GOVERNMENT DEGREE COLLEGE, BUDAUN

1ST INTERNATIONAL CONFERENCE ON RECENT TRENDS IN PLANT AND ANIMAL SCIENCES (RTPAS - 2025)

28th - 31th August, 2025

BOOK OF ABSTRACTS

EDITORS:

DR. PRIYANKA SINGH

DR. GAURAV KUMAR SINGH

DR. SACHIN KUMAR

AnuGanga Publication

CONFERENCE LEADERSHIP: CONVENORS AND COORDINATOR

Dr. Priyanka Singh
Ph.D. (Botany), Aligarh Muslim University
Department of Botany, Government Degree College, Budaun
Dr. Priyanks Singh specializes in plant physiology and stress biology, with 19 SCI-indexed publications and 2,220+ citations. She has received multiple awards and convened the international conference RTPAS-2025.

Assistant Professor

Dr. Gaurav Kumar Singh
Ph.D. (Zoology, Nematology), Aligarh Muslim University
Department of Zoology, Government Degree College, Budaun
Dr. Gaurav Kumar Singh specializes in nematode taxonomy, biodiversity, and biocontrol, with SCI-indexed publications and extensive teaching and research experience. He also served as Convenor of RTPAS-2025, contributing to its academic success.

Assistant Professor

Dr. Sachin Kumar
Ph.D. (Mathematics), IIT (BHU), Varanasi
Department of Mathematics, Government Degree College, Budaun
Dr. Sachin Kumar has published 29 SCI-indexed papers with 595+ citations (h-index 16, i10-index 22), contributing significantly to mathematical sciences. As Coordinator of RTPAS-2025, he ensured the smooth execution of the international conference.

Assistant Professor

Available at amazon

flipkart.com

AnuGanga Publication

ANUGANGA प्रकाशन
पंजीकृत कार्यालय: अंबिका विहार, डेलापीर,
बरेली - 243122, उत्तर प्रदेश, भारत
ईमेल: anugangapublication@gmail.com
संपर्क: +91 82187 32868

ISBN 978-81-982012-9-4

9 788198 201294

MRP: ₹ 250
(No Tax On Books)

ANUGANGA प्रकाशन
Registered Office: Ambika Vihar, Delapeer,
Bareilly – 243122, Uttar Pradesh, India
Email: anugangapublication@gmail.com
Contact: +91 82187 32868
website: www.anugangapublishers.in.net

For Any Queries

Book Title: **1st International Conference on Recent Trends in Plant and Animal Sciences (RTPAS – 2025) – Book of Abstracts**
Editors:

- **Dr. Priyanka Singh**
- **Dr. Gaurav Kumar Singh**
- **Dr. Sachin Kumar**

Edition: **First**
Year of Publication: **2025**
Language: English
Format: Paperback / Softback
ISBN: **978-81-982012-9-4**

Printed and Published in India by:
ANUGANGA Publication
Kagazwala, New Delhi

Price: Two Hundred And Fifty Only (250₹)

Disclaimer

The editors have taken utmost care to avoid errors and omissions while compiling this book of abstracts and have made every effort to ensure that the information is accurate and up-to-date. However, the editors and ANUGANGA Publication make no representations or warranties regarding the completeness, accuracy, or reliability of the contents.

This publication is released on the condition that neither the publisher nor the editors shall be held legally or otherwise responsible for any consequences arising from its use. The publisher and editors explicitly disclaim any liability towards any person—whether a purchaser of this book or not—for any loss, damage, or error resulting from the use of the information contained herein.

Furthermore, any names, places, or events mentioned in this book that may resemble actual persons or locations are purely coincidental. There is no intent to harm, defame, or insult any individual or institution.

GUEST OF HONOR

Hon'ble Dharmpal Singh

Minister of Animal Husbandry & Dairying
Government of Uttar Pradesh

Prof. (Dr.) Shashi Kapoor

Joint Director, Higher Education
Uttar Pradesh

Prof. (Dr.) B. L. Sharma

Assistant Director, Higher Education
Uttar Pradesh

KEYNOTE SPEAKERS

Prof. Dr. Charles Oluwaseun Adetunji

Dean Faculty of Science, Edo State University Uzairue Nigeria

Prof. Shamsul Hayat

Department of Botany, Aligarh Muslim University, Aligarh, India

Prof. Alok Srivastav

Director, DoR Department of Plant Science, M.J.P.R. University, Bareilly, India

Dr. Mohammad Mahamood

Department of Plant Protection, Qassim University Buraidah, Saudi Arabia

KEYNOTE SPEAKERS

Dr. Akhilendra Kumar Maurya

Department of Zoology, Institute of Science, Banaras Hindu University, India

Dr. Vishnu D. Rajput

International Lab on Nanobiotechnology, Southern Federal University, Russia

Dr. Khyne U Mar

Conservation biologist and Veterinarian Sheffield, United Kingdom

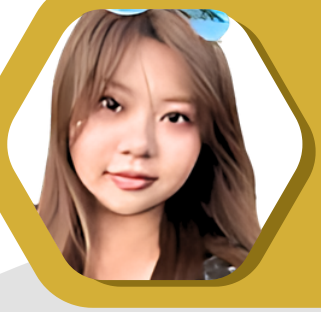
Dr. Mohammad Yusuf

College of Science, United Arab Emirates University, Al Ain, UAE

KEYNOTE SPEAKERS

Dr. Anayat Rasool Mir

College of Ecology, Lanzhou University, Lanzhou, China



DR. MINHUI BI

College of Ecology, Lanzhou University, Lanzhou, China

Dr. Nandini Thakur

College of Ecology, Lanzhou University, Lanzhou, China

SESSION CHAIR

Dr. Prof. Upendra Kumar

Professor, Department of Plant Science, MJP Rohilkhand University, Bareilly, India

Dr. Amit Kumar Bajhaiya

Assistant Professor, Department of Microbiology Central University of Tamil Nadu, Tamil Nadu, India

Dr. Vijay Kumar

Assistant Professor, Department of Zoology, Veerangana Avantibai Government Degree College, Atrauli, Aligarh (India)

Dr. Archana Chauhan

Assistant Professor, Department of Zoology Panjab University, Chandigarh, India

SESSION CHAIR

Dr. Sandeep Kumar

Assistant Professor, Department of Zoology
Dr. Harisingh Gour Vishwavidyalaya Sagar,
Madhya Pradesh, India

Dr. Aarti Gupta

Assistant Professor, Department of Botany
Dr. Harisingh Gour Vishwavidyalaya Sagar,
Madhya Pradesh, India

Dr. Yamshi Arif

Guest Teacher, Department of Botany,
Women's College, Aligarh Muslim University,
Aligarh, India

CHIEF GUEST'S ADDRESS

Hon'ble Dharmpal Singh
Minister of Animal Husbandry & Dairying
Government of Uttar Pradesh

I am pleased to extend my sincere congratulations to the organizing committee of the *1st International Conference on Recent Trends in Plant and Animal Sciences (RTPAS-2025)*, led by the young and dedicated team of **Dr. Priyanka Singh, Dr. Sachin Kumar, and Dr. Gaurav Kumar Singh**. This prestigious international event is a proud milestone for the **Government Degree College, Budaun**, and a testament to its growing stature in the academic and research community.

As Minister of Animal Husbandry & Dairying, I especially appreciate the conference's focus on themes of direct relevance to animal health, sustainable livestock management, biodiversity conservation, and innovative technologies in the field of animal sciences.

The gathering of eminent experts, researchers, and students from India and abroad provides a valuable platform for exchanging ideas, fostering collaborations, and developing solutions that will benefit both the scientific community and society at large.

I commend the commitment, vision, and meticulous planning demonstrated by the organizers in hosting a conference of such scale and importance. I am confident that the deliberations will inspire fresh perspectives, advance research, and contribute meaningfully to academic progress and societal welfare.

I wish RTPAS-2025 every success and trust that it will leave a lasting legacy for future academic endeavors at GDC Budaun.

With best wishes,

Dharmpal Singh

Dharmpal Singh
Minister of Animal Husbandry & Dairying
Government of Uttar Pradesh

MESSAGE

Prof. (Dr.) Shashi Kapoor
Joint Director, Higher Education
Uttar Pradesh

I am pleased to extend my warm greetings and congratulations to the young and dynamic organizing team—**Dr. Priyanka Singh, Dr. Sachin Kumar, and Dr. Gaurav Kumar Singh**—for their commendable efforts in hosting the *1st International Conference on Recent Trends in Plant and Animal Sciences (RTPAS-2025)* at **Government Degree College, Budaun**. This prestigious international gathering is indeed a proud moment for the entire GDC family, showcasing the institution's dedication to academic growth, research excellence, and global collaboration. I wish to place on record my sincere appreciation for the leadership and unwavering support of **Principal Dr. Shraddha Gupta**, whose guidance has been instrumental in making this event a reality.

As Joint Director of Higher Education, I strongly believe in the importance of platforms that encourage meaningful academic exchange, foster interdisciplinary collaboration, and inspire young minds to engage with contemporary scientific challenges. RTPAS-2025.

I commend the **GDC Budaun team** for their vision and perseverance in bringing together distinguished scientists, educators, and students from across the world. Such initiatives not only enhance the academic reputation of the college but also contribute significantly to building a culture of innovation and research excellence in Uttar Pradesh.

I wish the conference grand success and hope that it becomes a catalyst for continued research collaborations, groundbreaking ideas, and lasting professional relationships.

With best wishes,

Prof. (Dr.) Shashi Kapoor

Prof. (Dr.) Shashi Kapoor
Joint Director, Higher Education
Uttar Pradesh

PRINCIPAL'S MESSAGE: GUIDING THE SPIRIT OF RTPAS - 2025

Dr. Shraddha Gupta
Principal,
Government Degree College, Budaun

It gives me immense pride and satisfaction to extend my heartfelt best wishes on the occasion of the *1st International Conference on Recent Trends in Plant and Animal Sciences (RTPAS-2025)*, organized by our college. This historic academic event marks not only a milestone for our institution but also a celebration of intellectual exchange across nations and disciplines.

Science flourishes when minds meet, when ideas are tested, and when knowledge is shared selflessly. By bringing together eminent scholars, researchers, and young academicians from India and abroad, this conference exemplifies our shared commitment to advancing scientific inquiry and addressing challenges that matter to humanity—be it sustainability, biodiversity, environmental balance, or innovation in plant and animal sciences.

