruses to deliver DNA, although with limitations such as immune response activation, oncogenicity, and restricted cargo capacity. To overcome these issues, chemically produced non-viral vectors have emerged as adaptable, immune-stimulating-reduced alternatives. Non-viral vectors typically bind electrostatically with DNA to form complexes, with lipid-based and polymer-based nanocarriers being prominent examples. While lipid-based nanocarriers self-assemble into liposomes, polymer-based ones form complexes with nucleic acids, facilitating cellular uptake and preventing degradation.

Effectiveness of transfection is influenced by vector characteristics, complex formation, cellular entry methods, and intracellular delivery. Additionally, cell-specific transfection capacities vary, influencing gene therapy applications. This study aims to compare transfection efficiency across different cell types using nanocarriers. Human hepatocellular carcinoma (HUH-7) and human non-small cell lung cancer (H1299) cells will be employed for a comparative transfection study. Specifically, the study focuses on two nanocarriers: linear polyethyleneimine (LPEI) and Lipofectamine 2000 (LF2000), evaluating their performance in gene delivery. By analyzing nanocarrier-DNA binding and shielding capacities, the study seeks to enhance understanding and possibly develop more effective

nano vehicles for gene therapy applications. The research holds potential to advance gene therapy, especially for cancer treatment, by targeting specific cell types more effectively.

The research objectives encompass investigating nanocarrier transfection efficiency, comparing performance across cell types, and identifying factors influencing cell type-dependent transfection. The methodology involves plasmid identification, human cell culture, nanocarrier complex preparation, transfection, and transfection efficiency assessment using fluorescence microscopy. The study anticipates contributing to the knowledge of nanocarrier efficiency, promoting the way for improved gene therapy strategies.

In conclusion, this research aims to shed light on the intricate mechanisms of transfection and nanocarrier-mediated gene delivery. By expanding our understanding of these processes, it has the potential to refine gene therapy approaches, ultimately benefiting patients and advancing the field.

Keywords: transfection, gene delivery, nanocarriers, cell types, gene therapy.

Study of hematological and biochemical changes in children suffering from measles in district Bannu

Asia khan^{1*}, Abdul Majid¹, Malik Nawaz Shuja², Noor Ul Akbar¹

¹Department of Zoology, Kohat University of Science and Technology, Kohat 26000 Pakistan

²Department of Microbiology, Kohat University of Science and Technology, Kohat 26000 Pakistans

*Corresponding author's email: asiawazirbannu@gmail.com

Background: Measles, or rubeola, is a highly contagious and potentially severe viral respiratory infection caused by the Paramyxovirus family. It poses a significant public health threat in Pakistan, primarily affecting children under five, with potential complications including pneumonia, encephalitis, and blindness.

Methodology: This study aimed to assess the prevalence of measles and its impact on hematological and blood biochemistry profiles. Data from 128 subjects, encompassing apparently healthy individuals and clinically infected children across different age groups in Bannu district, were collected. Blood samples were aseptically obtained from both current and past cases, using vacutainer tubes with and without EDTA as an anticoagulant. EDTA-containing whole blood samples were used for hematological analysis, while EDTA-free samples were centrifuged to isolate serum, stored at sub-zero temperatures biochemical analysis.

Results: WBC in the case group was significantly lower than that in the control group ($p=0.011$). Besides, hemoglobin ($p<0.001$), hematocrit ($p<0.004$), MCV ($p<0.004$), MPV ($p=0.002$) and PLR ($p=0.011$) were significantly lower in the case group than those in the control group while the values of lymphocyte ($p=0.004$) were higher in the case group, bilirubin ($p=0.0003$), creatinine ($p=0.0003$) were increased in measles patient than control group.

Conclusions: In summary, this study's findings indicate that measles infection induces substantial alterations in hematological and biochemical markers, potentially contributing to the development of efficient methods for rapid measles diagnosis and identification

Keywords: Measles; Children; TLC; PVC; MCHC; Blood

Antileishmanial potential of plant extracts and isolated compounds from *anchusaarvensis*

Abubakar Saddique^{1*}, Naeem khan¹, Sajid Hussain², Syed Majid Shah³

¹Department of Chemistry, Kohat University of Science and Technology, Khyber Pakhtunkhwa, Pakistan

²Department of Pharmacy, Kohat University of Science and Technology, Khyber Pakhtunkhwa, Pakistan,

*Corresponding author's email: abubakarsaddique125@gmail.com

All around the world, medicinal herbs have been utilized to cure a variety of illnesses, including leishmaniasis. The goal of the present investigation was to assess the antileishmanial efficacy of herbal extracts and purified *A. arvensis* compounds. Plant was obtained from District Karak, Khyber pakhtun khwa Pakistan. Following plant identification, it was air-dried, finely powdered, and extracted using a maceration technique. Metanolic extract's in vitro antileishmanial activity will be assessed. In contrast to the reference medication, which has an IC₅₀ of 13.78, there will be antileishmanial activity (IC₅₀ = 14.68). tresearch findings showed that methanolic extract has the ability to have an antileishmanial impact and can be further examined.

Keywords: *Leishmaniasis*, *Anchusa arvensis*, Antileishmanial activity.

Efficacy of *metarhizium anisopliae* against wheat aphid species in field conditions

Iqra Yousaf^{1*}, Mariam Fatima², Muhammad Sufian², Muhammad Faisal²

¹Department of Zoology, University of Agriculture Faisalabad, ²Department of Entomology, University of Agriculture Faisalabad

*Corresponding author's email: agrarian.201418@gmail.com

Aphid is a serious pest that causes severe losses to many agricultural crops both qualitatively and quantitatively. Traditionally aphids are controlled by using different pesticides on different agricultural crops which results in health hazards and residue problems. Use of bio-control techniques can be helpful for the treatment of aphid pests especially in wheat where pesticides may be a serious threat for them. In the current study, efficacy of *Metarhizium anisopliae* was studied against different aphids in field conditions. Different concentrations of *Metarhizium anisopliae* $1 \times 10^8 \text{ ml}^{-1}$, $1 \times 10^7 \text{ ml}^{-1}$, $1 \times 10^6 \text{ ml}^{-1}$ were applied on wheat crop against wheat aphids. Two factorial Randomized complete block design (RCBD) was used with four treatments and four replications, and each treatment was applied homogeneously in all the blocks simultaneously. The sampling was done by fixed sampling method and four samples were taken from each block. Data was collected before the application of fungus. After treatment, data was collected from day 4 to day 8. Treatments were applied 3 times within 10 days of interval. In first application of *Metarhizium anisopliae*, the highest mortality rate was observed at the concentration of $1 \times 10^8 \text{ ml}^{-1}$ when there was 81% on day 7 and minimum mortality was observed at the concentration of $1 \times 10^6 \text{ ml}^{-1}$ when there was 38% on day 8. In the second application, the maximum population reduction was observed at the concentration of $1 \times 10^8 \text{ ml}^{-1}$ when there was 94% on day 8 and minimum mortality was observed at the concentration of $1 \times 10^6 \text{ ml}^{-1}$ when there was 51% on day 4. In third application, the maximum population reduction was observed at the concentration of $1 \times 10^8 \text{ ml}^{-1}$ when there was 84% on day 8 and minimum mortality was observed at the concentration of $1 \times 10^6 \text{ ml}^{-1}$ when there was 9% on day 6. There was no significant mortality recorded in control conditions. The study was useful for the future sustainable management of aphid species on wheat crops.

Keywords: Aphid, *Metarhizium anisopliae*, Wheat, Biocontrol, Natural Environment

Tea saponins as surfactants and its potential role in food; a concurrent review

Sadaf Javaria¹, Musarrat Rasheed^{1,2*}, Muhammad Umair³, Anila Aslam^{2*}, Suriya Manzoor⁴

¹Institute of Food Science and Nutrition, Gomal University, Dera Ismail Khan, Pakistan

²NUR International University, Lahore, Pakistan

³Pir Mehr Ali Shah- Arid Agriculture University, Rawalpindi, Pakistan

⁴ Department of Computer Sciences, Thal University Bhakkar, Bhakkar-30000, Punjab, Pakistan

*Corresponding author's email: musarratrasheed3999@gmail.com

Saponins have drawn a lot of interest in recent years. As versatile glycosidic chemicals, saponins and their derivatives are essential in the food, agricultural, and pharmaceutical sectors. They can be used in traditional therapies, as a natural food additive, or in a variety of pharmaceutical applications. With just a few negative effects like cytotoxicity, they have enormous therapeutic promise as hypolipidemic, hypoglycemic, anti-asthmatic, antioxidant, anti-hypertensive, and anti-microbial agents. The need for saponins surged as a result of these newly discovered qualities, and researchers now stress the need for synthetic saponin production in addition to natural saponin production to satisfy demand. Processing methods have a substantial impact on the content and bioavailability of saponins in food due to the changes they make in the connections between aglycones and sugar chains. As a result, an effort has been made to inform the customer of the possible health advantages of consuming this mystical substance. This paper offers a succinct and current summary of saponins, their industrial applications, health issues, and the impact of various processing techniques.

Keywords: saponin applications, therapeutical use, industrial use

Evaluation of Diversity of Aphids in Agro-Ecosystem in Relation to Changing Environment

Sehar Fatima^{1*}, Mariam Fatima¹, Muhammad Sufian¹

¹Department of Entomology, University of Agriculture Faisalabad.

*Corresponding author's email: agrarian.201418@gmail.com

About 5000 species of aphids have been documented worldwide, however nine species are prevalent in ecosystem of Faisalabad. Accurate aphid diversity is affected by biotic and abiotic factors. Increase in CO₂ indirectly affects the plant feeding insects and also causes an increase in temperature. Change in temperature causes the effect on biology of aphid species and disrupts the dynamics. Increase in temperature may or may not change the diversity abundance of aphids. Aphids are not only affected by temperature, but also change in landscape due to different agricultural practices and atmospheric pollution. A study was conducted to evaluate the diversity of aphid's population affected by different environmental factors in three crops wheat, canola, and maize in an area of Pakistan, Punjab, Faisalabad. Samples were taken from three crops wheat, canola, and maize by using different tools and methods. Collected specimens were preserved in 70% alcohol and identified the collected specimens with the help of taxonomic keys, result shows there were four species on wheat crop (*Schizaphis graminum*, *Rhopalosiphum padi*, *Rhopalosiphum maidis* and *Sitobion avenae*), two aphid species on canola crop (*Rhopalosiphum padi* and *Rhopalosiphum maidis*), one aphid species on maize crop (*Rhopalosiphum maidis*). Abiotic factors (temperature, humidity, and rainfall) were also determined at each sampling date on each crop. The results revealed that the increase in population densities of aphid species started in the 1st week of February. Aphid population densities were increased by increasing vegetative growth and population was at its peak during the mid of March due to suitable temperature. Highest increase in temperature lowers the aphid population abundance minimum temperature also decreases the aphid population. *S. graminum* were dominant than *R. padi*, *R. maidis* and *S. avenae* in wheat crop *R. padi* than *R. maidis* were dominant in canola crop, in a comparison in relation to wheat, canola and maize *R. maidis* were dominant in wheat crop than canola and maize respectively.

Keywords: Aphid, Abiotic factors, Wheat, Canola, Maize

Chlorpyrifos Residue Analysis in Cottonseed Oil

Mariam Fatima^{1*}

¹Ecotoxicology Research Program, Institute of Plant & Environmental Protection (IPEP), NARC, Islamabad.

*Corresponding author's email: agrarian.201418@gmail.com

Chlorpyrifos, a widely used organophosphorus pesticide, has raised concerns due to its potential adverse effects on human health and the environment. Cottonseed oil, a common cooking and food processing ingredient, may be at risk of contamination with chlorpyrifos residues. This study was conducted at NARC, Islamabad and presents a comprehensive analysis of chlorpyrifos residues in cottonseed oil samples, aiming to assess the extent of contamination and its implications for food safety. A systematic sampling strategy was employed to collect cottonseed oil samples from various sources, including agricultural regions, processing plants, and retail outlets. The samples underwent rigorous extraction and analytical procedures to quantify chlorpyrifos residues. The identification and confirmation of selected analytes were carried out with GC- μ ECD equipped with HP-532°C fused-silica capillary column. In order to determine the chlorpyrifos residues in cottonseed oil, the oil was spiked with the known concentration of the pesticide at two different levels. The spiking level was 0.5 ug/ml and 1 ug/ml respectively. The data was retrieved from the Agilent GC Software. The areas of the blank and spiked samples were plotted against the concentration to get the matrix matched calibration curve. R² value of 0.9981 indicated that the results are very accurate. The corresponding concentration for each cottonseed oil sample can be determined through the regression equation $y = 77518x + 5721.1$. The results revealed the presence of chlorpyrifos residues in a subset of cottonseed oil samples, indicating potential contamination during the production or processing stages. Results also showed that a very small area and subsequently concentration close to zero of the blank sample validates our clean up method. It means that our clean-up method was very good resulting in the least interference from the matrix. The average recoveries of the chlorpyrifos at the two spiked levels were 105% and 98 % respectively. These recoveries were within the range of the Guidance Document of European Union for method validation procedure for pesticide residues analysis. Furthermore, the findings emphasized the need for improved agricultural and processing practices to mitigate the risk of chlorpyrifos contamination and ensure the safety of consumers. Overall, this research contributes to our understanding of chlorpyrifos residue levels in cottonseed oil and underscores the necessity for ongoing surveillance and control measures to safeguard public health and food quality. Additionally, it provides valuable insights for policymakers, food industry stakeholders, and regulatory agencies in establishing guidelines and standards for pesticide residue management in edible oils.

Keywords: Cottonseed Oil, Chlorpyrifos, Residue Analysis, Food safety, GC- μ ECD

***Asparagus gracilis*: A Source of Natural Antileishmanial Compounds**

Muhammad Talha^{1*}, Syed Majid Shah¹, MajeedUllah¹, Sajid Hussain¹

¹Department of Pharmacy, Kohat University of Science and Technology, Kohat, Khyber Pakhtunkhwa, Pakistan

*Corresponding author's email: talha.afridi987@gmail.com

Cutaneous leishmaniasis represents the primary clinical manifestations of leishmaniasis that are prevalent throughout Pakistan. Approximately 90% of reported cases of cutaneous leishmaniasis have been documented in all provinces of Pakistan. Plants have been used by humans since ancient times to treat many human ailments including leishmaniasis. The pathogenic organisms in Pakistan responsible for this illness are either *Leishmania tropica* or *Leishmania major*. The plant *Asparagus gracilis*, also known as shaghandal, belongs to the family *Asparagaceae*. The plant is used traditionally in treatment of many skin diseases. The literature survey revealed that ethyl acetate is that most effective tested fraction against *Leishmania tropica* having IC₅₀ value of 13.5 μ g/mL confirming the presence of different phytoconstituents in this fraction. The study was designed to purify the compounds from this fraction with the help of different chromatographic techniques. Accordingly the plant was collected, grinded and macerated to obtain the desirable fraction. **T1** compound was isolated by eluting with 7 % *n*-hexane-Ethyl acetate solvent system. We intend to identify structure of this compound and to screen it against *Leishmania tropica*. The research might unearth *Asparagus gracilis* as a new source of natural antileishmanial

compounds.

Keywords: *Asparagus gracilis*, Natural compounds, Antileishmanial activity

Purification of natural cyclooxygenase-2 inhibitors from the fruit of *olea ferruginea*

Sana Mansoor^{1*}, Abdul Wahab¹, Syed Majid Shah¹

¹Department of Pharmacy, Kohat University of Science and Technology, Kohat, Khyber Pakhtunkhwa, Pakistan

*Corresponding author's email: sanaomair2@gmail.com

Natural medicines, especially those derived from plants, are regarded as safe and convenient, owing to their lesser side effects potential. The *Olea ferruginea* is an herb belonging to the Oleaceae family, locally named Indian olive or Kahoo. Its fruit relieves rheumatic pain and inflammation when mixed with olive oil. This project aims to explore for the first time the *Olea ferruginea* fruit phytoconstituents for their anti-inflammatory effect. For this purpose, the crude extract, and its subsequent fractions i.e., n-hexane, chloroform, and ethyl acetate were prepared based on increasing order of polarity. All fractions will then be subjected to initial COX inhibition screening, allowing the selection of active fractions for further purification of compounds. The study may lead to exploration of natural cyclooxygenase-2 inhibitors from the fruit of *olea ferruginea*.

Keywords: *Olea ferruginea*, Secondary metabolites, Cyclooxygenase-2 Inhibitory Activity

Nexus of Animal Health and Global Well-being: Challenges and Pandemic Preparedness

Maqsood Ahmad^{1*}, Muhammad Imran², Zia ud Din Sindhu², Muhammad Waqas³, Haleema Sadia¹

¹Department of Epidemiology and Public Health, University of Agriculture, Faisalabad

²Department of Parasitology, University of Agriculture, Faisalabad

³Department of Urology, Services hospital Lahore

*Corresponding author's email: maqsood.vet@gmail.com

Animal health is a prerequisite for global health, economic development, food security, food quality, and poverty reduction. Many diseases do not have any appropriate control tools, but the prioritization model suggests that international efforts on avian influenza to use and accurate diagnostics are available for many animal diseases. Influenza is an acute respiratory illness, caused by influenza A, B, and C viruses, that occurs in local outbreaks or seasonal epidemics. Influenza A viruses can also lead to sporadic infections or global pandemics when novel strains jump from animal hosts to humans. Influenza viruses are zoonotic in origin and mutate rapidly, regularly creating novel viruses in humans, but the public tends to downplay the seriousness of influenza owing to its seasonal nature and conflation with the common cold. Addressing these challenges calls for innovative approaches to influenza prevention and treatment, bridging both seasonal outbreaks and pandemics. Notably, many human infectious outbreaks stem from zoonotic transmission, although the focus on addressing animal health epidemics is often limited, particularly without direct links to livestock or human crossover. The global spread of Highly Pathogenic Avian Influenza (H5 HPAI) raises concern due to significant poultry mortality and reported human cases. Recognizing the historical origin of influenza pandemics in animal reservoirs, it emphasizes the urgency of preventing H5 HPAI from becoming a future pandemic and, if unsuccessful, preparing for its consequences. Achieving these objectives necessitates a shift in approach—from pandemic response to outbreak control, from standardized large-scale operations to tailored research and development for local needs.

Keywords: Avian Influenza, Zoonotic Transmission, Highly Pathogenic Avian Influenza (H5 HPAI), Pandemic

Reducing the Air Pollution by Using Different Emerging Techniques; A Mini Review

Muhammad Hammad^{1*}, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: m.hammad22t@gmail.com

Air pollution is a basic environmental problem that the world is facing nowadays. It is a serious environmental problem that affects almost every living body. In developed countries, air pollution has been controlled to a certain extent but there is an alarming situation in developing and low-income countries. Despite being told by the International Organizations, the developing and low-income countries are not taking any meaningful steps to control air pollution. Because of this inattention, air pollution is increasing at horrible rates day by day. This increasing level of air pollution is causing serious problems like health diseases, smog, acid rain, visibility reduction, and harming forests, crops, wildlife, and agriculture. Air pollution is not only creating problems for living individuals, but it affects every kind of thing whether it is living or non-living.

Air pollution can be controlled by using different techniques that are being used mostly in developed countries and their results are also effective in developing countries to control air pollution. These techniques include practicing the 3Rs method, reducing the vehicles from the road, using public transport, using electric vehicles, using filters in chimneys, proper treatment of factory wastes, reducing forest fire and smoke, using Diesel Emission Fluid (DEF) system in automobiles, adopting California like Smog Check Program, creating awareness among the people, enforcing the laws and the plantation.

These different techniques can be used in polluted areas to control air pollution and to make the environment clean and green. "A nation that destroys its soils destroys itself." There is no second planet where life exists, so we should protect our planet so that we can live happily on this beautiful planet.

Keywords: Air pollution, Health problems, Emerging techniques, Plantation, Protection.

Consequences of neglected skincare, exploring the pathogenesis of diseased & damaged dermis; a critical review

Muqadas Ahmad^{1*}, Shagufta Zafar¹, Muqadas Kainat¹, Amna Gul¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: muqadasahmad58@gmail.com

The human body is made up of trillions of cells and multiple organs. Out of them, Skin is the major organ that comes into contact with rest of the world. The foremost duty of the skin is to protect internal delicate organs from the harsh external territory of the body. People are facing diseased and damaged skin especially in developing countries like Pakistan. This is an alarming issue, but people are not very aware to talk about it. Damaged skin is that type of skin that is full of redness wrinkles, sores, lesions, dark spots, fine lines, pigmentation, hyper-pigmentation, and uneven skin tone. Disease skin is that skin that was first damaged and then converted into diseased. Cancers, Melasma and Acne are the states of diseased skin. Skin is damaged by various factors that are present in the atmosphere. The introductory source of skin damage is the Sun. As, it produces ultraviolet radiation that causes skin diseases like Melasma and even skin cancers. People are unaware about the significance of wearing sunblock which screens out the harmful rays of Sun and protects our skin. Environmental pollution is also an alarming factor. The atmosphere is currently not pure, it is mixed with smoke, smog etc. This can cause skin allergies and also clog pores which further turn into severe acne. Poor diet also leads to skin problems. Healthy skin requires healthy food such as fruits and vegetables. Unfortunately, junk foods are preferred over healthy ones. Also, in developing countries the food standards are desperately very low, that's why their skin is in a very miserable state. Using unprofessional skin care products such as whitening creams is a trend in Pakistan. The logic behind this is that pathetic beauty standards are established in our societies on the basis of physical appearances of skin, these cause complexes in people. Besides these, other factors are also reported as skin damaging like improper sleep, stress, alcohol consumption and smoking etc.

A quality skin care regimen is very helpful in creating a beautiful and healthy skin barrier. People should be aware of the importance of skin care. Proper sunscreen should be strictly followed by the people of any age group before going out in Sun exposure. Invest money in professional skin care products that should be tested by dermatologist. Skin should be healthy and glowing, not white, and dull. According to a survey of Canada in 2020, the Canadian people spend 500 \$ annually on skin care products. The diet of the people should be proper and healthy for a beautiful glowing and moisturized skin & indirectly it develops confidence, self-esteem, and happiness in life. A healthy and clean environment should be ensured by growing trees and plants. It is our ethical duty to protect the environment's glow. We must recognize that Allah has created every one of us to be incredibly precious, gorgeous & appealing. No one is ugly. We should thank God by caring ourselves as we are Ashraf-al-Makhluqat.

Keywords: Diseased, Damaged, unprofessional products, complex, sunscreen

Water contamination by pesticides & the assistance of nanotechnology in their degradation; A critical review

Amna Gul^{1*}, Hafsa Ubaid¹, Laila Bibi¹, Muqadas Yaqoob¹, Yusra Nagina²

¹*Department of Biological Sciences, University of Sargodha Ex sub-campus Bhakkar, Thal University Bhakkar*

²*Department of Chemistry, Government College University, Faisalabad*

*Contributing author's email: amnagull375@gmail.com

Pesticides are those substances which are being used to prevent, or control pests. The creation and use of pesticides to remove a range of herbivores and insectivorous pests that would otherwise reduce the amount and quality of agriculture output was a key factor in the Green Revolution. There are a variety of other benefits that pesticides may provide but aquatic life faces adverse effects which the majority of the population frequently ignores. Overuse and abuse results in significant waste, which raises costs and exacerbates the negative effects on the natural world and human health. When pesticides are applied, their waste disrupts the natural environment as a whole by contaminating the air, soil, ground water, aquatic life, and food chain. To address the problem of water contamination, which has become a global issue, legislation regarding water resources must now be continually assessed. Globally, water contamination causes illness and deaths, and each day, over 14000 people pass away as a result. Challenges with water contamination affect both industrialized and developing nations. Rainfall, environmental conditions, kinds of soil, vegetation, water levels in the ground, and human behavior are only a few of the variables that affect the overall quality of water. Urban growth, food and agriculture and the mining process all have an impact on the quality of the water.

Nanotechnology, the science of manipulating materials at the molecular or nanoscale, has emerged as a promising solution to address the pressing issue of water contamination. Nanoparticles have exhibited enhanced reactivity and specificity in targeting and degrading pollutants by taking advantage of unique features resulting from their smaller size. Modern uses range from photocatalytic nanoparticles that use sunlight to break down organic pollutants, like titanium dioxide, to magnetic nanoparticles that can absorb impurities and then be recovered. Nanomembranes also provide filtering capabilities, successfully removing minute impurities that conventional systems could overlook. However, in order to provide a comprehensive approach to water filtration, it is crucial to concurrently investigate any potential environmental effects of introducing nanoparticles into ecosystem. This demonstrates the creative application of nanotechnology to one of the most important environmental issues of our time- contamination of water through pesticides. It promotes two causes at once that ensuring toxic pesticides are effectively degraded and the techniques employed are consistent with long-term ecological sustainability.

Keywords: pesticides, contamination, nanotechnology, nanoparticles, ecological sustainability.

Balancing safety and ethics in artificial intelligence

Surraya Manzoor^{1*}, Shumaila Manzoor², Humaira Manzoor³, Mehwish Manzoor⁴, Ruqia Manzoor⁴

¹Institute of Computer Sciences, Thal University Bhakkar, Pakistan

²Institute of Mathematical Sciences, Sargodha University Bhakkar Campus, Pakistan

³Institute of chemical sciences, Sargodha University Bhakkar Campus, Pakistan

⁴Superior College, Bhakkar, Pakistan.

*Corresponding author's email: surrayamanzoor1@gmail.com

The confluence of ever-increasing big data availability, ever-expanding speed and reach of cloud computing platforms, and ever-improving machine learning algorithms has ushered in a wonderful moment of human promise. Artificial intelligence (AI) advancements are already having an impact on government, as they enhance the delivery of vital social goods and services such as healthcare, education, and transportation, as well as energy, food supply, and environmental management. Most likely, these bounties are only the beginning. While it's thrilling to think that advancements in AI would enable the government to address some of its most pressing issues, there are many valid concerns. A steep learning curve implies that errors and miscalculations will be made, and that both unexpected and detrimental effects may transpire, as is the case with any new and quickly developing technology. In "Using AI in the Public Sector," the possible risks posed by AI systems are noted, and workable solutions are suggested to mitigate them. It emphasizes that by fostering a culture of responsible innovation and putting in place governance procedures that enable the development and use of morally sound, equitable, and secure AI systems, public sector organizations may foresee and avert these possible risks. It also emphasizes the necessity of providing decision subjects with results that are easily comprehensible, accessible, and non-technical for algorithmically assisted outcomes to be interpreted by their users. Lastly, it develops an implementation strategy that is context-sensitive, human-centered, and places a strong emphasis on communication, evidence-based reasoning, situational awareness, and moral justifiability.

Keywords: AI and ethics, safety, and AI

Effect of Loneliness on Quality of Life and Life Satisfaction among married and unmarried women

Gull Afroz, Dawra Mehmood

Department of Psychology, Thal University Bhakkar

This study evaluated the effect of loneliness on life satisfaction and quality of life among married and unmarried women. The study was conducted with a research population of (N=200) which is equally divided between married and unmarried women population. Purposive sampling technique and Correlational research design were used in this study. Data was conducted by administering three self-report measures including Loneliness scale by (Russell et al., 1978) the satisfaction with life scale by (Diener et al., 1985) and Quality of life scale by (Flangan, 1970). Furthermore, in this study three types of analysis were used T-test, Correlational and regression analysis run on SPSS to find out the effect of Loneliness on Quality of Life and Life Satisfaction. Finding indicates that Loneliness has negative relationship with Life satisfaction and significance difference of marital status on Loneliness, Quality of Life and Life Satisfaction. Unmarried women score high on Loneliness. and shows that married women score high on Quality of Life and Life Satisfaction. Life satisfaction has a significant positive relationship with quality of life. Loneliness is computed as a predictor variable and Life Satisfaction as an outcome variable that specifies that Loneliness has significant negative effect on Life Satisfaction.

Keywords: Loneliness, Life Satisfaction, Quality of Life

Economic and Nutritional Value of Sesame Seed Cultivation: Unveiling the Hidden Treasure of the Plant World; A Critical Review

Hafsa Ubaid^{1*}, Muhammad Kabir¹, Amna Gul¹, Laila Bibi¹, Samreen Asghar², Muqadas¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

²*Department of Chemistry, Thal University Bhakkar, Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: hafsaubaid001@gmail.com

The botanical name of the Sesame Seed Plant is *Sesamum indicum* which is locally known as 'til' in Pakistan. It is monoecious, annual herb, having bell shaped flower, self-pollinated short day plants. It usually cultivated in altered territories of Pakistan. The plants customarily thrive in nether degrees. In this period of paucity, the rates of other fruitage seeds are very high which cannot be affordable for any citizen or farmer. However, Sesame Seed Plants prove to be a tremendous blessing for mankind offering unseen outcomes of crops within less prices of seeds. That's why any farmer can buy and cultivate this crop at less expense. Surely, it requires minuscule concentration of water. Copious rainfall and repeated water affect the crop defectively. This crop is also umbrageous to fungus and may get fungal infection due to perpetual water. Therefore, the different fungicides, sprays, and chemicals like Copper Sulphate (Nila thotha) are sprinkled for its cessation. The crop would give beneficial results within 80-110 days according to sandy nature of soil, and cultivated in specific rows, by drilling or by forming proper beds. The cultivation rate is about 2kg/acre. The average production rate is 2300 pounds with respect to one acre approximately. Thousands of hectares are cultivated to produce 34 hectares.

These have enormous importance in every tract. The seeds are used to obtain flour, oil, and different pastes. These are used in pharmaceutical industries, home cooking, accomplishing of redolence and bakery items and can be edible without any mechanism of roasting as well. We can intake one tablespoon per day. These are also used as antioxidants and for treatment of various diseases. The oil attained from them has no incense and zest and proved to be auspicious in treatment of muscles wretchedness. These seeds have voluminous commencement in nutritional compulsion. These also have incredible caliber in cosmetologically artefact. We can say that the worth of the crop is limitless. Verily, this is one of the number one crop of Pakistan. Due to altering in weather happenings and unexpected rainfall, the farmers may have to face hardships but by applying their proficiency related to their field lead to Success. Its resistance against aridity and slightest investments in cultivation increasing the physical strength of production annually. Its farming can provide us with a bright career. It is more fruitful within limited resources while other crops using the same means of resources do not benefit us like this.

Keywords: Seeds, Cultivation, Proficiency, Pakistan, Limitless Effects

Effects of Lactic acid on skin

Fatima, Farheen, Maria

Department of Chemistry, Thal University Bhakkar

Lactic acid is an alpha hydroxyl acid (AHA) mostly used in cosmetics. AHAs predominantly exist in OTC chemicals exfoliants and professional chemical peels. This abstract hash what is lactic acid, how it sways the skin, how to operation it to get rose coloured skin and it also review the detriments of lactic acid use. Lactic acid is a 2-Hydroxypropanoic acid. It naturally found in dairy product; Cleopatra's ancient milk baths unknowingly made utilization of this AHA. AHAs may sound redoubtable, but they carry serious skin care cogency. Lactic acid helps exfoliate dead skin cells, brightens complexion, and ameliorate skin hue. It animates collagen production, which can help reduce the appearance of fine lines and wrinkles. It acts as hydrating agent that can enhance moisture retention in skin, making it look well upholstered and juvenile. It presents in yogurt, pickles, sourdough bread, kimchi, fermented soy foods like soy sauce, cheese, legumes such as beans and peas, tomatoes, cherries, and kiwi. It is

antioxidant presents in versatile cosmetics, but doctors prefer products with high concentration of it. It fights acne and treats bumpy skin. It helps to address age spots, melasma, rough texture and fine lines. We must use lactic acid products with sunscreen at daytime and with retinol at night. ADA increases skin sensitivity to the sun and overuse and high concentration can cause irritation. Use low concentration of lactic acid if skin tolerates then increase % of it. Stick to product with PH level 3 to 4. Use lactic acid containing products according to individual skin tolerance.

Keywords: Alpha hydroxyl acids, antioxidants, exfoliants, Cleopatra

The Impact of microplastic pollution on aquatic life

Marij Sajjad Khan¹, Mamoon Parveen¹, Aalia Bibi¹, Muhammad Kabir¹, Sadia Afsheen¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: marijkh76@gmail.com

Microplastic and nano plastic debris has become an important global pollution issue because of their ubiquitous presence in water bodies both freshwater and marine water environments. In aquatic environment, plastic essentially exists in multiple forms before and after succeeding degree of fragmentation and degradation, includes bulk material and nanosized particles. The abundance of microplastics and nano plastics, combined with their small size and subsequent association with plankton in water bodies, allows for direct ingestion by aquatic life at different trophic levels. It is of great importance to understand the ecological and biological consequences of micro and nano particles released to nature considering that their properties differ greatly from their corresponding bulk material. It is well known that entanglement and ingestion of plastic debris has adverse effects on marine life such as internal or external abrasions and blockage of organs, which results in satiation, starvation, and physical deterioration. It is highly desirable that new legislations and regulations are introduced to control the manufacture and application of microplastic containing products that are eventually discharged to the wastewater treatment systems.

Keywords: Microplastics, Aquatic pollution, Hazards to marine life, effects of plastic pollutions.

Ecological Effects of Wind Storm on Different plant species in Thal Desert Bhakkar; A Critical Review

Shagufta Zafar^{1*}, Muqdas Ahmad¹, Sharjeela Intazar¹, Alishfa Bano¹, Samia Bibi²

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

²*Department of Botany, University of Agriculture Faisalabad*

*Corresponding author's email: shaguftazaf08@gmail.com

Wind Storm is one of the biggest challenges for different species of plant in Thal Desert Bhakkar. Many of plant species affected by wind Storm. Wind Storm effects plant species direct and indirect way. Air in motion is called wind. Due to Wind Storm, circulation of gases, water vapors and small soil particles take place. The action of wind is an ecological factor. Wind occurred by difference in atmospheric pressure. When a difference is created in atmospheric pressure, air moves from the higher to the lower pressure area. It causes wind of various speeds. Wind Storm effects plant species of Thal desert Bhakkar by uprooting the plants. Plants may be uprooted and blown away by Storm winds. By the pressure of wind Storm deformation of plants, breaking of branches, falling of reproductive parts also seemed. Abrasive action of particles due wind Storm damage plants.

Wind Storm also effects plant by indirect way. Transportation, Cooling, Stunted growth, soil erosion, dispersal of pollen grains and seed are the physiological effects of wind Storm. Wind influences the transpiration rate. Strong

wind Strom increases transpiration rapidly. So, these plants cannot maintain an internal water balance. Therefore, these plants suffer from dehydration. Wind blows away topsoil and causes soil erosion. Many xerophytic plants of Thal desert adapted themselves. They have well developed underground roots, harsh bark, and rhizome system. Wind Strom is the natural process, which effect vegetation of Thal desert Bhakkar.

Keywords: Wind Strom, Thal Desert Bhakkar, Atmospheric pressure.

Water Depletion by Anthropogenic Activities, it's Effects & Solutions; A Critical Review

Alishfa Bano^{1*}, Amna Gul¹, Hafsa Ubaid¹, Laiba Yaseen¹, Ariba²

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

²*Department of Psychology, Thal University Bhakkar*

*Corresponding author's email: alishfabano983@gmail.com

It is a harsh reality of today that water is everywhere, but usable water is very little, and we are aware of the importance of water without which life and survival is impossible. Water is the most wasteful resource on earth so now is the time to take some steps to prevent water scarcity for a sustainable future. We are all aware that water covers 3/4 of the surface of the world. There is salt water that cannot be used in 90% of this. Fresh water, which is 2% of all water, is available for drinking and other uses. Water is currently being used extremely carefully because it is soon running out. Water makes up 60% of the human body. Future water shortages will be a severe issue, in large part because of structures that humans have created. Human activities have led to a substantial decline in the overall amount of usable water, which is what is meant by water scarcity. However, the major argument we are facing is that the human population is increasing day by day and consequently their demand for water has also increased. Now, due to global warming and climate change, the temperature of the earth is increasing day by day and a large amount of water is being evaporated, respectively. Humans meet their needs through industries and after consumption release their waste i.e., harmful chemicals into the water bodies which in turn pollute the water. Humans have cleared a large area of forest to build industries, houses, roads for their own benefit and this also leads to water scarcity. Deforestation reduces the water holding capacity of the soil and causes water scarcity. There is no proper water storage strategy, so rainwater is lost but water scarcity is due to our apathy. Everyone knows that water is a renewable resource and if we continue to waste it, it will become more expensive in the future. Ground water is used for agricultural use by installing bore wells. This lowers the water table and causes water scarcity which will have severe effects on future generations.

Plantation can reduce water scarcity to a great extent as the roots of plants and trees have great capacity to absorb water and plantation is a solution that can relieve water scarcity to some extent. We should not throw sewage from homes and industries into water and the government should ban it. If we want to prevent water scarcity, we should take some steps to preserve it for our future.

Ozone layer depletion in Stratosphere by Environmental Pollution, its impact on Human Life and its Solution

Muqaddas Kainat^{1*}, Muhammad Kabir¹, Shagufta Zafar¹, Muqdas Ahmad¹, Samia Bibi²

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

²*Department of Botany, University of Agriculture Faisalabad*

*Corresponding author's email: muhammadhanifjutt223@gmail.com

One of the biggest and most pressing issues facing the entire globe is the thinning of the ozone layer. Environmental pollution comes in many forms, all of which are harmful. Here's an illustration: ozone depletion. In the region of

the stratosphere where ozone particles gather, the ozone layer mostly exists as a naturally formed gas. Although there is a balance between the ozone layer's creation and depletion, it naturally degrades as well. Ozone depletion happens when the stratospheric zone's natural equilibrium disturbs production and destruction. Although ozone depletion can be brought on by natural events, human activities like the usage of CFCs are most recognized as a large contributor. Since CFCs are non-flammable and very volatile, they can easily move up to the stratosphere where ozone is abundant and start to damage the ozone layer. Rocket launch is another factor in ozone depletion. Uncontrolled rocket launches can deplete the ozone layer more than CFCs, according to studies. Moreover, the ozone layer thin cause result of global warming. The troposphere layer below the stratosphere that layer most of the heat is held because of global warming and the greenhouse effect. Ozone hole is created in the area, this hole is formed, compounds such as N, NO₂ and N₂O that are released by activity. When the ozone depletion falls below 200 Dobson units, the phrase "ozone hole" is used. Antarctica (1970s), where the ozone hole was first found. However, the Arctic place also saw the discovery of the ozone hole most years ago. In 2000, there has been a 0.5 %each year increase in the rate of ozone depletion. Rays like UV are entering the troposphere as a result of ozone loss and having a negative impact on our health.