I firmly believe that the discussions and deliberations during this conference will ignite new collaborations, inspire future research, and ultimately contribute to the betterment of society at large. Our institution feels honored to host such a vibrant forum, and I am deeply appreciative of the tireless efforts of the organizing team in making this vision a reality.

As Principal, I extend my best wishes to every participant. May RTPAS-2025 become a beacon of knowledge and an enduring symbol of academic excellence, motivating us to continue this journey of discovery with even greater zeal in the years ahead.

With warm regards and best wishes,

Shraddha

(Dr. Shraddha Gupta)
Principal
Government Degree College, Budaun

MESSAGE FROM THE CONVENOR

Dr. Priyanka Singh
Convenor, RTPAS-2025
Government Degree College, Budaun

It gives me immense pleasure to extend a heartfelt welcome to all distinguished speakers, participants, and delegates from across the globe to the *1st International Conference on Recent Trends in Plant and Animal Sciences (RTPAS-2025)*, jointly organized by the Departments of Botany and Zoology, Government Degree College, Budaun.

This conference marks a significant step forward in our collective pursuit of knowledge, bringing together a vibrant community of researchers, academicians, and young scholars. The multidisciplinary themes of this event—spanning from biodiversity conservation, nanotechnology, and soil health, to animal sciences, climate resilience, and sustainable agriculture—reflect the urgent need to address today's global scientific challenges with holistic and innovative approaches.

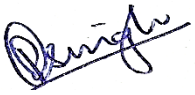
We are deeply honoured by the presence of eminent keynote speakers, distinguished session chairs, and enthusiastic participants, whose intellectual contributions from the cornerstone of this academic endeavour. Your research, insights, and discussions not only enrich the scientific community but also inspire future collaborations across disciplines and borders.

I sincerely hope that this Abstract Book serves not only as a record of your invaluable contributions but also as a lasting resource for continued learning, dialogue, and discovery.

On behalf of the organizing committee, I extend my gratitude to our esteemed Principal, colleagues, and dedicated team members, whose constant support made this event possible. I also express my appreciation to all participants whose active involvement transforms this conference into a true celebration of science and scholarship.

Let us work together to transform ideas into impactful actions for a sustainable and better future.

With warm regards and best wishes,



Dr. Priyanka Singh

Convenor, RTPAS-2025

MESSAGE FROM THE CONVENOR

Dr. Gaurav Kumar Singh
Convenor, RTPAS-2025
Government Degree College, Budaun

It is with great pride and joy that I welcome all participants, keynote speakers, and delegates to the *1st International Conference on Recent Trends in Plant and Animal Sciences (RTPAS-2025)*. This academic gathering stands as a testament to our collective commitment to advancing science, fostering innovation, and nurturing young minds.

The themes addressed in this conference—ranging from taxonomy and biodiversity to environmental sustainability and modern technological interventions—highlight the dynamic progress in biological sciences and their direct relevance to society. Bringing together such a wide spectrum of expertise on one platform is itself a remarkable achievement, and I am confident that the knowledge exchanged here will pave the way for future collaborations and scientific breakthroughs.

This Abstract Book reflects the breadth and depth of research contributions shared during the conference. I encourage all readers to explore its pages with curiosity and openness, as it represents not only individual scholarship but also the spirit of collective learning.

On behalf of the organizing committee, I express my sincere gratitude to all the distinguished guests, speakers, participants, and my fellow team members for their wholehearted support. Together, we have shaped RTPAS-2025 into a vibrant forum for discussion, inspiration, and progress.

I look forward to seeing the seeds of ideas sown here grow into fruitful outcomes for science and society alike.

With warm regards and best wishes,

Dr. Gaurav Kumar Singh

Convenor, RTPAS-2025

MESSAGE FROM THE COORDINATOR

Dr. Sachin Kumar
Coordinator, RTPAS-2025
Government Degree College, Budaun

It is with immense pride and joy that I extend my warm greetings to all the participants, distinguished speakers, and delegates of the 1st International Conference on Recent Trends in Plant and Animal Sciences (RTPAS-2025), jointly organized by the Departments of Botany and Zoology, Government Degree College, Budaun, Uttar Pradesh, India.

This conference is not merely an event—it is a vision realized. It brings together scientists, academicians, research scholars, and students from across the globe to share their knowledge, exchange ideas, and build collaborations for the advancement of science and society.

The Abstract Book is a reflection of the intellectual diversity of this conference. It encompasses a wide spectrum of themes, including plant and animal sciences, veterinary research, biotechnology, nanotechnology, environmental management, biodiversity conservation, sustainable agriculture, and human health sciences. Each abstract represents the hard work, dedication, and passion of researchers committed to pushing the frontiers of knowledge.

As the Coordinator, I feel deeply honoured to have been part of this academic journey. I sincerely thank our respected Principal, **Dr. Shraddha Gupta**, for her constant encouragement and guidance; our Conveners, **Dr. Priyanka Singh** and **Dr. Gaurav Kumar Singh**, for their leadership and dedication whose tireless efforts made this international event a reality.

I hope that the deliberations and interactions during RTPAS-2025 will inspire new ideas, foster meaningful collaborations, and contribute towards sustainable solutions for the challenges faced by humanity and the environment.

With best wishes for fruitful learning and collaboration.

Dr. Sachin Kumar

Coordinator, RTPAS-2025

List of Content

EFFECT OF CADMIUM STRESS ON GROWTH PARAMETERS AND THEIR ALLEVIATION BY JASMONIC ACID IN BRASSICA GENOTYPES

Sajid Khan, Dr Sridevi Tallapragada and Dr Vandana Khandelwal
Department of Botany and Plant Physiology
Choudhary Charan Singh Haryana Agricultural University, Hisar, Haryana

Abstract

The genus Brassica belongs to the family Brassicaceae and comprises over 30 species along with a wide array of varieties and hybrids. Renowned for their agricultural importance, these plants are cultivated worldwide for diverse purposes, playing a vital role in both agronomic practices and the global economy. The present study was carried out to understand the effect of cadmium stress on growth parameters and its alleviation by foliar spray of jasmonic acid in brassica genotype. Seeds of two genotypes of brassica (RH-725 and HNS-0901) were grown in pots under screen house conditions during the Rabi season of 2021. The desired levels of stress (Control, 14 mg kg^{-1}, 21 mg kg^{-1}) were created by saturating each pot. Foliar spray of jasmonic acid (5µmolL^{-1}, 10µmolL^{-1} and 20 µmolL^{-1}) was given 30 days after sowing (DAS) in control as well as each level of cadmium stress in both genotypes (RH 725 and HNS 0901). At 45 DAS plant height, number of leaves per plant, leaf area per plant and number of branches per plant decreased significantly with the increasing levels (control to 21 mg kg-1) of cadmium stress in both the genotypes (RH 725 and HNS 0901). Application of jasmonic acid (5 µmolL^{-1}, 10 µmolL^{-1} and 20 µmolL^{-1}) enhanced the growth parameters. The effects were more pronounced at 20µmolL-1 of JA at 45 DAS. Overall, RH-725 showed more growth rate as compared to HNS-0901. The interaction between both treatments (cadmium stress and jasmonic acid) was found statistically significant.

Keywords: *Brassica, cadmium stress, jasmonic acid (JA) and growth parameters.*

EXPLORING THE ENDOPHYTIC MICROBIOME OF *PIPER LONGUM* L.

Namrata Singh [1] and Dr. S. K. Soni [1]
[1]Department of Botany, Faculty of Science, Dayalbagh Educational Institute, Agra
namrata100678@dei.ac.in

Abstract

Endophytic microorganisms live inside plant tissues without causing any harm. Their mutualistic relationship with the host enhances plant health and secondary metabolite production. As the results, endophytes are increasingly recognized as potential sources of bioactive compounds similar to those of their host plants. This study hypothesized that *Piper longum* endophytes may produce the same alkaloids as the host, including piperine and piperlongumine, piplartine and various alkaloids. Based on this, the endophytes of Piper longum was examined to observe the contribution in alkaloid production.

Piper longum L (long pepper), a medicinally important member of the Piperaceae family, has long been valued for its therapeutic effects such as anti-inflammatory, antioxidant and neuroprotective effects. In this study, fungal and bacterial endophytes were isolated from root, stem, leaf and spikes of *Piper longum*. A total of 15 fungal and 8 bacterial isolates were obtained, with fungal isolates showing relatively higher abundance compared to bacterial counterparts. Preliminary characterization showed diverse morphology among isolates. Selected promising isolates were maintained in suspension cultures using appropriate liquid media to facilitate large-scale biomass production and secondary metabolite extraction for further phytochemical investigations. These findings highlight the rich diversity of the *P. longum* endophytic microbiome and its potential as a reservoir of bioactive compounds.

This research contributes to our understanding of plant-microbe interactions in medicinal plants and provides a foundation for utilizing endophytic resources for sustainable biotechnological applications.

Keywords- *Endophytes, Piper longum, Medicine, Bioactive compounds, Morphology*

INTEGRATING CELLULAR THERAPIES AND CONSERVATION BIOLOGY: A MULTIDISCIPLINARY APPROACH TO WILDLIFE PRESERVATION

Mr. Aryan Bhardwaj
M.Sc. Zoology
Chaudhary Charan Singh University, Meerut

Abstract

The conservation of endangered species is a complex issue that requires innovative strategies to address the challenges posed by habitat destruction, invasive species, and climate change. Cellular therapies, particularly those based on stem cells, hold promise as solutions for wildlife medicine and conservation. This review explores the potential of integrating cellular therapies with conservation biology to enhance wildlife preservation efforts. We discuss the current state of cellular therapies in veterinary medicine, highlighting advancements in mesenchymal stem cell therapies, gene therapy, and immunotherapy. We then examine the challenges in developing cellular therapies for endangered species, including insufficient biological knowledge, ethical concerns, regulatory hurdles, and resource limitations. Despite these obstacles, cellular therapies such as induced pluripotent stem cells (iPSCs) and spermatogonial stem cell (SSC) technologies have the potential to significantly impact wildlife conservation by improving survival rates, enhancing reproductive success, mitigating the effects of habitat loss and climate change, and supporting species reintroduction programs. We also explore future directions and emerging technologies, such as genome editing, organoid technology, artificial intelligence, and 3D bioprinting, which could revolutionize wildlife medicine and conservation. To fully realize the potential of cellular therapies in wildlife conservation, interdisciplinary collaboration and increased support from governments, NGOs, research institutions, and the private sector are essential. By integrating cellular therapies with conservation biology, we can develop innovative strategies to preserve biodiversity and protect endangered species for future generations.