To lessen and regulate depletion of ozone, negative impacts do not buy aerosol items that include chlorofluorocarbons if you want to avoid ozone depletion products. The simplest method to stop the destruction of the ozone layer is to minimize the number of vehicles on the road. Not using pesticides and go for eco-friendly cleaning supplies. Planting is the most important method of tackling this issue. The impacts of global warming can be managed by planting tress because it is a major contributor to ozone depletion.

Keywords: Ozone depletion, stratosphere, Human activities, CFCs, ozone hole, UV radiation.

Harsh climatic conditions of Bhakkar and their solution

Hamza Khalid^{1*}, Muhammad Kabir¹, Muhammad Sajid¹, Muhammad Awais Haider¹, Azhar Mehmood Khan¹, Aqib Siddique¹, Safeer Ahmed¹, Awais Asadullah¹, Tahir Awais¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: hamzaawanh70@gmail.com

Bhakkar, a district in Pakistan's central Punjab province, has challenging environmental circumstances as a result of its geographic location and climatic characteristics. 1. Extreme Temperatures: Because of its desert environment, Bhakkar experiences exceptionally hot summers with frequent highs of 45 degrees Celsius (113 degrees Fahrenheit). Heat strokes and other heat-related ailments can occur as a result of extreme temperatures. 2. Water Scarcity: Bhakkar is located in a region that is prone to drought and has limited access to water resources. As a result of over-extraction, the district is primarily dependent on groundwater, which is rapidly running out. The lack of water poses serious problems for human consumption and agriculture. 3. Dust Storms: Dust storms are a common occurrence in Bhakkar, particularly in the summer. These storms are brought on by blowing strong, dry winds etc and some other problems are also significant including limited biodiversity of Bhakkar. Temperature extremes make it difficult for vegetation and biodiversity to survive in inadequate supply of water (mainly by rainfall).

There are a number of approaches and steps that can be implemented to address the problems that the Bhakkar district is facing:1. Water Management: Implement measures to effectively manage and conserve water resources. This can involve building small dams and reservoirs to collect and store rainwater, putting water-saving agricultural techniques like drip irrigation into use, and raising local community knowledge and education about water conservation.2. Encourage farmers to switch to more sustainable and climate-resilient agricultural techniques by diversifying their practices. This can involve using agroforestry, integrated farming methods, and crops that can withstand drought. Government assistance in granting farmers access to resources, training, and cutting-edge agricultural technologies can also be beneficial.3. Afforestation and Reforestation: By encouraging the planting of

trees and afforestation in the area, you can prevent desertification and enhance the soil and as a result climatic conditions of Bhakkar could be improved. We should keep in mind that the green revolution is the best solution to pollution and also abiotic stress which is faced by living organisms. This would not only help in conservation of the environment but also all inhabitants of Bhakkar including plants, animals and humans would have a better life. There is only a lack of interest in authority and residents otherwise if all people work together to improve the climatic conditions there is no anything in the world which could not be achieved. We must keep in mind that God helps those who help themselves.

Keywords: Heat strokes, Dust storms, Temperature extremes, water management, Climate-resilient, agroforestry, afforestation, and reforestation

Chief causes and outcomes of water defiling and slumping occurring globally and consequences on forthcoming future; A Critical Review

Laiba Yaseen^{1*}, Alishfa Bano¹, Muhammad Kabir¹, Samia Bibi²

¹*Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

²*Department of Botany, University of Agriculture, Faisalabad*

*Corresponding author's email: laibayaseen763@gmail.com

Water calamities have become a booming issue in every corner of globe. The rudimentary reason for water scarcity and water adulteration is due to the anthropogenic activities that are proliferating with the increase in members of the human race. About more than half of the wetlands have become dehydrated at the present moment. Water resources are depleting deleteriously. There is a dire need to negotiate sustainable handling of water. Otherwise, it is a frightening threat eventually. Water slumping is emerging due to climate changes, population explosion, poor water supervision in agricultural sectors, misuse in household usage and uncontrollable usage day to day. Global warming is further an ancillary cause of water scarcity through which water is being dried out by evaporation. Water defiling is taking place due to anthropogenic doings like uncontrolled liberating of industrial waste, unleash garbage into freshwater depositories, usage of chemical stuffs like fertilizers, petrochemicals, and chemical sprinkles near natural basins. Waterborne disorders that are usual in living souls such as hepatitis bring about dysfunction of liver, diarrhea induces digestive troubles, typhoid results severe fever and polio leads to abnormality in human framework. Underwater creatures, seashore natives, earth bound inhabitants and all ecosystems of globe are being influenced by contamination and diminution of water. 2.7 billion individuals encounter water shortage for one month in a year and 1.1 billion humans face water slumping per year. This estimate is growing swiftly day by day. Rough calculations show us that in 2025, about two-thirds of the residents of earth will experience water reduction and thus will lead to a detrimental state for inhabitants of globe. Water usage around the globe will expand relatively by about 20-30 percent in the near future.

Some applicable measures must be followed to pare down the water associated challenges. Water can be guarded by administering the water crises which is utilized in agricultural motive because seventy percent of water is frittered away through agricultural practices. Preservation of wetlands, diminution of water consumption for household purpose, desalination of seawater, reutilization of formally used water and escalation of water storage in reservoirs are the steps that are needed to be adopted to redeem future from heinous ending. Otherwise, water, water far and wide but there would not only one drop of water for drinking purposes.

Keywords: wetlands, petrochemicals, agricultural sectors, anthropogenic activities, waterborne diseases.

Edible coating and food shelf life, special emphasis on the evaluation of chitosan-based nano emulsion blended with clove oil on postharvest preservation of strawberry fruit at various temperatures.

Shahzad Zafar Iqbal^{a*}, Hafiz Muhammad Shahzad^a, Amin Mousavi Khaneghah^{b,c}, Ijaz Ahmad Bhatti^d

^aDepartment of Applied Chemistry, Government College University Faisalabad, 38000, Pakistan

^bDepartment of Fruit and Vegetable Product Technology, Institute of Agricultural and Food Biotechnology – State Research Institute, Warsaw, Poland.

^cDepartment of Technology of Chemistry, Azerbaijan State Oil and Industry University, Baku, Azerbaijan.

^dDepartment of Chemistry, University of Agriculture Faisalabad, 34040, Pakistan

*Corresponding author's email: shahzad@gcuf.edu.pk

A solution of edible-coating nanoemulsion was prepared using chitosan (CS) and clove essential oil (CEO) with acceptable physical properties like size (99 ± 2.3 nm), ζ -potential (40.8 ± 3.2 mV), pH (7.3 ± 0.48), and whiteness index (86.32 ± 0.34). The antimicrobial and antifungal activity of chitosan-based clove essential oil nanoemulsion at different concentrations against *E. coli* and *A. niger* was satisfactory. The results have documented a reduction in weight loss of fruits ($7.32 \pm 2.4\%$), firmness, total soluble solids (TSS), and titratable acidity (TA) levels in strawberries by reducing oxidative stress and increasing the antioxidant enzymes during 21st at 10 °C, and 13th days of storage period at 25 °C storage temperatures. The nanoemulsion edible coating has prevented the oxidative damage-induced senescence of strawberries by maintaining the levels of antioxidant enzymes. The results have indicated that the microbial load was lower in edible-coated strawberries. Hence, the nanoemulsion (CS-CEO) edible-coating appears to have a high potential to extend the shelf life of fresh strawberries during the storage at 10 ± 2 °C and 25 ± 2 °C temperatures. The sensory evaluations have also indicated satisfactory performances in edible coating samples.

Keywords: Nanoemulsion; chitosan; clove essence oil; strawberry; edible coating

Local vegetation of Thal desert: *Tamarix dioica* adaptation to local vegetation and its economic impacts; A critical review

Sidra Shakoor^{1*}, Muhammad Kabir¹, Humaira Iqbal¹, Ifra Jabeen¹, Muqaddas Perveen¹

¹Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

*Corresponding author's email: sidrashakoor83@gmail.com

Thal desert is present in the province of Punjab on Sind Sagar Doab. It exists between the Indus River and Jhelum River. It covers an area which ranges 70 miles from east to west and 190 miles from north to south. The Thal desert receives very little rainfall. Average rainfall varies from 0 to 12 inches. The temperature from April to August is very harsh and hot. Thal desert consists of alluvial nature of soil. Main plants of this desert are *Tamarix dioica*, *Cynodon dactylon*, *Capparis decidua*, *Salvadora oleoides*. These plants consist of various adaptations to survive on desert land state. These plants having spines leaves with small surface area to reduce water loss, thick waxy cuticle present to tolerate harsh weather, succulent, or bulbous organs to store water for the tolerance of dry condition of atmosphere, stomata are sunken, and these are only present on bottom of surface of leaves, carrying CAM pathway. *Tamarix dioica* commonly known as khagal and ghaz in Pakistan. It is dioecious, twiggy shrub consist of needle like leaves, bark of young branches is smooth having reddish brown coloration then these branches replaced into ridged pointed leaves and gray, brown coloration. Due to desert conditions of environment, khagal plant having needle like leaves as the low number of stomata present that minimize loss of water. Leaves with small surface area that helps in minimum loss of moisture during photosynthesis. Khagal plant keeps deep and wide root system for the absorption of maximum water from surface of soil.

Tamarix dioica is present in saline soil with tolerance of high salt. It secretes salt via salt glands that makes other plants infertile present in their locality. It has various economic significance in local vegetation. It is used as windbreak. It is also used as a barrier against fire. It is used in medicine as a carminative. It is also used for diuretics

for the purpose of traditional medicine. It is used to relief inflammation of spleen and liver. Its leaves extracts are used for antifungal activity. Extracts of its bark are used as a remedy against infection of skin such as eczema. It is commercially used in furniture and fuel production. The deep root system of this plant prevents soil erosion.

Keywords: Alluvial nature, Carminative, Diuretic, eczema, CAM pathway.

The interplay of Carbon dioxide emissions and forest degradation: A vicious cycle

Sharjeela Intizar^{1*}, Muhammad Kabir¹, Amna Gul¹, Hafsa Ubaid¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: sheilarana12@gmail.com

The production of greenhouse gases is influenced by large-scale deforestation, the storage of hydrocarbons, and carbon dioxide emissions from industrial sources. Global warming is a result of the abundance of greenhouse gases in the atmosphere. Currently, between 60% and 70% of people are affected by carbon dioxide each day, the gas primarily responsible for greenhouse gases. Carbon dioxide levels in the atmosphere have substantially increased as a result of industrial smoke and waste. By the end of the twenty-first century, atmospheric carbon dioxide concentrations and emission rates will both double. In addressing the issue of climate change, forest resources have a special and significant role to play. The absorption and release of carbon dioxide by forests is their primary ecological role. This is an efficient approach to lower greenhouse gas emissions. The carbon cycle benefits greatly from forests. Natural processes (such as respiration and oxidation) and deliberate human actions both contribute to the carbon emissions from forest ecosystems. A forest's contribution to the carbon cycle must be evaluated in light of how harvested wood is used, such as for wood products that store carbon over time or produce energy while releasing carbon into the atmosphere. Biological carbon sequestration refers to the organic capacity of life and ecosystems to store carbon. Carbon is mostly stored or sequestered by forests, peat bogs, and coastal wetlands. Plant tissues like the bark of old trees and extensive root systems may both absorb and store carbon.

Due to environmental factors, tropical regions have faster tree carbon sequestration than temperate regions. However, using wood to create sustainable goods like paper, pulp, layers, or coatings defers the immediate release of absorbed carbon dioxide into the atmosphere. Human, climatic, and environmental health are all significantly impacted by forests.

Keywords: Carbon sequestration, forests, deforestation, carbon dioxide, biological carbon

Characterization and optimization of probiotic bacteria encapsulation efficiency via sodium alginate-based encapsulation

KulsoomArif^{1*}, Muhammad Qasim^{1*}, Abdul Rehman¹

¹*Department of Microbiology, Kohat University of Science and Technology (KUST), Kohat, 26000, Khyber Pakhtunkhwa, Pakistan.*

*Corresponding author's email: kulsooma502@gmail.com; qasim@kust.edu.pk

Background: Probiotics, living microorganisms commonly found in yogurt, fermented foods, and supplements, offer health benefits when administered in sufficient quantities. However, their vulnerability to gastric degradation limits their efficacy. Sodium alginate-based encapsulation technology has emerged as a promising strategy to protect probiotics during transit through the gastrointestinal tract, potentially enhancing their therapeutic potential. This study investigates the impact of sodium alginate-based encapsulation on the delivery and encapsulation efficiency of probiotics, with implications for the development of nutraceuticals and therapeutic foods. **Aim and Objectives:** This study aimed to isolate probiotic bacteria from dairy products in the Kohat region (KP Province) and subsequently encapsulate these probiotic bacteria using sodium alginate, with a focus on improving encapsulation efficiency.

Methodology: Probiotic bacteria were isolated from dairy products and subjected to morphological and biochemical characterization using standard laboratory procedures. These isolated probiotic bacteria were then encapsulated using sodium alginate, and the efficacy of the encapsulation process was quantified as colony forming units per bead (CFU/bead).

Results: The isolated probiotic bacteria were identified as Gram-positive, lactose fermenters, non-motile, and catalase negative. Encapsulation with sodium alginate successfully produced probiotic beads, with an encapsulation efficiency of 95%, indicating that a higher number of cells were entrapped within the sodium alginate matrix. The study likely found that sodium alginate-based encapsulation effectively protected probiotics, enhancing their viability during storage and transportation. This encapsulation method may have resulted in a higher encapsulation efficiency, ensuring a greater percentage of probiotics were successfully enclosed. Additionally, controlled release characteristics may have been observed, suggesting improved probiotic bioavailability.

Conclusion: In conclusion, sodium alginate encapsulation significantly enhanced the encapsulation efficiency of probiotic bacteria, achieving an impressive 95% yield. This study underscores the potential of encapsulation technology to maintain probiotic bacteria at standard levels (10^6 - 10^9 CFU) within carrier foods, thus improving their viability and applicability in nutraceutical and therapeutic formulations.

Keywords: Probiotics; Sodium Alginate; Encapsulation; Dairy Products; Encapsulation Efficiency; Gastrointestinal Delivery

Causes and Repercussions of urbanization on environment, A Critical Review

Humaira Iqbal^{1*}, Muhammad Kabir¹, Sidra Shakoor¹, Ifra Jabeen¹, Muqadus Perveen¹

¹Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

*Corresponding author's email: iqbalzeshan838@gmail.com

The displacement of people from small towns to inner cities is a process in which population in cities and town upgrades. The process of urbanization depends on the shift of surplus population from rural to urban areas along with the boost of some industrialized urban centers. Urbanization can be seen in both developing and enrooted countries. Due to automation, more and more clans are moving from rural to urban for better enrollment. The chief cause of welfare is over population in the area of Urban due to settling of people from rural locality. People to move Urban areas for enjoying the worth of stylish lifestyle. Urban areas characterized by new public relations, better stamina, and better standard of living. This induces people from rearward and rural areas to move to urban areas. Benefits like better edification, transportation, and trash collector. In rural area people mainly have to depend on cultivation and allied activities for their survival. Whereas in urban areas there are sundry craft opportunities in various sectors like edification, health, transport, and sports.

Due to the expansion of the population of cities the insistences of housing also upsurge. Thus, lead to a lack of housing facilities. Discover privy public partnership to implement services. Build conformation proper infrastructure. Planting trees and integrating the care of city green spaces as a pivotal element in urban planning to recede urbanization.

Keywords: Automation, Cultivation, infrastructure, Craft

Deficiency of rainfall due to lack of plantation, it's drastic consequences and change in local weather conditions

Memoona^{1*}, Muhammad Kabir¹, Amna Gul¹, Mariam Khan¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: memoonajabbar774@gmail.com

Rainfall and plantation have a great relationship to each other, and it also affects the changes in weather. Where there is more plantation, the chance of rainfall is more and vice versa. As the roots of the plants absorb the underground water which moves to leaves and the excess of water transpires in the form of vapors through the stomata of the leaves. These water droplets make the clouds and clouds shower rain. The effects of insufficiency of rainfall are so extreme and it affects all the organisms as well as the environment. It makes the drinking water less available, and the quality of the drinking water also influenced as in the arid regions mostly. The negative impacts on air quality, sanitation, hygiene, food, and crop productions are the outcomes of it. The dusty and dry air can damage the health as the lungs are irritated, the rate of asthma and the respiratory infection increases so a lot of diseases spread due to improper rain as water is basic unit of life. *Salmonella* and *E. coli* are the bacteria's examples which are the main reason of causing the infectious diseases because such bacteria are more operational and work readily in the drought. Due to water shortage to crops, there is low yielding of crops which increases the prices of the food materials, and this drawback is filed in economic crisis.

Due to deficit of rainfall, the state of air, atmosphere and the temperature also fluctuates. The insufficient rain produces harshness in weather and increase in normal temperature. At the areas of proper vegetation, the degree of coldness and hotness is stable in such places so there is more rain at the hilly areas because of the high number of plants and greenery which prevent from the intense of hot atmospheric situations. The tragedy of present times is the cutting down of trees instead of planting more trees and if the circumstances remain same it becomes the disaster in the near future and our incoming generations will long for the natural ecosystem. Therefore, the rainfall, plantation and weather are correlated with one another, and the more implementation of plants means the highly fixed and suitable climatic and weather conditions.

Keywords: Rainfall shortage, Plantation, Drastic results, Environment, Weather change

Acid rain and its deleterious effects on environment

Chandni Gull^{1*}

¹*Department of Chemistry, Thal University Bhakkar (University of Sargodha, Ex-Sub Campus Bhakkar) Bhakkar-300000, Punjab, Pakistan.*

*Corresponding author's email: gullchandni80@gmail.com

The impact of acid rain on the environment is very damaging. It affects both living and nonliving components of the environment. Oxides of Sulphur and oxides of nitrogen both are the major causes of acid rain. Anthropogenic activities are the major cause of rain becoming acidic. Human beings are also not safe, they are also affected by acid rain. When these oxides come in contact with rain droplets then acid rain comes. It causes many diseases in humans such as redness of the eyes, flu, rashes on nose and face and causes asthma problems in human beings. Aquatic animals such as fishes and whales will die due to high acidity of rainwater. Food will be reduced for fish and phytoplankton. Main cause of acid rain is industries that are running in famous countries that are highly populated countries. When the content of acid is more than its normal range than the rain will be acidic. Less than 5.6 is the PH of acid rain. Countries having high population rate are mostly affected by adverse effects of acid rain because they cause pollution by using technologies. So, pollutants will suspend in air and combine with water vapors to form rain acidic. It not only came in the form of rain drops, but it may also be in the form of mist fog or snow (wet or dry rain). We should reduce the sources that cause acid rain by using proper acid rain programme. By fossil fuels burning and by transportation, SO_x and NO_x will release that cause acid rain so reduce their use. Prefer public transport for journey and lessen the use of fossils fuels to protect both living and nonliving components of environment. US and other countries started many programs to get awareness about this natural disaster that is harmful.

Keywords: Heavy metals, Acid deposition, Vegetation, Anthropogenic activities.

Oceans in Crisis: The Growing Threat of Plastic Pollution

Maryam Khan^{1*}, Muhammad Kabir¹, Hafsa Nasir¹, Memoona¹, Hafsa Ubaid¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: maryamkhan207.pk@gmail.com

Every year 400 million tons of plastic is being made worldwide amongst which 14 million is being wasted in the oceans or marines either directly or indirectly. This happens because of the improper management of the plastic waste which leads to disturbance in the whole biosphere. Plastic is being used worldwide in almost every field but it's not the problem. The issue is its inappropriate wastage management. Almost 14 million tons of plastic is drained in oceans mostly through water overflow of land. Plastic contains highly octane organic elements which, when diffused in water, harms underwater species. The underwater species engulf these plastic wastages which either injures or kills these species. It can also harm the food cycle when these harmed are eaten by other species including humans as well. This was depicted by the results shown through satellite imagery, coastal surveys and oceans trawls that plastic pollution has caused horrific and long-lasting effects, disturbing the whole ecosystem. It may take decades to recover the pure ocean conditions again. Moreover, it also causes environmental pollution which harms each and every animate being. Plants are no exception. Plastic pollution disturbs the soil and causes dryness. It leads to the damage of organelles of plants and as plants are the main source of food for both animals and humans, it adversely affects the food chain.

To sum up, the government and agencies should be taking concrete measures to cover up this issue. As plastic is not biodegraded properly unlike other wastes that's why the use of plastic should be reduced like abandoning the use of plastic bags for unnecessary things as it has become a trend. Proper management is needed for plastic waste and taking care of marine life.

Keywords: plastic pollution, food cycle, satellite imagery, coastal surveys, ocean trawls, biosphere, biodegrade.

Biomolecular Harmony: Understanding Life's Choreography

Muqaddas BiBi^{1*}, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: muhammad.kabir@uos.edu.pk

Biomolecular synergy represents the harmonious interaction of various biological molecules within living organisms, orchestrating complex biological processes. It embodies the intricate dance of life, where biomolecules synergize to sustain life and propel essential functions. Understanding this synergy sheds light on the fundamental mechanisms that govern life processes at the molecular level. Biomolecular synergy encapsulates the cooperative and synergistic relationships among different types of biomolecules, including proteins, nucleic acids, lipids, and carbohydrates. These molecules work in unison, creating a symphony of interactions to perform vital functions that sustain life. The unique properties and functions of each biomolecule complement and enhance the actions of others, allowing the intricate orchestration of biological processes. Other proteins act as structural components, signaling molecules, or transporters. The synergy among various proteins is crucial for cellular homeostasis and maintaining the overall function of nucleic acid orchestrates cellular activities through transcription and translation, ultimately producing proteins. The seamless cooperation between nucleic acids and proteins is fundamental for gene expression and regulation, influencing cell behavior and development. Lipids contribute to cellular structure by forming the cell

membrane and acting as energy storage. Additionally, they participate in signaling pathways, working in harmony with proteins to regulate essential cellular functions. Carbohydrates interact with proteins and lipids, influencing cell recognition and communication. The synergy among biomolecules is a delicate balance achieved through precise interactions and signaling pathways. Proteins and nucleic acids collaborate to carry out processes like DNA replication, transcription, translation, and cellular signaling. Meanwhile, lipids and carbohydrates provide crucial structural support and energy, integrating seamlessly with proteins to maintain cellular function and integrity. Understanding biomolecular synergy offers insights into the mechanisms governing health, disease, and evolution. Future research should focus on unraveling more intricate biomolecular interactions, enabling the development of targeted therapies and interventions. As we delve deeper into this dance of life, we unlock potential advancements in medicine, biotechnology, and the understanding of life itself. Bio-molecular synergy epitomizes the cooperation and harmony among various biomolecules, orchestrating the intricate dance of life. This synergy, central to cellular function and biological processes, highlights the importance of understanding how these molecules interact and collaborate to sustain life. The ongoing exploration of biomolecular synergy promises to unveil new dimensions of life's complexities and pave the way for revolutionary advancements in science and medicine.

Keywords: Biomolecular synergy, interaction between proteins, nucleic acid, carbohydrates, lipids, cellular signaling

The influence of sugar mill wastes on local plant development; A Critical Review

Khadija Noor^{1*}, Muhammad Kabir¹, Amna Gul¹, Sara Rania¹, Ifra Amna¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: hasnainzulfqar@gmail.com

Waste from sugar mills has a considerable impact on the development of nearby plants, particularly in regions where sugarcane farming and sugar processing are important economic drivers. The ecosystem is harmed by the wastewater, effluents, and solid waste that sugar mills produce. Pollutants from quick industrialization are released into the atmosphere and have a big effect on plant development. Waste products from sugar refineries include bagasse, molasses, pulp, sugar beet dust, and wastewater discharges. Pakistan is home to 87 sugar mills, the most of which are in Sindh or Punjab. Heavy metals are a significant threat to plant growth, and sugar mills are a major source of trash that emits these pollutants. Only 10% of trash from sugar mills is handled; the rest is dumped into the environment. The irrigation water that provides plants with vital nutrients is produced by treated wastewater. However, both chemical and biological oxygen demands exist for untreated wastewater. Additionally, heavy metals and dangerous substances can be retained. The toxic waste that is released from the sugar mill has a significant impact on plant growth, causing the plant to grow less quickly and, in extreme situations, even die. Because of them, eating the plants is hazardous. Sugar mill waste has the potential to impede the soil's natural processes and hinder plant growth. When plants collapse, heavy metals can build up in them, creating a significant risk to people or animals. These untreated effluents are hazardous to plants and cause direct symptoms including defoliation, fewer branches, stunted development, damage to plant cells, changes in chemical characteristics, and nutritional status. Furthermore, avoid component acquisition. In light of the fact that nitrogen dioxide emitted by sugar mills limits plant growth, these facilities are a source of pollution for the air, water, and land. But the sugar sector is also crucial since it contributes significantly to the health of our country's economy by giving many farmers and laborers jobs.

The sugar industries therefore cannot be destroyed. We have various options that will allow us to safeguard both plant growth and the environment. Adoption of efficient waste management practices must be required in order to limit the influence of sugar mill effluents on plant growth. Employee education and promotion of organic farming are both necessary. Around sugar mills, the quality of the water or the soil should be checked. Additionally, we must create natural barriers to dangerous gas emissions. We may establish ecologically friendly sugar enterprises by employing these techniques.

Keywords: Effluents, Sugar refineries, stunted growth, defoliation, industrialization, hazardous, acquisition

Economic Impact of Agriculture in Pakistan; The major problems in Pakistan's Agricultural practices and their solution

Laila Bibi^{1*}, Muhammad Kabir¹, Amna Gul¹, Hafsa Ubaid¹, Muqadas Yaqoub¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: lailamureed937@gmail.com

The foundation of Pakistan's economic growth and food production is the agricultural sector. It boosts Pakistan's GDP by roughly 20% and employs about half of the country's labor force. Farming is the main source of income for the rural inhabitants. Regularly high agricultural growth rates are important for Pakistan's efforts to reduce poverty. Agriculture serves as a source of raw materials for companies as well as an avenue for exporting to and importing from other nations. The main crops grown in Pakistan include wheat, rice, sugar cane, maize, and cotton. Pakistan is blessed with fertile soil, making it excellent for crop growth. These crops are exported by Pakistan, which boosts its economy. Economic growth was fueled by agricultural growth, but Pakistan's agriculture industry is struggling, and as a result, the country's economy is losing ground daily. Major agricultural issues in Pakistan include insufficient water supply, a lack of rainfall, the issue of land reforms, improper allotment of certified varieties, expensive fertilizers, improper management of farmable waste land, uneducated farmers who lack technology awareness, high-cost agricultural equipment, indirect access for farmers to the main market, a lack of modern technological applications, and disease outbreaks. To develop its agriculture industry, which either directly or indirectly affects the economy, Pakistan must resolve these difficulties.

Agriculture must adopt new technologies like nanotechnology, biotechnology, cultivation protected by high technology, modern irrigation methods, awareness of proper farming techniques among farmers, affordable agricultural equipment, and direct access to the main market in order to increase productivity. To address the issues in agriculture, several steps should be taken. Utilizing current technology has a significant impact on boosting agricultural growth.

Keywords: Agriculture, Pakistan, Economy, Development, Farming, Technology

Global warming as a public health crisis all over the world: a critical review

Sara Rania^{1*}, Muhammad Kabir¹, Amna Gul¹, Khadija Noor¹, Ifra Amna¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: 786inaaminaam@gmail.com

Global warming is a serious problem throughout the world. It is gradually increasing in the Earth's temperature globally. It occurs due to rising levels of Carbon dioxide (CO₂) which leads to climate change. This is long-term heating of earth surface. The world is warming due to the continuous influence of greenhouse gases like Carbon dioxide, Nitrous oxide, methane, ozone, chlorofluorocarbons (CFCs) hydrofluorocarbons, water vapours, etc. These most harmful greenhouse gases result in a high rise in atmospheric temperature which warms the whole earth. The Earth's rising temperature is fuelling frequently droughts, heavy rainfalls, floods, longer heat waves, melting glaciers, warming oceans, loss of arid land, change in precipitation and include threats to biodiversity. The North and South Poles' ice is also melting at quicker rates, that's why sea level is rising, which exerts great impacts on the environment, bringing more intense floods and heavy storms. The coastlines and Islands might disappear into the ocean if this process continues. Despite the growing body of knowledge regarding the dynamics of the Earth's climate and the scientific community's declaration of a global warming consensus. Likelihood Americans now

consider the effects of global warming to be a threat to their way of life. However, the American people is more concerned about a number of other environmental issues than they are about global warming, and there hasn't been a steady rise in concern about it in the past 20 years. In addition to these, Major Health Risks are growing day by day as a result of anthropogenic/human activities like deforestation, transportation urbanization, industrialization population explosion and burning of fossil fuels. These result in changes in weather patterns and atmospheric conditions, which harm both humans and wildlife. Respiratory and cardiac diseases, pest-borne illnesses including Lyme disease and West Nile virus, illnesses associated with food and water, injuries, and fatalities are just a few of the health implications of climate change. Increases in violent crime and general poor mental health have also been linked to global warming.

Global warming cannot be completely stopped overnight, but we can help to find solutions. We can slow or stop global warming by adhering to the 3R (Reduce, Reuse & Recycle) principle and reducing the pace at which people emit carbon black (soot), a gas that traps heat.

Keywords: Carbon dioxide, Burning of fossils, Green House gases, Climate change, Environmental disasters (floods and droughts)

Destructive impacts of environmental pollution on roadside plants; a critical review

Ifra Amna^{1*}, Muhammad Kabir¹, Khadija Noor¹, Amna Gul¹, Sara Rania¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: ifraamna.bk@gmail.com

The material which is harmful to the environment is pollutant, and the harmful effect of substance on environment is pollution. The environment is not disturbed when it is present according to nature made but it can disturb when any unfavorable substance enters the environment. Environmental pollution is the adding of undesirable chemicals that affect the environment. As environmental pollution is present in different forms. Environmental pollution is a very serious problem for plants. This pollution very badly harms not only animals but also harms plants which are present on roadside. Plants on roadsides can face many pollutants.

Roadside plants: naturally grow along roadside & also artificially planted by humans. As plants form and function, damage by environmental pollution. Due to environmental effects, anatomically stem and leave can alter. Experiments also do by take leave from roadside plant that cell size reduces and some black dots like material observe. These results give importance about damaging and sensitivity about environmental pollution on roadsides. Air pollution contains O₃ and NO_x that effect leave metabolism. Air pollution is absorbed by plants' roots and leaves. These cause diseases in plants. Loss or reduction of photosynthesis pigment at polluted sites is greater than compared to less polluted areas. Due to vehicle pollution roadside plants also effect. By land pollution due to acidic soil roadside plants can also effect. As some climatic changes and seasonal changes due to environmental pollution affect roadside plants. Cutting plants on roadside is common which is cause of destruction of plants. As pollution increase day by day which cause death for roadside plants. To live friendly, produce good environment and not harm plants must be needed to remove harmful substance from environment. Try to grow more plants instead of harming plants.

Keywords: Environmental pollution, Roadside plants, Air pollution, Vehicle pollution, Anatomical effected features.

Epigenetics, A savior of plants against abiotic stress

Laraib Choudhary^{1*}, Muhammad Kabir¹

¹Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

*Corresponding author's email: laraibchouhdary888@gmail.com

Epigenetics is an inheritance-related phenomenon that describes that surroundings and habits may guide your genes to work accordingly and flow toward the offspring. DNA methylation, histone acetylation and modifications, and RNA interferences are the three most important systems that interact and regulate genetic expressions and obtain managed phenotypes. DNA methylation is the basic process in the Epigenetics which causes the diverse changes in the phenotypic expression. Also causes life-saving responses by epigenetic variation against abiotic stresses like drought, salt accumulation, cold, heat stress and trace metals, etc., which have a crucial role in the low annual yield of different plant products. In *Saccharomyces cerevisiae*, MSH1 protein has a role in the correction of mismatches and mitochondrial DNA maintenance. RNAi suppression in MSH1 is a result of diversions in phenotypes and production of the responses in abiotic environmental stresses. In *Zea mays* Transcriptome, miRNA, DNA methylation analysis results in improvement of water retention ability, Absciscic Acid (ABA) also regulates the responses by affecting DNA methylation and histone acetylation. The proportion of methylated cytosine in *Populus trichocarpa* in drought is 10.04% as compared to in a well-watered environment where it is 7.75%. Salt-concentrated soils affect 20% of global cultivated areas as in *Oryza sativa* rice lines the ELISA-based assay is used and the hypomethylated intolerant cultivars are observed as a result. MSAP (Methylation-Sensitive Amplification Polymorphism) analysis in Rapeseed (Brassica family) results in the response where there is DNA demethylation in heat-tolerant genotypes is enhanced and DNA methylation is increased in heat-sensitive genotypes. In *Populus simonii*, histone acetylation is greater in the genes having a role in cold responses. Clover and industrial hemp also have developed tolerance and some adaptations against Cd, Ni, and Cr. To summarize, DNA methylation will be an excellent future approach to save plants from environmental abiotic stresses.

Keywords: DNA methylation, trace metals, phenotypic expressions.

Ionic liquids and their applications in medicine and pharmaceuticals

Rufia, Faheela

Department of Chemistry, Thal University Bhakkar

Ionic Liquids termed as molten salts having large sized cations and weakly coordinating anions which exist as liquids below 100°C. Their stunning nature is their ability as an anticancer agent. Apart from antibacterial and antifungal properties ionic liquids find applications in the research area. Drug delivery, drug synthesis, solvents, green chemicals, and medical analysis are the main approaches of ionic liquids. Despite of traditional drugs ionic liquids led to the development of strategies using polymeric nano properties and micelles, lipid nanoparticle, liposomes, and nanotubes as colloid delivery carriers and prolonged released of active pharmaceutical ingredients at destination. The aim of the writing is to highlight the importance of active pharmaceutical ingredients-ionic liquids.

Unveiling the Profound Impact of Chromosomal Deviations on Human Health and Development: A Mini Review

Muhammad Awais Asadullah^{1*}, Dilawar Danish¹, Hamza Khalid¹, Safeer Ahmad¹, Tahir Awais¹, Muhammad Sajid¹

¹Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

*Corresponding author's email: cheenaawais572@gmail.com

This concise review delves into the profound implications of chromosomal deviations on human health and development. These genetic variations, encompassing both aneuploidies (abnormal chromosome numbers) and structural rearrangements, have a well-documented history of significantly contributing to a diverse spectrum of genetic disorders and developmental irregularities. These deviations disrupt the intricate orchestration of genetic material, leading to a cascade of consequences that impact human well-being in numerous dimensions, including physical health and cognitive function. By meticulously examining recent research discoveries and drawing insights from pertinent case studies, this comprehensive exploration unveils the intricate and multifaceted consequences of chromosomal anomalies. It sheds light on the pervasive influence of these genetic variations, which extend beyond the realm of purely physical health, profoundly affecting cognitive aspects as well. These insights underscore the urgency of understanding and addressing these deviations in the context of human development and health.

Moreover, this review highlights the latest advancements in diagnostic and therapeutic methodologies tailored to address the repercussions of chromosomal deviations. Emerging technologies and treatments hold promise in ameliorating the challenges posed by these anomalies. Importantly, the review underscores the critical significance of early detection and timely intervention in improving clinical outcomes and enhancing the quality of life for affected individuals and their families.

In summation, this succinct yet comprehensive overview emphasizes the pivotal role of chromosomal integrity as a cornerstone in shaping the course of human health and development. By unraveling the complexities of chromosomal deviations, we advance our understanding of the genetic underpinnings of health and open doors to innovative strategies for diagnosis and treatment, ultimately striving for a brighter future for individuals impacted by these genetic anomalies.

Keywords: Chromosomal deviations, Genetic disorders, Human health, Aneuploidies, Diagnostic strategies.

Effect of elicitors on the suspension cultures of *Ginkgo biloba* L. for terpene trilactones and flavonoids production

Muhammad Shahzaib Khan Laghari^{1*}

¹Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

*Corresponding author's email: shahzaiblaghari@hotmail.com

The rare gymnosperm *Ginkgo biloba* L., which belongs to the Ginkgoaceae family, has significant therapeutic value because of its secondary metabolites, which include flavonoids and terpene trilactones. Since ginkgo is a native of China and is restricted to a small natural area, alternate techniques for obtaining its medicinally significant metabolites must be investigated. Therefore, the purpose of this experiment was to use yeast extract and chitosan as elicitors to produce flavonoids and terpene trilactones in suspension cultures of ginkgo that would be viable. Initially, Ginkgo callus cultures were created by explanting leaves into MS (Murashige and Skoog's) media, to which different concentrations of plant growth regulators were added. In order to induce callus of *Ginkgo biloba* L., the combination of benzylamino purine (BAP) and naphthaleneacetic acid (NAA) worked best. With 95% callus induction frequency, the best proliferating, whitish-green, compact callus was formed in MS medium containing 0.002 (g L⁻¹) BAP and 0.002 (g L⁻¹) NAA. Cell growth in cell suspension cultures was quantified by measuring the increase in dry weight. At 100 ppm chitosan treatment, the highest dry weight of 98.3 mg was observed. At 1000 ppm yeast extract, the concentration of ginkgolide A increased up to 3.6 times, whereas at 3000 ppm chitosan, the quantity of bilobalide and ginkgolide B increased up to 1.3 and 1.1 times, respectively. Thus, the current study demonstrated the potential of suspension cultures as a successful biotechnological strategy to improve *Ginkgo biloba* L.'s secondary metabolite production.

Keywords: *Ginkgo biloba*; Elicitors; Chitosan; Yeast extract; Terpene trilactones; Flavonoids; Ginkgolide A; Ginkgolide B; Bilobalide; Cell suspension culture

Agrobots: why develop; Beneficial Role

Aqtuba Farooq^{1*}, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: aqtubafarooq@gmail.com

A robot is basically a machine or system that works like a human. Agrobots are robots that are used for agricultural purposes. These perform the farmer's task in the field. For example, vincross launched an agribot named "HEXA". It is called hexa because consists of six legs. It works to take care of plants. It also moves the plant from shadow to sunlight and the plant is placed on its head region. It shows single by doing little dance when plant need water. In 1920, robotics was first introduced in agricultural industry. In this industry farmers face many difficulties during harvesting and planting crops. Firstly, labour is required for this purpose. Secondly, it is time-consuming and thirdly, money is required to pay for the labor. Thus, to solve these difficulties agribots are developed and provide the best solution to these problems.

Agrobots are used for various purposes like fruit picking and collecting, seed and manual spreading on land, spraying crops, harvesting, eliminating weed, monitoring the environmental fluctuations, cloud seedling etc. These play an efficient role in agriculture. For example, fruit harvesting robot locates the position of fruit and then detach the fruit from the stem of plant without any harm to fruit. Thus, fruit picking robots effectively pick the ripened fruit. Similarly, seed sowing robots are also useful in sowing the seed in the fields. Agribots are also effective for spraying fertilizers and pesticides on crops. Agrobots help farmers to save money and time. These are also helpful to enhance the profit of various crops. Developed countries are using agribots in their agricultural industry.

Keywords: Agricultural purposes, harvesting and plantation, spraying crops, cloud seedling, eliminating weed, environmental fluctuations, Agricultural industry.

Synergistic Interactions between Humans and Wildlife, Potential for Enhancing Ecological Chains and Ecosystem Resilience

Raiqa Sarwar^{1*}, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: raiqa@scholar.tu.edu.pk

The escalating conflict and habitat disruption arising from the intensifying interaction between humans and wildlife, which significantly threaten ecological chains and the resilience of the ecosystem. A world where the boundaries between human society and the natural world blur, presenting a profound and urgent issue. As our global population continues its inexorable rise, encroaching upon pristine habitats, expanding urban centers and exploiting resource, the dynamic between human and wildlife interactions becomes increasingly complex and vital to address. Humans and wildlife share dwindling spaces these conflicts manifest in various forms, from animals foraging for sustenance causing damage to crop and property, resulting in economic losses for communities, to potentially perilous encounters with wildlife species. The scourge of poaching and habitat destruction, driven by human activities, threatens the very existence of many species. These conflicts, straddling the realms of livelihoods and human safety, cast a shadow over the delicate balance of ecosystems, demanding our immediate attention and resolution. Habitat loss not only endangers the survival of countless species but also undermines the intricate ecological chains that orchestrate the functioning of ecosystem. These chains, the lifelines of energy flow, nutrient cycling, and species interdependence, are the bedrock of ecosystem stability. Disruptions to these chains can set off cascading effects, affecting resources availability for other species, and potentially causing declines in their populations. Habitat

fragmentation is an equally consequential aspect of this issue. As natural habitats are carved into smaller, isolated fragments by roads, development and other human infrastructure, the connectivity between once-Interdependent habitats and species are severed. This fragmentation poses a significant challenge to the movement, dispersal, and genetic diversity of species, often leading to localized extinctions and weakened ecological resilience. The challenges posed by human-wildlife interactions lies in the fostering of coexistence through innovative technologies, such as AI-driven, wildlife monitoring and habitat restoration, coupled with global collaboration and policy frameworks that prioritize the protection and restoration of critical natural habitats. This approach harnesses the potential for harmonious synergy between humans and wildlife, aiming to fortify ecological chains and bolster the resilience of ecosystem on global scale.

Keywords: Conflict, Resolution, Bedrock, dwindling, Resolution, Disruption, Resilience, Critical, Harmonious Synergy, Bolster, Global.

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

Safeer Ahmad^{1*}, Muqadas Parveen¹, Dilawar Danish¹, Awais Asadullah¹, Akhtar Munir¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: soha382382@gmail.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

Revolutionizing Urban Agriculture: The Promises and Hurdles of Tissue Culture

*Muhammad Sajid¹, Muhammad Awais Haider¹, Hamza Khalid¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: sajidgorcha@gmail.com

Urban agriculture is on the rise as cities expand and the demand for fresh produce grows. However, space constraints and unpredictable weather patterns pose significant challenges. This abstract explores the potential of tissue culture as a game-changer in urban agriculture and the obstacles it confronts.

Tissue culture, a cutting-edge technique akin to nurturing plant "babies" in controlled environments, offers a glimpse into a more sustainable future for city farming. These miniature plants boast accelerated growth, reduced spatial requirements, and decreased reliance on chemicals.

The possibilities are intriguing. Tissue culture could rescue endangered plant species, yield disease-resistant crops, and conserve vital resources like water and land. Furthermore, it could extend agriculture into harsh climate zones.

Nonetheless, there are formidable barriers to overcome. Tissue culture demands skilled experts and specialized facilities, often incurring high costs. The transition from the lab to the real world can challenge the survival of these miniature plants, and adapting the technique to a broad spectrum of crops remains a puzzle.

In conclusion, the future of urban agriculture may hinge on tissue culture's potential to enhance food production while minimizing resource consumption. Yet, this journey is rife with challenges, including cost considerations and the need for broader crop applications. Pursuing tissue culture in urban farming holds the promise of a greener and more sustainable future for cities worldwide.

Synthesis of Novel Sultam derivatives through Transition Metal Catalyzed Late-Stage C-H Bond Functionalization

Abid Hussain Khan (PhD Scholar) *, Prof. Dr. Abbas Hassan
Department of Chemistry Quaid-e-Azam University, Islamabad, Pakistan.

*Corresponding author's email: ahkhan@chem.qau.edu.pk

Transition metal catalyzed C-H bond functionalization has been emerged as an important tool in organic syntheses, useful for the late-stage functionalization of drug molecules and pharmaceuticals, resulting in analogs of biological significance, natural product syntheses and material sciences. C-H bond functionalization does not require pre-functionalized substrates like most organic reactions for functional group transformations. The key features which make C-H activation more versatile include a) it is as an atom and step economic approach, b) functional group tolerant, c) selective in nature, and d) avoids waste production. C-C bond formation is fundamental transformation in organic synthesis. Sultams, cyclic sulphonamides are potentially active compounds and display various biological activities. These activities include anti-cancer, anti-leukemic anti-epileptic, anti-inflammatory, anti-viral, anti-HIV, anti-microbial and enzyme inhibition. Keeping in mind the importance of sultam derivatives, we started our synthetic plan from 4-Bromobenzoic acid, a very simple starting material. At the first step 4-Bromobenzoic acid was chlorosulphonated using chlorosulphonic acid. 4-bromo-3-(chlorosulfonyl)benzoic acid was treated with variously substituted anilines and amines to afford sulphonamides. In the next steps esterification and N-alkylation was carried out. At the last step C-H bond was activated as a C-C bond forming strategy to afford sultam derivatives. The products formed were confirmed using various analytical techniques like FTIR, GC-MS, ¹H and ¹³C NMR spectroscopy. All synthesized derivatives will be screened against various biological applications like anti-cancer and anti-viral agents. Molecular docking studies were performed to establish structure activity relationship.

The Healing power of plant therapy Or Simple Path to Wellness

Shaiza Ali Sher¹, Muhammad Kabir^{1*}, Kashmal Habib¹, Maryam Asghar¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: muhammad.kabir@uos.edu.pk

Imagine a world where your stress melts away like morning dew in the gentle embrace of nature. Welcome to the soothing realm of "Plant Therapy," where plants become your allies in the journey to well-being. Plant therapy is like a calming song played by nature's own orchestra. It's a way to feel better by taking care of plants. When you

spend time with them, it's like a soothing melody for your mind and emotions. This therapy isn't just about you; it's about your body too. Gardening gets your body moving, making you stronger and more flexible. Plus, you get to enjoy the delicious fruits and veggies you grow, making your diet healthier. Plant therapy isn't a solo act; it's a group dance. You can join others in gardens and make new friends. It's like a garden party where everyone's invited, and the conversation blooms as beautifully as flowers. It's also a feast for your senses. Touching, smelling, and looking at plants feels good. It's like a sensory adventure for your body and mind. And if you enjoy puzzles, taking care of plants is like a fun game for your brain. But it's not just about you and your new friends; it's about our planet too. When you take care of plants, you help take care of the Earth. It's like being a hero for the environment. In this simple story, plant therapy is like a friendly hand reaching out to help you feel better. It's a way to enjoy nature, make friends, and be kind to the planet. Plant therapy is your easy path to feeling good.

Keywords: Flexible, puzzle, Environment, Orchestra.

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

Dilawar Danish^{1*}, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: dilawardanish123@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 necessities 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

Antioxidants

Tahreem Gull, Mehwish Tahir, Amara Hameed, Farhat Iqbal

Thal University Bhakkar

Antioxidants are specialized species that trap Free radicals. Free radicals are also called reactive nitrogen and oxygen species (RNS/ROS) include hydroxyl, peroxide, and superoxide, these are very detrimental to human health, adversely altering the lipids, proteins, and DNA. There are 2 types of antioxidants: **Endogenous antioxidants** that

are produced by our body and **Exogenous antioxidants** that are taken through diet and supplements like diterpenes, flavonoids and vitamins. It protects the body from oxidative stress that causes many degenerative diseases like cancer, senile dementia, atherosclerosis, and degenerative diseases of the eye. **Oxidative stress** is a biological state that results from heightened concentration of unpaired electrons within cellular and tissue environment. So, antioxidants are beneficial to human health. Activity of antioxidants is measured by different sensors like Nano sensors and bio sensors. Exogenous antioxidants are useful for coping this oxidative stress but synthetic antioxidants such as butylated hydroxy toluene and butylated hydroxyanisole are reported dangerous to human health. So, in recent years, search of effective, nontoxic natural compounds that have antioxidant characteristics are intensified. This review presents a brief overview of mediated cellular damages due to oxidative stress and role of dietary antioxidants for diseases control.

Chemical composition and selected biological activities of the essential oil from *Nepeta lagopsis benth*

Abdul Hadi, Naeem Khan^{1*}, Sajid Hussain², Syed Majid Shah²

¹Department of Chemistry, Kohat University of Science and Technology, Khyber Pakhtunkhwa, Pakistan

²Department of Pharmacy, Kohat University of Science and Technology, Khyber Pakhtunkhwa, Pakistan

*Corresponding author's email: abdulhadikt901@gmail.com

Plants are recognized as the richest source of biologically active components called plant secondary metabolites such as steroids, phytolipids, alkaloids, phenolics and antimicrobial agents. The present research work was mainly planned to appraise the chemical composition as well as biological attributes of EOs isolated from four selected plants *Nepetalagopsisbenth*. Plant was obtained from District Karak, Khyber Pakhtunkhwa Pakistan. The essential oil of *Nepetalagopsis* was extracted by hydro distillation using Clevenger apparatus and the chemical composition of the volatile oil was characterized by GC-MS. The antioxidant effect of the essential oil at concentration of 20, 40, 60, 80, 100, and 200 µl/mL for ABTS and DPPH free radical scavenging were tested. The examined concentration of *N. lagopsis* EO showed different free radical scavenging potential. (Mean A-O activity for ABTS and DPPH are 71.47% and 69.75%). The EO was also tested against pathogenic bacterial and fungal strains through MIC showing different antibacterial and antifungal potential. MIC of Essential oil (%) for *E. coli*=6.25, *P. aeruginosa* = 3.125, *S. aureus*= 6.25, *S. mutans*= 6.25 and *C. albicans*= 6.25. essential oil of concentration 500, 250, 125, 62.5 and 31.5 µg/mL were tested against α- glucosidase enzyme showing different % inhibition having IC₅₀=18.57. The studied EO could be considered as an anti-microbial, antioxidant and anti-diabetic agent in the near future.

Keywords: Essential oil, *Nepeta lagopsis benth* Antimicrobial, Antioxidant activity, Anti- diabetic test.

Green Synthesis of Metallic Nanoparticles and Their Potential Applications to Treat Cancer

*Samreen Asghar¹, Aqsa Shaheen¹, Asma Tariq¹, Hafsa Ubaid², Amna Gul²

¹Department of Chemistry, University of Sargodha Ex-Sub-campus Bhakkar, Thal University Bhakkar

²Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

*Corresponding author's email: samreenasghar@gmail.com

The green synthesis of metallic nanoparticles has emerged as an eco-friendly, efficient, biologically safe, and sustainable alternative to ordinary chemical methods. This innovative perspective utilizes plant extracts, fungi, algae, cyanobacterial strains, and other natural resources as reducing and stabilizing agents. The potential of a living system to control its inherent organic chemistry processes for transforming inorganic metal ions into nanoparticles has disclosed a previously unexplored realm of biochemical investigation. Their small size, high surface area to volume ratio, and tunable surface properties enable precise targeting and enhanced cellular uptake. Furthermore, these nanoparticles possess inherent cytotoxicity toward cancer cells while sparing normal tissues, highlighting their selectivity and therapeutic potential. Biosynthesized metallic nanoparticles exhibit extensive potential across pharmaceutical applications, encompassing drug or gene delivery, pathogen or protein detection, and tissue engineering. The forefront of cancer treatment nanoparticles includes Gold Nanoparticles, Dendrimers, Silica Nanoparticles, Nanoparticle-Drug Conjugates, Magnetic Nanoparticles, and Polymeric Nanoparticles. In conclusion, the environmentally friendly synthesis of metallic nanoparticles offers a sustainable and promising pathway to advance cancer therapeutics. Their distinctive characteristics, combined with their eco-friendly production, position them as a compelling choice for personalized and targeted cancer treatment.

Keywords: nanoparticles, cancer therapy, green nanotechnology, Biomedical applications, Nanoparticle-based cancer treatment

Gastrointestinal issues and natural healing

Taherah Mohammadabadi

Faculty of Animal Science and Food Technology, Agricultural Sciences and Natural Resources University of Khuzestan, Iran

*Corresponding author's email: mohammadabadi.t@gmail.com

Nowadays, researchers following some adjunctive natural healings for gastrointestinal issues. Due to the side effects and temporary impacts of chemical drugs, the use of herbal drugs as a complementary drug along with chemical drugs is recommended for gastrointestinal and digestive issues. Continued consumption of ginger reduces stomach pain, improves gastric digestion and bloating, prevents nausea, and curcumin inhibits the proliferation of *Helicobacter pylori*. The extract of licorice (glycerinic acid) has significant effects against *Helicobacter pylori* and peptic ulcers which is even comparable to antibiotics. Consumption of licorice is also very effective in reducing gastritis and stomach ulcers and ultimately gastric infection. It seems that the use of cumin can reduce many gastrointestinal symptoms including bloating. The combination of *Nigella sativa* and honey is a powerful treatment for digestive problems, wound healing, and even severe infections, as well as eliminating harmful microbes in the gastrointestinal tract that cause bloating and gastritis. Due to increasing resistance to antibacterial drugs, cinnamon can be one of the effective plants in clearing *Helicobacter pylori*. The anti-*Helicobacter pylori* effect of chamomile, garlic, cinnamon, dill, fennel, cumin and saffron have been proved. Clove is very effective for the proper functioning of the gastrointestinal tract and treats diarrhea, bloating, nausea, vomiting, indigestion, and constipation. Chamomile is used in the treatment of various diseases such as gastrointestinal disorders (ulcers of the stomach and intestines, bloating, indigestion). Oregano also relieves anorexia and stomach weakness. Oral consumption of peppermint helps to treat gastrointestinal diseases. Mucilage's of mallow dissolved in water and swollen, or viscous solutions is formed with laxative property. Traditional use of lavender tea treats digestive problems such as nervous stomach and indigestion. High concentration of anti-inflammatory proteins of camel milk has proper effects on the stomach and intestinal issues. Recent reports proved the beneficial effects of camel milk on the digestive system health. Lactose-intolerant patients easily digest camel milk due to high concentration L-Lactate in camel milk. In autism subjects, due to camel milk containing inflammation-inhibiting and hypoallergenic properties, also smaller size of antibodies can treat gastrointestinal problems and improve some autistic behaviours. The use of herbal and natural drugs along with chemical drugs is recommended for gastrointestinal and digestive issues. However, about the medicinal effects of herbs and processed camel milk, more needs to do more studies to prove this efficacy.

Keywords: Herbal and natural drugs, therapeutic, gastrointestinal issues

Nutritional and therapeutic properties of camel milk

Taherah Mohammadabadi

Faculty of Animal Science and Food Technology, Agricultural Sciences and Natural Resources University of Khuzestan, Iran

*Corresponding author's email: mohammadabadi.t@gmail.com

Camel milk is considered as a superfood with medicinal values. It's rich in vitamins C, Mn, iron, Cu and Zn rather than cow milk. Due to lack of β -lactoglobulin and low β -casein as allergic proteins, camel milk is a suitable substitute for human milk in kids with allergies to cow milk. Also, camel milk has a high amount of unsaturated fatty acids for heart health. Lactose of camel milk is more digestible than cow milk for lactose intolerance cases. Also, a higher amount of zinc in the camel milk has key role for normal function of immune system. Camel milk has high number of immunoglobulins and protective enzymes like lactoferrin, peptidoglycan recognition protein, lacto peroxidase and lysozyme. Camel milk has the highest amount of lactoferrin with anti-viral and anti-bacterial properties against infections. Camel milk has hypoglycemic effects which may be beneficial in the healing of diabetes of Type 1 and 2 and gestational diabetes. It contains insulin like proteins, which do not form coagulum in the acidic media of stomach that can be an effective alternative for insulin. Furthermore, lactic acid bacteria of camel milk as strong probiotics are important for the gut health and function. Also, it has been proven that camel milk has beneficial application in disorders of stomach and intestinal, food allergy, cancer, autism, viral hepatitis, and cardiovascular system. Probiotic bacteria and hypocholesterolemia peptides of camel milk may interfere with cholesterol absorption from the intestine by conjugating bile salts and preventing reabsorption. Reduction of 1% in cholesterol reduces the risk of cardiovascular diseases by 2–3%. Camel milk can enhance the cellular immune responses, inhibits the replication of virus DNA, and recovers chronic hepatitis B patients. In autism subjects, due to camel milk containing inflammation-inhibiting and hypoallergenic properties, smaller size of antibodies can treat gastrointestinal problems and improve some autistic behaviors and improve motor skills, language and social. Anti-cancerous potential of camel milk lactoferrin is through regulation of cell cycle, apoptosis induction, inhibition of metastasis and immunomodulation. Also, smaller size of nanobodies of camel milk prevent food allergy and enhance the immune system and inflammations. Immunoglobulin's camel milk is the same to human milk, which improves allergic reactions to foods. Therefore, camel milk is not only food, but also it is an amazing superfood for many health complications.

Keywords: Camel milk, therapeutic, health

The effects of environmental degradation on wildlife; A critical a review

Mamoona Parveen^{1*}, Muhammad Kabir¹, Marij Sajjad Khan¹, Aalia Bibi¹.

¹*Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub Campus Bhakkar), Bhakkar-30000, Punjab Pakistan.*

*Corresponding author's email: mamoonaparveen777@gmail.com

Organisms in the environment interrelate with living and non-living parts of it. Wildlife depends upon their environment for basic needs such as food, shelter, and water. But these sources are getting depleted due to human activities, like soil erosion, desertification, and deforestation, draining of chemicals into rivers and lakes, and global warming. The cutting of trees for human needs is a big source of loss of habitat for animals and it is also a main reason for migration of birds. Over hunting is also a source of extinction of wildlife. From all these activities the habitat is lost which causes loss of change in diversity in genes and also causes extinction of species due to degradation of natural resources.

All life depends upon the plants for food, but plants are also being destroyed due to desertification, deforestation, acidic rain fall and infertility of land, which causes shortage of food and other resources. Pollution also causes disturbance to wildlife, as noise pollution decreases reproductive rate in them. Due to global warming and other human activities the level of carbon dioxide has increased to a higher level and this increase causes carbon dioxide to dissolve in oceans which forms carbonic acid, and it is dangerous to aquatic life. All these factors disturb wildlife and cause extinction of species.

Keywords: Deforestation, Wildlife, Infertility of land.

Food preservation and food packaging, recent developments, and future challenges

Muhammad Waseem^{a*}, Dr. Shahzad Zafar Iqbal^a

^a *Department of Applied Chemistry, Government College University Faisalabad, Pakistan*

*Corresponding author's email: waseemmby555@gmail.com

Contact info: +92 347 2099380

Food preservation and packaging are important aspects of ensuring the quality, safety, and availability of food products throughout their shelf life. Recent developments in these areas are aimed at improving preservation methods, extending shelf life, and minimizing food waste. This summary discusses the latest advances in food preservation and packaging technologies and the challenges ahead.

Innovative preservation methods have emerged in recent years, including high-pressure methods, pulsed electric fields, and ultrasonic techniques. These methods offer non-thermal alternatives for food preservation that can preserve nutrients, flavor, and texture while effectively killing pathogens and spoilage microorganisms. In addition, advances in food packaging have focused on improving the barrier properties of packaging materials to prevent oxygen, moisture, and light from affecting food quality. Modified atmosphere packaging (MAP) and active packaging systems containing antimicrobial agents, oxygen scavengers and ethylene absorbers have gained significant momentum. These technologies have helped extend the shelf life of perishable products, reduce food spoilage, and improve food safety.

However, despite these advances, a number of challenges remain. The development of sustainable packaging materials that are environmentally friendly, economically viable, and provide optimal food protection is a continuing concern. Other challenges for future implementation include the compatibility of new preservation technologies with different foods, as well as regulatory and consumer acceptance issues.

Keywords: Food preservation, Food packaging, Recent developments, Shelf-life extension.

Management of resources with increasing population

Shahid Rizwan

Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

Mismanagement in the resources is the main cause for the degradation or decreasing of the resources. We cannot control the increasing population 100 percent. We should pay full attention to the use of sources. Management of things in the environment, world, agriculture and in every field of life is very necessary for living on the earth. We should use modern technologies in every field of life with appropriate functioning on the earth. Humanity loving environment is very necessary for using the resources. By the suitable arrangements of the resources, we can survive with the increasing population, likewise, we are living now a days. So, we can say that increasing population is not the major factor for decreasing resources.

Keywords: Mismanagement, Degradation, modern technology, humanity loving environment

Oxidative stress and Inflammation in metabolic syndrome

Sadia Mukhtiar

Department of Chemistry, Thal university Bhakkar

Oxidative stress (OS) is a disruption in the balance between free radical generation and antioxidant defenses that can cause tissue damage. OS can impact the balance between oxidants and antioxidants in the body. When there is an excessive production of reactive oxygen species (ROS) and insufficient antioxidant defenses, oxidative stress occurs. ROS are produced by ETC in mitochondria during respiration. Excessive and un- controlled ROS levels interact with innate biological components and promote protein oxidation. lipid peroxidation or DNA damage by releasing volatile organic compounds (VOCs) in the body via urine, saliva, blood, secretion, and feces. Prolonged exposure to VOCs and OS can cause negative health effects and cause metabolic syndrome like obesity, Hypertension, Diabetes and Abnormal cholesterol level etc. Mainly obesity is associated with elevated plasma free fatty acid (FFA). Free fatty acid increases the production of radical and excess oxidative by- products. OS can directly affect adipose tissues by promoting inflammations and dysfunctions which disturb **Adipokines** (Hormone that releases fat and regulates metabolism). OS contributes to insulin resistance and causes diabetes. OS level impacts the balance of **Angiotensin II** hormone that enhances vasoconstriction and cause Hypertension. OS can lead to dysfunctions in endothelium (inner lining of blood vessel). This dysfunction can impair the production of Nitric oxide (which helps to relax and dilate blood vessels) resulting vasoconstrictions and increase Blood pressure. OS can contribute to the development of high cholesterol levels by promoting the oxidation of low-density lipoprotein (LDL) cholesterol. When LDL cholesterol is oxidized, it becomes more susceptible to being deposited within the arterial walls and forming plaque. This can cause atherosclerosis. OS can impact the balance between oxidants and antioxidants in the body. The imbalance between ROS and antioxidant can lead to lipid peroxidation. These oxidized lipids can further contribute to inflammation and damage the arterial walls and promote high cholesterol levels.

Keywords: Oxidative stress, Adipokines, low density lipoprotein (LDA) cholesterol Atherosclerosis, Reactive oxygen species (ROS).

Plant Disease Detection and Management in the Era of Emerging Technologies

Mahnoor Rafi^{1*}, Harmain Saba¹, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: rafimahnoor737@gmail.com

Plant pathology plays a pivotal role in safeguarding global food security by mitigating the impact of diseases on crop yields. Over the years, the field of plant pathology has witnessed a significant transformation, largely attributed to the rapid advancement of emerging technologies. This abstract provides an overview of the key emerging technologies that are revolutionizing the way plant diseases are studied, diagnosed, and managed. Molecular biology and genomics have unlocked a deeper understanding of the molecular mechanisms underlying plant-pathogen interactions. High-throughput sequencing technologies have enabled the rapid identification of pathogenic agents and the characterization of their genomes. This information has facilitated the development of more precise and effective disease management strategies, such as the engineering of disease-resistant crop varieties through gene editing techniques like CRISPR-Cas9. Remote sensing and imaging technologies, including drones and satellites, have empowered researchers to monitor plant health at a large scale. These tools provide real-time data on plant stress and disease outbreaks, allowing for timely interventions and resource allocation. Data analytics and artificial intelligence have revolutionized disease prediction and management. Machine learning algorithms can analyze vast datasets to identify patterns and predict disease outbreaks with a high degree of accuracy. This assists farmers in making informed decisions regarding disease control measures, reducing both economic and environmental impacts. Advancements in nanotechnology have led to the development of novel disease detection and control methods.

Nano sensors and Nano pesticides offer targeted and efficient solutions for disease management while minimizing the use of chemical inputs. In conclusion, emerging technologies are reshaping the landscape of plant pathology by enhancing our understanding of plant diseases, enabling early detection, and optimizing disease management strategies. These innovations hold the potential to increase agricultural sustainability and ensure global food security in the face of evolving plant-pathogen interactions and environmental challenges. Plant pathology is poised to continue benefiting from the integration of these technologies, ultimately contributing to the resilience of our agricultural systems.

Keywords: Plant Pathology, Molecular Biology, Nanotechnology, Precision Agriculture, Emerging Technologies in Agriculture, Disease Management.

Deforestation and its control to make the Environment Healthy

Muhammad Kamran^{1*}, Muhammad Kabir², Muhammad Aqeel¹, Muhammad Sajid¹

¹*Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: 8694kami@gmail.com

Deforestation means the cut down of vast areas of forest for housing, agriculture, industrialization, or animal grazing. It affects environment in different ways such as soil erosion, barren soil, environmental pollution and over harvesting etc. The requirements for food and shelter are increasing with an increase in population growth. Therefore, trees are cut down for agriculture and for wood that is used in housing schemes. If the forests are continuously cut down at this rate, then there will be no leaf canopy left for the protection of soil from driving rain. Due to this soil flows with water and reduced the fertility of soil. The Destruction of forests also causes reduction of nutrients from the soil and makes the soil barren. The problem of environmental pollution that we are facing now a days is also because of deforestation. Cutting trees leads to a decrease in oxygen level and cause the accumulation of carbon dioxide in atmosphere which leads to the serious problems.

The forest is a very important component of the human environment. They provide shelter to man and many other organisms. Fruits of forest trees are used as a source of food for different animals. They regulate the smooth flow of water in canals thus they prevent soil erosion and make the environment pleasant. They provide us with timber that is used for the construction of homes. The wood of trees is also used in homes. Forest plays a vital role in the field of medicine as they are the source of herbal medicine, honey, wax, and many other products. Forest serves as an environmental buffer. The regions with high rainfall that are suitable for the growth of trees are called **environmental buffers**. Forest increases the chances of rain fall. Transpiration is the main cause of rain fall that is basically due to the presence of forest. It keeps the environment cool and humid. If forests are removed, then there is also removal of the sources of rain. Thus, the climate changes rapidly. In this manner forests are also crucial for the maintenance of a suitable climate.

As forests are very important for the proper functioning of an environment their protection is also necessary. We should protect them by controlling deforestation and replacing it with **Reforestation** (replantation of trees in a forest) and by the establishment of Afforestation (the formation of new forest where no forests existed previously).

Keywords: Deforestation, forest, environment, reforestation, afforestation, soil erosion, environmental buffers.

Effects of Polluted Water on the Growth of Plants and their Solution

Muhammad Waqar^{1*}, Muhammad Hamza¹, Muhammad Kabir¹, Muhammad Sajid¹

¹*Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: mw876678@gmail.com

Water pollution means polluting the water bodies, like ponds, oceans, lakes. Add pollutant in the bodies of water decreases water quality. And it's directly effecting the growth of plants. Plant growth reduces, damage the plant roots, leaf of plants is damage, quality of soil decreases and immunity of plant decrease. And it directly affects the population of humans, humans get food from plants and food that we get from plants provides nutrients to humans that is important for human health. Pollutants through which the water quality is reduced are the main reason is waste that is released from the industries, chemical released from laboratory, detergent used in home add pollutants in the bodies of water. Aquatic ecosystem also polluted, and plants are affected, and growth of plant is stop. In developing countries like Pakistan polluted water is the main problem, it effects plants and due to which natural resources reduce and people face many problems like pollution, poverty, inequality. So, this problem is solved by applying strict rules, pollutants of industries are treated before release, reduce the use of chemical, advance technologies for water treatment are introduced, local communities are involved for protecting their sources of water. Aware public about this issue and ask them to use water in control amount. It affects the growth of plant, disturbed the human life and disturbed natural resources.

Keywords: polluted water, nature disturbance, plant death, poverty

The Energy Transition: Exploring Renewable Solutions for a Sustainable Future

Muhammad Awais Haider^{1*}, Muhammad Sajid¹, Hamza Khalid¹, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: awaishkhanbk512@gmail.com

In a world confronted by the pressing imperative to shift from fossil fuels to sustainable energy sources, this conference delves into the critical theme of "The Energy Transition" and its potential to shape a sustainable future. The adverse impacts of fossil fuels on our environment, climate, and finite resources emphasize the urgency of this transition. Nonetheless, renewable energy sources offer a promising alternative, drawing energy from the Earth's natural abundance. This conference thoroughly examines the pivotal role played by solar, wind, and hydropower technologies as champions of clean and dependable energy solutions.

However, our objective goes beyond merely identifying the challenges; it encompasses the presentation of viable solutions. Respected experts will dissect policies, innovations, and strategies aimed at accelerating the integration of renewable energy. From grassroots community initiatives to large-scale endeavors, we aim to uncover pathways for a seamless transition toward a low-carbon, sustainable energy future.

Join us in the exploration of "The Energy Transition" and become an active contributor to the solution, helping to mold a cleaner, greener, and more sustainable world for future generations.

Argan tree cultivation can address climate change and assist viable development, A Critical Review

Ayeza Noor^{1*}, Muhammad Kabir¹, Amna Gull¹, Nadia Shaheen¹

¹*Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: noorayeza211@gmail.com

The argan tree used to grow around North Africa, and now it only develops in Morocco. The cultivation of the argan tree can be a fruitful means of alleviating the climate change effects. The argan tree is adjusted to arid and semiarid regions, making it a beneficial resource for feasible land-use practices in such areas. These valuable trees have adjusted to dry climate environments by the aid of their roots which go down into the soil to gain water. Moreover, the argan tree plays an important role in carbon desolation, aiding in reducing the amount of carbon dioxide in the air. The large shade of trees and thick vegetation give shade and encourage moisture holding, which creates a local

environmental condition that aids the growth of other species of plants. One such way is the use of mycorrhizal fungi, which form symbiotic relationships with the roots of trees and help in increasing nutrient uptake and barrier to stress of environment. By supplying opportunities of employment and lowering scarcity, especially for women, cultivation of argan aids in viable development aims of finishing poverty and enhancing equality of gender. The profits of cultivation of argan can be reproduced in the wider international community by the application of feasible agro-Silviculture application that organize maintenance and social class expansion. This involves establishing partnerships and two-way information flow enterprise in between Moroccan participants and international institutions, investigators, and professional. By duplicating the feasible applications used in cultivation of argan and preservation, other communities all over the world could benefit from the services of ecosystem supplied by the argan tree, such as soil preservation, water holding, desolation of carbon, development of social class and empowerment of women, in that way committing to feasible evolution.

Keywords: Argan, cultivation, viable, climate change, development.

Role of soil organic Matter in soil fertility and plant health; A critical review

Nadia Shaheen^{1*}, Muhammad Kabir², Hafsa Ubaid², Ayeza Noor²

^{1,2}*Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: nadiashaheen045@gmail.com

The organic component of soil is soiling organic matter. It consists mainly of organic material obtained from animals and plants, and material that is altered by microorganisms at various levels of breakdown in the soil. Organic matter makes up a little but essential part, and it is derived from roots of deceased plants, residues of crops, different organic fertilizers such as cropland manure, fungi, bacteria, slime, and parasites. Organic matter has advantages for tilling and production of forests. The presence of organic matter dissolves insoluble soil minerals and these minerals can also reach plants. It plays an essential role in the supply of nutrient soil so it has acquired an excessive cation exchange capacity (CEC). This grows the water holding capacity of the soil, especially in sandy soils. Organic matter. It reduces soil loss from water and wind runoff. Soil temperature is maintained by the application of organic matter. It provides an important plant source of many nutrients like N, S, P etc. The easy type of organic matter is regarded beneficial in controlling the germicides, pesticides, and many large residues of metal. It sustains the absorption of chemical fertilizers by plants thereby increasing crop yield and reducing the harmful runoff of active chemical fertilizers into the environment. Therefore, the optimum surface is formed by organic matter and regulates positive soil properties that support plant growth. Food for soil organisms is provided by organic matter. It increases the microbial biodiversity of the soil and activity that can help prevent infections and pests. Pore spaces are increased by the actions of soil microbes. This helps to increase infiltration and reduce overflow. Agriculturalists can take several steps to manage, enhance, and renovate their lands. The challenge is therefore to find out methods. Soil management that encourages formation of organic matter of soil and retention of moisture ensures short-term yield and benefits for agronomists. This allows the soil to adapt to changes in soil acidity and helps decompose soil minerals. The secret to soil healing is to improve the amount of organic matter and nutrients that are retained and recycled by plants while lowering the amount of soil elements that are lost due to leaching, overflow, and erosion. However, it might take time to restore health and land quality through good farming methods, particularly in arid places where a lack of moisture lowers biomass production and soil biological activity. Finding strategies is the difficult part. Agronomists and short-term yield are both benefited by soil management that promotes the production of soil organic matter and moisture retention. This helps breakdown soil minerals and enables the soil to adjust to changes in soil acidity.

Keywords: Organic matter, Manure, infiltration, biomass production, soil acidity

Causes of Acid Rain and its Effects on the Health of Plants and its Solution

Muhammad Hamza^{1*}, Muhammad Kabir¹, Muhammad Waqar¹, Muhammad Awais Asadullah¹

¹Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

*Corresponding author's email: muhammadhamza71556@gmail.com

Acidic rain is formed by releasing different toxic gases like sulfur dioxide and nitrogen dioxide into the atmosphere and combining them with water vapors present in the atmosphere. These toxic gases are released by different activities like burning fossil fuels in vehicles and industries are responsible for the releasing of toxic gases. Naturally, lightning in the atmosphere is responsible for the making of nitrogen oxide and volcanic eruptions releasing sulfur dioxide. Normally the pH of rainwater is 5 to 5.5 but when rain is acidic its pH is 4. When acidic rain falls on the soil, it makes the soil acidic. As we know, plants uptake water and nutrients from the soil. When soil is acidic it makes soil water acidic. When plants absorb this acidic water, it damages the root and other parts of the plant. The high amount of acid in the soil can dissolve soil substances and cause erosion. Acidic rain eliminates the nutrients and minerals from the soil. When acidic rain falls on newly born plants, it completely damages the plant body. Acidic rain does not allow the seed to germinate in the soil. Leaves are the kitchens of plants where food is synthesized. When acidic rain falls on the leaves of plants. It damages the leaf tissue and removes the chlorophyll. When a leaf lacks chlorophyll. It cannot absorb the sunlight. When a plant cannot absorb the sunlight, its photosynthetic process is disturbed. When plants do not synthesize their food, their growth becomes stunted. The only solution for plants to prevent acidic rain is to cultivate the small plant under the shade of higher plants while higher trees can tolerate the effect of acidic rain. We can also stop acidic rain by complete treatment of toxic gases before releasing them from automobiles and industries.

Keywords: Acidic rain, Sulphur dioxide, Nitrogen dioxide, changing of soil pH, Damaging of plant part

Medicinal and economic review on *Eucalyptus camaldulensis* and its effect on agriculture crops and water: A review

Ifra Jabeen¹, Muhammad Kabir¹, Sidra Shakoor¹, Humaira Iqbal¹, Muqadas Parveen¹, Sidra Bibi^{1*}

¹Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

*Corresponding author's email: sbibi9548@gmail.com

Eucalyptus is commonly called Sufeda or gum tree. The family of *Eucalyptus* plants is *Myrtaceae*. Its species are almost 700. The eucalyptus tree grows very fast and remains green throughout the year. The Eucalyptus has the ability to tolerate drought conditions and not lose their leaves in autumn. Eucalyptus is the most popular plant and used for many purposes. In the field of medicine, it is used in the treatment of different diseases all over the world. It is used in the treatment of cough and cold. It is used in ointments and creams for relieving joint and muscle pain. The leaves of eucalyptus and oil are used for treatment of respiratory issues and used to protect the body from bacterial infections.

The eucalyptus wood is used in the industry of furniture. The wood of eucalyptus is very hard, and it is a source of income in the world. The eucalyptus is used in perfumes, detergents, and soap as fragrance. The Eucalyptus trees are a unique choice in Pakistan because it can grow in every type of soil and climatic conditions. These trees are very dangerous for crop lands, and they destroy the fertility of soil. The eucalyptus root system absorbs water in huge amounts from soil. Due to Eucalyptus trees, the water is decreasing day by day. The leaves of Eucalyptus release a harmful chemical which affects vegetation growth. The Eucalyptus tree consists of phenolics which are very toxic.