FORAGING TECHNIQUES IN INDIAN GAME BIRD *ORTYGORNIS PONDICERIANUS*

Anshu Mishra*, Ashish Kumar
Animal Diversity and Ecology Laboratory
Department of Zoology, University of Lucknow, Lucknow, U.P., India, 226007

Abstract

Foraging behaviour in birds refers to the strategies and actions to find, capture, and consume food. Grey francolin (*Ortygornis pondicerianus*) is one of the oldest game birds recorded in human history and are popular throughout the Indian subcontinent. They are found in the dry habitats, including dry to semi-deserts, grasslands, shrub lands, open thorn forests, and associated crop land. Their diet primarily consists of seeds, insects, and small invertebrates found in grasslands and croplands. The present study was conducted in district Lucknow in the year 2021 and 2022, during breeding and non- breeding seasons. The focal observation method was employed to investigate the foraging techniques. The results indicated that the pecking, probing and scratching were the main foraging techniques. Furthermore, pecking was the most frequently used technique (48%), while scratching followed by pecking was the least used technique (20%) in both the seasons.

Keywords: *Grey francolin, foraging technique, focal observation, scratching and pecking.*

ROLE OF RALLIDAE IN WETLAND ECOSYSTEM MANAGEMENT

Ashish Kumar* & Sachin Gupta
Animal Diversity and Ecology Laboratory, Department of Zoology
University of Lucknow, Lucknow, U.P., India

Abstract

The family Rallidae, comprising rails, coots, and crakes, plays an integral role in maintaining the ecological balance of wetland ecosystems. These secretive, ground-dwelling birds are widely distributed across freshwater and brackish habitats, where they contribute significantly to nutrient cycling, energy flow, and trophic interactions. As opportunistic omnivores, rallids feed on a diverse range of invertebrates, seeds, aquatic vegetation, and detritus, thereby influencing both plant community dynamics and the regulation of invertebrate populations. Their foraging activities facilitate seed dispersal, while trampling and grazing help in maintaining vegetation heterogeneity, preventing the dominance of invasive macrophytes. Furthermore, rallids serve as important prey for higher trophic level predators, including raptors and carnivorous mammals, thus linking aquatic and terrestrial food webs. Certain species, such as coots (*Fulica* spp.), are bioindicators of wetland health due to their sensitivity to water quality, pollution, and habitat modification. Declines in rallid populations often reflect broader ecological disturbances, making them valuable indicators of ecosystem integrity. From a management perspective, conserving rallids and their habitats ensures the preservation of ecosystem services such as water purification, carbon sequestration, and biodiversity support. Their presence highlights the necessity of integrated wetland management strategies that combine avian conservation with habitat restoration and pollution control. Overall, Rallidae function not only as key ecological actors but also as indicators of wetland resilience, reinforcing their role in sustaining the ecological stability of these fragile ecosystems.

Keywords: *Rallidae, wetlands, ecosystem management, seed dispersal, bioindicators*

A MODERN APPROACH TO ETHNOBOTANICAL STUDY: QUANTITATIVE ANALYSIS OF DATA COLLECTED FROM ETHNIC COMMUNITIES OF THE TERAI FOREST

Sandhya Devi*, Alok Kumar Khare
Department of Botany, Bareilly College Bareilly

Abstract

Ethnobotany, an interdisciplinary branch of study, draws on approaches from a wide range of disciplines. The knowledge was mostly about the plant's therapeutic properties, and the research was qualitative; nevertheless, quantitative studies have become increasingly important as research has advanced. The scientific precision of ethnobotanical study has increased significantly during the last decade. A number of ethnobotanical indicators are frequently used to translate primary data collected during field investigations into statistical measurements. Quantitative ethnobotanical indicators are used to examine and quantify plant value in traditional knowledge systems. Using indices like Use Value (UV), Fidelity Level (FL), Relative Frequency of Citation (RFC), Cultural value index (CV) and Informant Consensus Factor (ICF) can help evaluate the cultural and medicinal value of plants, prioritize species for conservation, and drive drug discovery. A survey was carried out among ethnic groupings using open-ended questionnaire. Concerned about plants recognized and used by them using ethnobotanical indices. frequencies were analysed. 72 medicinal plants from 36 families were identified, treating a wide range of ailments. *Achyranthes* and *Helminthostachys* showed highest RFC and UV values. This research review includes some additional and novel applications, as well as which could serve as a baseline for phytochemical analysis and potential medicinal qualities.

Keywords: *Ethnobotany, quantitative indices, ITK, therapeutic, Use Value, Relative Frequency citation*

BIOLOGICAL CONTROL OF *SCLEROTINIA SCLEROTIORUM* CAUSING STEM ROT DISEASE OF SUNFLOWER USING BACTERIAL ENDOPHYTES

Rajwinder Kaur[1], Pratibha Vyas[1] and Sandeep Sharma[2]
[1] Department of Microbiology
[2] Department of Soil Science
Punjab Agricultural University, Ludhiana, Punjab (India)

Abstract

The present study was conducted to screen antagonistic bacterial endophytes against *Sclerotinia sclerotiorum* causing stem rot disease in sunflower. Out of 42 endophytic bacterial isolates, four isolates exhibited antagonistic activity varying from 20.0 to 36.6% in dual plate assay and 35.4 to 92.0% in liquid media against *S. sclerotiorum*. The effect of bacterial endophytes on the ultrastructure of *S. sclerotiorum* was observed by scanning electron microscopy which showed thinning, rupturing and shrinkage of the fungal hyphae. The endophytes also exhibited phosphate solubilization, production of siderophores, HCN, auxins, ammonia, lipase, cellulose and amylase. The isolates were identified as *Sphingobacterium spiritivorum* EB1, *Bacillus* sp. EB6, *Pseudomonas aeruginosa* EB21 and *Serratia liquefaciens* EB23 with MALDI-TOF-MS analysis. The bacterial strains exhibited ability to produce volatile organic compounds with the highest number of VOCs produced by Bacillus sp. EB6. The bacterial treatments singly or in combinations also significantly enhanced the vigour index. A significant increase in growth parameters, chlorophyll content, and nutrient content of shoot and soil was also observed with the bacterial treatments in sunflower grown in glasshouse conditions. The disease control by the bacterial treatments varied from 66.7 to 88.9%. The results indicated that the consortium of four strains was statistically not different from the consortium of SsEB1+ BaEB6 +SlEB23, indicating thereby the potential of these strains as biocontrol agent against *S. sclerotiorum*. As the future line of recommendation, the formulation containing the consortium of these strains may be developed and tested in sunflower to control *Sclerotinia sclerotiorum* in field conditions.

Keywords: *Biocontrol; Sclerotinia sclerotiorum; Sunflower; Endophytes; Volatile organic compounds.*

BOVINE TUBERCULOSIS IN A FEMALE MURRAH BUFFALO (*BUBALUS BUBALIS*): A CASE REPORT

Taranjot Kaur, Kanika Sharma, Abhishek Verma and Omer Khalil Baba*
Department of Veterinary Pathology, Guru Angad Dev Veterinary And Animal Sciences University, Ludhiana-141004
*Corresponding Author: Omer Khalil Baba, Assistant Professor, Department of Veterinary Pathology, Guru Angad Dev Veterinary And Animal Sciences University, Ludhiana-141004.

Abstract

Bovine tuberculosis remains an economically and zoonotically significant disease in livestock. In addition to posing a risk to human health, it also leads to reduced productivity with higher rearing costs in livestock and the treatment is often not economically feasible. An eleven-year-old female buffalo was presented for postmortem with the history of marked submandibular and pharyngeal swelling accompanied by respiratory distress and inspiratory stridor. A complete necropsy was performed and revealed marked enlarged and firm retropharyngeal lymph nodes pressing the upper respiratory tract. Multiple firm, 5-10 mm caseous granulomatous lesions were also observed in the lung parenchyma. Histopathologically, the lesions were characterized by scattered to coalescing granulomas with calcification at the center. Modified Ziehl–Neelsen staining confirmed the presence of acid-fast *Mycobacterium bacilli*. The case was diagnosed as bovine tuberculosis on the basis of gross, histopathology and acid fast staining. This case highlights the role of conducting the systematic necropsy and histopathology for the detection of mycobacterial diseases in large animals, especially in endemic regions.

Keywords: *Tuberculosis, Zoonotic, Stridor, Ziehl-Neelsen staining*

BENEFITS OF SPENT MUSHROOM COMPOST IN SOYBEAN (*GLYCINE MAX*)

Pooja Lodhi*[1] and Deepak Vyas[1]
1. Lab of Microbial Technology and Plant Pathology, Department of Botany, Dr. Hari Singh Gour Vishwavidyalaya, Sagar (M.P)-470003
Email: poojathakur367893@gmail.com

Abstract

Area surrounding sagar (M.P.) is known as soybean estate. It is a cash crops of the area. However, is also sustable for many diseases, the most promising disease is wilt caused by *Fusarium oxysporum*. In past disease was controlled by using chemicals but here an attempt have been made to control Fusarium wilt using SMC (Spent mushroom compost) and others botanicals. The result obtained from the experimental suggest that SMC produces better result as a antagonist. Here SMC is a residue substrate or reminants after the harvesting of *Pleurotus* mushroom

Keywords: *Agricultural crops, mushroom compost, Pleurotus ostreatus, soil conditioner*.

MADHUCA LONGIFOLIA (L.) J.F. MACBR.: AN ECONOMICALLY IMPORTANT TREE WITH CONSERVATION NOTES

Somendra Verma[1] & Shweta Shekhar[2]*
[1]Research Scholar, Department of Botany, University of Allahabad, Prayagraj-211001
[2]Assistant Professor, Department of Botany, University of Allahabad, Prayagraj-211001
Email: somendra_phd2025@allduniv.ac.in

Abstract

Madhuca longifolia is an important ethnomedicinal, deciduous tree that belongs to the family Sapotaceae. It has ethnomedicinal, pharmaceutical, and ethnopharmacological properties. It is effective against various diseases such as cancer, ulcers, and snakebite. Almost all parts of the tree are medicinally important. The bark is used for treating ulcers, tonsillitis, and bleeding. The flowers exhibit hepatoprotective properties and are also used for making beverages. The fruits of Mahua are used as vegetables, and the seeds are rich in edible fats. Seed oil is used in the manufacturing of laundry products and detergents, and is also used as a cooking oil in various tribal regions in India. The tree is considered a blessing by the tribal people living in the forest. In the present study a population survey was conducted in the eastern part of Uttar Pradesh. It was observed during the study that due to the indiscriminate development, overexploitation, and habitat loss the population of mahua trees are decreasing. The fruit set is also low in many areas. As, different parts are consumed by the tribals as well as the local villagers for ethnomedicinal purposes, it is crucial to understand their ecology, reproductive biology ensuring their conservation, and improving their cultivation. It will also aid in maintaining biodiversity and develop effective strategies for tree improvement and conservation.

Keywords: *Mahua, Ethnomedicine, Conservation, Biodiversity, Survey, Uttar Pradesh.*

EFFECT OF STORAGE ON ANTIOXIDANT AND ANTIBACTERIAL PROPERTY OF AWALA (*EMBILICA OFFICINALIS*)

Dr. Reema Upadhyay,
Assistant Professor, Department of Botany, M.M.H. College, Ghaziabad, 201001

Abstract

Awala is one of the most widely used drugs in India. It is a medium sized deciduous tree belonging to the family Phyllanthaceae. Its berry fruits are rich in vitamin C (ascorbic acid). It contains potent antioxidants ie. ellagic acid and gallic acid more than any other fruit. It acts as immunity booster, by its antioxidant and antibacterial property. It reduces cardiovascular diseases, fortifies lung, maintains blood pressure, balance the stomach acid level, cures skin diseases, lowers the level of diabetics and also beneficial in cold and cough. An accurate and simple o-phenyleredianine fluorometric method was used to determine the acid content in Awala (Shishoo, C.J.S.A. Shah, I.S.Rathod and S.G. Patel 1997). The stability of natural ascorbic acid obtained by Awala fruit was compared with synthetic ascorbic acid by using 1percent oxalic acid under similar condition. Natural ascorbic acid was found more stable than that of synthetic ascorbic acid. With the time the amount of ascorbic acid in Awala was decreasing. In the case of pickles more than 85 percent ascorbic acid was lost within 30 to 40 days of storage. In Chyawanprash more than 95 percent ascorbic acid was lost during the frying of Awala pulp. While dried form of fruit contains more than 87 percent ascorbic acid under normal condition of storage upto 12 to 16 months Taking fresh awala is the best way to consume vitamin C but if it is not possible then it can be recommended to take it in the dried form as we know that there is no vaccine for covid -19 developed yet, we have to take care a lot for our immunity.

HEAVY METAL CONTAMINATION OF WATER AND THEIR TOXIC EFFECT

Shivam Singh[1], Dr. Neeraj Malik[2], Mohammad Tazeem Khan[2]
Vardhaman College, Bijnor[1],
S.M. Degree College Chandausi, Sambhal[2]
(Affiliated to Guru Jambheshwar University, Moradabad)

Abstract

Water has become an important concern in the world of today. As the world's population expands, development and industrialization increase, becoming the main root cause of water contamination. Water is polluted by higher amounts of heavy metals and metalloids released from mine tailings, elimination of high metal wastes, growing industrial areas, leaded petrol and paints, animal manures, electronic waste, sewage sludge, pesticides, wastewater irrigation, coal and so on. Some of these heavy metals, such as copper, cobalt, iron, nickel, magnesium, molybdenum, chromium, selenium, manganese, and zinc, play significant functions in the body's numerous physiological and biochemical processes. However, some of these heavy metals have negative effect to the body in large amounts, and others, such as cadmium, mercury, lead, chromium, silver, and arsenic, have devastating effects in the body, producing acute and chronic toxicities in humans. Heavy metal toxicity has shown to be an alarming hazard, with multiple illnesses linked with it. Our present study aims on the analysis of heavy metals and its fatal toxic effects on physiology.

Keywords*: heavy metals, toxicity, water, hazard, cadmium etc.*

EFFECT OF META-TOPOLIN ON MORPHOLOGICAL, PHYSIOCHEMICAL, AND MOLECULAR DYNAMICS DURING IN VITRO REGENERATION OF *SALIX TETRASPERMA* ROXB.

Zubair Altaf Reshi

Department of Botany, Aligarh Muslim University, Aligarh (Uttar Prades)

Abstract

An efficient and reproducible in vitro propagation protocol was developed for *Salix tetrasperma*, using mature nodal explants. The study investigated the effects of different concentrations and combinations of cytokinins (mT, BA, Kn) and auxins (NAA, IAA, IBA) on regeneration efficiency with Murashige and Skoog (MS) medium. Among individual cytokinin treatments, 5.0 µM mT produced the highest regeneration response (92%), with an average of 11.6 ± 0.08 shoots per explant and a shoot length of 4.5 ± 0.22 cm after 12 weeks of culture. Synergistic application of 5.0 µM mT with 0.5 µM NAA further enhanced proliferation, with 21.3 ± 0.40 shoots per explant and mean length of 6.9 ± 0.13 cm in 96% of cultures. Root induction from regenerated shoots was most effective on half-strength MS medium supplemented with low concentrations of auxins, where 0.5 µM IBA gave the best response with 10.4 ± 0.20 roots per shoot, mean root length of 5.7 ± 0.11 cm, and 97% rooting frequency within four weeks. Acclimatized plants exhibited 86% survival under greenhouse conditions. Photosynthetic assessments during acclimatization revealed an initial decline in photosynthetic activity, followed by significant recovery with growth progression. SEM analysis highlighted ultrastructural differences between in vitro and in vivo leaves, while DPPH assays showed variable antioxidant activity during acclimatization. GC–MS profiling of leaf extracts confirmed diverse phytochemicals with pharmacological potential. Genetic fidelity analysis using SCoT markers showed no polymorphism, confirming clonal stability. This study is the first to report mT-mediated regeneration in *S. tetrasperma*, demonstrating its superior effectiveness compared to BA and Kn.

MEDICINAL PLANTS OF FAMILY CONVOLVULACEAE IN UTTAR PRADESH

Dr. Jaswinder Kaur
Assistant Professor, Department of Botany, Government Degree College, Sirathu, Kaushambi, Uttar Pradesh

Abstract

The family Convolvulaceae comprises climbers, herbs, shrubs, and occasionally trees, characterized by regular flowers with a sympetalous corolla and five conspicuous mid-petaline bands. Globally, it includes 59 genera and approximately 1,900 species, several of which are valued as ornamentals, food sources, medicinal plants, and in religious practices. Many species exhibit therapeutic potential in the management of various ailments, including fatigue, inflammation, hypertension, diabetes, dysentery, constipation, rheumatism, arthritis, meningitis, and hydrocephaly. Pharmacological investigations have further revealed antimicrobial, anticoagulant, analgesic, hypoglycemic, and anticancer properties in certain members of the family.

The present study documents the medicinal plants of Convolvulaceae in Uttar Pradesh. A total of 28 species representing 12 genera were collected from different districts between May 2015 and March 2021. For each taxon, the botanical name, vernacular name, habitat, flowering and fruiting period, distribution status, taxonomic description, and medicinal applications are provided.

This study underscores the significance of integrating biodiversity and cultural conservation in ethnobotanical research. Further phytochemical and pharmacological investigations are essential to identify bioactive compounds and validate the therapeutic potential of these species.

INFLUENCE OF NITROGEN FERTILIZER ON HERBAGE YIELD AND OIL CONTENT OF *OCIMUM* SPS.

Syed SAAD*
Department of Botany Gandhi.Faiz-e-Aam,College, Shahjahanpur 242001, U.P.India.
*Corresponding author Email: syedsaad1981@gmail.com

Abstract :

To determine the effect of various doses of nitrogen fertilizer on herbage yield and essential oil content of three species of *Ocimu*m (*Ocimum sanctum*, *Ocimum basilicum* and *Ocimum americanum*), a factorial bloc designed experiment was carried to evaluate the effect of different doses of nitrogen on herbage yield and essential oil content of three replicates of all the species of Ocimum. In this experiment four levels of nitrogen were applied @ of 0 (control), 50, 100 and 150 kg N/ha on three species of *Ocimum*. The experimental results indicated that herbage yield and essential oil content gradually increase in all three species of *Ocimum* but the best results were recorded with 150 kg N/ha in *Ocimum americanum*.

Keywords: *Ocimum sps, nitrogen fertilizers, oil content & yield parameters.*

VISCERAL ACTINOMYCOSIS IN A VRINDAVANI CALF: A CASE REPORT

Vinay Kumar S D[1], Vidya Singh[1], Renuka Prasad K[2], Sree Lakshmi P[1], Ankita[1], Avantika Srivastav[1], Neha[1], Rahul Singh[1], Manohar S[1], Pawan Kumar[1], Rajveer Singh Pawaiya[1*]
[1]Division of Pathology, [2]Division of Microbiology, ICAR- Indian Veterinary Research Institute, Izatnagar, Bareilly -243122, Uttar Pradesh, India
Presenting author: Vidya Singh
*Corresponding author: Vidya Singh, Sr Scientist, Division of Pathology, ICAR- Indian Veterinary Research Institute, Izatnagar, Bareilly -243122, Uttar Pradesh, India, Email: vidyasingh100@gmail.com

Abstract

Actinomycosis is a sporadic endogenous chronic bacterial disease of cattle, caused by Actinomyces bovis. The present study reports a rare presentation of visceral actinomycosis in a 43-day-old female Vrindavani calf, which was presented for necropsy with a history of erosive oral lesions and diarrhoea. Grossly, multiple pyogranulomatous lesions ranging from 0.5-1 cm dia. were seen on tongue, alveolar socket of mandible, muzzle and skin over the lower jaw. In small intestine, multiple ulcers with central yellowish sulphur granules were seen along the entire length of the jejunum and proximal colon. Gram staining of crushed sulphur granule revealed Gram-positive bacterial clumps with branching filaments at the centre surrounded by club shaped pinkish material. Histopathology revealed chronic active suppurative inflammation surrounded by amorphous eosinophilic material characteristic of Splendore-Hoeppli reaction in gingiva and lamina propria of jejunum. In lungs, marked thickening of interstitium with infiltration of mononuclear cells was seen. The terminal bronchiolar lumen and alveoli showed gram positive long filamentous rods in Brown and Brenn staining. Bacterial culture of intestinal sulphur granule yielded typical 'molar tooth' colony on BHI agar and characteristic biochemical profile of A. bovis were recorded. Gross, histopathological, microbiological observations were suggestive of disseminated form of Actinomycosis. The initial lesions might have developed in oral cavity and subsequently disseminated to visceral tissues like lungs and intestine producing chronic interstitial pneumonia and typical pyogranulomatous ulcers in intestine. To the best of our knowledge, this is the first ever report of bovine actinomycosis with orofacial, enteric and pulmonary involvement.