Keywords: Eucalyptus, treatment, world, wood

Exploring the Hidden Alliances: Plant-Microbe Symbiosis Unveiled

Yasir ShifaUllah^{1*}, Areeba Kousar¹, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: yasirshifaullah@gmail.com

Plant-microbe interactions play a pivotal role in shaping the health, growth, and adaptability of plants in various ecosystems. These interactions, often characterized by complex symbiotic relationships, have intrigued scientists for decades. This abstract provides a concise overview of the current state of research on plant-microbe interactions, highlighting key aspects of these intricate relationships. Symbiosis, as the cornerstone of these interactions, encompasses mutualistic, commensal, and parasitic associations between plants and microbes. Mutualistic interactions, such as mycorrhizal and rhizobia symbioses, exemplify the mutually beneficial exchange of resources between the partners. These interactions enhance nutrient uptake, improve stress tolerance, and foster overall plant health. Conversely, pathogenic microbes engage in parasitic relationships, triggering a delicate balance of defense mechanisms in plants. The resulting evolutionary arms race between plants and pathogens has spurred extensive research into plant immunity and disease resistance. Recent advances in molecular biology, genomics, and metagenomics have enabled a deeper exploration of the genetic and biochemical underpinnings of these interactions. Insights into the signaling pathways, microbial effectors, and host responses have broadened our understanding of the intricate crosstalk between plants and their microbial counterparts. Furthermore, next-generation sequencing technologies have unveiled the remarkable diversity of microbial communities residing in and around plants, emphasizing the significance of the plant microbiome in shaping plant health and productivity. This agenda also sheds light on the practical implications of unraveling the secrets of plant-microbe interactions. Harnessing the power of beneficial microbes in agriculture holds promise for sustainable crop production and reduced reliance on chemical inputs. Strategies involving microbiome engineering and the development of bio inoculants have the potential to revolutionize modern agriculture by enhancing nutrient use efficiency and mitigating abiotic and biotic stresses. In conclusion, the study of plant-microbe interactions is a dynamic field with far-reaching implications for agriculture, ecology, and environmental science. The secrets of symbiosis, once unraveled, may pave the way for innovative solutions to global challenges such as food security and climate change, making this area of research both timely and critically important.

Keywords: Plant-microbe interactions, Symbiosis, Plant microbiome, Environmental science, Pathogenic interactions

Black Soldier Fly (*Hermetia illucens*), A novel insect as a tool for organic waste management

Hafiz Kamran Yousaf

Department of Biological Sciences, Thal University Bhakkar, 30000

*Corresponding author's email: [hksamranyousuf@gmail.com](mailto:hkamranyousuf@gmail.com)

Massive amounts of organic waste have been produced by the rapidly expanding human population from a variety of sources, including households, municipalities, supermarkets, industries, expired manufactured foods, consumer leftovers, and both human and animal wastes. Two thirds of organic waste, mostly from developing countries, is neither collected nor handled. Even though it includes many recyclable nutrients and is typically regarded as useless garbage, about 5% of it is used worldwide in the manufacture of biogas and compost. The majority of organic waste is carelessly dumped into urban streets and drains. This kind of dumping led to the outbreak of diseases connected to sanitation, clogged drainage systems that are harmful to people during flood rains and created habitats and breeding grounds for pathogens and disease vector. Additionally, natural rotting of organic waste produces different gases such as, hydrogen sulphide, carbon dioxide, methane and ammonia that have damaging effects on humans as a result, it is necessary to categories the simple and affordable methods to deal with the problems caused by organic waste. The bioconversion process, which uses naturally occurring biological organisms like insect larvae, is one approach to handle organic waste. Maggots of the Black Soldier Fly (BSF) (*Hermetia illucens*) are becoming more

popular because they can break down organic waste and provide protein for domestic livestock. During the decomposition process, BSF maggots also remove unpleasant odors and methane gas; as a result, the biomass of the decomposition has been observed to have about 44% dry matter crude protein, 23% DM lipids, 21% - 48%, fat content, and other nutrients.

Keywords: Black Soldier fly, Organic waste management, Protein Source

From Impact to Innovation: Mitigating Environmental Damage with Green Technology

Muhammad Bilal Khan^{1*}, Muhammad Kabir¹, Yasir Shifa Ullah¹, Muhammad Sadam¹, Aown Abbas¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: bb5777368@gmail.com

Human-induced environmental impacts encompass a wide spectrum of issues, including air and water pollution, deforestation, habitat destruction, and the release of greenhouse gases leading to climate change. These activities have resulted in the depletion of natural resources, loss of biodiversity, and the deterioration of ecosystems, thereby endangering the delicate balance of our planet's ecosystems. In response to these challenges, green technology, often referred to as sustainable or clean technology, has emerged as a critical tool for mitigating environmental degradation. Green technology encompasses innovations and practices that aim to reduce the environmental footprint of human activities. This includes renewable energy sources, energy-efficient technologies, sustainable agriculture practices, waste reduction and recycling methods, and eco-friendly transportation options. Here highlighted the diverse ways in which green technology is being employed to combat environmental degradation. Examples include the rapid expansion of solar and wind energy, the development of electric vehicles, the adoption of energy-efficient building designs, and the promotion of sustainable agricultural practices such as precision farming and organic agriculture. These technological advancements not only reduce the negative impacts of human activities but also offer economic benefits, such as job creation and energy cost savings. Furthermore, policies should be made to support international cooperation in promoting the adoption of green technology on a global scale. Government incentives, regulations, and international agreements play a crucial role in accelerating the transition to a more sustainable future. In conclusion, this idea underscores the urgency of addressing the environmental challenges posed by human activities and highlights the pivotal role of green technology in mitigating these impacts. By embracing and advancing sustainable technologies, humanity can take significant strides toward preserving the environment, conserving natural resources, and ensuring a healthier, more resilient planet for future generations.

Keyword: Environmental Impact, Environmental Challenges, Green Technology, Usage of natural resources.

Quantum Entanglement in Quantum Networks for Secure Communication: A Mini Review

Atif iqbal^{1*}, Khadija Mumtaz¹, Hafsa Bibi¹, Muhammad Asif¹, AatqaJabeen¹

¹*Department of Physics, University of Sargodha ex sub-campus, Bhakkar, Thal University Bhakkar*

*Corresponding author's email: Atif.iqbal.2019@gmail.com

Quantum entanglement, a fundamental quantum phenomenon, has emerged as a cornerstone in the development of quantum networks for secure communication. This research delves into the intricate interplay between quantum entanglement and quantum communication protocols, aiming to harness the unique properties of entangled states for achieving unprecedented levels of security and efficiency in information transfer.

We explore the practical implementation of entangled photon pairs as the cornerstone of quantum key distribution (QKD) systems, a key component of quantum-secured communication. Through rigorous theoretical analysis and

experimental validation, our study demonstrates the crucial role of entanglement in enhancing the security of QKD protocols by detecting eavesdropping attempts.

Additionally, we investigate the scalability of quantum networks based on entanglement, with a focus on quantum repeaters and quantum teleportation as pivotal building blocks. The research highlights the potential for extending quantum entanglement across long distances, laying the groundwork for the development of global-scale secure communication networks.

Furthermore, we examine the challenges and prospects of integrating quantum entanglement into emerging quantum internet architectures. Our findings emphasize the need for novel techniques in entanglement distribution, purification, and error correction to enable reliable and efficient quantum communication over large-scale networks. This research not only advances our understanding of quantum entanglement but also paves the way for practical applications in secure communication, quantum cryptography, and quantum information processing. It underscores the transformative potential of quantum entanglement in shaping the future of secure and quantum-enhanced communication technologies.

Keywords: Quantum Entanglement, Quantum Networks, Secure Communication, Quantum Key Distribution (QKD), Eavesdropping Detection, Quantum Repeater, Quantum Teleportation, Scalability, Quantum Internet, Entanglement Distribution, Error Correction, Quantum Cryptography, Quantum Information Processing, Quantum-enhanced Communication Technologies

Effects of polluted water on agriculture and its solution; A Critical Review

Zakia Noreen^{1*}, Muhammad Kabir¹, Aqsa Zulfiqar¹, Zunaira Ameer¹

¹*Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: zakianoreen11@gmail.com

Agriculture is very necessary for the survival of living organisms on earth. It is the main component of the global economy. It is very important to fulfill the need for food. As the population is increasing it is expected that in 2025 the requirement for food will increase by about 40-45%. Water plays a very important role in agriculture. Water pollution is an international issue that is increasing daily in both developing and under-developing countries. Many water problems have been created due to poor water management systems. Industrial water is discharged into the river, canals, streams, and ponds that are used for irrigation purposes. This polluted water contains many harmful materials and heavy metals. This polluted water affects agriculture badly. The main objectives of this critical review are to explore the destruction of agriculture due to polluted water. Crop production is directly linked to water. The polluted water decreases both quality and quantity of the crop. The sewage water decreases the fertility of the soil which badly affects agriculture. The crops that are obtained from the contaminated water are very dangerous for the health of living organisms. In developed countries, about 90% of polluted water is used for the purpose of irrigation. The fruits and vegetables that are imported from developed countries can cause many human health problems. This polluted water also causes the destruction of the aquatic ecosystem. This polluted water also causes agriculture pollution. The use of fertilizers, manure, and other organic wastes can also cause the accumulation of heavy metals in the soil leading to agricultural pollution.

The farmer should check the water of irrigation before giving it to the crops. The government should hold the camps to promote awareness about the damages of using polluted water for irrigation. In order to avoid agricultural pollution, the farmer should have to shift the place of the crop. Apply fertilizers to the crops at regular intervals of time in a proper manner. There should be a proper management system for irrigation.

Keywords: Agriculture, polluted water, poor management, agricultural pollution

Electronic garbage and the disposal of electronic garbage

Adeel Ahmad^{1*}

¹*Department of Physics, Thal University Bhakkar (University of Sargodha, Ex-Sub Campus Bhakkar) Bhakkar-30000, Punjab, Pakistan.*

*Corresponding author's email: Adeelahmadkhang4567@gmail.com

Electronic garbage is the material collected after breakage of electronic instruments and it includes broken down laptops, radios, telephones etc. This is a great issue of today. A huge amount of electronic garbage is collected every day. Even the developed countries, the countries where huge number of electronics devices are manufacturing each day and at the same rate electronic devices are broken down, but people are not alert about this electronic garbage. Electronic devices used in homes to facilitate human beings are broken down and results in an increase in electronic garbage. The amount of this electronic garbage has increased to an alarming level and humans throughout the world are not conscious about it. In 2005 a worldwide study was made on this topic and scientists made calculations that this electronic garbage may increase 8 times up to 2015. India produced about 3 lakhs tonnes electronic garbage in 2007 and only a fraction of this garbage was recycled to manufacture again new electronic devices. There are many ways in which electronic garbage spread throughout the world. First and most important way is throwing away of broken electronics, mostly people throw away their useless electronic instruments and contribute toward creating electronic garbage, broken mobile phones are thrown away and new electronic devices are manufactured to substitute the old ones, in this way a huge electronic garbage is spreading out. Scientists throughout the world are trying to reduce the level of electronic garbage but their efforts are fruitless without the cooperation of citizens. The electronic garbage collected by broken down of instruments should be reused in manufacturing of new electronic devices, it should be recycled. Such electronic devices should be devised which are resistant to temperature, so they can be used for a longer period of time without any damage and in this way electronic garbage level can be reduced to some extent. Such electronic devices should also be devised which use less power, it may be beneficial for future energy conservation programs. Laws should be developed to control the spread of electronic garbage and these laws should be implemented strictly.

Keywords: Electronic garbage, spread, recycling of electronic, temperature resistant electronic, laws, implementation of laws.

Increase in Global Population: Causes, Effects and Plans for Future

Muhammad Aaqib Siddique^{1*}, Azhar Mehmood Khan Niazi¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: aaqib@scholar.tu.edu.pk

Once the nineteenth century reached, the population of whole world was more than the one thousand million brinks for at the very initial timecard in the history of the homo sapiens. Since the rate of development and growth is increasing incredibly, it is reaching to the high ranks in the twentieth century and decelerating down a little bit later. The population of the total world was greater than 7000 million in just after 2010. Now it is anticipated to count thousands of millions by 2045. This paper measures and tells the dominance and varieties in the population growth among the different world parts. Next one is the medium and source behind those populations which are still unknowable are explored and presumptive scripts for unborn advancement are altercate. Pivotal for a huge term trend will be rate of stopping of the numbers of deliveries by a female is known as the total fertility by a woman.

The modifications in education, knowledge, reproduction health measures and birth survival will be required to go fast and up to the decline of total fertility, particularly in the areas like African countries. But in all ways and scripts, the total population of the world will gradually grow to the next level for some time due to the population instigated. Meanwhile, the paper notes and outlines the debate about the aftermath and aftereffects of the population exploration, including barrenness and diet securities, the effect and impact on the natural terrain, and migration overflows.

Keywords: Family planning, Population Momentum, Urbanization, Population transition

Causes and effect of Overpopulation on Biodiversity and its Conservatives

Zeeshan Haider Shah^{1*}, Muhammad Kabir¹, Azhar Mahmood Khan¹

¹*Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: zeeshanbot20@gmail.com

Biodiversity is a science in which explains the difference variety of living organisms that exist on the earth's surface. Our Earth was about 4.54 billion years ago and the total number of species on earth surface is about 10 to 14 million range but 5 billion is extinct. According to Scientific about 1.2 million species are documented and about 86% species have not been described. In Biodiversity living organisms are discussed geographically. Mora says about 8.1 million terrestrial and 2.2 million species are living in Ocean. Biodiversity is a combination of natural and artificial ecosystems. According to Scientist about 30-35% species are extinct in near 2050. According to World Wildlife Foundation the 70% of species are destroyed from 1960 to 2020. These all are due to overpopulation in the world. The major causes of overpopulation are high birth rate, low death rate, advance technology, and health care. According to International report current human population in the world is about 7-8 billion and in 2050 it will be 10 billion.

The loss of Habitat is the major cause of loss of living organisms. The ratio of overpopulation in the developing countries is greater than the developed countries and the government policies are not strict to safe habitat. The biodiversity is preserved by education and spiritual heritage. Overpopulation, deforestation, industrialization, and pollution are major causes of loss of natural habitat and effect on living organisms. According to IUCN about 150,300 species are in the red list and about 42,100 species are threatened. Many organizations work on conservative of living organisms. Create and conserve natural habitat for safe lives of species form extinct. Over population cause the CO₂ production in environment cases climatic effect also stressed on natural resources and other species extinct. The only solution to this major problem is that to reduced population level in environment, keep rules, stand with organization, organized conference in school colleges and universities to aware society from its Hazzard and conservative natural ecosystem.

Keywords: Biodiversity, Heritage, Threatened, Hazzard, conservative

Efficacy of Topical Retinols in Acne Treatment: A Comprehensive Review

Jamila Kalsoom

Department of Chemistry, Thal University Bhakkar, Punjab, Pakistan

*Corresponding author's email: kalsoomjamila10@gmail.com

This study will investigate retinol's impact on human skin and its role in treating acne. Retinols are organic compounds that are derived from or related to vitamin A. Retinol is a compound of the non-aromatic ring structure, polyprionids side chain, and carbonyl end group having molecular formula C₂₀H₃₀O. Retinol is derived from carotene, a pigment in plants that the body converts into vitamin polyprionid is the most active form of Vitamin A

and is fat soluble. The chemical name for retinol is "all-trans-retinol," which indicates the stereochemistry of its atoms. This means that all the double bonds in the molecule have a "trans" configuration, which is important for its biological activity. Retinol is usually applied on the skin and commercially comes in the form of creams, serums, ointments, gels lotions, etc. Retinols increase the rate of cell division in the skin. Retinol works in the outer layer of skin(epidermis), it exfoliates dead skin, dirt, and oils. These compounds work in the deep skin layer (dermis) and provoke the production of collagen which results in the reduction of fine lines, wrinkles, etc. Retinols are used to treat acne, acne scars, large pores, melasma, stretch marks, and wrinkles. Acne is a skin condition when pores of the skin are blocked with oils or dead skin that causes blackheads, whiteheads, or pimples on the face. Retinol helps in treating acne by anticipating clogged pores. Retinols are commonly used in cosmetic products. Retinol starts to work right away but it takes several weeks, and you may see pimples, it is also possible that our skin may look even worse but if you stick to it, you'll feel clear skin.

Keywords: Retinol, Human Skin, Acne

Crystal Field Theory (CFT)

Sehrish Batool

Department of Chemistry, Thal University Bhakkar, Punjab, Pakistan

*Corresponding author's email: sehrishbatool184@gmail.com

The physical and chemical properties of transition metals such as their variable valences and their colors compounds, are due to the presence of incomplete d-orbitals. CFT is also known as Crystal Field Theory or Electrostatic theory. CFT was developed by Hans Bethe and J.H Van Vleck in 1929. This theory explains the breaking of the degeneracy of electronic orbitals which occurs in transition metal coordination compounds, as a result of the presence of ligands. It describes complexes magnetic properties. Crystal field theory also qualitatively describes the strength of the metal-ligand bond. According to CFT, there is an electrostatic force of attraction between the central transition metal ion and ligand which induces electrostatic field. As a consequence of this field, the bond between metal ions and ligand is purely ionic in nature. All the five d-orbitals have the same energy. These energies are called degenerate orbitals. The d-orbitals are orientated. In the case of negative ligand (Cl⁻, Br⁻, CN⁻), the interaction with metal ion is ion-ion interaction. While in the case of positive ligand (H₂O, NH₃), interactions are ion-dipole interactions. Let us consider, for example, [Co(NH₃)₆]³⁺ in case of coordination number six, as a Co³⁺ ion in the field of a set of six ammonia molecules. [NiCl₄]²⁻ in case of coordination four, Ni²⁺ ion in the field of a set of four chlorine.

Keywords: CFT

Causes, impacts and solutions of rapidly increasing environmental pollution in changing climate of Pakistan; A Critical Review

Muhammad Kabir^{1*}, Um e Habiba², Muhammad Zafar Iqbal³, Muhammad Shafiq³, Zia-Ur-Rehman Farooqi³ and Wali Khan⁴

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

²*Department of Physics, Riphah International University, Faisalabad Campus, Punjab, Pakistan*

³*Department of Botany, University of Karachi, Karachi, 75270, Sindh, Pakistan*

⁴*Department of Zoology, University of Malakand, Lower Dir, Khyber Pakhtunkhwa, Pakistan*

*Corresponding / Presenting author's email: muhammad.kabir@uos.edu.pk

Environmental degradation is one of the most important problems on a global scale in recent years. The negative effects of a polluted environment are becoming very severe due to the degradation of environmental conditions and

loss of biodiversity. The presence or absence of any specific plant species in an area points out a specific level of environmental pollution which means the quality of life depends on the quality of the environment. A clean environment creates good conditions for the existence, growth & development of all living organisms. All organisms are affected indirectly or directly due to environmental pollution. It is due to rapid increases in the human population, rapid industrialization, urbanization, and vehicular emissions. Environmental contamination, especially by the industrial revolution in urban areas, is a major problem in front of the world today and there is the rising alertness of the fact that a clean and green environment is essential for better health and growth of living organisms. It is our topmost priority to keep our country clean and green as cleanness is a part of our faith. Primary sources of environmental pollution are increasing significantly ($p < 0.05$) by anthropogenic activities which are continuously adding different types of pollutants into the environment. Different types of factories discharge their toxic wastes into the environment which are contaminating the soil which acts as a basic medium for plant growth. So, this environmental degradation by different anthropogenic activities including industries is causing a great hazard to plants, animals as well as humans.

All over the world, there is a big issue of environmental pollution due to which the world is in anxiety. However, the main cause of pollution is man himself. The person thus known as a human being doesn't show any humanity for the environment, as humans use and exploit all sorts of resources for their own profit no matter what they may derive from nature or by using different species of the planet. Someone may go up to any level for his ends, the highest most ungenerous species on the planet and create issues for himself and even for other living organisms.

So, each problem has a solution, as a problem is all the time man-made (anthropogenic), so man needs to discover the solution because nothing is unchangeable and pure in this universe except Allah. With recent advances, there is a need to build up green spaces within and around polluted areas for the existence of healthy environmental situations. Some plants can act as pollution sinks, acting as natural lungs of the environment. It was concluded that if haphazard population growth and construction of new structures go on without realizing the importance of trees in the environment then there would be more destructive changes for living organisms in the near future. So, a humble request to all humanity is that adopt the "green revolution which is the best solution to arrest pollution" for a sustainable environment to keep it clean and green.

Keywords: Anthropogenic activities, Environmental pollution, green revolution, Industrial activities, Plantation.

Chemistry, Pharmacology, Medicinal Property of Sage (Salvia) to Prevent and Cure illnesses such as Obesity, Diabetes, Depression, Dementia, Lupus, Autism, Heart, Disease and Cancer

Khadija Gull, Kashaf Zahra, Sidra Zafar

Department of Chemistry, Thal University Bhakkar

INTRODUCTION

The genus *Salvia*, commonly sage, is the largest member belongs to *Lamiaceae* or mint family and includes nearly 900 species. The plants are mostly aromatic and perennial, having flowers of different colors. Many species of *Salvia*, including *Salvia officinalis* (common sage), are native to the Mediterranean region and some of the *Salvia* species have been used worldwide flavoring spices as well as traditional herbal remedies. Essential oils are very important sources for the screening of anticancer, anti-microbial, antioxidant, and free radical scavenging agents. *officinalis* (common sage) is considered to have the highest number of essential oils compared to the other species of *Salvia*. Sage tea has been traditionally used for the treatment of digestive and circulation disturbances, bronchitis, cough, asthma, angina, mouth and throat inflammations, depression, excessive sweating, skin diseases and other diseases.

ABSTRACT

Sage or *Salvia* species, indeed have a long history of traditional use in various cultures for their medicinal properties. These plants are known for their diverse pharmacological activities and have been studied for their potential therapeutic applications in many countries of the Middle East and Asia. The antioxidant properties of sage

have been studied intensively and are found to be related to the presence of Rosmarinus acid and carnosic acid. The aqueous extract of *Officinalis* has been shown to have antioxidant and antiviral effects. In a study it was observed that after drinking sage tea (common sage) for two weeks the liver antioxidant status improved. A study conducted on the antibacterial effect of sage against selected food spoiling bacteria in vitro indicates that sage aqueous extract exerted significant antibacterial activity and it was most effective against *Bacillus myoids*, *Bacillus subtilis*, *Enterobacter cloacae* and *Proteus sp.* This has made sage essential oil a good alternative to the traditional antibiotics as well as food preservatives.

CONCLUSION

The objective of this paper is to review the recent advancement in the exploration of sage (*salvia* species) as phytotherapy and to illustrate its potential as a therapeutic agent. In recent decades, with the increase in pharmacological knowledge about the beneficial effects of sage, especially *officinalis*, these herbal medicines with antibacterial, antioxidant, anti-inflammatory, free radical scavenging, and antitumor activities have been found to be very effective in the development of novel natural drugs to prevent, control, and treat many minor health problems as well as more serious and complicated diseases.

Recent Applications of Machine Learning in Medicinal Chemistry

Wardat Hassnain*, Samreen Asghar, Khadijah Imtiaz, Aqsa Shaheen

Department of Chemistry, University of Sargodha Ex sub-campus Bhakkar, Thal University Bhakkar.

*Corresponding author's email: wardathasnain@gmail.com

In the current decagon, Artificial intelligence and machine learning have taken part a remarkable role in increasing the organizational processes across a wide-ranging industry. Although it was introduced in the pharmaceutical and biotechnology section, a number of instruments warrant by evolution of computer science have been come into existence and now frequently used. Howbeit, several features of computational techniques and instruments along with advancement of availability of this new technology. In this analysis of recent progress in machine learning applications are recounted that they have capability to effect different parts of the drugs discovery development flow scheme. Especially new deep learning-based applications over the compound design and synthesis, prognosis of binding, accupation and ADMET effects. Furthermore, the implementation of genetic description and accentuate. Artificial intelligence is turning the table by helping to guide and accelerate the process of drug discovery. AI helps to identify drug condidates. We might not have found otherwise. AI system Can be a general description of what we want to find. AI analyzes the bunch of literature and database and picks out the best hits for later research. One of the systems performed by AI is neural network that helps to identify the chemical structures that are related to medical. Neural networks give information about chemical compounds, functional groups, and their possible biological activity. AI has the potential to go through all the databases and find the molecule that best fits a specific biological target. In general, the algorithm eliminates ineffective drugs Recently, world first AI design drug entered the clinical trials. Due to the pharmaceutical companies accelerate their search for new drugs discovery process. Therefore, the future looks promising, and it can assure a new era of medicine discovery.

Keywords: Artificial Intelligence, Machine Learning, Pharmaceutical, Biotechnology, Computational Techniques, Drug Discovery

Stress Reducing Effect of Indoor Plants

Zarnab Zahra¹, Shoaib Akhtar¹, Muhammad Ikram¹, Farhana Sheikh^{1*}

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: farhanashiekh04@gmail.com

The present studies focus on possible benefits of indoor plants on attention capacity in a controlled experiment. The study was performed by conducting interviews of 37 students randomly assigned to one of two conditions: a classroom setting with four indoor plants, both flowering and foliage and the same setting without plants. Immediately after entering the classroom, performing a demanding cognitive task, and after 5 minutes break. Participants in the plant condition improve their performance from time one to two, whereas this was not the case in non-planted condition. The results are discussed in the context of attention; this is growing evidence to support the notion that plants can play an important role in providing a higher quality living environment. This study conducted a series of experiments to investigate the effect of characteristics, such as color, odor, and size of indoor plants like lavender, peace lily and English ivy on human comfort. A survey was conducted to record participant's satisfaction degree. The results demonstrated that an interior classroom with plants was preferred over a classroom without plants. From the review of literature, it is concluded that many investigators have proposed indoor plants and artificial windows to improve human performance.

Practical use of Bio luminance in Daily life, to reduce the use of light as possible at Night.

Muhammad Naeem Rana^{1*}, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: muhammadnaeemr7@gmail.com

The use of electricity for daily use which is generated by Hydroelectric Power stations or other electricity power-generating houses (Nuclear, Wind, etc.) is increasing as human beings make progress. But Nature gives us a solution to overcome the use of natural resources for one purpose. Nature creates animals and plants like creatures that emit light. These creatures are called bio-luminant organisms. These may be plants, animals, fungi, algae, bacteria, etc. These creatures emit light concerning their habitat i.e., maximum sea creature emits blue light and dinoflagellates(algae) emits bluish-green color. This bio-luminant creature bears a pigment that is like chlorophyll in the plant called luciferin and an enzyme called luciferase which catalysis the bio luminance.

By growing the bio luminant organisms in specific medium can be used in houses, shops, restaurants, etc., at night instead of electricity bulbs. This luminant organism grows in a specific habitat and produces light as the luciferin molecule moves with the help of luciferase. Because the bio luminance is dependent on the arrangement of luciferin molecules while the luciferase enzyme just catalyzes the luciferin. When luciferin and luciferase interact with each other bio-luminance shows.

The reality is that luminance by living organisms is very low but can be improved by modern genetic techniques. These creatures can grow in number through cloning and tissue culturing techniques. Because, with time population increases and the requirement of natural resources increases, we will have to bring the natural resources into use for the appropriate usage for saving the resources and use the natural resources that are not used.

Bio luminance is significantly deserving of the heed for saving resources and wise use of natural resources. It can be improved effectively by genetic engineering and modern techniques of appropriate fields.

Effects of fertilizer' use on the natural nutrients of soil and crop yield; a critical review

Zunaira Ameer^{1*}, Muhammad Kabeer¹, Javeria Wakeel², Zakia Noreen¹, Aqsa Zulfiqar¹

¹Department of Biological Sciences, Thal University of Bhakkar, Bhakkar, Punjab, Pakistan

²University of Punjab, Lahore

*Corresponding author's email: zunairaameer7813@gmail.com

Fertilizers are legitimate or strained matter having the synthetical components that meliorate vegetation and effectiveness of plants. These fertilizers raise the richness of the soil and restore chemical elements taken from soil by prior crops. These fertilizers are also used to enhance the assemblage of carbon, nitrogen, and phosphorus in the soil to improve the efficiency of the soil to provide nutrients to crops. There are three groups of fertilizers. Some are minerals which are obtained from the environment. Some are organic and are achieved by feces of animals and disintegrate matter of plants or animals. And some are the industrial fertilizer which are established by humans through chemical reactions. Nowadays, industrial fertilizer is most widely used. Use of fertilizer like chemical fertilizers has brought in approval for humans that overcome the hunger and death in different countries of the world.

Fertilizer affects soil and crop yield. Most fertilizer has nitrogen as an essential element. This nitrogen increases food production. But it causes more problems in soil. Some soil microorganisms can modify the nitrogen into nitrogenous gases that are released into the atmosphere like greenhouse gases and nitrous oxide. These gases are the main cause of global warming and eutrophication. Eutrophication produces toxic chemicals like algal blooms. Fertilizer causes acidification in the soil. These fertilizers cause stunted growth of the plants. Fertilizer causes depletion of essential minerals present in the soil. Fertilizer affects the contamination of water. In constant amount fertilizers are beneficial for soil but in access amount these cause harmful effects on soil and the crop production. Therefore, fertilizers are used in such amounts that is suitable for soil and crop yield.

Keywords: Fertilizer, Crop, Nitrogen, Nutrients, Eutrophication.

Impacts of Invasive Plants on Soil Fungi and Implications for Restoration; A Critical Review

Muqadas Parveen^{1*}, Humaira iqbal¹, Sidra Shakoor², Ifra Jabeen², Iqra Malik²

¹Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

²Department of Psychology, Thal University Bhakkar

*Corresponding author's email: muqadasp27@gmail.com

Biochemical plant invasions have an effect on the biodiversity and operation of ecosystems all over the world by displacing native plants species and altering the chemical and physical make up of this oil environment. While the direct competition of invasive and native plants is widely known, the influence of plant invasion on the soil fungal population is less well recognized. Fungi play a crucial role in maintaining a healthy soil system and are necessary for the survival of many plants species. *Arbuscular mycorrhizal* mushrooms are plant mutually beneficial symbionts that connect with numerous species and of Fer crucial services like increasing surface area for root transpiration and immunity to pathogens, while ecto mycorrhizal moulds also play an important part and are crucial for plant nutrient getting in boreal and tropical forests.

Sometimes for years after an invasive plant has been eliminated from the region, invasive plants alter the number of microbes in the earth's soil in ways that subsequently impact the makeup of native plant communities (also known as legacy impacts). These changes can often be so profound that even with careful control, it might require months or even decades to undo them. Restoration is made more difficult by these changes in areas where persistent plant infestations have been eradicated.

Keywords: mycorrhizal, fungi, roots, legacy effects, restoration, microbial, invasion

Impacts of invasive Species on Native Ecosystem: Ecological Consequences and Management Strategies

Tahir Awais^{1*}, Muhammad Kabir¹, Hamza Awan¹, Muhammad Sajid¹, Muhammad Awais Haider¹, Azhar Mehmood Khan¹, Aqib Siddique¹, Awais Asadullah¹

¹*Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar- 30000, Punjab, Pakistan*

*Corresponding author's email: shahidhoneyh@gmail.com

Exotic species are non-native species that are brought into an ecosystem and have the ability to actuate harm to the surrounding, recession, or human health. They could have the ability to compete with native species, alter ecological processes, and even cause extinctions. Here we discuss the ecological consequences of invasive species and some management strategies to control them. Invasive species can displace native species for resources such as food, aqua assets, and refuge. They can also grow faster than native species and occupy more spaces, reducing available habitat for other species. Invasive species can alter food webs by becoming predators or prey for native species, leading to imbalances in the ecosystem. Invasive species can bring new sickness or bugs that native species can't fight, causing them to die. Invasive can alter the physical environment by changing the soil chemistry, water availability or quality, or reducing native vegetation, leading to profound changes in ecosystem. The most fitting method to handle invasive species is to stop their launch and expansion in new environments. This can be achieved by implementing quarantine measures, monitoring, and controlling pathways of their entry, and creating public awareness about them. Early detection and rapid response are critical in eliminating invasive species. This can be done through mechanical, chemical, or biological methods. These methods require careful consideration of environmental impact and can be costly. The objective of control is to reduce the impact of invasive species on the ecosystem, rather than eliminating it completely. This can be done through integrated pest management technique, biological control. Use of herbicides, controlled burns, limited species range, and monitoring and evaluation of the population. Restoration involves rehabilitating an ecosystem that has been damaged by invasive. This can be done by removing invasive species and reintroducing native species through habitat restoration, reforestation, and ecological engineering. The impact of invasive species on native ecosystem can be important. It threatens biodiversity and ecosystem stability and, ultimate, human interest. Management strategies for invasive species very depending on the species and ecosystem its effects. An integrated approach that employs prevention, eradication, control, and restoration strategies is often the most effective. Educating the public about the impact of invasive species is also crucial.

Keywords: Invasive species, Environment, Ecosystem, Diseases, Impact, Biodiversity, Control

The fossils oil energy effects on the environment; A Critical Review

Aqsa Zulfiqar^{1*}, Muhammad Kabir¹, Zakia Noreen¹, Zunaira Ameer¹

¹*Department of Biological Sciences, Thal University Bhakkar, (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar- 30000, Punjab, Pakistan*

*Corresponding author's email: Shahaqsashah6@gmail.com

Energy as a necessary aspect of creation that has been significant not alone in riding sphere 's stylish fiscal progress but also preserve occupation. From a endow side approach the international bank census suggest that the lighted fossil fuels are the powerful energy dawn in all kinds of nation. During ignition bearing from crude has been slowly falling. Sources of primary fuels used by human beings have carried about sunder changes to the world's atmosphere.

Scornfully influencing precipitation scheme coincident the origination of ignition has accelerated the harshness of ecological bump. Expand in community profit the extensive exploit of computerized unite devices and growing demand from broad progressing country such as China and India have subsidized towards boost desire for energy from fossil sources amidst other factors. The blow on atmosphere is manifest for express of warmth, ray, and carbon dioxide. The future collision of carbon dioxide on climate which may be fully sedate and permanent. There are no carbon dioxide shedding if hydrogen is passed down as a sincere energy transporter. Auto thermal artificial fuel manufacturing may decision in substantial Carbon dioxide increases. In so much as all other mal technique may conclusion in large carbon dioxide abatement.

Keywords: Energy, fuels, Carbon dioxide

Toxicity profiling and antimicrobial activity of *Zea mays* husk mediated synthesis of zinc sulphide nanoparticles

Hafsa Bashir^{1*}, Muhammad Iqbal Khan¹, Murad Ali Khan¹, Saima Gul¹

¹Department of Chemistry, Kohat University of Science and Technology, Kohat, 26000, Pakistan.

*Corresponding author's email: bashirhafsa422@gmail.com

This study focuses on the toxicity profiling and antimicrobial activity of *Zea mays* husk-mediated synthesis of zinc sulphide nanoparticles (ZnS NPs). The aim of this research is to assess the potential toxicity and anti-microbial activities of the ZnS NPs synthesized using *Zea mays* husk as a reducing and stabilizing/capping agent. The synthesis of ZnS NPs was done by the chemical precipitation method using *Zea mays* husk extract. The physicochemical properties of the synthesized ZnS NPs were characterized by various analytical techniques. Furthermore, the toxicity profiling of the ZnS NPs, bacterial activity (Gram-negative bacteria strains *Escherichia coli* and *Pseudomonas aeruginosa* and Gram-positive *Streptococcus mutans* and *Streptococcus pyogenes*) and anti-fungal activity (*Aspergillus Niger* and *Aspergillus Parasiticus*) were evaluated. The results demonstrated that the plant extract mediated synthesis of ZnS NPs had significant anti-bacterial activities and anti-fungal activities, while also possessing low toxicity effects. Therefore, the study concludes that *Zea mays* husk-mediated synthesis of ZnS NPs is a safe and effective method for the synthesis of environmentally benign nanomaterials for various biomedical applications.

A Transparent Partnership between Blockchain and the Environment; A Unique Review

Muhammad Muzammil Aziz^{1*}, Muhammad Kabir¹

¹Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

*Corresponding author's email: muzammilazizkalwal@gmail.com

In this era, technology has changed our world into a global village, by turning our dreams into reality. It made much more advancement in every field of life, also elevated humanity to new heights. But knowing all we couldn't be

unaware of its emerging part. This emerging part of technology is called blockchain technology. As basically the block chain technology was developed for cryptocurrencies like Bitcoin, Ethereum and Cardano etc. Most important aspects where it's transparency, sustainable system, decentralization, and security. This enables us to relate the environment with it and makes everyone responsible against the destruction of the environment. We can explore the important role in the environment through this technology. The first section delves into pressing environment challenges like pollution, deforestation and killing of wildlife for own benefits leading them to endangered. Pollution is not only the problem of developing nations but even it grapples developed nations. So that's why it created an alarming situation in developed nations. The major component of pollution is plastic. But the problem is that it's widespread and cheap manufacturing material. It can only be controlled through the supply chain method. Block chain technology manages its data, from the production of material to its supply. By utilizing block chain explorer, it provides transparent system to monitor material usage by industries. Basically, block chains store data in blocks linked together via cryptography. This enables us to monitor wildlife through this without the interruption of any big institutes. Carbon emissions are also controlled through it, which is a primary contributor to global warming. Now the developing countries are addressing experts of block chain technology and that's the only solution of it. Through block chain technology they are implementing carbon tokenized mechanism and reward system to gain the more attraction of people and making industries responsible to reduce carbon emissions. In conclusion it has become our need that's only way to fight against these crises.

Keywords: Blockchain Technology, Environment Crises, Transparency, Decentralization, Supply Chain Management, Carbon Emissions, Reward System

Synergetic effect of dietary calcium and phosphorus on the growth performance and hematology of *Ctenopharyngodon idella*

Arooj Zaib Warraich¹, Khalid Abbas^{1*}, Muhammad Sarfraz Ahmed¹ and Taqwa Safdar¹

¹Department of Zoology, Wildlife and Fisheries, University of Agriculture, Faisalabad

*Corresponding author's email: dr.abbas@uaf.edu.pk

Fish is considered as major source of protein and minerals for humans. Due to more awareness about health benefits and increased income, the fish consumption rates are increasing rapidly. Mineral deficiencies always lead to stunted growth of fish. For this purpose, a 120 days' trial was conducted at Fisheries Research Farms, Department of Zoology, Wildlife and Fisheries, University of Agriculture, Faisalabad to determine the effects of dietary calcium and phosphorus supplementation on the growth performance of juvenile Grass Carp reared under intensive culture system. Four experimental diets were prepared containing different levels of each, calcium, and phosphorus, i.e., 0.2%, 0.4%, 0.6%, and 0.8%. Initial body weight and length of the fish were recorded at the time of stocking. The survival rate and growth performance, i.e., increase in weight and length were determined on a fortnightly basis while the hematological parameters were checked at the end of the trial. Physico-chemistry of water was maintained on daily basis throughout the trial. Statistical analysis of data was done by applying one-way ANOVA. Results showed that fish fed with 0.8% Ca and P showed best growth performance and survival rate ($P < 0.05$) whereas, poor growth performance was observed in T0. The order of growth performances is $T_4 > T_3 > T_2 > T_1 > T_0$. It was found that the Ca and P supplementation exerted a positive synergistic effect on growth performance of juvenile *C. idella*.