STEM CELL THERAPY IN VETERINARY MEDICINE: APPLICATIONS FOR TISSUE REGENERATION, INJURY REPAIR, AND TREATMENT OF DEGENERATIVE DISEASES IN ANIMALS

Mr. Sachin Gupta
Department of Biotechnology
Khandelwal College of Management Science and Technology, Bareilly U.P

Abstract

Stem Cell therapy is the most emerging and transformative technique or approach in the field of veterinary medicine, which gives many techniques to help treat tissue injury, organ dysfunction, etc. This study focuses on mesenchymal stem cells derived from bone marrow, adipose tissue, and umbilical cord blood. Which have self-renewal and multipotent differentiation ability. These features help in the regeneration of cartilage, bone, muscle, and other tissues while modulating immune responses. Recent discoveries, including autologous and allogeneic transplants, exosome-based therapies, and scaffold-assisted tissue engineering, highlight the innovative strategies for clinical application. The research estimates the isolation, culture, and characterization methods for stem cells, including their therapeutic efficiency in musculoskeletal, neurological, and degenerative conditions in domestic and farm animals. Safety and ethical considerations are emphasized on clinical outcomes, safety, and ethical considerations, focusing on identifying effective techniques and protocols for routine veterinary practice. Stem cell therapy promises improved animal health, accelerated recovery, and enhanced welfare by emerging regenerative medicines with the latest and modern biotechnological tools. This abstract provides a comprehensive overview of current trends and practical applications, offering insights into the future of veterinary regenerative treatments.

VERMICOMPOSTING; A GLOBAL NEED FOR SUSTAINABLE AGRICULTURE

Deepak Kumar Bhartiya1 and Keshav Singh2
[1]Assistant Professor, Department of Zoology, Government Degree College, Dhadha Bujurg, Hata, Kushinagar, U.P., India.
E-mail- deepak26bhartiya@gmail.com
[2]Professor, Vermibiotechnology Laboratory, Department of Zoology, D.D.U. Gorakhpur University, Gorakhpur, U.P., India.
∗Corresponding author: keshav26singh@rediffmail.com

Abstract

Abundant use of chemical fertilizer and pesticides disturbs the soil texture and microbial biodiversity of agricultural land and have made of our soil sick and problematic. Physico-chemical properties of soil are the main factors affecting by the mobility, speciation and hence availability of toxicity heavy metals in soil is a best complicated heterogeneous system, constituted of soil organic matter, minerals, plants, microbes, faunas and toxic metals. Vermicomposting, the process of using earthworms *Eisenia fetida* to convert biodegradable material into rich nutrient vermicompost, which uses in sustainable agriculture. Vermicompost have rich in growth promoting hormones, enzymes, and microorganisms. Vermicompost significantly increases the plant growth and enhances resistance to diseases.

Keywords- *Earthworm Eisenia fetida, Heavy Metals toxicity, soil, Vermicomposting and Vermicompost*

GLOBAL WARMING AND DENGUE: A GROWING THREAT FROM VECTOR-BORNE DISEASES

Imrose Shahewar
Department of Zoology,
Telangana Social Welfare Residential Degree College for Women Karimnagar

Abstract

Global warming is now one of the biggest challenges affecting both the environment and human health. One serious outcome of rising temperatures and changing rainfall patterns is the spread of vector-borne diseases. Dengue fever, a viral infection transmitted mainly by the mosquito *Aedes aegypti*, has become a major health concern in many countries. Warmer weather, higher humidity, and frequent rains create ideal conditions for mosquito breeding and also speed up the growth of the dengue virus inside the insect. This leads to faster transmission and larger outbreaks. Recent reports, such as the 2025 dengue surge in the Pacific Islands, clearly show the strong link between climate change and the increase in dengue cases. In addition, urban crowding, poor waste management, and global travel make the disease spread even more quickly. This paper highlights how changes in the environment directly affect mosquito behavior and disease patterns. To control dengue, it is important to combine climate awareness with strong public health strategies, including vector control, community participation, and preventive healthcare. Understanding these connections between the environment, mosquitoes, and human health is essential to reduce future risks. This study emphasizes the role of environmental biology in solving current health problems and stresses the need for joint efforts between scientists, policymakers, and communities.

Keywords: *Global warming, Dengue, Mosquito, Climate change, Environmental biology*

FROM SYMBIOSIS TO PATHOGENESIS: THE DIVERSE RELATIONSHIPS OF NEMATODES AND MOLLUSCS

Kulsum Nasir * and Qudsia Tahseen
Nematode Research Laboratory, Department of Zoology, Aligarh Muslim University, Aligarh, 202001
Email: Kulsumnasir7808@gmail.com

Abstract

Nematodes exhibit diverse interactions with terrestrial molluscs, ranging from symbiosis to pathogenesis. Mutualistic interactions between nematodes and molluscs are rare and have been demonstrated in *Rhabditis* and *Pellioditis* that inhabit the gut or slime trails of terrestrial molluscs (Pieterse *et al*., 2016). These nematodes feed on bacteria and organic debris, helping to regulate microbial populations and potentially aiding in digestion, while benefiting from a nutrient-rich environment and protection within the host. Commensal interactions between nematodes and molluscs have been reported between synanthropic molluscs like *Achatina fulica* and *Bradybaena similaris* and free-living nematodes that reside in the gut, slime trails, or mucus of molluscs, feeding on bacteria and organic debris without causing harm. Parasitic species, especially *Phasmarhabditis hermaphrodita*, invades and kills slugs and snails, leading to host mortality. Such interactions are largely influenced by the environmental conditions and host immunity. These associations, from harmless coexistence to pathogenicity, highlight the phenoplasticity of nematodes and hold significant importance in the context of evolutionary diversity, host specificity and biocontrol applications in managing pest molluscs in agriculture and natural ecosystems. The present study reports the preference of microhabitats and the nature of association and its prevalence in nematode and snail taxa in moist terrestrial habitats.

STUDYING THE EFFICACY AND APPLICATIONS OF SOME AROMATIC PLANTS LIKE LAVENDER, GINGER, ROSEMARY, MINT, LEMONGRASS AND BASIL IN MODERN MEDICINE

Dr. Pratiksha Raghuvanshi, Assistant Professor, Department of Botany, Shri Varshney College, Aligarh

Abstract

This study focus on the medicinal and aromatic plants have been used for centuries in traditional medicine due to their diverse therapeutic properties. Plants like Lavender, Rosemary, Mint, Lemongrass, Ginger, and Basil inspect their efficacy and composition of their essential oils, which are complex mixtures of secondary metabolites. The unique chemical composition of these oils, often containing terpenes, terpenoids and phenylpropanoids, contributes their medicinal value. Essential oils from these plants exhibit antimicrobial activity against micro-organisms. Many of these plants possess anti-inflammatory, and antioxidant properties which are crucial for managing various chronic diseases and promoting overall health like ginger oil have zingiberene, β-phellandrene, camphene, geranial, and α-curcumene and mint oil have menthol and menthone, with other significant components including menthofuran, 1,8-cineole, and limonene these oils have been used to reduce postoperative nausea and vomiting. Lavender oil have menthol and menthone, with other significant components including menthofuran, 1,8-cineole, and limonene is widely used in aromatherapy for its relaxing and calming effects, healping ro relieve stress, anxiety and promote sleep. The essential oil of lemongrass is used as an insect repellent and rosemary oil is used in hair care products. Basil contains compound like eugenol, linalool, and citronellol which can help reduce inflammation and is a good source of antioxidant, which can help protect the body against cell damage. Traditional uses of these Plants and their uses in modern healthcare, including their potential in aromatherapy, pain management and of conditions like acne and nausea.

Keywords: *Medicinal, Aromatic Plant, Lavender, Lemmongrass, Mint, Ginger, Antimicrobial, Anti-inflammatory, antioxidant, Oil*

YOGA: THE KEY TO HEALTH IN MODERN TIME

Rajvir Singh Ojha
Department of Zoology,
Raja Balwant Singh College,
Agra, (U.P.), India-282002

Abstract

Yoga has become more and more popular among the people. In today's polluted environment, yoga is like a medicine which does not have any adverse effect, rather there are many yoga asanas which, if acquired in life, eradicated many diseases and reduce the effect of chronic diseases. Shavasana normalize high blood pressure, Bhramari pranayama calms the mind, Shalbhasana and Tadasana relieve back pain and neck pain. Bhastrika pranayama is advantageous in the severe diseases like heart disease, breathing problems and high blood pressure. Kapalbhati pranayama acts as a life-saver for life. It helps in curing untreatable diseases like cancer, hepatitis, psoriasis, AIDS, obesity, vitiligo and infertility, uterus, ovary or any mass in the body. All these untreated diseases can be cured by doing. By doing various yogasana and pranayama, the mind remains fixed, calm and happy. Negative thoughts are demolished, which gives relief from diseases like depression. Yoga develops immunity in the body along with keeping us healthy, yoga also gives us positive energy. Yoga gives us a feeling of spiritual satisfaction, peace and energetic consciousness due to which are life sails ahead on calm and tranquil seas. Therefore, it would not be an overstressed to say that yoga is necessary for all of us in every way.