Keywords: Grass Carp, calcium, growth performance, hematology

Characterization of Genetic Variance in *Mystus seenghala* Populations of River Jhelum Revealed by Molecular Markers

Ayesha Aslam¹, Khalid Abbas^{1*}, Taqwa Safdar¹ and Muhammad Sarfraz Ahmed¹

¹Department of Zoology, Wildlife and Fisheries, University of Agriculture, Faisalabad

*Corresponding author's email: dr.abbas@uaf.edu.pk

Genetic diversity provides potential to cope effectively with environmental challenges necessary for the fitness of species. During the last few decades, natural stocks of *Mystus seenghala* have been depleted due to anthropologic and natural catastrophes. The proposed study was conducted to assess genetic variance of 150 specimens of *M. seenghala* collected from selected five sites of River Jhelum by using DNA-based markers. DNA was extracted by using standard phenol/chloroform DNA isolation methods and the quality and quantity of isolated DNA was examined by agarose gel electrophoresis and nanodrop, respectively. PCR products were resolved on PAGE. Different statistical software primarily designed for population genetics viz. FSTAT, POPGENE, ARLEQUIN and STRUCTURE were used for analysis of genotypic data. The PDK population had the highest average value of number of alleles and allelic richness, whereas the MD population had the lowest. Moderate heterozygosity levels were recorded in the studied populations. The average values of observed heterozygosity (H_o) in *M. seenghala* populations ranged from 0.620 to 0.580 while the expected heterozygosity (H_e) values ranged from 0.759 to 0.560. The average FIS values were - 0.072 to 0.239 in all the examined populations of *M. seenghala*. The maximum genetic distance (GD) was between the population pairs of PDK-MD and the lowest was between the JB-PDK populations. The AMOVA found that most of the variance (%) lied among the individuals. Two large clusters, A and B, were formed by UPGMA dendrogram: one cluster consisted of JB, PDK and THW while other consisted of RB and MD. This analysis of population genetic variance will be useful in developing future conservation plans of this species.

Keywords: *Mystus seenghala*; population genetics; genetic variance; microsatellite markers

Impacts of plastic pollution on the soil, water, animals and human life, critical review

Bahjat BIBI^{1*}, Muhammad Kabir¹, Wajeeha zahra², Fakhar Baneen², Khadija Noor²

²Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

²Government Girls Degree College, Bhakkar-30000, Punjab, Pakistan

*Corresponding author's email: bahjatbibi93@gmail.com

There are most important sources of plastic pollution construction and illegal dumping. Today, plastic is increasing from food wrappers containers, bottles, container caps and more. Oceans are the main source of plastic pollution by the fishing industry naval operations and aquaculture bad waste management fishing include traps and nets. It is estimated that 40 plastic pollutions are due to consumer goods and 11 clothing and textiles. China is the largest producer of plastic pollution 60 million tons of plastic waste, and 16 million tons were recycled. Pakistan is present 250 million tons of plastic pollution in which 20 million tons of solid waste annually and 5 to 6 presents in plastic waste and only 9 plastics recycled. 3.3 million tons of plastic waste in Pakistan each year due to unmanaged dumps and waste bodies. According to the research 158,943,925 tones of plastic waste created in 3023 and 43 global plastic waste mismanaged at the end of its life. 400 million tones of plastic material are created in the world every year. Plastic is most cheap material so available and used is everything. Plastic material is the harmful chemical that absorbs in the soil and decreases growth of the plants. Plastic material is the most effects in our life, such as human, animals, as well as Plant habitat. Plastic pollution is the very harmful of the human life we should that used of the plastic material at least today and apply proper banana throw plastic material in the open land surface water, ocean etc.

Keywords: plastic material, uncontrol pollutant, fishing, chemical

Isolation, characterization, and cytotoxic activity of secondary metabolites of euphorbia serpens kunth against the human hepatocarcinoma cell

Hina Bano¹, Mansoor Khan¹, Syed Majid Shah²

¹Department of Chemistry, Kohat University of Science and Technology Khyber Pakhtunkhwa, Pakistan

²Department of Pharmacy, Kohat University of Science and Technology Khyber Pakhtunkhwa, Pakistan

*Corresponding author's email: hinabano088@gmail.com

Natural products, especially plants, have been used for thousands of years to treat a variety of diseases. Since medicinal plants have unique active components that can alter biological processes, they are used to make synthetic and natural medicines in Egypt, China, India, Greece, and Pakistan. Cancer is the second most common cause of death all over the world and the number of cancer related deaths in all over the world was indeed high approximately over 10 million mortality rate in 2020. Liver cancer is the most prevalent cause of deaths related to cancer globally. Liver cancer is the fifth and ninth most prevalent types of cancer in both men and woman, respectively and the second most common reason of death worldwide. Plants have played a vital role as sources of effective anticancer drugs. Around the world, several species of plants are used to treat a variety of diseases, including diseases of the skin, migraines, gonorrhea, intestinal parasites, skin diseases and serious conditions like cancer. The genus *Euphorbia* is regarded as one of the plants that is very effective. The purpose of this study is to isolate the compound from bioactive extract of the *Euphorbia serpens* Kunth plant and evaluate its potential cytotoxicity against hepatocarcinoma cells (Hep-G2 cell line). The plant was collected from District Kohat. The plant powder will soak in them ethanol for 15 days at room temperature. The mixture will be shake daily and the extract will be obtained via filtration. The filtrate will be evaporated by a rotary evaporator at a controlled temperature and lowered pressure to produce crude extract. Current result confirmed the presence of pure compounds through column chromatography and thin layer chromatography. Further characterization of pure compounds will be done including NMR, FTIR, UV techniques and it will be evaluate the cytotoxicity potential of isolated compounds from *Euphorbia Serpens* Kunth plant against hepatocarcinoma cell (Hep_ G2 cell lines using standard procedure.

Keywords: Anticancer, *Euphorbia Serpens* Kunth, pure compounds

Prevalence and genetic characterization of *Toxoplasma gondii* active infection in cats of District Kohat

Khadeeja Baree^{1*}, Dr. Abdul Majid¹, Dr. Muhammad Yasir²

¹Department of Zoology, Kohat University of Science and Technology, Kohat 26000 Pakistan

²Veterinary Research and Disease Investigation Center, Kohat 26000 Pakistan

*Corresponding author's email: barikhadija57@gmail.com

T. gondii is a common protozoan parasite that affects small ruminants, as well as other mammals and humans, and has considerable zoonotic potential. Under-cooked and raw meat with tissue cysts, as well as horizontal transmission from the mother to the fetus, are all ways that *T. gondii* can be transmitted from animals to people. It's been shown to lead to miscarriages during reproductive cycles. This work can assist in raising awareness and creating new doors for the molecular-level results of *T. gondii* infection in the area. The aim of the study was to determine the prevalence and to identify the prevailing strains of *T. gondii* in cats of district Kohat. About one hundred and eight (Stray, 85 and Pet, 23) feces samples from cats were collected from nine different areas in the district Kohat and placed in sterilized falcon tubes. Before being transported to the "Molecular Parasitology Laboratory at KUST in Kohat" for further processing, each and every sample is labeled. All of the samples were kept at 4 degrees Celsius and were examined through microscope for the detection of *T. gondii* oocysts. Samples positive for *T. gondii* oocysts were subjected to DNA extraction and *T. gondii* B1 gene amplification through PCR. Amplified products were confirmed through gel electrophoresis. Out of total 65/108 (60.18%) were found positive for *T. gondii* oocysts through microscopy. 65 positive samples through microscopy were further subjected to molecular analysis where only 27/65 (41.5%) were successfully amplified through PCR. The overall prevalence of *T. gondii* among cats of district Kohat through microscopy was recorded 65/108 (60.18%) while 27/108 (25%) through PCR. Based on various localities of district Kohat *T. gondii* was found highest in Kohat city 16/20 (80%) followed by Surgul 7/10 (70%), Jungle khel 8/12 (66.6%), Jerma and Lachi 6/10 (60%), KDA 7/12, Cannt 5/9 (55.5%), and lowest was

recorded in Tappi and Dhoda 4/10 (40%). During various months the prevalence of *T. gondii* was recognized highest during the month of June 13/15 (86.6%) followed by September 8/10 (80%), and lowest in the month of December 1/10 (10%). Out of total PCR positive samples six random samples were selected and sequenced using Sanger sequencing method. The molecular characterization from all the data obtained was tabulated. Sequences obtained were analyzed using bioinformatics tools BLAST and MEGA-X. According to BLAST and phylogenetic analysis, it is concluded that *T. gondii* isolates from the research area belonging to the *T. gondii* Type-I strain. Furthermore, it strongly reflects previously made available sequencing data from countries in Asia, including Iran, Iraq, India, and China, as well as Slovakia, Nigeria, Mexico, and Egypt. According to this study, stray cats in the study area are far more likely to have *T. gondii* infection 60/90 (66.6%) than domestic cats 5/18 (27.7%), which raises serious public health concerns. It is important to take the proper precautions to stop the infection of stray cats from spreading to domestic cats and the public.

Keywords: *T-gondii*, transmission, genetic and molecular characteristic.

Antileishmanial and antioxidant activity of organotin (iv) complex of oxygen nitrogen donor ligand

Khalid khan^{1*}, Dr. ShaukatShujah¹, Prof. Dr. Azhar Ul Haq¹, Shah Hussain¹,

¹Department of Chemistry, Kohat University of Science & Technology (KUST), Kohat-26000, Pakistan

*Corresponding author's email: khalidkhan890098@gmail.com

In the current study, a [O, N] donor ligand N¹, N⁶ bis (5-bromo-2-hydroxy-1-phenylethanone) adipohydrazide was synthesized by reaction of adipic dihydrazide with 5-bromo-2-hydroxyacetophenone in ethanol. A series of three diorganotin (IV) derivatives of these compounds have also been synthesized in good yields by refluxing the compounds or its triethylammonium salt and the appropriate organotin (IV) chlorides in dry toluene for 7-8 hours. The synthesized compounds were characterized by a variety of spectroscopic techniques including Uv-Visible, FTIR and NMR (¹H, ¹³C). The spectroscopic investigation was used to check the structure, coordination mode of ligand and geometry of tin in the resulted 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 synthesized ligand and organotin derivatives have been studied for their effectiveness against leishmania parasites and oxidants. The synthesized organotin (IV) complexes showed high effectiveness against leishmania parasite than ligand. The dibutyl tin derivative of the ligand showed high percentage inhibition potential with IC₅₀ value of 1.81 µg/mL. Similarly, the complexes also showed significant antioxidant potential compared to the ligand. The dibutyl tin derivative of the ligand showed high percentage radical scavenging activity with a value of 78-90%.

Keywords: Oxygen Nitrogen Donor Ligand, Organotin (IV) complexes, Antileishmanial, Antioxidant Activity.

Synthesis and characterization of azomethine-sulfone linked titania- nanocomposites as antimicrobial coating.

Muhammad Amjid^{1*}, Ahtaram Bibi¹, Naila Khalid¹

¹Department of Chemistry, Kohat University of Science and Technology, Khyber Pakhtunkhwa, Pakistan

*Corresponding author's email: khanamjid561@gmail.com

Polymer nanocomposites are a new emerging class of materials due to their potential applications. The goal of the present investigation was to develop advanced antimicrobial coatings. This study focuses on the synthesis and characterization of azomethine-sulfone linked titania nanocomposites. Antimicrobial coatings play a vital role in preventing the proliferation of harmful microorganisms on various surfaces, contributing to improved hygiene and public health. Titania nanoparticles, known for their excellent photocatalytic properties, are chosen as a fundamental component in these nanocomposites.

The synthesis process involves the creation of azomethine-sulfone linkages, forming a stable matrix for the incorporation of titania nanoparticles. This unique chemical structure not only enhances the stability of the coating but also offers potential for controlled release of antimicrobial agents. The successful synthesis is confirmed through various analytical techniques, including Fourier-transform infrared spectroscopy (FTIR) and X-ray diffraction (XRD), which provide insights into the chemical composition and crystal structure of the nanocomposites.

Keywords: Titanium dioxide, azomethine-sulfone linked titania nanocomposites, antimicrobial coating.

Kinetic Alfven waves in spin polarized quantum plasma

Hina Zaib, Muhammad Adnan*, Ikramullah

Department of Physics, Kohat University of Science and Technology, KUST, Kohat, 26, 000 Pakistan

*Corresponding author's email: adnan_physics@yahoo.com

In the present study, we investigated the effects of spin polarization effect due to spin mismatch on the wave features of the Kinetic Alfven waves (KAW) mode in an electron-ion plasma configured in a low beta plasma limit. The electrons are taken as having spin polarized densities with spin-up $ne\uparrow$ and spin down of $ne\downarrow$ states. In the linear regimes, we traced out the effects spin polarization on and spin mismatch on the dispersion relation and discussed it parametrically. In the nonlinear regime, a nonlinear Korteweg-de Vries (KdV) type equation that describes the evolution of KAWs is derived via Reductive Perturbation Technique (RPT). The role of spin polarization index and Fermi pressure on the non-linear wave structures such as solitons of the KAWs in spin-polarized plasma are investigated. The results of the present study may have potential applications in low β electron-ion plasma having spin-up $ne\uparrow$ and spin-down $ne\downarrow$ states.

Impact of social anxiety and resilience on subjective happiness among adolescents

Janita Narmeen, Dawra Mehmood

Department of Applied Psychology, Thal University Bhakkar

This study evaluates the impact of social anxiety and resilience on subjective happiness among adolescents. This study conducted with a research population of (N=200) which is equally divided between the male and female population. Data is collected by administering three self-report measures including, social anxiety scale (Coballo, 2010), Resilience Scale (University of Washington, 2008) and Subjective Happiness Scale (Lyubomirsky & Lepper, 1999) used to measure the social anxiety, resilience, and subjective happiness in adolescents. Current study used correlational research design and purposive sampling technique. In this study, three types of analysis are used T-test, correlation, and regression analysis to find out the impact of social anxiety and resilience on subjective happiness. The findings show that there is a significant negative relationship between social anxiety and resilience. And negative relationship between social anxiety and subjective happiness. This study shows a positive relationship between resilience and subjective happiness. There is no difference between male and female in social anxiety resilience and subjective happiness. This study also concluded that IV social anxiety and resilience are very impactful on DV subjective happiness.

Keywords: Social anxiety, Resilience, Subjective Happiness.

We live in need in years.

Yusra Malik^{1*}, Muhammad Kabir¹

¹Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

*Corresponding author's email: yusramalik848@gmail.com

One's life is not measured by years but by greatness. The proverb
"We live in deeds not in years."

Means one's life is judged by great verbs and adventures not by the years which are lived by one. Allah almighty His blessed human being with life, but this gift has been showered with expiry date life is very short. It must be made immortal virtual deeds a brief glance on history removes the ambiguity and shows that there are many great men who made their lives a model for others. For example, look at the life of John Keats, romantic poet whose life span is very short, but he made his life great by his liberty masterpieces. It is a word recognized reality that both life and death are opposite to each other and are not in once hands. So very tiny deeds performed by a man like kindness, pity, helping the needy, the neglected children of society set a stamp of greatness of man's life. Some people live their life, and some people only exist in their life. People who live their life by eating, drinking and being is not life. Alexander the Greek world-famous conqueror, whose life is consisting of only thirty-six years. It is said about him that he kept on weeping because there was no more world to conquer for him. Islamic history also shows that life is remembered not by years but by good deeds. Hazrat Muhammad (P.B.U.H) made his life a model of tolerance and patience not for the Muslim world but for the whole humanity. His life is no less than an inspiration for the whole world. In short, criteria of judgment of one's life are achievement performed by a man not the years lived by one's.

Keywords: Meering means joy, immortal means ever living; Ambiguity means cryptic or obscure, Conqueror means defeater or winner.

Impact of *Melia azedarach* leaf extract on cyprinus carpio growth, Immunity, and hematological profile

Owais Rehman, Shehzad Zareen, Khalid Usman

Department of Zoology, Kohat University of science and technology Kohat, KP, Pakistan
Department of Zoology, Qurtaba University of Science & Information Technology, Peshawar

A study was conducted to evaluate the effect of *Melia Azedarach* leaf extract on the growth performance, hematological parameters, and immune response of common carp fingerlings with an average weight of 22.14 ± 0.98 g. After acclimation for two weeks, fish (n=25) were randomly selected and placed in four glass aquaria (T0, T1, T2 and T3) at constant water temperature (30.0 ± 1.0 °C), pH (7.50 ± 0.5) and total hardness (200 ± 2.0 mgL, -1) for a period of 12 weeks, with three replicates each. Fish were fed with *Melia Azedarach* leaf extract supplemented feed @ 0.0%, 1.0%, 2.0% and 3.0% in T0, T1, T2 and T3, respectively. At the end of the experiment, five fish were randomly selected from each aquarium for hematological parameters. Total proteins, albumins, and globulins were also recorded to evaluate immunological memory. The result revealed that fish in T2 showed better growth performance with an average weight gain of 56.11 ± 0.51 g. Thus, it had been concluded that *Melia Azedarach* a medicinal plant, can also be used to enhance the growth performance and immune response of common carp as attractive alternatives against antibiotics and vaccines and has shown no negative side effects on fish health as well as on its environment.

Keywords: growth, antibiotic, immunity, common carp, *Melia Azedarach*

Biodiversity loss and Species extinction due to environmental pollution and their Preservation; A critical review.

Muhammad Aqeel^{1*}, Muhammad Kabir¹, Muhammad Kamran¹, Muhammad Sajid¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: aqeelgskzmx@gmail.com

Biodiversity means different varieties within the living organisms, that may be plants as well as animals. This diversity is the blessing of Allah Almighty. However, there is extensive loss of this biodiversity due to major environmental issues such as pollution caused by population explosion, transportation, deforestation, and industrialization leading to the habitat loss of organisms. Due to the loss of habitat, there is a high rate of biodiversity loss and species extinction.

Many organisms of the past such as dinosaurs are now extinct because of these major issues. The culprit of these issues is man itself who is destroying the creativity of the best creator (Nature). Through population explosion, transportation, industrialization, and deforestation, man is destroying the beauty of nature. Now dolphins are also near to being extinct. Many plant and animal species are now extinct and many more are endangered because of this environmental pollution. Many seabirds and animals are endangered because of aquatic pollution best example is the mistaking of plastic by the crocodile leading to their death. If we want to conserve biodiversity loss and species extinction rate, we have to:

- ❖ Avoid deforestation, promote afforestation or reforestation to avoid habitat loss by planting more and more trees.
- ❖ Use public transport.
- ❖ Use appropriate measures at industrial sites to avoid pollution in aquatic as well as terrestrial habitats.
- ❖ Proper waste disposal will also be helpful.
- ❖ Strictly follow 3R strategy (Reduce, Reuse, Recycle)

Keywords: Deforestation, Habitat loss, Nature's beauty destruction, species extinction

Fundus Image Assessment Using Quaternion Valued Singular Decomposition Method

Muhammad Kamran^{1*}, Syed Zuhair Abbas²

¹*Department of Mathematics, Thal University Bhakkar, 30000, Punjab, Pakistan*

²*Department of Physics, Thal University Bhakkar, 30000, Punjab, Pakistan*

*Corresponding author's email: kamran.tu.edu@gmail.com

The study "Fundus Image Assessment Using Quaternion-Valued Singular Decomposition Method" presents a unique method for fundus image evaluation using the QVSD (quaternion-valued singular decomposition) approach. By improving the extraction of intricate features from fundus photographs, this technique helps ophthalmologists make more thorough and precise diagnoses. The study shows that QVSD has the potential to be an important tool for developing fundus image analysis. The image-denoising problem is an inverse mathematical problem, and the approximation solution causes a storage problem when the approach is used. This challenge is solved through the use of prior learning, in which a dictionary is created during the training phase and then used in later applications such as image denoising. The learning of dictionaries is a categorization problem. The quaternion dictionary is created in this work, with each member being a pure quaternion. The QVSD method is utilized for pixel classification, and the Quaternion Orthogonal Matching Pursuit Algorithm is employed for optimization. This method is already used for real images, whereas the real images represent the ground truth, and the medical images represent soft tissues and fine structures of the body, which is further used for medical purposes. We employed the algorithm for the eye image's quaternion pixel representation. For experiments, we add the Additive White Gaussian Noise to the eye image and this noise is removed successfully and the results are promising.

Keywords: Eye Images, Quaternion Sparse Matrix, Quaternion Singular Value Decomposition, Additive White Gaussian Noise

Phytoremediation is an emerging clean and green technology for polluted environment.

A concise review

Muhammad Kabir^{1*}, Um e Habiba², Muhammad Zafar Iqbal³, Muhammad Shafiq³, Zia-Ur-Rehman Farooqi³ and Wali Khan⁴

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

²*Department of Physics, Riphah International University, Faisalabad Campus, Punjab, Pakistan*

³*Department of Botany, University of Karachi, Karachi, 75270, Sindh, Pakistan*

⁴*Department of Zoology, University of Malakand, Lower Dir, Khyber Pakhtunkhwa, Pakistan*

*Corresponding / Presenting author's email: muhammad.kabir@uos.edu.pk

Environmental pollution is an undesirable change in biological, chemical, and physical characteristics of all components of environment i.e., soil, water and air that may harmfully affect living organisms. Natural environment creates proper conditions for, existence, survival, growth, and development of all living organisms on surface of the earth. The rapidly increasing environmental pollutants escaping in all components of environment not only affects natural resources, but also causes major destruction of ecosystems. Due to their toxic nature, environmental pollution has posed a serious threat to the environment and the ecosystem. Therefore, remediation of pollutants is of great importance. The aims and objectives of this review include developing plant-based green technology to clean polluted environment at low cost. It also mitigates the adverse effects of pollution on the environment, human health, and the well-being of all living organisms. These goals are important for ensuring a sustainable and healthy planet. Phytoremediation is the use of plants to combat the effects of environmental pollution. It is an eco-friendly approach used for cleaning up the environment (soil, water, and air) from pollutants such as heavy metals with the use of plants. It is believed as a cost effective, efficient, new, environmentally friendly, and highly adoptable technology. Focus on phytoremediation as a technique to resolve environmental pollution has been emerging rapidly in current years. This clean and green technology which involves "tolerant plants" has been utilized to clean up air, soil and water from different other toxic pollutants including heavy metals. Plants are natural organisms having significant metabolic and absorption potential, and conduction systems that can take up nutrients or pollutants from the growth medium, air, soil, and water. Certain plant species are chosen for their ability to absorb, accumulate, or break down specific pollutants. These plants are often referred to as "hyperaccumulators" when they can accumulate high concentrations of contaminants without being significantly harmed. So, phytoremediation is considered environmentally friendly because it generally has lower energy and chemical inputs compared to traditional remediation methods. It can also be used in conjunction with other remediation techniques in a sustainable and holistic approach. This abstract in the form of review concluded that plants are natural purifier of environmental pollution. So, a humble request to all humanity is that adopt the "green revolution (plantation) which is the best solution to arrest environmental pollution" for a sustainable environment to keep it clean and green. It gives a concise overview about phytoremediation to encourage more research on this emerging technology and further improvement and its effectiveness in practical way.

Keywords: Environment; Green Technology; Hyperaccumulators; Phytoremediation; Pollution.

A DFT computational design and exploration of the novel Perovskites for eco-friendly power production schemes

Syed Zuhair Abbas,

Department of Physics, Thal University, Bhakkar, Pakistan.

*Corresponding author's email: zuhair.abbas@tu.edu.pk

Over the past fifty years, as the world's population has increased and industries have expanded, power consumption has been rising dramatically with each passing day. As a result, the present electricity resources, which are primarily based on conventional power generation systems, will eventually run out. As a result, there has been a lot of emphasis paid to the study of novel materials for cleaner, more environmental friendly power generation techniques in an effort to close the energy deficit. In this scenario, the thermoelectric and photovoltaic materials have emerged as viable options for generating electricity from wasted heat generated by traditional fossil fuel processes and from freely available solar light, respectively. The previously mentioned power generation methods have multiple advantages for instance free from noise, free from toxicity, free from outflow residuals, pollution-free, reliable, and economical. The well-known Seebeck effect, which relates energy directly from temperature gradients, is the foundation of thermoelectricity. The ideal thermoelectric material for use in thermoelectric generators and other applications is one with a high figure of merit (ZT). It is possible to convert solar light into power by using photovoltaic materials. Large absorption coefficients, energy band gaps in the visible range, acceptable charge carrier mobility, a significant capacity to convert solar radiation into electricity, and strong resistance to oxidation, heat, and moisture are all necessary for photovoltaic materials to be attractive. At the moment, we investigate the aforementioned material characteristics with codes based on density functional theory (DFT), such as Quantum ESPRESSO, PHONOPY, and BOLTZTRAP. These theoretical/computational studies are quite helpful in screening the efficient materials before synthesis in labs for multiple innovative applications particularly for solar cell and thermoelectric generator applications.

Sustainable Energy Storage; LC as Electrode Material

Fatima Kainat

Department of Physics, Thal University Bhakkar

*Corresponding author's email: fatimakainat96@gmail.com

Growing demands for compact, fast, portable electronics, it is highly intriguing to transform natural self-growing plant lignocellulose, into paper-based electrodes for energy storage applications. Graphene oxide (GO) is a potential flexible energy storage application due to its inherent rigid structure. As GO/LC fiber makes the working electrode flexible, low-cost, and environmentally friendly. In order to ameliorate the reduction ionic conductivity, we have employed the technique of electrode position. The morphological and structural properties of the sample were investigated by different characterization technique such as Raman spectroscopy Fourier transform infrared spectroscopy and scanning electron microscopy, whereas the Electrochemical properties were studied by Cyclic Voltammetry and Electrochemical Impedance Spectroscopy. SEM images clearly indicate the deposition of MnS nanoparticles on GO nanoparticle embedded in LC fibers whereas FTIR results confirm the bonding of the functional groups. Cyclic voltammetry measurements showed efficient kinetics of GO/LC after electrodeposition of MnS nanoparticles. The deposition of MnS nanoparticles on GO/LC sheet acts as a conductive path and reduces the associated resistance. Incorporated flexibility in rigid structure of GO and further improvements in conductive and energy storage characteristics will open the possibilities to be used as electrode in modern bendable energy storage devices.

Functional Analysis of Phytochrome A and B1B2 variants in Tomato Under Heat Stress

Muhammad Arslan Zafar^{1*}, Qasim Ali¹, Farah Saeed², Nasreen Sikandar¹, Muhammad Rizwan¹, Fazeela Nawaz¹, Zahoor ul Hassan¹

¹*Department of Botany, Government College University Faisalabad, Faisalabad, Pakistan.*

²*Department of Botany, Government College University for Women Faisalabad, Faisalabad, Pakistan.*

*Corresponding author's email: arsalmalik2121@gmail.com

Heat stress (HS) is a well-recognized detrimental element that significantly impacts the growth and development of plants. It is a pervasive global phenomenon that poses substantial danger to agricultural practices on a large scale. Phytochromes (PHYs) are a class of photoreceptors that play a crucial role in regulating several aspects of plant growth and development. It has been shown that the stress signaling response might partly impede the normal functioning of these phytochromes. In tomatoes, the most widely recognized PHY varieties are PHYA, B1, and B2. Our study sought to determine the function of tomato 'Money Maker' PHY A and PHYB1B2 variants at fluctuating and consistent high temperatures at various phases of growth. During the seed sprouting and vegetative development stages, PHY variants exhibited HS tolerance. However, during the blossom stage, phy mutants exhibited two contradictory functions contingent on the period of HS exposure. PHY variants responded similarly to HS throughout the fruiting period, just like wild type. By influencing stomatal closure, PHY variants were capable of achieving a high level of membrane stability and improved water retention during the vegetative growth period. Additionally, both variants enhanced the expression of stress-responsive genes associated with heat tolerance. The PHYA variant boosted proline levels while reducing malondialdehyde buildup. These results shed light on the HS response of tomato PHYA and PHYB1B2 variants.

Keywords: Heat stress, phytochromes, Variants,

Causes, effects, and treatment of plant diseases by using technology

Amna Razzaq^{1*}, Amna Javed¹, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: amnarazaq56@gmail.com

Any condition of plants that was abnormal is called disease. There are many root causes which affect the plants. Fungi, Pathogen, Lack of major nutrients any environmental stress, round worms, Pathogens (opening of stomata and welcoming the bacteria, viruses etc.) affect the plants. The infection may be destroying the whole life of plants. It's mean it may be kills the plants.

Quarantine also helps to reduce the plants pathogen's transfer. Well developed checking plans help to reduce the disease of plants from one place to others. Proper labs or greenhouses help to discover the material which helps plants survival. Many technologies like IoT or EEG, sensor systems, computer systems are used to recognize the plant's infection and deal with them in real time and at large scale. Rotation of crop in the same field should be followed for best crops production. Sensing systems by using the latest computer or robot for the great survival of plants should be used at that time. Internet knowledge of things used nowadays for survival of healthy plants. Healthy plants give healthy lifestyle to living organisms.

Keywords: Plants, Disease, Pathogens, Environmental Stress, Infection. Technologies, Survival, Recognize Disease, Computer System, Sensor System, Rotation.

Climate change and its effect on biodiversity: Mitigation and adaptation strategies

Muhammad Kabir¹, Kashmala Habib^{1*}, Shaiza Ali Sher¹, Maryam Asghar¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: kashmalahabib19@gmail.com

Climate change is a global phenomenon with profound implications for biodiversity and ecosystems. As our planet faces increasing temperatures, altered precipitation patterns, and extreme weather events, the delicate balance of life on Earth is under threat. This abstract explores the multifaceted relationship between climate change and biodiversity, highlighting the far-reaching impacts on ecosystems, species, and human societies.

The effects of climate change on biodiversity are manifest in altered habitats, shifts in species distributions, and changing ecological dynamics. These impacts pose serious challenges for the conservation of numerous species, particularly those with specialized habitats or limited ranges. Furthermore, climate-driven alterations in phenology and the timing of natural events can disrupt critical ecological interactions.

This abstract also delves into mitigation and adaptation strategies aimed at safeguarding biodiversity in the face of climate change. Mitigation measures, including reducing greenhouse gas emissions and habitat restoration, seek to address the root causes of climate change. Additionally, adaptation strategies such as protected area management and the creation of wildlife corridors aim to help ecosystems and species cope with changing conditions.

Furthermore, it discusses the importance of international cooperation, scientific research, and public engagement in confronting this issue. As climate change continues to accelerate, proactive measures to protect and preserve biodiversity become increasingly critical. By integrating mitigation and adaptation strategies into broader conservation efforts, we can strive for a sustainable future where both biodiversity and humanity thrive amidst a changing climate.

Keywords: Profound, Multifaceted, Phenology, Mitigation measures, Restoration

Challenges in international human rights law enforcement

Ume Aiman^{1*}, Muhammad Kabir¹, Muhammad Shahzaib Khan¹, Nimra¹, Mahnoor Sohail¹, Eisha Noor Shah Hashmi¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: aysunaysun712@gmail.com

The enforcement of human rights on an international scale is a multifaceted and intricate endeavor, beset by numerous challenges. This abstract has shed light on some of the primary hurdles that hinder the effective protection and promotion of human rights across the globe. Cultural and legal disparities present a substantial obstacle, as they influence the interpretation and implementation of human rights in diverse regions. Moreover, the principle of state sovereignty can sometimes create resistance to international involvement in domestic human rights matters. Resource limitations and political considerations further complicate the process. Nonetheless, addressing these challenges is imperative for the sake of global justice and the preservation of human dignity. It is essential to work towards a world where human rights are universally respected and protected, irrespective of cultural, political, or geographical boundaries. In the pursuit of overcoming these challenges, international cooperation, diplomacy, and the exchange of best practices become indispensable tools. Strengthening international institutions and mechanisms for monitoring and accountability is also crucial. Moreover, public awareness, advocacy, and civil society engagement play a pivotal role in pressuring governments to fulfill their human rights obligations. In conclusion, the path toward effective international human rights law enforcement may be fraught with complexities, but it is a path worth pursuing. The universal recognition and protection of human rights are fundamental to achieving a more just and equitable world. Researchers, policymakers, and advocates must collaborate to address these challenges and propel human rights enforcement into the global spotlight.

Keywords: human rights, enforcement, political considerations, resource limitations, just world, cultural disparities, challenges

Investigation of gamma-ray and neutron shielding characteristics of thallium-tellurite glasses using fluk monte-carlo code

Aaqil Bashir, Sajid Khan, Ghulam Hassan, Rashid Ahmad

Department of Physics, Kohat University of Science and Technology, Kohat, Khyber Pakhtunkhwa,

In this study various thallium, tellurium based glass system $(\text{TlO}0.5)_x - (\text{TeO}_2)_{1-x}$, (where $x=10, 20, 30, 40$, and $50\text{wt}\%$) coded as TT10, TT120, TT130, TT140, and TT150 have been studied as a shielding material against gamma radiation. Gamma radiation shielding parameters such as mass attenuation coefficients (MAC) are calculated through Flukamonte Carlo code and Phy-X/PSD software in the energy range of 0.015-15 MeV. Obtained MAC values are then used to calculate other gamma radiation shielding parameters such as mean free path (MFP) and effective atomic number (Z_{eff}). Besides this, the exposure buildup factor (EBF) was also calculated by using EXABCal software at different penetration depths (PDs) in the energy range of 0.015-15 MeV. Sample TT150, which has a larger thallium oxide content of 50mol% shows higher values of MAC and lower values of MFP among all the examined glass samples. Our investigated TlO0.5–TeO glass samples possess the lowest MFP values in comparison with the different types of concretes and commercially available shielding glasses. In addition, fast neutron shielding characteristics in light of fast neutron removal cross-section have also been computed. Glass sample TT150 possesses the higher values of fast neutron removal cross-section as compared to the other glass samples. The results indicate that the adding up of TlO0.5 improves shielding against the fast neutron and gamma radiation.

The Role of Greenery in Climate Change Mitigation

Muhammad Faiz-Ul-Bari Shah

Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

*Corresponding author's email: faizulbarishahhashmi45@gmail.com

In the face of escalating climate change concerns, the role of greenery in climate change mitigation has become increasingly significant. This study delves into the botanical aspects of how trees and plants serve as essential components in the battle against rising global temperatures. Greenery, encompassing forests, urban trees, and vegetation, plays a pivotal role in reducing the concentration of greenhouse gases, particularly carbon dioxide, in the atmosphere. Through the process of photosynthesis, plants absorb carbon dioxide and store it as biomass, thereby acting as a carbon sink.

Furthermore, the role of greenery extends beyond carbon sequestration. Trees contribute to local cooling through transpiration and shade, reducing the urban heat island effect. They also enhance air quality by filtering pollutants and promoting oxygen production. These ecological services provided by greenery are essential for creating resilient and sustainable urban environments.

This abstract investigates the use of greenery in climate change adaptation and mitigation strategies. Forest conservation and afforestation initiatives are explored, along with the concept of urban green infrastructure. The impact of climate change on plant species and ecosystems is discussed, emphasizing the need for conservation and protection.

In conclusion, understanding the botanical significance of greenery in climate change mitigation is pivotal. The interplay between plants and the environment offers a holistic approach to address the challenges of a changing climate while fostering sustainable, green landscapes for future generations.

Keywords: mitigation, components, sequestration, transpiration, infrastructure, conservation.

Biodegradable Plastics: A Way to Reduce the Impact of Plastic Pollution on Environment

Areeba Khalid Khan

Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

*Corresponding author's email: niaziareeba1@gmail.com

Excessive plastic use has made our lives heavily reliant on this material. Unfortunately, this dependence has led to severe plastic pollution, which is having detrimental effects on our environment and human health. One promising solution to reduce this problem is the adoption of biodegradable plastics. Bioplastics, derived from renewable resources like cornstarch, sugarcane, and plant-based oils, provide a more environmentally friendly alternative to conventional plastics. Their production has a lower environmental impact, as they rely on organic sources with a reduced carbon footprint. This lessens the strain on ecosystems. One of the key advantages of bioplastics is their biodegradability. In the right conditions, they naturally break down into compounds, reducing the long-lasting presence of plastic waste in the environment. This aligns with global efforts to minimize plastic pollution, particularly in marine and terrestrial ecosystems. Furthermore, bioplastics contribute to a decrease in our reliance on fossil fuels. This shift reduces the environmental harm associated with fossil fuel extraction and processing. By using renewable resources for bioplastic production, we move closer to a more sustainable and eco-friendly future. It's important to note that the success of bioplastics in addressing plastic pollution depends on the collective efforts of governments, industries, and environmental organizations. Collaborative promotion and policy development can make a significant impact. Additionally, continued research and innovation in this field will refine bioplastics' properties, making them more durable and cost-effective. However, it's crucial to recognize that bioplastics are just one aspect of a broader strategy that includes reducing, reusing, and recycling plastics. All of these elements are essential in tackling the complex issue of plastic pollution.

Keywords: Biodegradable Plastics, Sustainable Alternatives, Renewable Sources, Environmental Impact

The Impact of Climate Change on Plant Adaptation Strategies

Mahnoor Sohail^{1*}, Eisha Noor Shah Hashmi¹, Umme Aiman¹, Nimra¹, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: mahnoorsohail73@gmail.com

Exploring the profound implications of climate change on plant adaptation strategies unveils a critical aspect of our ever-evolving natural world. This investigation delves into the intricate relationship between shifting environmental conditions and the evolutionary responses of plant species. The central focus of this examination is to comprehend how plants are adapting to the rapidly changing climate. As our planet experiences disruptions in temperature, precipitation patterns, and the frequency of extreme weather events, plants are compelled to evolve. The survival and reproduction of plant species depend on their ability to adjust to these new conditions. Examining how climate change affects the way plants survive and thrive is crucial. When the climate changes, plants have to find new ways to survive. This might mean growing differently, changing when they flower, or even moving to new areas. The essence of plant adaptation is intertwined with a multitude of mechanisms. Phenotypic plasticity, where a single genotype can display a range of trait variations in response to environmental stimuli, plays a fundamental role. This

capacity allows plants to adjust their physical attributes and physiological processes to optimize their chances of survival and reproduction. However, genetic adaptation through natural selection and the spread of advantageous traits within plant populations is a more enduring process. Over successive generations, plants that exhibit traits better suited to the new climate become more prevalent. This gradual adaptation is essential for the long-term sustainability of plant species. The examination will also encompass the role of human intervention through breeding programs and genetic engineering to accelerate plant adaptation. This holds promise for maintaining agricultural productivity and food security in the face of climate change. It is crucial to recognize that while plants exhibit remarkable adaptability, the rapid pace of contemporary climate change presents significant challenges. Urgent efforts in conservation, habitat protection, and sustainable land management are necessary to facilitate the survival of vulnerable plant species.