Keywords: *Yoga, health, life-saver, energy, satisfaction.*

COMMON MEDICINAL PLANTS AND THEIR BIOACTIVE COMPOUNDS

Pushpraj Singh
Assistant Professor, Department of Chemistry,
Govt. Girls Degree College, Chhibramau, Kannauj-209721,
(Affiliated to CSJM University, Kanpur), Uttar Pradesh, India
Email: pushpraj1509@gmail.com

Abstract

Medicinal plants have long served as a foundation for traditional healthcare systems and continue to play a vital role in modern medicine. These plants are rich sources of bioactive compounds that exhibit a wide range of pharmacological properties, including antimicrobial, anti-inflammatory, antioxidant, antidiabetic and anticancer effects. The bioactive constituents, such as alkaloids, flavonoids, terpenoids, glycosides, tannins and phenolic compounds, are responsible for the therapeutic potential of these herbs. Commonly used medicinal plants like Tulsi (*Ocimum sanctum*), Neem (*Azadirachta indica*), Turmeric (*Curcuma longa*), Amla (*Phyllanthus emblica*) and Ashwagandha (*Withania somnifera*) are traditionally employed to treat ailments ranging from infections and inflammation to metabolic disorders and mental stress. For instance, curcumin in turmeric shows potent anti-inflammatory and antioxidant activity; azadirachtin in neem exhibits strong antibacterial and antifungal properties; withanolides in ashwagandha are known for adaptogenic and immune-modulatory effects. Scientific interest in plant-derived compounds has significantly increased due to their lower toxicity, cost-effectiveness and compatibility with the human body. Numerous modern drugs have originated from these phytochemicals or are inspired by them. However, despite the extensive traditional knowledge, many medicinal plants and their active compounds remain underexplored. This paper aims to highlight some widely used medicinal plants and their key bioactive components, emphasizing their roles in traditional healing systems and potential applications in contemporary pharmaceutical research. Understanding these natural compounds may pave the way for novel drug discovery and support the integration of herbal medicine into mainstream healthcare.

Keywords: *Medicinal plants, bioactive compounds, phytochemicals, traditional medicine, therapeutic properties, drug discovery.*

ASSESSMENT OF TOXICITY OF LEAD NITRATE ON GERMINATION AND VEGETATIVE GROWTH OF *PISUM SATIVUM* L.

Sunil Kumar* and Astik Kumar Buts
Department of Botany, D.S. College Aligarh, U.P., India
Email : sunilarya101024@gmail.com

Abstract

The present study was conducted to assess the toxicological effects of lead nitrate on morphological traits of *Pisum sativum* L. using varieties IPF-99-25 (Adarsh) and IPFD-1-10 (Prakash) in M1 and M2 generations. The healthy seeds of both varieties of Pisum sativum were treated with 0.1%, 0.2%, 0.3%, 0.4% and 0.5% concentration of Lead Nitrate before sowing in the experimental field. The obtained plants were considered as M1 generation. The seeds obtained from M1 generation were further treated with corresponding concentration of Lead Nitrate and sown in experimental plot to obtain M2 generation. Seeds were treated with 0.1 to 0.5% concentrations of lead nitrate prior to sowing. Observations revealed that seed germination, seedling survival, plant height and number of branches declined progressively with increasing concentrations. Delay in flowering and slight extension in harvesting period are also recorded at higher doses. Effects were mild at lower concentrations (0.1–0.2%) but became markedly adverse above 0.2% indicating a threshold for toxicity. These findings clearly demonstrate the negative impact of lead nitrate on germination and vegetative growth of Pisum sativum highlighting its toxicological effect on germination and vegetative growth.

Keywords: *Pisum sativum, Lead nitrate, Germination, Vegetative growth and Toxicity*

GLYCODELIN: FUNCTIONS, ISOFORMS, AND DETECTION TECHNIQUES

Rohit Sain
Department of Zoology, Maharshi Dayanand University, Rohtak (Haryana)
Email: *rohit13122000sain@gmail.com*

Abstract

Glycodelin is a glycoprotein from the lipocalin family, mainly produced in primate reproductive tracts. It plays a key immunoregulatory role in pregnancy by preventing maternal immune rejection of the fetus and supporting processes like sperm function, endometrial receptivity, and embryo implantation. Its expression, regulated by progesterone, is crucial for reproductive success. Abnormal glycodelin levels are linked to disorders like infertility, miscarriage, and cancers such as ovarian, endometrial, and breast cancer. Traditional detection methods (ELISA, IHC, WB, PCR) have advanced understanding but face limitations in sensitivity and specificity. Emerging biosensor technologies offer real-time, highly sensitive detection, especially electrochemical biosensors. Techniques like amperometric, potentiometric, and impedimetric sensing have shown detection limits as low as 0.43 ng/mL. These innovations mark a significant step forward in the diagnostic and therapeutic use of glycodelin biomarkers.

UNRAVELING VARIETY-SPECIFIC PROTEIN EXPRESSIONS IN RICE LEAVES UNDER LOW-NITROGEN STRESS

Sana Basri*, Altaf Ahmad
Department of Botany, Aligarh Muslim University, Aligarh, Uttar Pradesh, India-202002
Email: sana.basri8270@gmail.com

Abstract

Nitrogen (N) is essential for proper plant growth and its application has proven to be critical for agricultural produce. However, for unavoidable economic and environmental problems associated with excessive use of N-fertilizers, it is an urgent demand to manage application of fertilizers. Improving the nitrogen use efficiency (NUE) of crop plants to sustain productivity even at low N levels is the possible solution. In the present investigation, contrasting low-N sensitive (Aditya) and low-N tolerant (Vikramarya) genotypes were identified and used for comparative proteome-profiling of leaves under low and optimum N supply. The analysis of differential expression pattern of proteins was performed by 2-D gel electrophoresis. Using gel-free proteome analysis, we identified differentially expressed proteins (DEPs) associated with various metabolic pathways, stress response, nitrogen metabolism and photosynthesis in the leaves of both rice varieties. According to our study findings, Vikramarya demonstrates a strong adaptation response in low-N treatments, shown by increased protein expressions in various pathways. Conversely, Aditya showed a restricted reaction, significantly downregulating essential proteins required for effective nitrogen utilization. The significance of choosing N-efficient rice varieties for low-input crop cultivation is heightened by the differential expression patterns, which also emphasise the genetic foundation of NUE in rice. In addition to advancing our knowledge of the molecular mechanisms driving NUE, this study offers suggestions for tactics that might be used to increase rice yield in situations where nutrients are scarce. This study provides insights into the leaf protein profiles linked to different nitrogen levels, which will help design focused breeding programs to increase rice's NUE and, in turn, support sustainable farming practices and food security in the face of escalating environmental threats.

Keywords: *Rice, low nitrogen, proteomics, nitrogen use efficiency.*

ROLE OF ARBUSCULAR MYCORRHIZAL FUNGI IN PHOSPHORUS UPTAKE BY PLANTS

Mohd. Sayeed Akhtar*
Department of Botany, Gandhi Faiz-e-Aam College, Shahjahanpur 242001, Uttar Pradesh, India

Abstract

Phosphorus (P) is a vital macronutrient desired for the growth and development of plants; however, its availability in soils is often safeguarded by phenomena such as fixation and limited solubility. In this regards, arbuscular mycorrhizal fungi are integral to the enhancement of P uptake and translocation within plant systems. AM fungi have the ability to excrete organic acids, phosphatases, and biologically active compounds that facilitate the mobilization of unavailable soil P to plants through their extensive extraradical hyphal networks. The assimilated phosphate is conveyed to host plants through specialized phosphate transporters located on the peri-arbuscular membrane. This nutrient exchange mechanism is meticulously regulated by the internal phosphorus status of the host plant. Thus, the aim of this paper is to present novel molecular techniques for investigating the genetic foundations of phosphate metabolism in AMF, including RNA interference and CRISPR-based gene silencing.

Keywords: *Arbuscular mycorrhizal fungi, Nutrient Mobilization, Phosphorus uptake, Phosphate transporters, RNA interference*

A CASE OF INTESTINAL COCCIDIOSIS IN A YOUNG FEMALE RHODE ISLAND RED CHICKEN

Loveleen Kaur and Geeta Devi Leishangthem
Department of Veterinary Pathology, College of Veterinary Science
Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana-141004

Abstract

Poultry coccidiosis is one of the most invasive protozoal diseases caused by various species of *Eimeria*, with escalating morbidity and mortality imposing huge economic burden on commercial poultry industry. In this study, a young emaciated female Rhode Island Red chick with marked dehydration was presented for necropsy with history of profuse bloody diarrhoea following sudden death. Gross examination revealed "Salt and Pepper" appearance in jejunum and inflated hemorrhagic caeca with typhlitis filled with bloody intestinal content. The impression smear of intestine revealed presence of coccidian oocyst. Histopathological examination demonstrated marked villous atrophy, haemorrhages, infiltration of inflammatory cells along presence of different stages of coccidian oocyte. The gross and histological findings revealed that the causative agents as *Eimeria necatrix* in jejunum and *Eimeria tenella* in caeca.

Keywords: *Coccidiosis, Bloody diarrhoea, Eimeria sp., Poultry*

MODERN PLANT TAXONOMY AND ARTIFICIAL INTELLIGENCE

Dr. Preeti Verma
Assistant Professor (Botany), Rajkiya Mahavidyalay Sehmo Basti

Abstract

Modern plant taxonomy has evolved from traditional morphological methods into a highly integrative discipline that incorporates advanced molecular and computational tools. Techniques such as high-throughput DNA sequencing, digital imaging, and phylogenomic analyses have significantly enhanced our ability to classify and understand plant diversity. A key advancement in recent years is the incorporation of Artificial Intelligence (AI) into plant taxonomy. Machine learning algorithms, particularly deep learning models like convolutional neural networks, are used to accurately identify plant species from field and herbarium images. These tools facilitate rapid and automated trait extraction, species classification, and even the digitization and curation of herbarium collections. Additionally, Natural Language Processing (NLP) is employed to mine taxonomic literature, extracting structured phenotypic and ecological data from vast textual records. This shift toward AI-assisted taxonomy supports the broader concept of "taxon-omics," integrating genomic, morphological, and environmental datasets to produce more holistic taxonomic insights. Recent applications span multiple domains including precision agriculture, where AI aids in weed and crop identification; biodiversity conservation, through monitoring of endangered or invasive species; and ecological monitoring, via analysis of phenological changes and species distribution patterns. While traditional methods remain foundational, the synergy of AI technologies and classical taxonomy is transforming the field, making it more scalable, accurate, and accessible. This review highlights how modern plant taxonomy is entering a new era, where digital and intelligent systems complement expert knowledge to accelerate plant discovery, documentation, and conservation. Present findings underscore AI's transformative potential and highlight the need for continued innovation to overcome current challenges.

Keywords*: Taxonomy, Artificial Intelligence, Machine Learning, Herbarium, Deep learning.*

ANTIOXIDANT PROPERTIES OF SECONDARY METABOLITES FOUND IN SOME MEDICINAL PLANTS

Preetika Sharma, Ambrish Kumar, Hina Farheen, Devesh Kumar, Shivam Parmar,
and Saroj Singh Chahar*
Department of Botany, Raja Balwant Singh College (Affiliated to Dr. Bhimrao Ambedkar University) Agra- 282002, India.
Corresponding Author- Saroj Singh Chahar, * e-mail: chaharsaroj555@gmail.com

Abstract

This review explores the antioxidant potential of secondary metabolites present in medicinal plants. These bioactive compounds, including flavonoids, phenolic acids, terpenoids, tannins, alkaloids, and steroids, neutralize free radicals or unstable molecules formed during metabolic processes that damage essential biomolecules like DNA, RNA, proteins, and lipids. Free radicals are a major contributor to oxidative stress, which is linked to chronic diseases such as cancer, diabetes, and cardiovascular disorders. Medicinal plants such as *Eleutherine americana* (Red bulb plant), *Ocimum sanctum* (Tulsi), *Adansonia digitata* (Baobab), *Syzygium cumini* (Blackberry), *Cinnamomum zeylanicum* (Dalchini), *Saraca indica* (Sita Ashok), and *Dalbergia sissoo* (Sheesham) serve as rich sources of these natural antioxidants. The review emphasizes the significance of understanding the antioxidant mechanisms of these secondary metabolites, paving the way for their application in functional foods, nutraceuticals, and pharmaceuticals. Natural antioxidants offer safer alternatives to synthetic agents like BHT or butylated hydroxy toluene and BHA or butylated hydroxy anisole, promoting health and reducing disease risk.

Keywords*: Secondary Metabolites, Antioxidant, Free Radicals, Medicinal Plants, Flavonoids and Alkaloids.*

TAXONOMY AND DISTRIBUTION MAPS OF TERMITES OF WESTERN GHATS

Dr. Vidyashree A.S1, Dr. Kalleshwara swamy C.M[2], Dr. Sharanabasappa S Deshmukh[3]
[1] Assistant Professor (Entomology), [2&3] Professor, Department of Entomology
Keladi Shivappa Nayaka University of Agricultural and Horticultural Sciences, Iruvakki, Shivamogga
Corresponding Email: vidyashreeas@uahs.edu.in

Abstract

The Western Ghats are the mountain range covering the states of Maharashtra, Goa, Karnataka, Tamil Nadu, Kerala and Gujarat. The region is expected to be rich in insect fauna including termites and they are key soil ecosystem engineers. Being a biodiversity hotspot, the region is expected to be rich in insect fauna including termites and considered to be 'taxonomically tractable'. However, when morphology is studied hand-in-hand with genetic structure, it provides a powerful tool in recognition, characterisation and classification of species (Clement *et al*., 2001). The collection of termites was carried out during September 2013 to May 2016. Results revealed that termite fauna comprised of 42 species belonging to 13 genera and six sub-families under two families, Termitidae and Rhinotermitidae contributed 97.99 and 2.01 per cent respectively. The distribution maps were developed for each collected species using geographical information like altitude, longitude and latitude using global positioning system (GPS) (Montana 650 Garmin, USA). The maps were developed using Q-GIS software. Many species expanded their distribution but some species are recorded only in few localities compared to earlier reports. From these maps, the pattern of distribution, species rich areas and species poor areas were identified. Two possibilities can be witnessed here (i) The expansion may be due to their adjustment to various biotic and abiotic variabilities and became common in all the places. (ii) The reduction in their distribution may be due to anthropogenic activities.

Keywords: *Termites, Distribution maps, Western ghat*

PENTATOMIDAE (HEMIPTERA): FAUNAL DIVERSITY IN THE JAMMU DISTRICT OF JAMMU AND KASHMIR, INDIA

Pallavi Shrikhandia[1], Pallaki Srikhandia[2], Raman Jasrotia[1] and Meenakshi Bandral[1]
[1.] Department of Zoology, Cluster University of Jammu, Jammu.
[2.] Department of Botany, University of Kashmir, Srinagar.
shrikhandiapallavi@gmail.com

Abstract

The family Pentatomidae belonging to order Hemiptera comprises stink bugs or shield bugs. Members of this family possess piercing and sucking mouthparts. The majority of Pentatomids exhibit phytophagous feeding habits and several of them are serious pests of crops. It includes nearly 4700 species grouped under about 900 genera making it the largest family within the Pentatomoidea superfamily. After the families Miridae, Reduviidae, and Lygaegidae, the Pentatomidae is the fourth most abundant family in the order Hemiptera. During an extensive survey, a total of 12 genera and 15 species of Pentatomidae, were recorded from the Jammu district of Jammu region (J&K). Further, each identified species was studied in detail with respect to its taxonomic status, distribution, habit and habitat, host plant, diagnostic features and nature of damage caused to host plant in the study area.

Keywords*: Hemipterans, Pentatomidae, Phytophagous, Pest*

LC–MS PROFILING OF BIOFLAVONOID-CATALYZED GREEN SYNTHESIS OF SIZE-CONTROLLED SILVER NANOPARTICLES FROM *Cordia sinensis* FOR SUSTAINABLE ANTIMICROBIAL APPLICATIONS

Anjali[1], Kanti Prakash Sharma[1], Umesh Kumar[1], Vidyullatha Peddireddy[1]*
[1]Department of Nutrition Biology, School of Interdisciplinary & Applied Sciences, Central University of Haryana, Jant-Pali, Mahendergarh, Haryana-123031, India.
*Corresponding author, Dr. Vidyullatha Peddireddy, Associate Professor, Dept. of Nutrition Biology, School of Interdisciplinary & Applied Sciences, Central University of Haryana
Jant-Pali, Mahendergarh, Haryana-123031
Email: vidyullatha@cuh.ac.in; vidyullatha.p@gmail.com Orchid ID: 0000-0002-4816-777X

Abstract

The increasing demand for sustainable antimicrobial agents in food safety and healthcare has driven interest in plant-mediated nanoparticle synthesis as an eco-friendly alternative to chemical methods. In this study, leaves and stems of *Cordia sinensis* were used as bioflavonoid-rich, renewable resources for the green synthesis of silver nanoparticles (AgNPs). Aqueous plant extracts acted simultaneously as reducing and stabilizing agents, enabling controlled AgNP formation under ambient, aqueous conditions without toxic chemicals. LC–MS profiling revealed the presence of key bioactive compounds, including quercetin, rutin, kaempferol, and catechin, which play critical roles in nanoparticle nucleation and stabilization. The biosynthesized AgNPs exhibited tunable sizes ranging from 12–32 nm, confirmed by UV–Vis spectroscopy, FE–SEM, DLS, and zeta potential analyses, with good colloidal stability. Functional assays demonstrated potent antioxidant activity and broad-spectrum antimicrobial efficacy against *Escherichia coli*, *Staphylococcus aureus*, and *Pseudomonas aeruginosa*. The thermal stability of AgNPs (>280°C) highlights their potential for integration into biopolymer-based active packaging, offering a biodegradable and antimicrobial alternative to petroleum-derived plastics. By valorising *C. sinensis*, a plant with traditional ethnobotanical relevance, the study bridges modern analytical techniques with green chemistry principles, contributing to interdisciplinary advances in plant sciences, environmental biotechnology, and material innovation for a sustainable future.

Keywords*: Cordia sinensis, silver nanoparticles, LC–MS profiling, bioflavonoids, antimicrobial activity, sustainable packaging.*

UNVEILING ACTIVITY PATTERNS THROUGH CAMERA TRAP BIOSTATISTICS: SMOOTH-COATED OTTERS AND SYMPATRIC FAUNA OF PILIBHIT TIGER RESERVE, INDIA

Arun Kumar[1], Ashok Kumar[1], Ujjwal Kumar[2]
[1]Department of Zoology, BSNV PG College, University of Lucknow, Lucknow, 226001
[2]Research Scientist, NTCA and Tiger Cell, Wildlife Institute of India, Dehradun
Email ID: arunkumar02071997@gmail.com

Abstract

The Smooth-coated Otter (*Lutrogale perspicillata*), a wetland-dependent carnivore, remains poorly studied in the Terai Arc Landscape, particularly with respect to its distribution and activity ecology. To assess its occurrence and community-level interactions, a systematic camera-trapping survey was conducted across five ranges of the Pilibhit Tiger Reserve, Uttar Pradesh (Mahof, Mala, Deoria, Barahi, and Haripur). Fifteen camera traps were deployed along riparian habitats and wetlands, resulting in no independent otter captures but 56 independent detections of other faunal species. Direct otter sightings, however, were confirmed from the Bifurcation Canal and Malasi Beat in the Mala Range, supporting their persistence in the reserve. Sympatric species documented included tiger (*Panthera tigris*), sloth bear (*Melursus ursinus*), spotted deer (*Axis axis*), sambar (*Rusa unicolor*), woolly-necked stork (*Ciconia episcopus*), and red-naped ibis (*Pseudibis papillosa*). Circadian activity analyses revealed distinct temporal segregation: chital and woolly-necked stork were strongly diurnal (>70% and ~100%, respectively), sambar exhibited temporal plasticity (45% diurnal, 35% nocturnal, 20% crepuscular), while tiger showed nocturnal dominance (~60%) with crepuscular peaks (~20%). Wild boar and sloth bear demonstrated broadly distributed activity (~30–40% across all phases), indicating temporal opportunism, whereas red-naped ibis remained primarily diurnal (~70%) with crepuscular tendencies (~20%). Frequency distribution and χ^2 tests confirmed non-random activity partitioning ($p < 0.05$), reflecting temporal niche differentiation that minimizes competition and predation risk. These results highlight the low detectability but continued presence of Smooth-coated Otters in Pilibhit's wetlands and underscore the utility of integrating camera-trapping with GIS-based wetland mapping for monitoring riparian carnivores. Such approaches are essential for developing conservation strategies aimed at sustaining aquatic biodiversity and ensuring coexistence of sympatric species in the Terai landscape.