Keywords: Climate change, Plant adaptation, Strategies, Critical, Investigation, Environmental conditions, Evolutionary responses, Planet, Extreme weather, Phenotypic, Breeding, Genetic engineering, food security, vulnerable

Static and Dynamic Properties of Bose-Einstein Condensate

Jawad Hassan Mehdi

Department of Physics, Thal University Bhakkar, Pakistan.

*Corresponding author's email: jawad.dhandla@gmail.com

In the last two decades, many experiments have been performed that confirmed the Bose-Einstein condensates with weak contact interaction in ultra-cold atoms. It took a long time to enable advanced techniques that measure the effects of dipole-dipole interaction (DDI) with a permanent or induced electric or magnetic dipole moment that is present between the atoms or molecules. This type of experiment was first performed for chromium atoms in 2005 and after that, many other experiments have been demonstrated for large magnetic moment atoms like Erbium and Dysprosium. In this research thesis, we explore the characteristics of dipolar condensates at approximately zero temperature. In this respect, we use the variational approach and plot the dependence of density wave function on the dipole-dipole interaction. To quantify the dependence of the width of the density profile of the dipolar BEC we calculate the width of the wave function versus the dipole-dipole interaction strength. We find out that the width of the condensate is small for the small dipole-dipole interaction (DDI) and it increases as the dipole-dipole strength increases. Later, to discuss the dynamics of the system, we calculate the equations of motions of the system and discuss the time-of-flight dynamics of the dipolar condensate. During the time of flight, we notice that the dynamics of the condensate width strongly depend on the initial dipole-dipole interaction.

Structural Refinement of Naturally Synthesized Cadmium Selenide Nanoparticles for Ablative Laser Propulsion Applications

Sehrish Mehmood,

Department of Physics, Thal University, Bhakkar, Pakistan.

*Corresponding author's email: Sharimehmood767@gmail.com

Lasers can precisely transmit lots of irradiance into limited portions of a substance to generate the required response. On this subject, countless books and research papers have been published. The capacity to just be regulated so in that object or even at whatever frequency light brought down is one of laser's key advantages as a technique for material processing. A laser pulse generates the thrust in the technique of laser ablation propulsion and ablates the surface of the sample. Nanoparticles are deposited on the surface of substrate and laser beam interacts with the nanoparticles. The properties like surface Plasmon resonance and huge surface area of nanoparticles influence the

laser matter interaction. CdSe (naturally synthesized) has been used to improve the LAP features of a metallic substrate to the greatest possible degree for the first time. An Nd:YAG laser (Q-Ouantel brilliant) which has a pulse of 5 nanoseconds and a wavelength of 1064 nanometer has been targeted at normal temperature and pressure. Nd:YAG laser has been used to ablate copper samples. The spin coating technique has been used for coating nanoparticles on the Copper. Momentum coupling coefficient C_m , exhaust velocity V_E , specific impulse I_{sp} and ablation efficiency η_{AB} had been recorded. The research showed that CdSe (natural and synthesized) nanoparticles dramatically boost the laser ablation propulsion parameters.

Comparative Study of CdSe and CdO Nanoparticles Influenced by Laser Ablation Propulsion

Sehrish Mehmood,

Department of Physics, Thal University, Bhakkar, Pakistan.

*Corresponding author's email: Sharimehmood767@gmail.com

A laser pulse ablates the sample surface and provides thrust in laser ablation propulsion. The laser beam power interactions with the nanoparticles (NPs) that are deposited on the material surface. The principle of surface plasmon resonance and the huge surface area of NPs have an impact on laser matter interaction. To the highest possible standard, it is the first time that CdO NPs (natural and synthesized) and CdSe (natural and synthesized) have been used to improve LAP characteristics of metallic earmark. At normal temperatures and pressures, an ND: YAG laser (Quantel Brilliant) using a pulse of 5ns and a wavelength of 1064nm was employed. It was utilized to ablate copper samples that were coated with CdO (natural and synthesized) NPs and CdSe (natural and synthesized) NPs and those that were not. The CdO NPs film was formed on copper using the spin coating process. The exhaust velocity V_E , ablation efficiency η_{AB} , Momentum coupling Coefficient C_m , and specific impulse I_{sp} were computed. The study discovered that coated CdO (natural and synthesized) and CdSe (natural and synthesized) nanoparticles dramatically boost the laser ablation propulsion parameters.

A Coherent Analysis of Bessel-Riesz Operators Boundedness in Companato Spaces

Saba Mehmood¹, Fatimawati², Eridani², Wasim Raza³

¹Department of Mathematics, Thal University Bhakkar, 30000, Punjab, Pakistan.²Department of Mathematics, Faculty of Science and technology, Universitas Airlangga, Surabaya, Indonesia

³Department of Mathematics, Institut Teknologi Sepuluh Nopember (ITS), Surabaya, Indonesia

This paper aims to examine the boundedness characteristics of Bessel-Riesz operators in Companato spaces, specifically within the context of Euclidean spaces. In this study, we utilize the maximal operator and classic dyadic decomposition techniques to investigate the influence of the interplay between the kernel and space parameters on the boundedness of the operators. This study aims to provide useful insights into the behavior of operators in Companato spaces, thereby contributing to the advancement of functional and harmonic analysis within the framework of Euclidean spaces.

Keywords: Companato Spaces, Bessel-Riesz Operator, Euclidean Spaces

The Japanese art of Bonsai tress

Maryam Asghar^{1*}, Muhammad Kabir¹

¹Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

*Corresponding author's email: maryamasghar1214@gmail.com

Bonsai, the Japanese art of cultivating miniature trees, is a fascinating and centuries-old tradition that has captured the imagination of people worldwide. This abstract provides a glimpse into the enchanting world of Bonsai and offers insights into its cultural, artistic, and horticultural significance. Bonsai, derived from the Japanese words “bon” (meaning tray) and “sai” (meaning plant), represents the harmonious fusion of nature and art. The art of Bonsai involves nurturing tiny trees to resemble their full-sized counterparts while maintaining a sense of balance, harmony, and proportion. This miniature replication serves as a metaphor for the essence of nature itself. The history of Bonsai traces back to ancient China, but it was in Japan where it evolved into an intricate art form. Japanese Bonsai masters perfected the techniques of pruning, wiring, and shaping to create living sculptures that evoke emotions and storytelling. Each tree tells a story through its form, age, and seasonal changes. Bonsai is not merely an art form; it's a profound cultural expression deeply rooted in Zen Buddhism and the appreciation of simplicity, patience, and the impermanence of life. It invites us to contemplate the transient nature of existence through these resilient yet delicate trees. The aesthetic principles of Bonsai encompass fundamental design elements, such as balance, harmony, and unity. Different styles, like formal upright, informal upright, and cascade, reflect the diversity of nature itself and the creativity of the artist. Bonsai trees require meticulous care, including precise pruning, wiring, watering, and repotting, which make it a unique horticultural practice. The relationship between the bonsai enthusiast and the tree is one of profound connection and mutual growth. This abstract explores the symbolism embedded within the Bonsai practice, emphasizing how it encourages mindfulness, patience, and introspection. The cultural significance of Bonsai extends beyond artistic appreciation, as it has become an emblem of Japan's rich cultural heritage, embodying the values of tradition and respect for nature. Additionally, this paper discusses the global spread of Bonsai and how enthusiasts from various cultures have adapted the art while respecting its traditional core. The International Bonsai community plays a vital role in preserving and evolving this timeless art. In the context of the seminar conference, we will delve into the techniques of Bonsai creation, from selecting the right tree species to the intricate wiring and shaping processes. Moreover, we will explore the therapeutic and meditative aspects of Bonsai, as well as its educational potential in teaching patience, responsibility, and environmental awareness.

Keywords: Miniature, Harmony, Symbolism, Enthusiast, Intricate, Meditative.

Global Climate Change, Its Impact on Plant Diversity, and Its Mitigation

Tanveer Abbas^{1*}, Aun Abbas¹, Ghazanfar Mehdi¹, M. Saqlain¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: aun@scholar.tu.edu.pk@gmail.com

Climate change is a global problem with a huge impact on human wellbeing and biodiversity. In this review, the drivers of climate change, its impact on biodiversity and human wellbeing, and mitigation measures being taken at the global level are briefly discussed. The main drivers of global warming are due to the burning of coal and fossil fuels and deforestation. A marked increase in the frequency and intensity of natural disasters, a rise in sea level, a decrease in crop productivity, and the loss of biodiversity are the main consequences of global climate change. An increase in atmospheric temperature has serious consequences for biodiversity, ecosystems, and human welfare. Climate change has a huge impact on plant and animal species such as the polar bear, Arctic fox, and Arctic wolf and also threatens the survival of native animals in submerged coastal areas and islands due to the rise in temperature and acidity of the oceans. The aim of COP 26 is to limit global warming to well below 2 °C compared to preindustrial levels. Climate change is having a profound effect on plant diversity around the world, as changing temperatures and rainfall patterns affect the habitats where plants can thrive. One of the biggest impacts of climate change on plant biodiversity is the loss of habitats due to rising temperatures and changing rainfall patterns. This event can have a significant impact on food security, particularly in developing countries where agriculture is a

major source of livelihood. The report calls for urgent action to reduce greenhouse gas emissions and to protect and restore natural habitats. It also highlights the need for a more sustainable approach to agriculture and forestry and the importance of involving indigenous communities and local people in conservation efforts.

Keywords: Climate change, Impacts on plants diversity, Protection strategies.

Holography: Principles, Applications, and Future Prospects

Hafsa Bibi^{1*}, Saira Noreen¹

¹*Department of Physics, Thal University Bhakkar*

*Corresponding author's email: Hafsaawan986@gmail.com

Holography, a revolutionary imaging technique rooted in the principles of wave optics, has transcended its inception in physics laboratories to become a driving force in contemporary physics research and technology. This research paper provides an in-depth exploration of the fundamental physics underpinning holography, its historical evolution, and the profound impact it has had on the field of physics. From its inception by Dennis Gabor in 1947, holography has provided physicists with a unique tool to capture and reproduce both the amplitude and phase information of light waves, enabling the creation of holograms, which serve as a physical manifestation of the interference patterns between object and reference beams. The rich physics behind this interference, involving wave superposition and diffraction, allows for the recreation of a three-dimensional representation of the object or scene. This paper delves into the intricate physics of holography, emphasizing the wavefront reconstruction process and the associated mathematical and optical principles. Furthermore, it showcases how holography has revolutionized physics research by enabling high-precision interferometry and the study of complex wave phenomena. In addition to its foundational principles, this paper elucidates the current and potential applications of holography within the realm of physics. Holography has become an invaluable tool for the precise measurement of physical parameters, opening new avenues in fields such as optical metrology, quantum optics, and astrophysics. It has been instrumental in the exploration of novel materials, such as the study of complex materials and condensed matter physics. Moreover, this research paper offers a glimpse into the future of holography in physics, highlighting ongoing developments and emerging applications, and discusses the exciting prospects for holography in quantum information science and its potential to advance our understanding of fundamental physical phenomena.

Keywords: Holography, Wave optics, Interference patterns, Wavefront reconstruction, Amplitude and phase information, Three-dimensional representation, Quantum optics

Science and Technology

Noreen qamar^{1*}, Musafa Nawaz¹, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: qamarnoreen853@gmail.com

Science and technology are pivotal drivers of societal progress, shaping the course of human civilization and revolutionizing the way we live, work, and communicate. This abstract provides an overview of their interconnected roles, focusing on their impact on diverse domains, including healthcare, communication, environmental sustainability, and artificial intelligence. It explores how scientific research, innovation, and technological advancements are pivotal in addressing global challenges and fostering a sustainable and prosperous future. Furthermore, this abstract emphasizes the necessity of responsible and ethical development in science and technology to ensure the equitable distribution of benefits and to mitigate potential risks. Understanding and harnessing the power of science and technology are essential for navigating the complexities of a rapidly evolving world and achieving sustainable development goals in the 21st century.

Keywords: civilization, revolutionizing, communication, environmental sustainability, artificial intelligence, understanding and harnessing.

Environmental Pollution & its impacts on living organisms

Rubina Bano¹, Muhammad Kabir^{1*}

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: muhammad.kabir@uos.edu.pk

The importance of environmental elements to human populations' health and well-being becomes more and more evident. Environmental pollution is a global issue with significant potential to affect human population health. The heavily populated metropolitan-industrial centres of the more industrialized nations are where pollution reaches its most dangerous proportions. Over 80% dirty water is utilized for irrigation in developing nations, but only 70% to 80% of people in industrialized and semi-urbanized areas have access to food and shelter. The government of Pakistan (2009) states, that industry which is concentrated in urban and semi-urban areas and encircled by low-income, densely populated areas continues to contaminate the environment with impunity. Global concern over the effects of environmental pollution on the public health has grown over the past three decades. It is thought that human exposure to pollution is at its highest point in history at this moment. Both natural and human - caused factors can contribute to pollution. The atmospheric environment encyclopedia self-centered private industry and their ignorance of societal costs, natural calamities, and the welfare of the general population. One of the primary causes of pollution is Icelandic volcanic ash. British Airways (1993) outlines their environmental concerns in its overarching mission statement, which reads, "To be a good neighbor, concerned for the community and the environment". This implies that companies have incorporated their responsibility into their overall business strategy, which should align with their larger business objectives. Currently, environmental auditing is optional in all economic sectors, but future legislation may take it required. It's interesting to note that Goodall (1995) mentions the potential environmental harm that tourism may cause. There is no doubt that excessive pollution is harming people's and animal's health, plants and trees, including tropical rainforests, as well as the wider environment. Teheran is one of the cities most affected by environmental pollution. Significant public health issues are caused by the intertwining of unsustainable anthropogenic activity with environmental pollution. In the USA, there is essentially no oversight over the 8,000 industrial facilities that contribute to high pollution levels. Environmental health issues encompass more than just a collection of issues related to air pollution control, solid waste disposal, water and wastewater treatment, occupational health, and radiological health.

Photosynthesis in plants: opening the secrets of nature's energy harvesting process

Ishmal Fatima¹, Muhammad Kabir^{1*}

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: muhammad.kabir@uos.edu.pk

Photosynthesis in plants is a biological process which is responsible for utilizing solar energy and converting it into chemical energy in the form of glucose. In my abstract I was trying to provide analysis of our recent improvements in our understanding of photosynthesis and the proceeding efforts to unravel its complex secrets. Process of photosynthesis occurs in the chloroplast of the plant cell, mainly in chlorophyll containing thylakoid membrane. Due to absorption of light energy from sun, plants initiate a complex domino reaction that take part in the synthesis of glucose and the release of oxygen. According to recent researches role of various pigments, enzymes and protein complexes involved in this process. The discovery of photosystem is one of the critical development, and it's role in splitting the water molecules, generating electrons and releasing energy for energy conversion. Scientists in addition to it has made traipse for the understanding of how plants optimize photosynthetic efficiency while adapting to varying environmental conditions. Moreover, development in imaging techniques like cryo-electron microscopy allowed researchers to imagine the structural complexity of photosynthetic machinery at remarkable level of details. It gives rise to deeper comprehension of how the various components work together to capture, store and transport energy. In conclusion, the untangling of secrets behind the photosynthesis in plants is a thrilling and dynamic field of research. As we can increase our knowledge, it opens doors to research and innovation in agriculture, renewable energy, conservation of environment. By understanding the elaborateness of nature's energy harvesting process increases our knowledge of plant biology but also holds potential for addressing global challenges.

Feeding the World: Biotechnology and Genetic Engineering's Impact on Food Security

Fiza Younas^{1*}, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: fizayounas85@gmail.com

As the global population continues to burgeon, ensuring food security remains one of the most pressing challenges of the 21st century. Biotechnology and genetic engineering have emerged as powerful tools to address this challenge by enhancing crop productivity and bolstering food security. This abstract explores the pivotal role of biotechnology and genetic engineering in revolutionizing agriculture, emphasizing their contributions to crop improvement, disease resistance, and sustainable farming practices. Genetic engineering techniques, such as gene editing and transgenic technologies, have enabled the precise manipulation of plant genomes to create crops with improved traits. These innovations have led to the development of high-yielding, drought-resistant, and pest-tolerant varieties, which can thrive in diverse environmental conditions. Additionally, biotechnology has facilitated the production of crops with enhanced nutritional profiles, offering solutions to malnutrition and hidden hunger. Biotechnology-driven advancements have also revolutionized crop protection by developing disease-resistant plants and reducing the reliance on chemical pesticides. This not only contributes to safer and more sustainable agricultural practices but also minimizes the environmental impact of conventional farming. Furthermore, biotechnology plays a critical role in the development of sustainable agriculture practices. Techniques such as precision farming, biofertilizers, and crop rotation management are essential components of the modern agricultural landscape. These practices not only optimize resource utilization but also reduce the environmental footprint of farming, contributing to long-term food security. While the integration of biotechnology and genetic engineering has the potential to revolutionize agriculture, it also raises ethical, regulatory, and socio-economic challenges. Striking a balance between promoting innovation and addressing these concerns is crucial to harness the full potential of these technologies. In conclusion, biotechnology and genetic engineering are pivotal in enhancing crop productivity and ensuring global food security. Their contributions to crop improvement, disease resistance, and sustainable agriculture practices provide promising avenues for addressing the ever-growing food demands of the world. However, responsible, and ethical application,

coupled with effective regulatory frameworks, is essential to fully realize the potential benefits while mitigating associated risks.

Keywords: Biotechnology, Genetic engineering, Crop productivity, Food security, Global agriculture, Crop improvement, Disease resistance, Sustainable farming, Environmental impact, Precision farming, Malnutrition, Hidden hunger, Transgenic crops, Pest tolerance, Environmental sustainability Resource optimization, Innovation in agriculture.

Causes and effect of Genetically modified Organism (GMO) Food on Human

Akhter Munir^{1*}, Muhammad Kabir¹, Zeeshan Haider Shah¹, Safeer Ahmad¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email; akhtarmunircheena14@gmail.com

Genetically Modified Organisms (GMO) food is produced in factories and industrial belt for the control food curtailment in society. Genetically Modified Organisms (GMOs) are organisms whose genetic material has been changed using genetic engineering techniques. These techniques are used to transfer genes from one organism to another, resulting in a new organism with properties that would not have been available in nature.

There are many potential useful GMOs, including increased grains production, hindrance to insects and diseases, and increased dietary quantity. However, there are also concerns about the protection and ecological impact of GMOs.

One of the main concerns about GMOs is that they could have harmful effects on living health. Some people are annoyed that GMOs could cause skin infection, new diseases, or nutritional absence. However, there is no scientific proof to help this inclusion. Actually, GMOs have been shown to be just as helpful as accepted foods. Some people worry that GMOs could harm wild animals, widen genes into wild populations, or create new super pesticides. However, there is no scientific allowance to strengthen these affairs.

Overall, there is no scientific attestation to guide the corporation about the safety of GMOs. GMOs are just as safe as habitual foods and byproducts.

Keywords: Grains production, nutritional absence, annoyance, pesticides.

Lead free indium-silver and thallium-silver based double-perovskites for thermoelectric and photovoltaic applications: A first-principles study of structural, optoelectronic and thermoelectric properties

Jawad Hassan Mehdi, Sehrish Mehmood*, Fatima Kainat, Muhammad Nouman Ashraf, Adeel Afzal, Saima Zafar

Department of Physics, Thal University, Bhakkar, Pakistan.

*Corresponding author's email: Sharimehmood767@gmail.com

Energy consumption is increasing day by day in today's world, so it is a matter of concern for the scientific community to find alternative power generation mechanisms by minimizing the whole world's reliance on traditional power generation methods. Thermoelectricity and optoelectronics have emerged as an attractive area of research for finding an efficient non-traditional power generation mechanism. In this scenario, it is a matter of immense potential to find more efficient thermoelectric and photovoltaic materials. In this work, the structural, electronic, optical and thermoelectric properties of double perovskites $X_2\text{InAgCl}_6$ ($X=\text{Cs}, \text{K}, \text{Rb}$) and $\text{Cs}_2\text{AgTlX}_6$ ($X=\text{Cl}, \text{Br}$) have been studied in detail using density functional theory (DFT) within the framework of

generalized gradient approximation (GGA). The results of $\text{Cs}_{2/6}\text{InAgCl}_{2/6}$ and $\text{Cs}_{2/6}\text{AgTlX}_{2/6}$ are consistent with already reported data whereas $\text{K}_{2/6}\text{InAgCl}_{2/6}$ and $\text{Rb}_{2/6}\text{InAgCl}_{2/6}$ have been reported for the first time. The direct wide band gaps, structural stability, thermal stability, large Seebeck coefficients and figure of merit (close to unity) of these lead-free indium-silver and thallium-silver based double perovskites suggest various thermoelectric and optoelectronic applications.

The Impact of Climate Change on Biodiversity (Both Natural and Managed)

Misbah Kanwal

Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan

Climate change, driven primarily by human activities, poses a profound threat to global biodiversity, encompassing both natural ecosystems and those under human management. This abstract provides an overview of the multifaceted impact of climate change on biodiversity, emphasizing the intricate interplay between natural and managed environments. Natural biodiversity, found in ecosystems ranging from rainforests to coral reefs, faces unprecedented challenges as shifting climate patterns disrupt habitats and food chains. These disruptions lead to altered distribution patterns, population dynamics, and increased risks of extinction for numerous species. The abstract discusses the ways climate change influences species migration, adaptation, and potential loss, highlighting the urgency for conservation efforts. In contrast, managed biodiversity, exemplified by agricultural systems and forestry, is also profoundly affected by climate change. Crop yields and livestock production are susceptible to temperature shifts and extreme weather events, posing risks to global food security. Additionally, changing climate conditions can impact the management of natural resources and ecosystem services, such as water supply, leading to cascading effects on human livelihoods. The abstract delves into strategies for mitigation and adaptation to the impacts of climate change on biodiversity. It underscores the importance of sustainable land-use practices, conservation measures, and international cooperation to preserve biodiversity in the face of a changing climate. Additionally, it explores the role of policy, technology, and public awareness in shaping our response to this critical issue. Ultimately the abstract serves as a call to action, stressing the urgency of addressing climate change to safeguard both natural and managed biodiversity. Failure to do so may result in irreversible damage to ecosystems, loss of species, and significant disruptions to human societies worldwide.

Population Pressure: Unraveling the Environmental Consequences of Overpopulation; A Rare Review

Umm e Ammarah^{1*}, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: ummeammarahruhi@gmail.com

In a world increasingly resembling an overcrowded cave, the phenomenon of overpopulation emerges when the human population surpasses the planet's natural resource capacity. This imbalance in ecological equilibrium is perpetuated by factors such as excessive birth rates driven by cultural, societal, or economic factors, as well as improved healthcare and longer life expectancy, contributing to a continuous population surge. Migration, while offering opportunities for economic growth and safety, also plays a dual role, both exacerbating and mitigating

overcrowding in different regions. The consequences of overpopulation are dire, with Earth's finite resources under severe strain, leading to scarcity and environmental degradation. Congested cities, social challenges, and adverse effects on ecosystems and climate change have further repercussions. To combat overpopulation, education campaigns emphasizing responsible family planning and the availability of contraception must be prioritized. Sustainability practices in agriculture and energy production are imperative, as is the regulation of migration to balance population density and ease stress on resources and infrastructure. In embracing these initiatives, we strive to create a more balanced, sustainable future for all.

Keywords: Overpopulation, ecological imbalance, excessive birth rates, life expectancy, migration, resource scarcity, environmental degradation,

Science in Media and Popular Culture

Fahad Abbasi

Department of Physics, University of Sargodha ex sub-campus, Bhakkar, Thal University Bhakkar

The study aligns with the nature of a desk-based case study, relying on the synthesis of existing research and ongoing work in this field, aiming to provide a precise and comprehensive overview.

The study indicates that the perceived intricacy associated with science dissuades individuals from attempting to grasp its true essence, leaving them reliant on media portrayals. Consequently, the majority form their beliefs about science based on these representations. This suggests that public perception of science is predominantly shaped by the media, potentially leading to distortion. Many films (e.g., 'The Matrix,' 'Blade Runner,' 'X-Men') have contributed to a negative image of science and technology, depicting them as agents of destruction, climate change, human subjugation, and even planetary ruin. An associated study has revealed that numerous senior politicians share similar skeptical views about science.

Conversely, the media appears to exert a positive influence by making science more accessible to the general public. One study demonstrates that students exhibit increased interest and grasp fundamental scientific principles more easily when exposed to sci-fi movies alongside conventional text materials. Furthermore, media portrayals of science have spurred greater private investment in scientific research, particularly in fields such as space exploration, potentially diverting funds from less media-popular but equally vital areas. Media also plays a pivotal role in raising awareness about climate change, yet occasionally lacks scientific precision when presenting its causes and solutions.

In conclusion, this case study emphasizes the media's influence on public perceptions of science, revealing both its potential for positive impact and misinformation.

Keywords: Desk-based case study, science perception, scientific precision, sci-fi movies, climate change, misinformation

MINI SPY WIFI CAM ROBOT: Principle, Application, Working

Muhammad Awais*, Areeba Mughal, Aatqa Jabeen, Tahmeena Umar

Department of Physics, Thal University Bhakkar

*Corresponding author's email: myselfawais995@gmail.com

In this paper, we will discuss how to control the car Robot using the Wi-Fi module through a Smartphone. This robot is used in a variety of areas and is used for various purposes, which is controlled remotely about ± 250 meters away. This is useful for espionage and natural disasters and helps keep the controlling person away from danger or out of sight in case of espionage. The robot has several DC motors to move from one place to another and has cameras that collect the data and send it to the microcontroller (ESP 32). There is a base-mounted camera with two

servo motors to control the direction of the camera with 180-degree rotational motion and 90degreesvertical. The camera used to provide the necessary data from the surrounding environment of the robot to ESP 32 in manual condition control by press button on web server. The signal is being generated by ESP 32. Web server capture and visualize the signals of ESP 32 cam. There are various buttons on the web server for movement of robot, intensity of light, pan and tilt motion of camera. The car along together with camera can wirelessly transfer video in real time. it can also carry weight up to 5kg. The car is able to reach a particular destination smoothly and intelligently.

Keywords: Wi-Fi Robot, ESP 32 system, video streaming, smart Robot, Education.

Generation of Dynamical S-Boxes using Super Singular Elliptic Curve

Qamar Noreen

Department of Mathematics, Thal University, Bhakkar, Pakistan.

*Corresponding author's email: qamarnoreen98@gmail.com

Cryptography is the study of converting plain text that is in readable form to cipher text that is in non-readable form to hide secret data and information from unauthorized access. In the past, many cryptographic techniques such as RSA were used to hide data from cryptanalysis. Mathematics is playing a major role to develop strong cryptographic algorithms such as prime factorization, modular arithmetic, message-digest algorithm (MD5), special codes of coding theory, algebraic structures like finite fields, and chain rings are used precisely in designing these cryptosystems. Elliptic Curve Cryptography provides a better security level with smaller keys as compared to RSA. Substitution boxes play a key role in transmitting secret data and image encryption through unreliable channels.

In this article, we proposed the group law defined on the rational points of an EC, over the finite field F_p with $p = 2^n, n \geq 3$, (n must be odd) offers extra-ordinary technical advantages for defining the bijective map between two structures. Many researchers introduced their own methodologies to create confusion in data using S-boxes. In this technique, we introduce a new and systematic method for mathematical construction of S-boxes using the super singular elliptic curves over a Galois field and compared their security analysis with some existing.

Keywords: Galois field, Elliptic curve, Group law, Substitution box, Super singular

Join the Green Movement and Stop Pollution

Tahreem Riaz^{1*}, Muhammad Kabir

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: tahreemriaz32@gmail.com

Stop pollution by joining the green movement! It's time for all of us to work together to transform the world for the better. Our lives are impacted by contamination in every way, from the air we breathe to the water we drink. We can make a cleaner, healthier future for ourselves and generations to come by acting now. Let's start by talking about air pollution. Respiratory troubles and other health problems are brought on by the toxic pollutants that are released into the environment by automobiles, industry, and other sources. We can lessen our ecological impact and enhance air quality by adopting environmentally friendly transport choices like biking or traveling. Another major issue is water contamination. Our water supplies are contaminated by industrial waste, agricultural runoff, and poor chemical disposal, jeopardizing aquatic organisms and our health. By being careful about what we flush down the toilet, supporting groups that defend water resources, and taking part in neighborhood cleanup projects, we can all make a difference. The management of garbage is included in the green revolution. Pollution of the land and water is a

result of our overabundant consumption and inappropriate disposal of disposable plastics and other non-biodegradable materials. We can decrease waste and encourage the development of a circular economy by embracing a "reusing, recycling, and reducing" mentality. Environmental deterioration is mostly caused by deforestation. In addition to absorbing carbon dioxide, trees also provide a habitat for a vast number of species. To stop forest destruction, we should encourage sustainable management of land techniques, support regeneration initiatives, and buy items made with ecologically harvested materials. Let's not overlook the significance of renewable energy, either. To reduce greenhouse gas emissions and combat the effects of climate change, we must switch from fossil fuels to renewable sources of energy including. In summary, the green revolution is a concerted attempt to clean up the environment. We can build a more secure, healthier, and more sustainable environment for ourselves and future generations by making mindful choices in our everyday lives, promoting sustainable practices, and calling for change. Let's join the green movement and create the change we want to see.

Keywords: Green revolution, pollution, deforestation, reforestation, atmosphere, non-biodegradable.

Obstacle Avoiding Robot: Principle, Application, Working

Muhammad Awais*, Areeba Mughal, Aatqa Jabeen, Tahmeena Umar

Department of Physics, Thal University Bhakkar

*Corresponding author's email: myselfawais995@gmail.com

Obstacle detection and avoidance can be considered as the central issue in designing mobile robots. This technology provides the robots with senses which they can use to traverse in unfamiliar environments without damaging itself. In this paper an Obstacle Avoiding Robot is designed which can detect obstacles in its path and maneuver around them without making any collision. It is a robot vehicle that works on an Arduino Microcontroller and employs three ultrasonic distance sensors to detect obstacles. The Arduino board was selected as the microcontroller platform and its software counterpart, Arduino Software, was used to carry out the programming. The integration of three ultrasonic distance sensors provides higher accuracy in detecting surrounding obstacles. Being a fully autonomous robot, it successfully maneuvered in unknown environments without any collision. The hardware used in this project is widely available and inexpensive which makes the robot easily replicable.

Keywords: obstacle avoidance, ultrasonic sensor, Arduino microcontroller, autonomous robot, Arduino software

Triggered Surveillance Home Automation: Principle, Application, Working

Muhammad Awais*, Areeba Mughal, Aatqa Jabeen, Tahmeena Umar

Department of Physics, Thal University Bhakkar

*Corresponding author's email: myselfawais995@gmail.com

This paper describes the overall notion of the IOT based sensing systems and monitoring systems for implementing an automated home. The proposed prototype uses a Node MCU board with internet being remotely controlled by Android/iOS OS smart phone. Node MCU is the heart of this system, and it can perform as a micro web server, and it acts as an interface for the wide range of hardware modules. To control lights, fans and other home appliances which are connected to the relay system, the system offers switching functionalities. As technology is advancing houses are also getting smarter. Modern houses are gradually shifting from conventional switches to centralized control systems, involving remote controlled switches. Presently, conventional wall switches located in different parts of the house make it difficult for the user to go near them to operate. Even more it becomes more difficult for the elderly or physically handicapped people to do so. Remote controlled home automation systems provide the

most modern solution with smart phones. In order to achieve this, a microcontroller board with built-in WIFI module at the receiver end while on the transmitter end, a blank application on the cell phone sends ON/OFF commands to the receiver where loads are connected. By touching the specified location on the blank, the loads can be turned ON/OFF remotely through this technology. Furthermore, we can sense temperature, humidity, water level and we can also detect motion interruption at particular places by using DHT-11 and Pir motion sensor.

Keywords: IOT, Node MCU, Importance of automation, Wi-Fi connection, blynk application, Relay system, Sensing system, sensor

Green synthesis of zinc oxide and Cu-Doped zinc oxide photocatalysts for degradation of methylene blue

Sara Gul*, Dr. Shaukat Shujah, Dr. Tasleem Hussain

Department of Chemistry, Kohat University of Science and Technology

*Corresponding author's email: gulsara647@gmail.com

Society is now very concerned about environmental issues related to chemical water contamination. The biggest challenge of the twenty-first century is giving people access to clean water. Recent developments in the fields of nanoscience and nanobiotechnology have made the use of plant extracts for the synthesis of metal oxide nanoparticles (NPs) an attractive topic with several advantages over traditional physicochemical methods. The ability of biologically produced pure and Cu-doped ZnO nanoparticles (NPs) to degrade dye contaminants via photocatalysis is examined in this study. Pure and different Cu-dopant concentrations were used in the current investigation to create ZnO NPs from leaf extract. The physical and optical characteristics of the synthesized samples were examined using measurements from UV, FTIR, EDX, XRD, SEM. XRD and SEM examination verified the wurtzite crystal structure of the synthesized samples. FTIR analysis was also used to confirm that functional groups were present in the produced samples. UV and EDX were also carried out. Methylene Blue (MB) was used as organic contaminants in the photocatalytic investigations of the synthesized Cu-doped ZnO NPs samples. The photocatalytic activity of the 3% and 5% Cu-doped samples was superior. Additionally, the factors that affect photo degradation efficiency were evaluated, including catalyst concentration, initial hydrogen potential (pH), and dye concentration and time. The synthesized cost-effective and environmentally friendly Cu-doped ZnO NPs have increased photocatalytic activity against MB dye and can be used as wastewater treatment materials.

Keywords: Nannorrhop Ritchiana, Cu doped ZnO, Green synthesis, Nanoparticles, Dye.

Artificial Intelligence Advancements and Their Applications in Physics

Muhammad Asif*, Hassan Tashan, Atif Iqbal, Tehseen Raza

Department of Physics, Thal University Bhakkar

*Corresponding author's email: Ziasif687@gmail.com

Artificial Intelligence (AI) has taken center stage in the scientific world, profoundly impacting physics. This poster explores the symbiotic relationship between AI and physics, revealing its transformative influence on research. We meticulously examine AI's current state in physics, highlighting its role as a catalyst for innovation. In our quest to comprehend the universe's mysteries, AI proves invaluable across particle physics, materials science, and astrophysics. Machine learning and neural networks drive discoveries, expedite simulations, and enhance data analysis. AI unravels subatomic intricacies in particle physics, accelerates tailored material development in materials science, and unlocks celestial secrets in astrophysics. Our presentation showcases recent findings, underlining the

tangible outcomes of this interdisciplinary AI-physics fusion. Through this synergy, we gain deeper insights into the universe while accelerating scientific exploration. This poster encapsulates an enthralling journey of AI-enabled discovery, reshaping physics, and promising an innovative, collaborative, and breakthrough-rich future, where the marriage of AI and physics is not just a scientific endeavor but a testament to the boundless potential of human intelligence and technology in unlocking the secrets of the cosmos.

Keywords: Artificial Intelligence (AI), Physics Innovation, Particle Physics, Materials Science, Astrophysics

Physics Beyond the Blue Planet: Space Exploration Unveiled

Hassan Tashan*, Muhammad Asif, Atif Iqbal, Abdul Rehman

Department of Physics, Thal University Bhakkar

*Corresponding author's email: Hassantashan792@gmail.com

The quest for understanding the universe beyond our home planet has driven humanity's relentless pursuit of space exploration. This poster delves into the foundational role that physics plays in every aspect of space exploration. From the intricate mechanics of rocket propulsion to the enigmatic nature of celestial bodies, the laws of physics are the guiding principles behind our journey to the cosmos. This presentation offers a comprehensive overview of the essential physics concepts that underpin space exploration, including orbital mechanics, gravitational dynamics, and the challenges posed by extreme environments. We explore the innovative technologies and instruments that physics has enabled, from spacecraft propulsion systems to telescopes capable of peering into the depths of the universe. Through this poster, we unveil the intricate interplay between physics and space exploration, shedding light on the remarkable achievements, the ongoing challenges, and the infinite possibilities that the future holds. Join us in this captivating journey through the physics of space exploration, where science fiction becomes science fact, and the cosmos beckons us to unlock its deepest mysteries.

Keywords: Space Exploration, Physics, Rocket Propulsion, Orbital Mechanics, Gravitational Dynamics, Innovative Technologies, Cosmos

Reshaping Residences: The Confluence of Home Automation, Smart Gardening, and Solar Tracking

Ayyan Asghar*, Atif Iqbal, Aleena Jan, Qurat-ul-Ain, Zartasha Habib

Department of Physics, Thal University Bhakkar

*Corresponding author's email: Atif.iqbal.2019@gmail.com

This project explores the integration of home automation, smart gardening, and solar tracking to enhance the efficiency and sustainability of residential environments. The project's objectives include developing an integrated home automation system that encompasses features such as automated garage control, automatic fan control, and smart lighting. In addition, the project implements a smart gardening system to optimize gardening practices and a solar tracking system to maximize energy generation. The results demonstrate that these technologies improve user convenience, reduce energy consumption, promote eco-friendly gardening, and increase solar panel efficiency. This groundbreaking project seamlessly integrates technology and environmental stewardship, aligning with global efforts to foster more sustainable and eco-conscious living practices, ultimately shaping the future of smart and green residential living. It exemplifies the potential of advanced technology to elevate the quality of daily life, forging a path toward a more sustainable and user-friendly future. By providing a tangible bridge between innovation and sustainability, this project is not just a technical achievement but a blueprint for the future of residential living. This groundbreaking project seamlessly integrates home automation, smart gardening, and solar tracking to create more sustainable and efficient residential environments. By enhancing user convenience, reducing

energy consumption, and promoting eco-conscious gardening, it aligns with global efforts to foster sustainable living practices.

Keywords: Home Automation, Smart Gardening, Solar Tracking, Sustainability, Energy Efficiency.

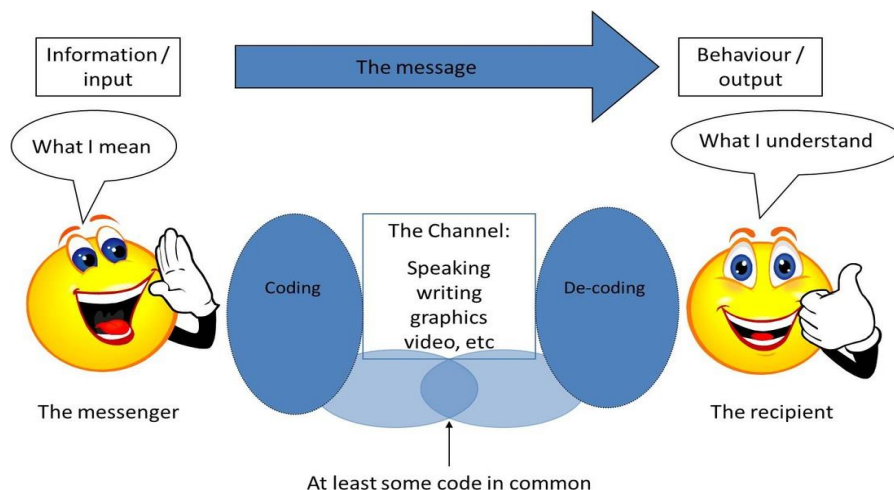
Cryptography (Application using matrices)

Muhammad Shaban

Department of Physics, Thal University Bhakkar, Bhakkar-3000, Punjab, Pakistan.

*Corresponding author's email: m.shaban4230@gmail.com

Cryptography is an application of matrices. It is very interesting to learn. In this technique we encode and decode data using matrices. Armed forces especially use this technique to make their data secure and private. Only the sender and receiver know the original message and their data remains private and secure. The following figure



shows what cryptography is.

Key words: Cryptography (Encoding and decoding of data)

A Comprehensive floristic Review of Thal desert

Kinza Hakeem¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: hafeezfjii03428613778@gmail.com

The Bhakkar region is known for its rich and large floral landscape. Which attracts a lot of attention of Botanist and Ecologist. In this review I wanted to provide a comprehensive review of its flora. During this research 248 species, 166 genera and 38 families were reported. First time recorded specie in Pakistan was *Themanda triandra*. All of them one fern, 4 monocots, 33 dicots families were founded. one of the most dominating family was Poaceae with (52 spp. 21.49%) followed by Fabaceae with (34 spp. 13.05%), and Asteraceae with (17 spp. 7.02%). Euphorbia is the largest family 6 spp. Cyperus, Eragoristis and solanum (5 spp. each) Mollugo, Helotropium Cenchrus (4 spp. each),

Prosopis, Acacia, Tephrosia, Boerhavia, Ziziphus and corchorous (3 spp. each) etc. This list consists of updated systematic families and plant's name that will provide a starting point in the research of the area of the study.

Keywords: Landscape, comprehensive, reported, updated, systemics, dominating

A numerical method based on quadrature rules for Ψ -fractional differential equations

Aneela Sabir¹, Dr. Mujeeb-ur-Rehman², Shama Sadiq¹

¹Department of Mathematics Thal University Bhakkar, 30000, Punjab, Pakistan.

²Department of Mathematics, National University of Sciences and Technology Islamabad, 44210, Pakistan.

The purpose of this article is to present a numerical method for the solution of a class of fractional differential equation with other variable Ψ involving Caputo derivative with respect to a function. Initial value problem for the certain Ψ -fractional differential equation is converted into equivalent second kind of Volterra integral equation. A combination of Simpson's and Trapezoidal rule is used to transform the Volterra Integral equation into a system of algebraic equations. The numerical solutions to the original problem are recovered from a solution of an algebraic system. An error estimate for the function approximation and fractional integral approximation is also given. Error bound for the numerical approximation of solutions is also derived. The numerical method is tested for various specific problems.

Keywords: Caputo Derivative, Ψ -fractional differential equation.

Physics in climates change

Nazia Bashir*, Iqra Akbar, Rimsha Saleem

Department of Physics, Thal University Bhakkar

*Corresponding author's email: mailtonaziagull@gmail.com

Climate change is a pressing global issue with profound consequences for our planet. Physics plays a fundamental role in understanding the complex mechanisms that underlie climate change. This poster presentation aims to elucidate the key physics concepts that contribute to our understanding of this phenomenon and emphasizes the importance of such knowledge. The greenhouse effect, a core physics principle, explains how certain gases in the Earth's atmosphere trap heat, leading to an increase in global temperatures. This process, primarily driven by carbon dioxide and methane. Physics-based models help us quantify the radiative forcing of different greenhouse gases, allowing us to predict their impact on global temperature changes. Climate physics investigates feedback loops, where changes in temperature trigger secondary effects, further amplifying climate change. Understanding the physics of ocean circulation is crucial in explaining the movement of heat in the Earth's system and its impact on climate. This poster presentation highlights the significance of the physics of climate change in guiding both research and policy decisions. The insights gained from physics-based climate models contribute to our ability to predict and mitigate the impacts of climate change. It also underscores the urgency of transitioning towards more sustainable practices to limit greenhouse gas emissions. The fusion of physics and climate science is essential for comprehending the intricate web of processes driving climate change. This presentation seeks to raise awareness about the role of physics in climate change and its importance in charting a sustainable path forward for our planet.

Development and Characterization of Different Concentration of Pear Based Bread

Qibra Farooq¹, Sadaf Shakoor^{1*}, Rizwan Shaukat², Muhammad Tuseef Asghar¹

¹ Department of Food Science and Technology, University of Agriculture Faisalabad Sub Campus Burewala-Vehari, Pakistan

² National Institute of Food Science and Technology, University of Agriculture Faisalabad, Pakistan.

*Corresponding author's email: sadaf.shakoor@uaf.edu.pk

The pears (*Pyrus communis* L.) are members of the Pomoideae subfamily and the Rosaceae family. In addition to being a good source of fiber, pears are strong in potassium, vitamin C, vitamin K, and antioxidants. Additionally, they are very beneficial for gut health. With the advantages of pears in mind, this study will be designed to raise the nutritional value of bread and to improve bread's shelf life by utilizing pear powder. While bread is a cheap staple item that is consumed all around the world, including in Pakistan, it has the potential to be a carrier of healthy ingredients. Pear powder was used in place of flour in a variety of ratios (10–30%). Different analyses of the pear-fortified bread were carried out, including those of its rheological characteristics, antioxidant (TFC, TPC, FRAP, and DPPH), and mineral (potassium and calcium) content. A 9-point hedonic scale was used to evaluate the developed product's sensory characteristics, and the results showed that treatment T3 was the most preferred treatment. The result was that bread enhanced with pear powder was added with the intention of analyzing the improved nutritional quality. The pear-based fortified bread was likewise high in vitamin C and popular with consumers even at a 15% fortification level.

Keywords: Pear, Bread, antioxidants, rheology, sensory evaluation

Inflationary Parameters and Swampland Conjectures in Various Scenarios of Gravity

Shama Sadiq¹, Dr. Abdul Jawad², Aneela Sabir¹

¹Department of Mathematics, Thal University Bhakkar, 30000, Punjab, Pakistan.

²Department of Mathematics, COMSATS University Islamabad (Lahore Campus), 54000, Punjab, Pakistan.

The purpose of this article is to investigate the inflationary parameters and Swampland conjectures in the presence of scalar field and Chaplygin gas models. We investigate the inflationary parameters such as slow roll parameters, scalar power spectrum, tensor power spectrum, spectral index, tensor-to-scalar ratio in the presence of scalar field and Chaplygin gas models also discuss the recently proposed swampland conjectures. The inflationary scenario is assumed to be working under a standard scalar field having Γ as decay ratio. This decay ratio has dependence in the form of generic power-law of scalar field φ along with thermal bath temperature T that is, $\Gamma(\varphi, T) = C_\varphi \frac{T^a}{\varphi^{a-1}}$ where C_φ is dimensionless parameter and a is inflation decay rate. Assuming that our model bends according to strong dissipative regime ($R \gg 1$). We study the background and perturbative dynamics as well as inflationary observable as the scalar power spectrum P_R , scalar spectral index n_s , dissipative ratio R , the tensor-to-scalar ratio r , running of the scalar spectral index $\frac{dn_s}{d \ln k}$ and generalized ratio of Swampland de-Sitter conjecture $\frac{T'V}{TV}$ for three different potentials; Quasi-Exponential Potential, Quartic Potential and Exponential Potential.

Keywords: Swampland conjectures, Chaplygin gas models, inflationary parameters.

Optical Coherence Tomography (OCT): Innovations in Medical Imaging

Muhammad Atif*, Muhammad Rizwan, Kifayat Ullah

Department of Physics, Thal University Bhakkar

*Corresponding author's email: atif492155@gmail.com

Optical Coherence Tomography (OCT) has emerged as a powerful and versatile imaging technique with applications spanning ophthalmology, cardiology, dermatology, and beyond. This abstract explores the latest innovations in OCT technology and its ever-expanding role in medical imaging. We delve into advancements in OCT system design, signal processing techniques, and imaging modalities, emphasizing the growing importance of functional and molecular imaging.

The abstract discusses the impact of OCT in early disease diagnosis and treatment monitoring, providing non-invasive, high-resolution, and real-time visualization of tissue microstructures. Furthermore, it highlights recent developments in OCT, such as extended imaging depth, angiography, and multimodal integration with other imaging modalities, promising even greater clinical utility.

The paper reviews key challenges, including speed and cost-effectiveness, and discusses ongoing efforts to address these limitations. Additionally, it touches upon the exciting potential of OCT for personalized medicine and its role in guiding minimally invasive surgical procedures.

In conclusion, this abstract underscores the transformative role of Optical Coherence Tomography in the medical field, showcasing how ongoing innovations continue to enhance its diagnostic and therapeutic capabilities, ultimately leading to improved patient care and outcomes.

Keywords: Optical Coherence Tomography, Physics Innovation, signal processing techniques Science, medical field

MXenes: The Emerging Two-Dimensional Materials for Multidisciplinary Applications

Muhammad Amer Mustafa

Physics Department, Thal University Bhakkar, Bhakkar Pakistan

*Corresponding author's email: amermustafa58@gmail.com

With the passage of time various classes of 2D material have attracted lots of attention such as Graphene, WS_2 , BN , MoS_2 , Transition Metal Di Chalcogenides, Stanene, Phosphorene, Germanene, Silicene and most recently Mxene was studied to seek new physics and interesting properties for more dedicated applications. However, the limitations of graphene and its byproduct, such as environmental pollution, high price, toxicity, cannot be ignored which inspires to create new 2D materials. A wide band gap exists in TMDs and importantly it changes with number of layers which leads to unique optical properties of TMDs. However, applications of TMDs become limited in the infrared range because absorption decreases rapidly for longer wavelength photons. A family of two-dimensional transition metal carbides and nitrides has gained significant attention in recent years for their unique properties and versatile applications. The variety of terminated functionalization ($T = O, OH$ or F) and various transition metals provides MXenes tunable physical and chemical properties and, thus, promising applications in catalysis, energy storage, wearable electronics, EMI shielding and purification of Pb etc. This presentation will provide benefits of 2D materials over bulk materials, general introduction of various 2D materials, especially a comprehensive overview of recent material MXenes, discussing their synthesis, properties, and the wide range of applications they offer. The focus will be on their role in advancing technology in fields.

Quality Of Relationship, Impact of Social Media Usage & Marital Satisfaction in Married Couples

Manahil Fatima

Department of Psychology, Thal University Bhakkar

*Corresponding author's email: manahilrao83@gmail.com

The current study will examine the relationship between Quality of Relationship, Impact of Social Media Usage & Marital Satisfaction in Married Couples. A quantitative study will be carried out to conduct this research. The participants of the study will be comprised of married couples ($N=200$). The non-probability convenience sampling technique will be used to collect data from the participants. Social Media Addiction Scale by (Andreassen et al., 2017), Enrich Marital Satisfaction Scale by (Fowers & Olson, 1993) and Relationship Assessment Scale by (Hendrick, 1988) will be used to collect data from the participants. T-test, correlation and regression analysis will be used to investigate the difference, relationship, and prediction between the study variables. The analysis will be conducted through the updated version of SPSS 23. Limitations, recommendations, and implications will be mentioned after conducting this research.

Keywords: Social Media Usage, Relationship Quality, Marital Satisfaction

Finding the voltage and resistance of a circuit by using linear equation

Muhammad Muzammil

¹Department of physics, Thal University Bhakkar (University of Sargodha, Ex-Sub Campus Bhakkar) Bhakkar-300000, Punjab, Pakistan.

*Corresponding author's email: muzamil199700@gmail.com

Linear algebra almost seemingly operates by electrical circuits. Anytime there is a system of linear equations appear the idea of linear algebra. Several electrical circuits solved by using KVL and Ohm's law are theoretical appear linear algebra. We are applying those rules and solving the system of equation to find the unknown resistance current and voltage. We are connected diodes and transistor in the electrical circuit. This is shown in the diagram.

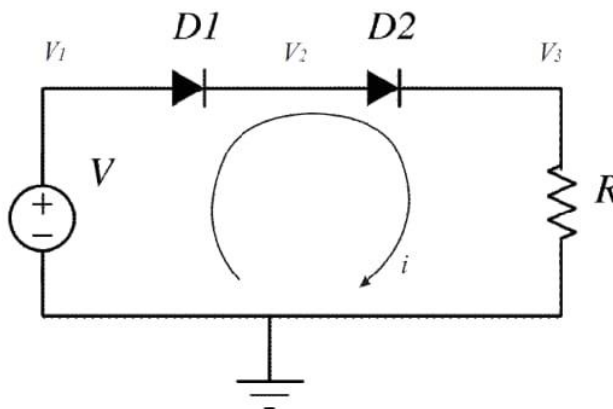
Keywords: KVL, Ohm's law, Linear equations, Resistance, Voltage.

Solar cells and Renewable energy resources

Tamseela Parveen

Department of physics, Thal University Bhakkar, Pakistan

*Corresponding author's email: tamseelaparveen579@gmail.com



With respect to time, much research was conducted for the energy resources, as they are available in abundance like energy received from fossil fuels, petroleum these are the nonrenewable resources. The renewable resource for energy is solar energy, which is taken by working of solar cells. In which many organic and inorganic materials are used. When light falls on cells in the form of photons, these photons emit the electron from the surface of metal, whose motion generates electrical energy. It converts light energy into electrical energy. It works on the principle of photo voltaic effect. In this paper development mechanism and influence on the environment is discussed, it also presents the workings mechanism and performance of solar cells. In all energy resources, solar energy is mostly used because it has no side effects like noise or any other environmental pollution.

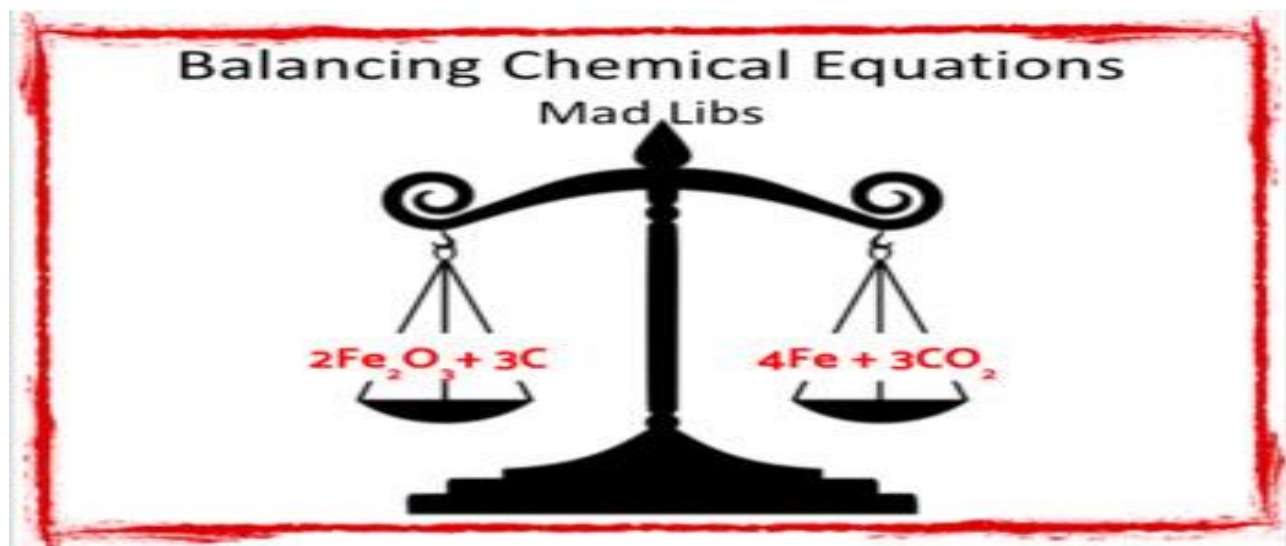
Balancing Chemical Equations (using matrices)

Tahir Usman

Department of Physics, Thal University Bhakkar, Bhakkar-3000, Punjab, Pakistan

*Corresponding author's email: www.tu125555@gmail.com

Balancing chemical equations using matrices is a mathematical approach that simplifies the complex task of ensuring the conservation of mass in chemical reactions. By representing reactants and products as matrices, the coefficients of each compound can be determined systematically. This method streamlines the balancing process, making it more efficient and accurate. It utilizes linear algebra principles to create a system of equations that can be solved to achieve a balanced equation. This approach is particularly valuable in chemical calculations and stoichiometry. Balancing Chemical Equations



Harnessing the Power of Physics in Medicine: A Comprehensive Review of Multifaceted Applications in Healthcare, with Emphasis on Advances in X-ray and MRI Technologies

Muhammad Asif*, Muzamil Ur Rehman, Samiullah

Department of Physics, Thal University Bhakkar

*Corresponding author's email: maasifhashim@gmail.com

This comprehensive review explores the multifaceted applications of physics in the field of medicine, with a specific focus on the remarkable advances in X-ray and MRI (Magnetic Resonance Imaging) technologies. Physics has played a pivotal role in enhancing healthcare practices, spanning diagnostics, treatment modalities, and imaging technologies. Recent advancements have had a profound impact on improving patient care and outcomes. In diagnostics, physics-driven technologies like X-ray imaging have undergone significant evolution, enhanced image quality and reducing radiation exposure while introducing emerging techniques like dual-energy X-ray absorptiometry (DXA) and tomosynthesis. The field of MRI, which relies heavily on physics principles, has seen substantial growth, with high-field MRI machines improving imaging resolution and functional MRI (fMRI) revolutionizing the study of neurological conditions and brain activity. Physics also plays a vital role in treatment modalities, most notably in radiation therapy for cancer patients, with techniques such as intensity-modulated radiation therapy (IMRT) and proton therapy honing the accuracy of treatment. These developments underscore the significance of physics in personalized medicine. Biophysics and biomechanics, the interdisciplinary fields melding physics and biology, deepen our understanding of the human body's mechanics and contribute to orthopedics and rehabilitation. In conclusion, physics in medicine has propelled healthcare to unprecedented heights, sharpening diagnostic accuracy and personalizing treatment while broadening our understanding of human physiology.

Keywords: Artificial Intelligence (AI), Physics Innovation, Particle Physics, Materials Science, Astrophysics

A Neutrosophic Approach to the Transportation Problem using Single-Valued NeutrosophicZ Numbers

Anns Uzair, Aiman Ishtiaq, Muhammad Kamran*

Department of Mathematics, Thal University Bhakkar, 30000, Punjab, Pakistan

*Corresponding author's email: kamran.tu.edu@gmail.com

Neutrosophic sets are a generalization of intuitionistic fuzzy sets, fuzzy sets, and crisp sets that are used to represent incomplete, inconsistent, and ambiguous data related to real-world problems. This study aims to offer, for the first time, the mathematical formulation of the issue of transportation in terms of neutrosophic Z numbers. The transportation problem (TP) has many real-world applications, which makes it an important topic in operation research. Most real-world problems involve some degree of uncertainty, making it difficult to determine the precise cost (supply/demand). Although it has various drawbacks, the fuzzy set is a well-known field for managing uncertainty. Because of this, a different set of values known as the neutrosophic set with Z numbers is introduced in this work. It is an extension of intuitionistic fuzzy sets, fuzzy sets, and crisp sets that are used to tackle problems with erratic, unpredictable, and incomplete data in the real world. Here, we'll look at a few neutrosophic sets where the supply, demand, and cell cost have Z numbers of values. The TP with neutrosophic environment called the neutrosophic transportation problem (NTP) is solved in this study using the extensions of the linear programming principle, the north-west principle, the extended principle of the MODI method, and the extension of the Vogel's approximation method (VAM) principle. These methods are compared using neutrosophic sets of value as well as a combination of neutrosophic and crisp value for analyzing every uncertain situation that arises in real life.

Keywords: Transportation problem, Neutrosophic information, Z numbers

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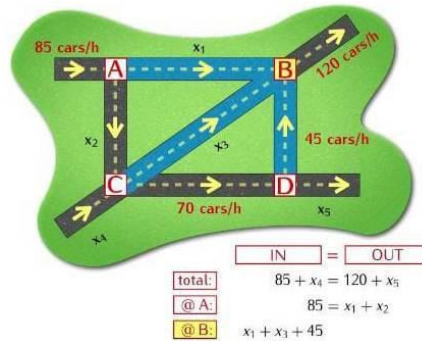
Traffic Flow (Application using matrices)

Syeda Gulnaz*, Sadia Iqbal, Areeba Chaudhary

Department of Physics, Thal University Bhakkar
*Corresponding author's email: Gulnaz.naqvi0514@gmail.com

A traffic matrix is a two-dimensional matrix with its ij -th element, t_{ij} determining the amount of traffic sourcing from node i and exiting at node j . The value t_{ij} is also called the traffic demand and each demand represents the amount of data transmitted between every pair of network nodes.

Traffic flow is the study of interactions between vehicles, drivers, pedestrian, cyclists, other travelers, and infrastructure with the aim of understanding and developing an optimal road network with efficient movement of traffic and minimal traffic congestion problems. We all run into traffic after chapel going to chamberlain.



Keywords: Traffic flow in XY plan.

Electrical Networks using Matrices

Muhammad Adeel*, Muhammad Waqas

Department of physics, Thal University Bhakkar, Bhakkar-3000, Punjab, Pakistan.

*Corresponding author's email: adeel63570@gmail.com

An electrical network, frequently allude to as an electrical circuit, is a system of unified electrical components that facilitate the transmission, scattering, and control of electrical energy. These networks are designed to transport electrical current and voltage to power a number of devices and systems. They can be simple, equally a basic series or parallel circuit, or complex, like the interconnected grids that bestow electricity to homes and industries. The abstract of an electrical network typically focuses on its topology, components, and the principles of electrical energy transfer within the system, highlighting the importance of retain a balance between generation and expenditure to set the scale on reliable and well-organized power carriage. At this moment, I will make and solve electrical problems.

Keywords: Transmission, Unified, highlighting, Power carriage, Expenditure

Reducing Plastic Pollution by Using the 3Rs Method and its benefits to combat Greenhouse Gas emission; A Mini Review

Muhammad Hammad^{1*}, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: m.hammad22t@gmail.com

Plastic pollution is one of the most dangerous emerging environmental problems all over the world. Humans have created this problem on their own, and it is now affecting every individual on Earth, mostly impacting marine life. The world is struggling to control this problem, but no one is properly paying attention to combat this problem. This problem not only affects developing and low-income countries but also severely impacts developed countries. This pollution causes serious problems like health disease, devastating ecosystems, affecting marine ecosystems, destroying habitats and natural processes, and affecting food production.

There are many techniques, strategies, and methods that the world uses to deal with plastic pollution, but the 3Rs method is the best technique to deal with plastic pollution. 3Rs stand for 'Reduce, Reuse and Recycle'. In reducing process, we reduce the usage of plastic by reducing plastic-made things, and this reduces the demand for new virgin plastic. In the reusing process, the plastic products that can be reused again and again, are encouraged to be used in the market and encourages the usage of biodegradable products. In the last, recycling process, the plastic products that cannot be reused, are melted, or broken into small compartments, and a new plastic product is made. This reduces the demand for new virgin plastic and indirectly reduces the energy consumption which benefits in reducing the Greenhouse Gas emission.

By using this 3Rs method, we can control plastic pollution to a certain level. "Plastic will make our end drastic!" There is no second planet in the universe where life exists. Nature has provided us with only one planet to live on, so we should protect it from such harmful factors to ensure a happy and sustainable life.

Keywords: Emerging Environmental Problems, Natural Processes, Virgin Plastic, Biodegradable Products, Second Plastic

Levitating into the Future: High-Temperature Superconductors and Innovation

Maryam Ukasha Hameed*, Farwa Hassan

Department of Physics, Thal University Bhakkar

*Corresponding author's email: Maryamhameed.041@gmail.com

Superconductivity, a truly remarkable phenomenon enabling the unrestricted flow of electrical current at temperatures nearing absolute zero, has long been constrained by the substantial costs linked to helium-based cooling for achieving the critical temperature. Recent advancements in high-temperature superconductors have ushered in a new era of technological innovation, sparking an exciting wave of research and development. This paper delves into the expanding applications of superconductivity across diverse fields, encompassing telecommunications, medical technologies, space exploration, and defense systems. These developments signify a profound transformation in the application of superconductors, extending their significance far beyond the realm of scientific research. One of the most fascinating aspects of superconductivity is its capacity to induce the Meissner effect, causing superconducting materials to repel magnetic fields. This property not only underpins the functionality of various applications but also gives rise to captivating manifestations, such as levitation. The levitating action, an eye-catching demonstration of superconducting principles, underscores the extraordinary potential of this technology. In this paper, we delve into the multifaceted world of superconductivity, illuminating its newfound significance in contemporary society and its potential to reshape our technological landscape, driving innovations that promise to redefine the boundaries of what is possible in diverse industries.

Keywords: Superconductivity, high-temperature superconductors, applications, Meissner effect, magnetic fields, levitation, technological innovation

Cryptology (Application uses in data protection)

Muhammad Shoaib*, Mudasir Ali

Department of physics, Thal University Bhakkar, Bhakkar-3000, Punjab, Pakistan.

*Corresponding author's email: mshoaibbitta@gmail.com

Cryptology, often referred to as cryptography, is a field of study and practice focused on obtaining communication and information through the use of mathematical algorithms and techniques. Its primary goal is to protect data from illegal access or alteration. Cryptology encompasses two main disciplines: cryptography, which deals with encoding information to keep it secret, and cryptanalysis, which involves decoding encrypted data without the proper key. These techniques play a central role in modern information security, ensuring the confidentiality, integrity, and authenticity of digital communications and data. Cryptology is essential for safeguarding sensitive information in areas such as cybersecurity, finance, and government intelligence.

Keywords: Cryptology (Protection of data)

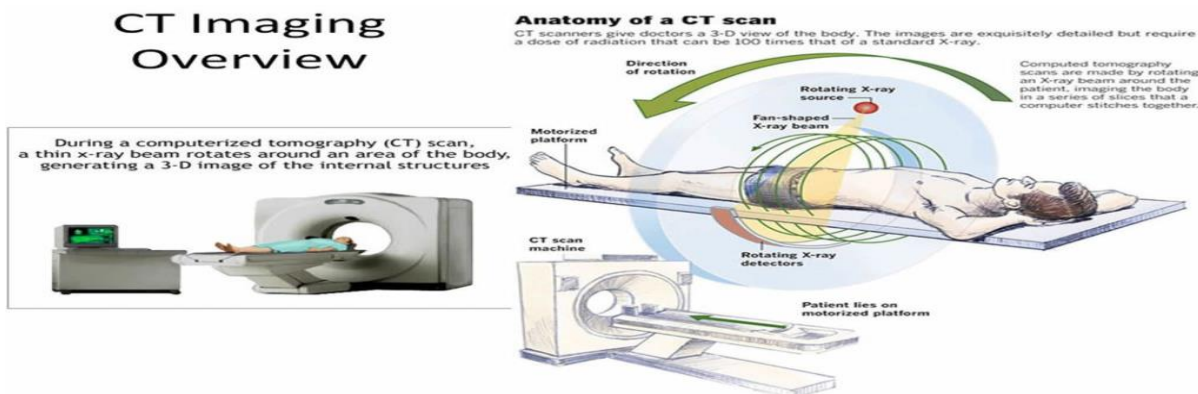
Computed Tomography

Muhammad Asif

Department of Physics, Thal University Bhakkar

*Corresponding author's email: maasifhashim@gmail.com

Computed Tomography has emerged as a marvel in the world of diagnostic radiology, offering an unprecedented glimpse into the human body's inner intricacies. This abstract offers a succinct exploration of computed tomography, delving into its core principles, diverse applications, and the transformative influence it wields in the realm of healthcare. Computed tomography imaging is a transformative technology grounded in the art of tomography, capturing cross-sectional snapshots of the body's internal landscapes through the judicious use of X-rays. At its heart, a computed tomography scanner revolves around a choreography of X-ray generation and detection, crafting an orchestra of multidimensional imagery. With the computational symphony, a comprehensive three-dimensional representation of anatomical marvels is sculpted, making CT an invaluable oracle for medical diagnostics.



Nanoparticles and Nanomaterials

Sadia Nazir

Department of Chemistry, Thal University Bhakkar

*Corresponding author's email: sweetsadi5555@gmail.com

Nanoparticles are tiny particles with at least one dimension smaller than 100 nanometers (nm). For comparison, a human hair is about 100,000 nm wide. Nanoparticles can be made from a variety of materials, including metals, semiconductors, polymers, and ceramics. Due to their small size, nanoparticles have unique physical and chemical properties that are not found in their bulk counterparts. For example, nanoparticles can have higher surface area, which makes them more reactive and efficient catalysts. They can also have different optical and magnetic properties than their bulk counterparts. Nanoparticles have a wide range of potential applications in a variety of fields. Nanoparticles can be used to deliver drugs to specific cells in the body, which can improve the efficacy and reduce the side effects of treatments. They can also be used to image cells and tissues at the nanoscale. Nanoparticles can be used to improve the efficiency of solar cells, fuel cells, and batteries. They can also be used to develop new energy storage technologies. Nanoparticles can be used to develop new types of transistors, sensors, and other electronic devices. They can also be used to create new types of displays and other optical devices. Nanoparticles can be used to develop new materials with improved strength, durability, and other properties. They can also be used to create new types of self-cleaning and self-healing materials. One of the challenges of nanotechnology is developing safe and efficient ways to produce and use nanoparticles. Some nanoparticles can be toxic to humans and the environment, so it is important to develop methods to control their size, shape, and composition. Despite these challenges, the field of nanotechnology is rapidly advancing, and nanoparticles are already being used in a variety of commercial products. In the future, nanoparticles are expected to play an even greater role in our lives, as they are used to develop new and innovative technologies in a wide range of fields.

CdO NANOPARTICLES ENHANCED LASER ABLATION PROPULSION

Sehrish Mehmood

Department of Physics, Thal University, Bhakkar, Pakistan.

*Corresponding author's email: Sharimehmood767@gmail.com

In laser ablation propulsion a pulse of laser ablates the target material and thus produces thrust. The nanoparticles (NPs) that are present on the target material interact with the laser beam power. Laser matter interaction is affected by the mechanism of surface plasmon resonance and large surface area of NPs. In this effort calculations are done for CdO NPs (Natural and synthesize) for improvement in LAP parameters. ND: YAG laser (Quantel Brilliant) wavelength 1064nm and with under normal atmospheric conditions was used. The experiment is done by copper specimen with and without CdO nanoparticles layer. By using spin coating technique, the CdO NPs film was dropped on copper. The LAP parameters ablation efficiency, exhaust velocity, momentum coupling coefficient and specific impulse were put a figure on.

Application of linear algebra in computer graphics

Muhammad Yousuf, Muhammad Nouman Khalid

Department of Physics, University of Sargodha ex sub-campus Bhakkar, Thal University Bhakkar

Computer graphics is a multidisciplinary field that focuses on creating, manipulating, and displaying visual content using computer graphics. It encompasses the generation of images, animations, and interactive visual experiences. I have made a poster on one of the applications, i.e., scaling, rotating, and reflecting images. There is a matrix defined for every application. The matrix of a plot, namely the input matrix, which is to be rotated, reflected, or scaled, is multiplied with a specified operator matrix, and the result is obtained.

Keywords: Computer graphics, animation, scaling, reflecting, rotating

Technological Advancements in Agriculture: A Focus on Precision and Smart Farming

Areeba Kousar^{1*}, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: areebakousar848@gmail.com

Precision Agriculture and Smart Farming represent a paradigm shift in modern agriculture, leveraging advanced technologies to optimize farming practices for improved efficiency, productivity, and sustainability. Here is an overview of the key principles and components of these transformative approaches, highlighting their potential to address the pressing challenges of food security, resource conservation, and environmental sustainability. Precision Agriculture, the cornerstone of Smart Farming, relies on data-driven decision-making and the integration of various technologies such as Global Positioning System (GPS), remote sensing, data analytics, and automation. These technologies enable farmers to precisely manage every aspect of their operations, from soil analysis and nutrient management to planting and harvesting. The result is reduced input usage, increased crop yields, and minimized environmental impact. By tailoring actions to specific conditions in each field, Precision Agriculture maximizes resource efficiency while minimizing waste. Smart Farming expands the concept of precision agriculture by incorporating the Internet of Things (IoT), cloud computing, and artificial intelligence. These technologies facilitate real-time monitoring, predictive analytics, and autonomous decision-making, making farms more interconnected and intelligent. Through the integration of smart sensors, drones, and automated machinery, Smart Farming optimizes tasks such as irrigation, pest control, and livestock management. This approach not only enhances efficiency but also promotes the welfare of plants and animals, reducing stress and improving overall yields. One of the main advantages of Precision Agriculture and Smart Farming is their potential to address the challenges of feeding a growing global population while conserving natural resources and minimizing environmental impact. By reducing the use of water, fertilizers, and pesticides, these approaches contribute to sustainable farming and protect ecosystems. Furthermore, they empower farmers to adapt to changing climate conditions by providing real-time weather data and forecasting tools. In conclusion, Precision Agriculture and Smart Farming are pivotal in shaping the future of agriculture. By embracing technological advancements and data-driven decision-making, farmers can achieve higher productivity and greater sustainability in their operations. These innovative approaches not only contribute to food security but also play a critical role in safeguarding the environment and promoting sustainable agriculture for generations to come.

Keywords: Precision Agriculture, Smart Farming, Agriculture Technology, Sustainable Farming, Data-Driven Farming, Precision Farming Technologies, IoT Sensors

NUCLEAR ENERGY

Kifayat Ullah Khan*, Shah Behram, Azhar Mahmood Khan

Thal University Bhakkar, Bhakkar-3000, Punjab, Pakistan.

*Corresponding author's email: Kkifayatkhan796@gmail.com

Nuclear energy can play a role in carbon free presentation of electrical energy, thus manufacturing it engrossing for tomorrow's energy mix. However, several issues have to be direct. In fission technology, the sketch of so-called fourth stage of life reactors show significant insurance, specifically in addressing substance logicity and well-being issues. If successfully spread, such reactors may have an important and feasible part in future energy manufacturing. Working fusion reactors may be uniform more materials systematic and environmental efficient, but also need more enlargement and analysis. The instructions for construction of fourth creation fission and fusion reactors, therefore, asks for awareness and research in this discipline must be make healthy.

Keywords: nuclear energy, energy crises,

Young's double slit experiment

Muhammad Noor ul Hassan

Department of physics, Thal University Bhakkar Bhakkar-3000, Punjab, Pakistan.

*Corresponding author's email: noorulhassan4@gmail.com

The Young's Double-Slit Experiment is a fundamental physics experiment that indicates the wave-like character of light and additional forms of electromagnetic radiation. In this experiment, a stream of light or particles is directed at a railing with two firmly spaced slits. The light progress through the slits generates an interference design on a display, appearing alternating bright and dark bands. This design proposes that light acts as a wave, with the slits behaving as sources of subordinate waves that obstruct constructively and destructively. This test played a key role in the evolution of wave-particle duality and quantum mechanics, demanding classical ideas of light and matter.

Keywords: Wave-like character, bright and dark bands, obstruct constructively and destructively.

Antioxidant potential of ready to serve drink prepared using Roselle (*Hibiscus Sabdariffa*) extract

Muhammad Nadeem^{1*}, Ayesha Nadeem¹, Sadaf Javaria², Tahir Mahmood Qureshi³, Salim-ur-Rehman⁴, Ammara Ainee¹, Mian Nadeem Riaz⁵

¹*Institute of Food Science and Nutrition, University of Sargodha, Sargodha 40100, Pakistan*

²*Institute of Food Science and Nutrition, Gomal University, DI Khan, Pakistan*

³*Department of Food Sciences, Cholistan University of Veterinary and Animal Sciences, Bahawalpur 63100, Pakistan*

⁴*Department of Food Science and Technology, Riphah International University, Faisalabad Campus, Faisalabad, Pakistan; drsalim_rehman@yahoo.com (S.U.R.)*

⁵*Department of Food Science and Technology, Texas A&M University, College Station, TX 77843-2256, USA*

*Corresponding author's email: Muhammad Nadeem (nadeem.abdul@uos.edu.pk)

Fruit juices are rich in nutrients and would be an appropriate dietary choice to experience the health benefits of fruits. Roselle (*Hibiscus Sabdariffa*) is a rare and incredibly important plant that has been found to have great potential in medicinal products and nutraceutical fields. Despite its great nutritional content, food manufacturers here do not give it much attention because of its less unavailability. The main objective of this study was to evaluate the functional properties, and quality of roselle juice. Different ratios of roselle extract were utilized for preparation of drink and evaluated for quality parameter during storage upto 120 days through physico-chemical, microbiological, and sensory analysis. The results revealed that pH ranged 2.29 to 2.81 and a total soluble solids content decreased from 11.89 to 9.76 Brix after 120 days. The outcomes of the research indicated that roselle drink contains sufficient amount of total phenolic compounds, including antioxidants and flavonoids, to enhance the nutritional value and storage capacity of ready to serve drink (RTD). Total flavonoid contents decreased from 325.87 to 791.11 mg CE/100mL, total phenolic content 574.20 to 489.20 mg GAE/100mL, and total antioxidant activity varied from 3183.1 to 1776.9 ug/g Trolox during 120 days of storage study. The results of the microbiological analysis revealed that TPC mean values gradually increased from 1.646 log₁₀ CFU/g to 1.982 log₁₀ CFU/g at 0 and 120 days, accordingly. The study suggested that roselle is suitable for the development of high-quality drinks, and it improves the physicochemical and sensory qualities as well as the shelf life and antioxidant potential of drink. As a result of its great nutritional value, it can have a large market potential.

"Statistical Analysis for Scientists and Engineers: A Comprehensive Overview"

Dr. Muhammad Sarwar Ehsan

Associate Dean of the Faculty of Information Technology and Computer Science at the University of Central Punjab in Lahore, Pakistan.

Statistical analysis plays a pivotal role in the decision-making processes of scientists and engineers across various fields. This abstract provides a concise overview of the significance of statistical analysis in their work.

In today's data-driven world, scientists and engineers rely heavily on statistical analysis to extract meaningful insights from vast and complex datasets. This talk presents a comprehensive overview of statistical methods and their applications in the fields of science and engineering. It addresses the fundamental principles of statistical analysis, including data collection, exploratory data analysis, and hypothesis testing.

The presentation delves into the practical applications of statistics, such as experimental design, regression analysis, and quality control, showcasing how these methods are essential tools for scientists and engineers to make informed decisions, optimize processes, and solve complex problems. It also discusses the importance of data visualization and the use of statistical software for efficient analysis.

Furthermore, the talk highlights the ever-evolving landscape of statistical techniques and their relevance in emerging areas such as machine learning, data mining, and artificial intelligence. The role of statistics in ensuring the validity and reproducibility of scientific experiments is emphasized, as well as its critical function in risk assessment and decision-making in engineering projects.

Keyword: Statistical analysis, Data-driven decision-making, Hypothesis testing, Regression analysis, Machine learning, Artificial intelligence, Risk assessment

Mathematical Approach to Control the Infectious Diseases

Muhammad Rafiq^{1*,2,3}

¹*Faculty of Science and Technology, University of Central Punjab Lahore, Pakistan*

²*Mathematics Research Center, Department of Mathematics, Near East University, Turkey*

³*Department of Computer Science and Mathematics, Lebanese American University Beirut, Lebanon*

*Corresponding author's email: m.rafiq@ucp.edu.pk

The global threat posed by infectious diseases necessitates innovative strategies for their control and prevention. This talk delves into the pivotal role of mathematics in combating the spread of such diseases. By integrating mathematical models and computational tools, this approach enables us to comprehend the dynamics of transmission, anticipate potential outbreaks, and formulate effective intervention measures. The talk highlights the application of various mathematical tools, including epidemiological models, to simulate and forecast the progression of infectious diseases. Furthermore, it underscores the significance of mathematical modeling in guiding public health policies and resource allocations. By elucidating the impact of mathematics in the realm of infectious disease control, this presentation aims to emphasize the crucial synergy between theoretical insights and practical applications in safeguarding global public health.

Keywords: Epidemiological modeling; Disease transmission dynamics; Mathematical analysis; Intervention strategies; Public health policies

Policy Approaches to Combat Deforestation

Ghulam Mustafa

Department of Biological Sciences, Govt. Post Graduate College Bhakkar, Bhakkar

*Corresponding author's email: gmustafa9945@gmail.com

Deforestation is a global crisis that demands comprehensive policy approaches to combat its detrimental effects. Environmental policies at both the national and international levels play a pivotal role in addressing this issue. This article delves into various policy strategies aimed at mitigating deforestation and promoting sustainable land management. At the national level, governments worldwide are enacting legislation to curb deforestation. Many countries have implemented forest protection laws, land tenure reforms, and regulations that restrict logging in critical areas. Additionally, financial incentives, such as subsidies for sustainable forestry practices, are being introduced to encourage responsible land use.

On the international stage, initiatives like the United Nations' Reducing Emissions from Deforestation and Forest Degradation (REDD+) program bring countries together to combat deforestation collectively.

These programs create a framework for financial incentives to countries that reduce their deforestation rates and promote reforestation. Furthermore, international agreements like the Paris Agreement acknowledge the significance of forests in mitigating climate change, encouraging countries to cooperate in protecting these vital ecosystems. Market-based mechanisms, such as certification systems like the Forest Stewardship Council (FSC), offer consumers the ability to choose products from sustainably managed forests. These initiatives incentivize businesses to adopt sustainable practices to meet growing consumer demand for eco-friendly products. Moreover, technology is playing a crucial role in monitoring and enforcing deforestation policies. Satellite imagery and data analytics provide real-time information on forest cover changes, enabling governments and environmental organizations to detect illegal logging and deforestation activities more efficiently. In conclusion, addressing deforestation requires a multifaceted approach, combining national and international policies, financial incentives, market-driven solutions, and cutting-edge technology.

These strategies collectively provide a promising path forward in the global effort to combat deforestation and safeguard our planet's forests for future generations.

Keywords: Detrimental, Pivotal, Sustainable, Reforestation, Multifaceted, Safeguard.

The Impact of Artificial Intelligence on Global Healthcare

Nimra^{1*}, Muhammad Kabir¹, Misbha¹, Ume Aiman¹, Eisha Noor Shah Hashmi¹, Mahnoor Sohail¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: nimra.fatima7711@gmail.com

Artificial Intelligence (AI) is reshaping healthcare globally, revolutionizing diagnostics, treatment, and health management. It permeates various healthcare facets, from early disease detection to personalized care. AI-driven algorithms meticulously analyze extensive medical data, facilitating early disease detection for more effective treatments and improved patient outcomes. AI-powered diagnostic tools enhance the precision and speed of medical image interpretation, reducing misdiagnoses and aiding informed decision-making by healthcare providers. Tailored treatment plans based on patients' genetics, medical history, and lifestyles improve effectiveness while minimizing medication risks. AI accelerates drug development, predicts candidates, and streamlines research processes. Chat bots and virtual assistants improve healthcare access through remote consultations. Wearable devices and AI monitoring systems track health continuously, manage chronic conditions, and detect deteriorations in real-time. Administrative tasks are automated; allowing healthcare professionals to focus on patient care. AI predicts disease outbreaks, resource needs, and patient risk factors, aiding preparedness, and resource allocation. However, ethical and privacy concerns, including data security and algorithmic bias, accompany AI's profound impact on global healthcare. Balancing the promise of improved accessibility, accuracy, and personalization with these challenges is essential as AI shapes healthcare's future.

Keywords: Early Disease Detection, Improved Diagnostics, Personalized Treatment, Telemedicine, Patient Monitoring, Predictive Analytics, Enhanced Research, Ethical and Privacy Concerns

Evolution of plants

Asia Bano^{1*}, Mahnoor Sohail¹, Ishmal Fatima¹, Muhammad Kabir¹

¹*Department of Biological Sciences, Thal University Bhakkar (University of Sargodha, Ex-Sub-Campus Bhakkar), Bhakkar-30000, Punjab, Pakistan*

*Corresponding author's email: bk463904@gmail.com

The evolution of plants is a remarkable journey that spans hundreds of millions of years and showcases the fascinating adaptations and diversification of the plant kingdom. From their humble beginnings as simple green algae in aquatic environments, plants have undergone profound transformations to conquer terrestrial habits. Key milestones in their evolutionary history include the development of vascular tissues, which allowed for efficient water and nutrient transport, and innovations in reproduction strategies, such as seeds and flowers. Plants have not only adapted to terrestrial life but have also played a crucial role in shaping Earth's ecosystems. Their ability to photosynthesize and capture energy from the sun not only sustains their own growth but also forms the foundations of food chains, influencing the evolution of countless other organisms. This abstract provides a glimpse into the complex and awe-inspiring story of plant evolution, highlighting the pivotal adaptations that have enabled plants to thrive on land and profoundly impact the planet's biological diversity.

The evolution of plants has caused a large variety from primitive algal mates through multicellular marine and fresh water green algae terrestrial bryophytes to vascular plants to the seed producing gymnosperm to the flowering and fruit producing highly evolved angiosperm.

Keywords: Evolution, Kingdom, Environments, Aquatic, Terrestrial, Vascular, Nutrients, Ecosystem, Photosynthesis, Algae, Multicellular, Bryophytes, Seed Producing, Gymnosperm, Flower, Fruit, Angiosperm.

Artificial intelligence (AI)

Hammad Rizwan*

Department of Physics, Thal University Bhakkar

*Corresponding author's email: rizwan.chheena777@gmailMu.com

The field of artificial intelligence (AI) encompasses both science and engineering, with a focus on creating systems that possess traits associated with intelligence in human behavior. After briefly reviewing the field's history, this article provides a general overview of artificial intelligence, highlighting its many subfields and their intersections. It is structured around the major modules of the notional architecture of an intelligent agent, which include knowledge representation, problem solving and planning, learning and knowledge acquisition, natural language, speech, and vision, action processing, robotics, and also their integration.

Properties and reactivity of plasmonic photocatalysts with Engineered interface

Uzma Rubab*, Muhammad Sheraz

Department of chemistry, Government Graduate College, Bhakkar, Punjab, Pakistan

*Corresponding author's email: uzmarubabkazmi@gmail.com

Plasmonic photo catalysts are promising materials for energy conversion and effective light-driven catalysis. Plasmonic metals play decisive role for photo catalysis in plasmonic photocatalysts. Plasmonic metals support surface plasma resonance (SPR), a collective electronic vibration. Light stimulates SPR and transmits energy to the semiconductor. The light absorbed by the plasmonic metal stimulates (PSR) and transfers energy to semiconductors. This energy can form a pair of electron holes that commence chemical processes. The integration of plasma metals and semiconductors offers opportunities for improved light absorption, charge separation and catalytic activity. In recent years the field of plasmonic photocatalysis has made significant progress. The researchers studied a variety of plasma metals such as Au, Ag, Zn, Al, and Cu as well as semiconductors such as TiO₂, ZnO, CuO, CdS and MoF₅.

These hybrid systems exhibit increased light absorption and load separation due to local surface plasma resonance effects (LSPR). Many studies have shown the potential of plasmonic photo catalysts, but one of the key challenges in plasmonic photocatalysis is the interface between the plasmonic metal and the semiconductor. This interface can affect the outcome of photocatalysts. The Commencement will develop plasmonic photocatalysts to optimize interface by strengthening knowledge of interface properties between plasmonic metals and semiconductors. These new raw materials are used in a wide range of applications, such as water splitting, CO₂ reduction and contamination degradation. This research proposal aims to explore the fundamental aspects of plasma photocatalysts, to investigate the design strategies of interfaces engineering, by using Ag(a) CDS/PANI as a plasmonic photocatalyst. As researching this field continues to evolve, we can look forward to the use of plasmonic photo- catalyst for energy conversion at large scale.

Keywords: Promising, decisive, commence, exhibit, interface, explorer, investigate.

Linear Algebra's Transformative Role in Shaping Electrical Networks

Sabiha Shafqat¹, Shaiza Ali Sher²

¹*Department of Mathematics, Thal University Bhakkar, Punjab, Pakistan*

²*Department of Biological Sciences, Thal University Bhakkar, Punjab, Pakistan*

Linear algebra, a mathematical discipline rooted in the abstract study of vector spaces, matrices, and linear transformations, has transcended its theoretical origins to become an indispensable tool in the realm of electrical networks. This extended abstract aims to provide a comprehensive exploration of the profound and multifaceted role of linear algebra in the modeling, analysis, and optimization of electrical circuits and systems, underscoring its transformative impact on the field. Linear algebra forms the linchpin of electrical network engineering by enabling the concise representation of complex circuit elements and interactions as matrices and vectors. This abstract delves into the intricate interplay between linear algebra and electrical networks, revealing how the marriage of these two seemingly distinct domains has streamlined and enhanced our approach to solving intricate electrical engineering problems. From foundational concepts like circuit analysis, nodal and mesh analysis, to advanced techniques like Thevenin and Norton theorems and state-space representation, linear algebra offers a unified framework that simplifies the understanding and analysis of electrical networks. This abstract highlight specific applications, showcasing how linear algebra empowers engineers and researchers to dissect and synthesize circuit behavior with unprecedented precision and efficiency. Furthermore, this abstract underscore the pivotal importance of eigenvalues and eigenvectors in assessing the stability and dynamic behavior of electrical networks. It demonstrates how these mathematical constructs can predict system responses to disturbances, enabling the design of more robust and resilient electrical systems. This abstract illuminates the symbiotic relationship between mathematical rigor and real-world applications, providing insights into how linear algebra's theoretical elegance fuels practical advancements in electrical engineering.

From the optimization of power distribution grids to the design of intricate microelectronic circuits, the pervasive influence of linear algebra is undeniable. This abstract unveils a path towards a future where electrical networks are not merely efficient but also intelligent, adaptable, and sustainable, thanks to the transformative power of linear algebra. It is a testament to the ever-expanding synergy between mathematics and technology, driving innovation and progress in the electrified world of today and tomorrow.

Keywords: Transcended, Optimization, Interaction, Unprecedented, Adaptable.

Impact of Perfectionism, Perceived Stress and Academic Performance among College Students

Umarah Kanwal, Hamna Ghafoor, Anam Arshad

Department of Psychology, Thal University Bhakkar

The paper throws light on the view that human progress depends on education and education is a valuable asset to humanity. Education contributes to the development of individuals in all aspects including intelligence, interest, character, discipline, and healthy living which in turn is reflected in the development of society and the nation as a whole. Perfectionism is a personality trait characterized by an obsession with perfection, as well as critical self-evaluation and concerns for the opinions of others. Feeling psychological pain or pressure is called stress which is a type of psychological distress, and this purposive research was conducted in order to investigate the impact of perfectionism, perceived stress, and academic performance among college students. The sample of 215 students was collected with an age range of 17-25 years. The sample was collected using purposive sampling technique. Three instruments were used for data collection including Positive and Negative Perfectionism (PANPS), Perceived Stress Questionnaire (PSQ) and Academic Performance Rating Scale (PARS). The statistical analysis of the quantitative data was performed using SPSS. The result of the analysis indicates a positive perfectionism score has a positive impact on academic performance. A positive outcome of perfectionism is that it reduces perceived stress. Negative perfectionism negatively impacts academic performance but is independent of perceived stress. There was a negative correlation between perceived stress and academic achievement.

Keywords: Perfectionism, Perceived Stress, Academic Performance, purposive, Analysis, correlation.

Objectification Leads towards Cosmetic Usage and Body Satisfaction

Aneeka Arif, Rimsha Bibi, Anum Arshad

Department of Psychology, Thal University Bhakkar

This study was intended to find out the relationship between objectification, cosmetic usage, and body satisfaction in females of university. It was hypothesized that objectification in university females leads them towards cosmetic usage and body satisfaction. It was also hypothesized that cosmetic usage and body satisfaction would predict body image in university females. The non-probability purposive sampling techniques was used to recruit the sample. The participant was female young adult (N=300) with age range 18-26 years. The research was based on correlational research design. The Objectification Scale (OBS; Lain Bailey, 2012). Cas Cosmetic Use Inventory (CCUI; Cash, 1985) and Body Image Concern Inventory (BICI; Littleton, 2003) were used for data collection. Correlation analysis was used to find out the relationship among study variables. The test revealed that there was positive relationship between objectification, cosmetic use, and body satisfaction. Moreover, hierarchical analysis showed that both objectification and cosmetic usage positively predicted body satisfaction. These results have implication in awareness, counselling and research setting for assessing the factors and concern related to body satisfaction due to increased cosmetic usage, contributing towards the higher objectification.

Keywords: Objectification, Cosmetic Usage, Body Satisfaction

Perceived Social Support and Illness Perception in Cardiac Patients Mediating role of Psychological Morbidity

Anam Arshad, Amarah Qureshi

Department of Applied Psychology, School of Professional Psychology, University of Management and Technology, Lahore.

The aim of the current study was to examine the mediating role of psychological morbidity in perceived social support and illness perception in cardiac patients. It was hypothesized that there will be a negative correlation of perceived social support with psychological morbidity and illness perception in cardiac patients. A quantitative study was carried out to conduct this research and a correlational research design was used to get the required results. A non-probability purposive sampling technique was used to select the participants from both private

and government hospitals, with an age range 30 – 60 years. Multidimensional scale of Perceived Social Support (Zimet,1988), General Health Questionnaire (Goldberg,1970) and Brief Illness Perception scale (Weinmanetal., 1996) were the tools used in this study. A significant negative relation highlighted in social support, psychological morbidity and illness perception and a positive relation found between psychological morbidity and illness perception in cardiac patients. Psychological morbidity mediates social support and illness perception. Significant gender differences were found, psychological morbidity and illness perception was higher in women as compared to men therefore social support was higher in men. Furthermore, study will help to understand the significance of social support in cardiac patients.

Keywords: Perceived Social Support, Psychological Morbidity, Illness Perception, Cardiac Patient

Topological Pumping in an incommensurate Aubry-André Harper Model

Qurat ul Ain, Dr Muhammad Sajid

Department of Physics, Kohat University of Science and Technology Kohat

Aubry-André Harper (AAH) model is a convenient platform to investigate topological phenomena in one dimension. When realized on a one-dimensional (1D) lattice with open boundaries, the AAH model features topological protected boundary states which are localized around the endpoints of the lattice. Here, we harness the topological character of these states by performing an adiabatic quantum pump. We start with a boundary state localized on a given boundary and tune the control parameter, which here is the phase of the off-diagonal modulation of the lattice potential, adiabatically. The boundary state merges in the bulk of the system and then appears at the other end of the lattice. We show the quality of the adiabatic pumping depends on the off-diagonal modulation strength. Furthermore, we investigate the effect of the off-diagonal modulation strength on the time-evolution of a continuous- time quantum walk driven by the incommensurate, off-diagonal AAH Hamiltonian. Our results show that the spread rate of the quantum walk in the bulk of the 1D lattice decreases with the increase in. Our work is important to harness and manipulate quantum transport in a topological insulator in 1D.

Impact of stigmatization, care giving burden and relationship adjustment in female schoolteachers

Tayyaba Hanif, Muniba Sami, Anam Arshad

Department of Psychology, Thal University Bhakkar

The study aimed to examine the relationship between perceived stigma, caregiving burden and relationship adjustment among female schoolteachers. The objective of the study was to investigate the predictors of relationship adjustment with students and mediating role of caregiving burden between the relationship of perceived stigma and educational adjustment among teachers. 200 teachers aged between (22-45) years, participated in this study. Data was analyzed using Pearson Product Moment correlation, Multiple Hierarchical linear regression, and PROCESS by Hayes (2018).” The perceived devaluation and discrimination scale (PDD), “The inventory of teacher student relationships (ITSR),” Screen for caregiver burden (SCB). The following scales were used in this study. Results showed that high caregiving burden was significantly related with low relationship adjustment among female teachers. Good relationship adjustment emerged as positive caregiving burden and stigmatization as negative predictor of impactful learning experiences. Mediation analysis revealed caregiving burden to fully mediate the pathway between perceived stigma, caregiving, and relationship adjustment. The study has implications for mental health practitioners, educational officers, and education ministry/government to develop awareness and public educational policy for teachers for better relationship adjustment between teachers and students.

Keywords: Caregiving burden, relationship adjustment, stigmatization, learning, mediation analysis.

Impacts of Parental Bonding on Academic Performance and Self-Esteem of School Students

Savera Anam, Tanjina Yaqoob, Anam Arshad

Department of Psychology, Thal University Bhakkar

This study addressed the relationship among parental bonding, self-esteem, and academic achievement of school students. It was predicted that parental bonding significantly impacts the academic performance and self-esteem of school students. It was also hypothesized that parental bonding positively correlates with the self-esteem and academic performance of school students. Quantitative research has been conducted to evaluate this study. Using nonprobability purposive sampling, 60 school students aged between 7 years to 15 years old from five schools were selected to participate in this study. A survey instrument for data collection consisted of a demographic questionnaire and a Likert-scale questionnaire. Rosenberg self-esteem scale (RSE5, Sinclair et Al, 2010), Parental bonding instruments (PBI, Gordon parker, L.B Brown), Academic performance rating scale (APRS) were used for data collection. Findings of this study showed that the relationship between parental Bonding and closeness was also examined in relation to student's academic performance and self-esteem. This was done in order to investigate whether close parent-child relationships effects on academic outcomes and self-esteem also. The results revealed that parental bonding was positively associated with students' academic performance. Parents closeness was positively associated with school student's self-esteem. Finally, a significant relationship between the interaction of parental bonding, student's academic performance and self-esteem was found.

Keywords: Parental bonding, Academic performance, and Self-esteem.

Impact of Mindfulness on Mental Toughness and Anxiety in University Teachers

Muhammad Anees ur Rehman Shaheen, Sumaira Afzal

Department of Psychology, Thal University Bhakkar

The study examined the impact of mindfulness, mental toughness, and Anxiety in university teachers. This study investigated the positive and negative impact of mindfulness on mental toughness and anxiety in university teachers. The participants of the study were university teachers. The non-probability purposive sampling technique was used to collect data, and sample size was $N=200$ ($M=100$, $F=100$). The study was based on correlation research design. T test, correlation and regression analysis was used to investigate the difference, relationship, and prediction of IV effect on DV among all study variables. The variables were measured through Mindful attention awareness scale by (Brown & Ryan, 2003), Mental toughness questionnaire by (Clough et al., 2002), Hamilton anxiety rating scale by (Hamilton, 1959) to collect data from the participants. The analysis was conducted through the updated version of SPSS 23. The study revealed that mindfulness improved mental toughness and reduced anxiety. The findings are consistent with previous studies that observed the positive linkage between mindfulness and mental toughness and negative linkage between mindfulness and anxiety. The findings suggest that mindfulness training may be an effective tool in addressing psychological challenges experienced by university teachers.

Keywords: Mindfulness, Mental Toughness, Anxiety.

Species Distribution Modelling of *Laudakia Nupta* in Southern Khyber Pakhtunkhwa

Najma Shoukat¹, Abdul Majid¹, and Muhammad Shehzad¹

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

Reptiles are considered important environmental health indicators. They are employed as model animals to comprehend animal ecology because they are sensitive to changes in their habitat. The documentation of Pakistan's squamate species is good, however, very little information is available about the species' population status, distribution, and factors affecting its distribution in Pakistan. In the present study, we predicted the distribution of *Laudakia nupta* (Large-Scaled Rock Agama) in Southern Khyber Pakhtunkhwa associated with different environmental variables. We used 48 presence points of the species from the field data, and environmental variables were extracted from freely available sources. The MaxEnt analysis showed that highly suitable habitats were mostly present in district Tank, Bannu, and different areas of Kohat and Hangu. In addition, some patches were also predicted by MaxEnt in Waziristan Hills. BIO15 (Seasonality of precipitation) (35.2%), BIO17 (Precipitation of the driest quarter of the year) (15.3%), Pak_vrmint (11.2%), and BIO7 (Temperature annual range) (8.3%) were identified as the main environmental factors that affect the habitat distribution of *Laudakia nupta* in Southern Khyber Pakhtunkhwa. Almost all of the area was estimated to be suitable areas for *Laudakia nupta*, respectively. It is advisable to focus on conserving the identified habitats and mitigating anthropogenic impacts in order to ensure the immediate and long-term conservation of this species throughout the study area.

Keywords: Habitat, Maximum Entropy, Environmental Variables, Rock Agama, and Southern Khyber Pakhtunkhwa.

Impact of perceived social support on life satisfaction and self-efficacy among young adults

Samreen Gul, Misbah Batool, Dawar Mehmood

Department of Psychology, Thal University Bhakkar

This study investigates the impact of perceived social support on life satisfaction and self-efficacy among young adults. Social support can be described as providing help or comfort to other people to help them cope with various problems. High levels of self-efficacy can contribute to the increase of activity level of young adults and to their being pleased with themselves. People who are low in self-efficacy tend to see difficult tasks as threats they should avoid, and the life satisfaction focus on primary school students, adolescents, and university students (Tuzgöl-Dost, 2007) but this study was focused on young adults only in the context of all these study variables. Purposive sampling technique and correlational research design was used with the sample of (N=200) which was equally distributed on the basis of their genders. T-test, correlation and regression analysis was used to investigate the difference, relationship, and prediction of IV impact on DV among the entire study variable. All these analyses were conducted on SPSS. Multidimensional Scale of Perceived Social Support (Zimet et al., 1988), Satisfaction with Life Scale (Diener et al., 1985) and General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995) all these scales were used in this study. This research was conducted in two phases, in the first phase pilot study was conducted and in the second phase full-fledged research was conducted. In this research results, limitations, recommendations, and suggestions were mentioned after conducting the research. Mean, standard deviation and t-values of male and females on all study variables indicate that there are no significant gender differences on perceived social support, life satisfaction and self-efficacy. Pearson correlation between the various factors. The results show a significant positive association between perceived social support and life satisfaction as well as a positive relationship between perceived social support and general self-efficacy. The results also demonstrate a positive association between overall self-efficacy and life satisfaction. Regression analysis is computed with perceived social support as predictor variable and life satisfaction as outcome variable. The ΔR^2 value of .36 indicates that 36% variance in the dependent variable can be accounted by the predictor with $F(110.34, P<.001)$. The findings indicates that perceived social support ($\beta = .61, p < .001$) has significant positive impact on life satisfaction. Regression analysis is computed with perceived social support as

predictor variable and Self-Efficacy as outcome variable. The ΔR^2 value of .16 indicates that 16% variance in the dependent variable can be accounted by the predictor with $F(37.85, P < .001)$. The findings indicates that perceived social support ($\beta = .40, p < .001$) has significant positive impact on self-efficacy.

Keywords: Perceived Social Support, Life Satisfaction, Self-Efficacy

Impact of loneliness and suicidal ideation on decision making among love failure young adults

Asma, Sehar Fatima, Zubia Iftikhar, Hafiz Zeeshan Iqbal

Department of psychology, Thal University Bhakkar

The goal of this research was to explore loneliness and suicidal ideation on decision making among love failure young adults. Overall research was divided into two parts. Firstly, the Pilot study was carried out in order to examine the psychometric properties of the scale and exploration of the direction of relationship among variables. Pilot study was conducted on the limited sample of love failure young adults ($N = 30$). After pilot testing, the main study was carried out. The sample of the main study was comprised of love failure young adults ($N = 114$) from universities of Bhakkar city. Purposive sampling technique was used in the present study. UCLA loneliness scale is developed by Russell, D, Peplau, L. A. & Ferguson, M. L. (1978). Suicidal ideation scale developed by David D. Luxton, M. David Rudd, Mark A. Reger, and Gregory A. Gahm 2004), Decision making scale is developed by French DJ, West RJ, Elander J, Wilding JM (1993) were used to collect data from love failure. To achieve the objectives multiple statistical analyses were conducted including descriptive statistics, reliability analysis, Pearson correlation and linear regression. Statistical analysis revealed that loneliness has a negative effect on young adults and suicidal ideation has negative effect on love failure. Finally, implications of these results and limitations of the study were discussed in line with the literature and suggestions for future studies were mentioned.

Keywords: Loneliness, Suicidal ideation, Decision making

Impact of emotional intelligence and personality traits on academic achievements among college students

Shangool Kainat, Ayesha Shamshair, Dawar Mehmood

Department of psychology, Thal University Bhakkar

The purpose of the current study was investigating the impact of emotional intelligence and personality traits on academic achievement among college students. Personality traits of conscientiousness and self-discipline are positively associated with academic achievement. Emotional intelligence is multidimensional and encompasses cognitive capabilities competencies and skills that influence one's ability to succeed in coping with environmental demands. Wijekoon et al.'s (2016) found that the relationship between emotional intelligence and academic achievement was positive and significant. This research was investigating all these variables interaction with each other. Purposive sampling technique and correlational research design was used with the sample of ($N=200$) which will be equally distributed in students on the bases of their gender this sample will be collected from all the government and private collages of Bhakkar. T-test, correlation and regression analysis was used to investigate the difference, relationship, and prediction of IV impact on DV among all the study variables. All these analyses were conducted on SPSS. Three scales were used in this study which is given as Emotional Intelligent Scale (Schutte et al., 1998), Big Five Inventory Scale (John & Martinez, 1998) and Academic Success Inventory (Prevatt et al., 2011) all these scales were used. This research was conducted in two phases in the first phase pilot study will be conducted and in the second phase full-flagged research will be conducted. In this research results, limitations, recommendations, and suggestions will be mentioned after conducting the research.

Keywords: Emotional Intelligent, Personality traits, Academic achievements.

Impact of Psychological Morbidity, Mindfulness, and Illness Appraisal in Diabetic Patients

Nida Maqsood, Attika Zafar, Anum Arshad

Department of psychology, Thal University Bhakkar

The study examined the impact of Psychological Morbidity, Mindfulness, and Illness Appraisal in Diabetic Patients. This study investigated the positive and negative impact of psychological morbidity on mindfulness and illness appraisal in diabetic patients. The participants of the study were diabetic patients. The non-probability convenience sampling technique was used to collect data, and sample size was $N=120$ ($M=60$, $F=60$). The study was based on correlation research design. T test, correlation and regression analysis was used to investigate the difference, relationship, and prediction of IV effect on DV among all study variables. The variables were measured through psychological morbidity scale (GHQ) by (Mitchell et al., 1970), Mindful attention awareness scale (MAAS) by (Kirk et al., 2003) and Illness appraisal scale (DRAS) by (Vicki et al., 2009) to collect data from the participants. The findings revealed that mindfulness is positively correlated with illness appraisal whereas psychological morbidity is negatively correlated to illness appraisal.

Keywords: Psychological Morbidity, Mindfulness, Illness Appraisal

Identification of Natural Compounds as Inhibitors of Pyruvate Kinase M2 for Breast Cancer Treatment

Iqra Sarfraz^{1,2}, Azhar Rasul^{2*}, Sevki Adem³

¹*Department of Zoology, Govt. Associate College for Women Bhakkar*

²*Department of Zoology, Faculty of Life Sciences, Government College University Faisalabad (GCUF), 38000, Pakistan*

³*Department of Chemistry, Faculty of Sciences, CankiriKaratekin University, Cankiri 18100, Turkey.*

The reliance of tumor cells on aerobic glycolysis is one of the emerging hallmarks of cancer. Pyruvate kinase M2 (PKM2), an important enzyme of glycolytic pathway, is highly expressed in a number of cancer cells. Tumor cells heavily depend on PKM2 to fulfill their divergent energetic and biosynthetic requirements, suggesting it as novel drug target for cancer therapies. Based on this context, we performed enzymatic-assay-based screening of the in-house phenolic compound's library for the identification of PKM2 inhibitors. This screening identified silibinin, curcumin, resveratrol, and ellagic acid as potential inhibitors of PKM2 with IC_{50} values of 0.91 μ M, 1.12 μ M, 3.07 μ M, and 4.20 μ M respectively. For the determination of K_i constants and the inhibition type of hit compounds, Lineweaver-Burk graphs were plotted. Silibinin and ellagic acid performed the competitive inhibition of PKM2 with K_i constants of 0.61 μ M and 5.06 μ M, while curcumin and resveratrol were identified as non-competitive inhibitors of PKM2 with K_i constants of 1.20 μ M and 7.34 μ M. The in-silico screening of phenolic compounds against three binding sites of PKM2 provided insight into the binding pattern and functionally important amino residues of PKM2. Further, the evaluation of cytotoxicity via MTT assay demonstrated ellagic acid as potent inhibitor of cancer cell growth ($IC_{50} = 20 \mu$ M). These results present ellagic acid, silibinin, curcumin, and resveratrol as inhibitors of PKM2 to interrogate metabolic reprogramming in cancer cells. This study has also provided the foundation for further research to validate the potential of identified bioactive entities for PKM2 targeted-cancer therapies.

Self-Efficacy, Need for Achievement and Machiavellianism in Public Sector Employees

Maria Zaman, Shazia Qayyum

Institute of Applied Psychology University of the Punjab, Lahore, Pakistan

The present study was conducted to examine the relationship between self-efficacy, need for achievement and Machiavellianism in public sector employees. It was hypothesized that there is likely to be a relationship in self-efficacy, need for achievement and Machiavellianism in public sector employees. It was hypothesized that self-efficacy and need for achievement are likely to predict Machiavellianism. The sample size of was ($N=200$) males selected from different public sector department of Lahore using the purposive sampling. The data was collected using New Generalized Self-Efficacy Scale (Gully & Chen, 2001), Need for Achievement Scale (Jackson, 1974) and Mach IV scale (1970). Results revealed the significant positive relationship between self-efficacy, need for achievement and Machiavellianism. And self-efficacy was the positive significant predictor of Machiavellianism and need for achievement was the negative predictor of Machiavellianism. The present study

helps to understand the predictors of Machiavellianism and that could help to eradicate this manipulation and deceptive behavior and could be used for improved interventions.

Gut Microbiota Physiological and Biochemical analysis and their role in diseases of district Kohat population

Sonia Naz^{1*}, Dr. Mubbashir Hussain², Shah Qiaz³

1. Department of Zoology, Kohat University of Science and Technology, Kohat 26000 Pakistan

2. Department of Microbiology, Kohat University of Science and Technology, Kohat 26000 Pakistan

3. Department of Biotechnology and Genetic engineering Kohat University of Science and Technology, Kohat 26000 Pakistan

*Corresponding author's email: soniabangash7175@gmail.com

Background

Gut microbiota, the community of microorganisms living in the human digestive system, plays a crucial role in maintaining overall health. They are involved in various physiological processes, including digestion, nutrient absorption, and immune system regulation. However, an imbalance in gut microbiota, known as dysbiosis, has been linked to several diseases and conditions, including Inflammatory Bowel Disease (IBD), Obesity, Diabetes, Autoimmune Diseases, Mental Health, Allergies, Cardiovascular Disease, Cancer.

Methodology

Following the approval of the study by the Ethical committee at Kohat University of Science and Technology (KUST), a total of 100 stool samples were collected from individuals in district Kohat. Subsequently, these samples were transported to the Molecular Parasitology and Virology Laboratory, located within the Department of Zoology at KUST, where they underwent further processing and analysis. The sample were cultured on different media manually like from nutrient agar to differential media like blood agar or MacConkey agar for differentiation. samples were subjected to microscopy for physiological differentiation after staining with eosin stain and were observed at 60 and 100X. After physiological differentiation the sample was subjected to 16s RNA analysis and then for further processing for biochemical analysis.

Results

The overall physiological and biochemical analysis and species interaction of samples showed that 75% of a urban area people had dysbiosis in gut microbiota species *Bacteroides fragilis*. The urban area people showed a 30% decrease of the *Bacteroides fragilis*, this species is associated with maintaining gut barrier integrity and immune system regulation. Dysbiosis involving a decrease in *Bacteroides fragilis* has been linked to inflammatory bowel diseases (IBD) like Crohn's disease. Other species like *Akkermansia muciniphila* showed 33% decrease in an urban area than rural. Results showed that who consume much fry's food had decrease in these species, these species are associated with maintaining the gut mucosal barrier and has been linked to metabolic health. Low levels of *Akkermansia muciniphila* are observed in obesity and type 2 diabetes. Some other species like clostridium were also absorbed who produce short chain fatty acids which play an important role in energy metabolism and can prevent inflammation disease. These species were associated with the gut species *Bifidobacterium* population in gut. Results showed that the decrease in *Bifidobacterium* directly affects the clostridium population. The decrease of *Bifidobacterium* which directly affects the gut microbiome disbiose was associated with the dietary habit of a urban and rural area populations.

Conclusions:

It's important to note that the field of gut microbiota research is continuously evolving, and while many associations have been identified, causation and precise mechanisms are still subjects of ongoing investigation. The human gut microbiota is highly individualized, and its interplay with genetics, diet, and lifestyle adds complexity to understanding its role in various diseases.

Quran offers a unique perspective on science and technology

Muhammad abubakkar¹, Hafsa latif², Muhammad Ikram³

¹Department of Islamic studies , Thal University Bhakkar

²Department of Islamic studies , Thal University Bhakkar

³Department of Islamic studies , University of Thal University Bhakkar

*Corresponding author's email: abubakkarsiddeeqe23@gmail.com

Abstract

The Quran offers a unique perspective on science and technology. It encourages the exploration of the natural world as a means to understand God's creation. Many verses in the Quran emphasize observation, reflection, and the pursuit of knowledge. For instance, the Quran mentions the concept of "Ayat" (signs) in the natural world, which are seen as evidence of God's existence and wisdom.

Moreover, Islamic scholars throughout history have made significant contributions to various fields of science and technology, including mathematics, astronomy, medicine, and optics. They viewed science and technology as tools to better understand and serve humanity, in alignment with the Quranic teachings of compassion and stewardship of the Earth.

However, it's important to note that interpretations of the Quran's perspective on science and technology may vary among scholars and individuals. Some may see it as a harmonious relationship, while others may emphasize caution and ethics in technological advancements. Ultimately, the Quran's perspective on science and technology encourages the responsible use of knowledge for the betterment of society and the world.

Keywords: Creation of man meditating day and night. There are signs for those of understanding The quest who I am.

A Novel Distachionate from *Breynia distachia* Treats Inflammations by Modulating COX-2 and Inflammatory Cytokines in Rat Liver Tissue

Malik Saadullah ¹, Muhammad Asif ², and Sania Arif ¹

¹GC University, Faisalabad

Breynia distachia is a plant of genus *Breynia* belonging to family Phyllanthaceae. This study was conducted to isolate and examine the anti-inflammatory attributes of the roots of *Breynia distachia*. Methanol extract from roots were prepared by simple maceration. For phytochemical studies, isolation, purification, structure elucidation, metal analysis, total phenolic content, and solubility test were done by chromatographic and spectroscopic techniques. Anti-inflammatory activity was evaluated by cotton pallet edema model and carrageenan paw edema model, and antioxidant potential was evaluated by DPPH, FRAP, ABTS antioxidants assays. Metal analysis of BD.Me revealed the presence of Na > Mg > K > Mn > Fe = Zn in respective order. Four phytochemicals such as gallic acid, quercetin, sinapic acid, and *p*-coumaric acid are found in *Breynia distachia*. Quercetin is present in relatively larger quantity, and shows antioxidant activity by reducing the ferric iron to ferrous iron. Novel distachionate shows high antioxidant activity in ABTS assay by reducing reactive oxygen species. Quantitative or qualitative analysis performed by HPLC indicates the ascending peaks or presence of secondary products (metabolites) respectively. Histopathology analysis of liver, spleen, heart, and kidney was done, revealing mild inflammations in spleen and liver, and no cytotoxicity in heart and kidney. Orally administered BD.Me and ditachionate show significantly inhibited effect on carrageenan and cotton pellet-induced paw edema in 1st and 2nd h with (ns = $p > 0.05$) than control. After 3rd, 4th, 5th, and 6th h, BD.Me and ditachionate showed inhibition of paw edema in a highly significant (*** = $p < 0.001$) manner as compared to control. In cotton-pellet edema model, distachionate shows a %inhibition of 57.3% at a dose level of 5 mg/kg. Docking values obtained from distachionate-Cox2 complex suggest a potent inhibitor evaluated for this protein. The distachionate shows effective anti-inflammatory activity. Methanol extracts of roots showed significant lipoxygenase inhibitory activity by IC₅₀ values of 155.7 ± 0.55 and 132.9 ± 0.33 µg/mL. Data from various in vitro and in vivo models suggest that novel distachionate isolated from *Breynia distachia* shows strong antioxidant and anti-inflammatory activities; it should be further studied for the exploration of its medicinal potential.