***Keywords**: Smooth-coated Otter, Lutrogale perspicillata, Pilibhit Tiger Reserve, camera trapping, temporal niche partitioning, sympatric species, circadian activity, wetland ecology, Terai Arc Landscape.*

MOLECULAR TAXONOMY: A MODERN APPROACH TO PLANT CLASSIFICATION

Mahim Fatima,
Department of Botany, Bareilly College Bareilly,
Uttar Pradesh, India

Abstract

Plant taxonomy is the branch of science concerned with the identification, naming, and classification of plants. Traditional taxonomy mainly based on morphological features, generally faced some shortcomings because of different environmental conditions. To overcome this modern taxonomy trends used advanced approaches such as numerical, cytological, chemotaxonomic and molecular techniques. Among these, molecular taxonomy has become the most powerful tool, as it uses DNA sequences like (rbcL and matK) for accurate identification. Molecular techniques such as DNA barcoding and molecular phylogenetic s have greatly improved our understanding of plant diversity, conservation and authentication of medicinal plants. This presentation will discuss modern trends in plant taxonomy with a special focus on molecular approaches.

COMPREHENSIVE ASSESSMENT OF ARSENIC STRESS IN WHEAT: GROWTH, BIOCHEMICAL, AND MICROSCOPIC INSIGHTS

Sameen Zaidi* and Shamsul Hayat
Department of Botany, Aligarh Muslim University, Aligarh-202002
(*E-mail: sameenzaidi1179@gmail.com: Mb. 9453105559)

Abstract

Arsenic (As) contamination in soil and irrigation water is an emerging global challenge threatening food security. Wheat (*Triticum aestivum* L., cv. HD2967) was evaluated under increasing concentrations of sodium arsenate (25–100 mg kg^{-1}) to investigate its physiological, biochemical, and microscopic responses across growth stages. Results demonstrated a dose-dependent decline in early growth, biomass accumulation, photosynthetic pigment content, nutrient uptake, and enzyme activities, together with an increase in antioxidant enzymes and proline levels, consistent with As exposure. Carbohydrate metabolism was also altered, reflected in variable levels of total soluble sugars, sucrose, starch, and total non-structural carbohydrates. The highest toxicity symptoms were observed at 100 mg kg^{-1}, while 25 mg kg^{-1} had only marginal effects. This study offers a comprehensive assessment of As stress in wheat and provides critical insights for risk evaluation and mitigation strategies.

"ELEVATED INTERLEUKIN-6 AS A BIOMARKER OF SEVERITY IN ISCHEMIC STROKE: A CASE-CONTROL STUDY"

Akanksha Gupta[1]*, Dr. Suchit Swaroop[1], Dr. Vandan Tiwari[2]
[1]Experimental & Public Health Laboratory, Department of Zoology, University of Lucknow,
2Department of Biochemistry, Dr. RMLIMS, Lucknow,226010
* Email ID: simpleakankshagupta@gmail.com

Abstract

Background: Ischemic stroke (IS) is a major cause of death and long-term disability globally. Survivors often endure significant disabilities, impacting their quality of life and burdening their families. Inflammatory cytokines, especially Interleukin-6 (IL-6), play a key role in IS pathophysiology. IL-6 is rapidly produced after ischemic injury, leading to microglia and astrocyte activation, blood-brain barrier disruption, and neuronal apoptosis. Elevated IL-6 levels in blood and cerebrospinal fluid are linked to increased stroke severity and poor outcomes.

Method: Blood samples were collected from 50 IS patients, 50 normal controls, and 50 diseased controls (seizures, migraines, headaches). IL-6 levels were quantified using the Access 2 system (chemiluminescent immunoassay). The NIHSS was administered via the Medscape app, with trained healthcare professionals evaluating patients' neurological status based on consciousness, vision, motor skills, and language abilities.

Results: The mean ages of the IS, DC patients, and control participants were 55.2, 51.91, and 46.03, respectively. There is a significant age difference (p=0.05) but no difference in gender (p=0.28) among the IS, DC, and control groups, indicating an adequate match. IL-6 levels were significantly higher in the IS group (mean: 114.47±35.39 pg/mL,p=0.001) and disease control (29.09±9.28 pg/mL,p=0.001) as compared to the control group (13.23±5.46 pg/mL). Among the 50 IS cases, severity was categorized into mild[N=11] (NIHSS score >5), moderate [18] (NIHSS score 5-15), and severe [21] (NIHSS score <15), with IL-6 levels significantly increased mild (17.83±22.34 pg/mL) < moderate (18.10±22.25 pg/mL) < severe (19.37±24.39 pg/mL).

Conclusion: IL-6 levels are significantly elevated in ischemic stroke patients compared to controls and increased with severity, indicating a strong inflammatory state.

Keywords*: IS: Ischemic Stroke, IL-6: Interleukin-6, NIHSS: National Institutes of Health Stroke Scale, DC: Diseased control.*

EFFECTS OF SALINITY STRESS ON SEEDLING GROWTH OF *Vigna radiata* (L.) WILCZEK

Dr. Seema Anand (Associate Professor), Department of Botany, S. V. College, Aligarh.

Abstract

Salinity reduces mung bean (*Vigna radiata*) radicle and root elongation, delays and inhibits hypocotyl elongation and mobilization of reserves from the cotyledons to the embryo axis. Fresh and dry masses and water content of the embryo axes were reduced. Under salinity, a net leakage of K to the media increased with time and increasing NaCl concentrations. Sugars present in the cotyledons of seeds were of primary importance for growth of the embryo axis up to 18 h after sowing whereas breakdown of starch by amylase contributed later, the contribution being delayed and reduced with increasing NaCl concentration. Even when amylase activity in the cotyledons was progressively reduced with increasing NaCl concentration, the increasing contents of soluble sugars in the cotyledons indicated that sugars were not limiting for mung bean seedling growth under salinity. Salinity stress is a major environmental factor limiting crop productivity worldwide. This research aims to investigate the effects of salinity stress on the germination of mung bean (*Vigna radiata*) seeds and explore potential mitigation strategies to enhance germination rates under saline conditions.

The objective of our research was to study the effect of salinity stress on mung beans (*Vigna radiata*) germination by observing the result of increasing salt concentrations on the germination of mung bean seeds. The primary aim of this research is to investigate the effects of salinity stress on the germination of mung bean (*Vigna radiata*) seeds. This study focuses on evaluating key germination parameters, including germination percentage, germination rate, and mean germination time, under varying levels of salt concentration.

***Keywords**: Salinity, seedlings, germination, salt concentration.*

POTENTIAL OF PHYTOREMEDIATION MODELING IN WETLAND ECOSYSTEM OF EASTERN UTTAR PRADESH, INDIA

Jishu Rao[1], Smita Singh*[1], Abhai Kumar[2]
[1]Department of Zoology, DDU Gorakhpur University, Gorakhpur, India
[2]Department of Botany, DDU Gorakhpur University, Gorakhpur, India

Abstract

The natural wetlands include a microcosm of large biodiversity. The buildup of natural wetland involves constant community succession, climate changes, hydrology, and sedimentation. The present study was performed on monitoring-based research on biodiversity rich inland water bodies of eastern Uttar Pradesh which are station to migratory birds. A total of eleven water bodies were observed within the geographical location, range from (26028.233, N, 83053.717, E) in the five districts of Gorakhpur, Kushinagar, Maharajganj, Deoria and Basti. The area covered was from (25 to 2900) hectares, they receive water reservoir from rivers like Gandak, Narayani, Rapti, Ghagra and Aami. The study examined the water pH range (7.6 to 8.2), temperature (26.2 oC to 27.5 oC). The water inlands like Sonda taal, Berhara taal, Pachar taal have dried up in present from previous reports. Pollution and continuous waste drainage, fishing, harvesting of aquatic resources, and invasion of non-native species are adversely affecting the ecological character of the lakes and lowering the previous biodiversity. The hydrophytes like *Eichhornia* sp., *Vallisnaria* sp., *Ceratophyllum* sp., were observed at various sites, seeking some possibilities to enhance phytostablization of heavy metals to reduce the toxicity of lake. Plants which sustained the changing environment are low-cost and environmentally-safe strategies that seem to be a potential approach to remediate the pollutants through phytoremediation.

DIVERSITY AND CONSERVATION STATUS OF AVIAN FAUNA IN WETLANDS OF UTTAR PRADESH, INDIA

Dr. Jitendra Kumar[1] and Dr. Arshad Ali[2]
[1]Assistant Professor, Department of Zoology, Government Degree College, Kant, Shahjahanpur, U.P.
[2]Assistant Professor, Department of Zoology, Gandhi Faiz-e-Aam College, Shahjahanpur, U.P.

Abstract

Wetlands are one of the most valuable ecosystems on the earth, offering various vital ecological amenities that are significant to human population as well as other wildlife too. The Ramsar Convention defines wetlands as "Wetlands are area of marsh, fen, peat land or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six meters". They are considered as the most significant natural water reservoirs on the earth and act as amphibious habitats between aquatic and terrestrial areas. Wetlands have tremendous value for livelihoods of all forms of life as water is their basic need. They are known for their rich biodiversity. This chapter presents a review on the diversity and conservation status of avian fauna in wetlands of Uttar Pradesh and suggests some important recommendations for conservation of their avian fauna.

Keywords*: Avian Fauna, Wetland, Biodiversity, Ecosystem, Wildlife.*

STUDY ON THE EFFECT OF INVASIVE AQUATIC PLANT SPECIES ON AQUATIC ECOSYSTEM AND THEIR MANAGEMENT

Km. Vinay Meena, Research scholar,
Department of Botany, S.V. College Aligarh, Uttar Pradesh (India)

Abstract

Aquatic ecosystems is a group of living beings that interact with each other and their surrounding environment. Aquatic ecosystem is very useful because they provide many essential services like food source, water filtration, oxygen production and climate regulation. Aquatic ecosystem facing a big issue due to increasing many anthropological activities like shipping, aquaculture and the aquarium trade are major way for the ignition and spreading of an invasive species in aquatic ecosystems. Invasive species is a non-native plant species into any aquatic ecosystem. Invasive plant species like, water hyacinth (*Eichhornia crassipes*), floating pennywort (*Hydrocotyle ranunculoides*), water lettuce (*Pistia stratiotes*), salvinia (*Salvinia molesta*) etc. invade into an Aquatic ecosystem and changed their structure and functions. This work will focus on recognize mechanisms of invasion and identify vulnerable ecosystem and developing effective management strategies like that early detection of invasive species, physical removal, chemical treatments, biological control agents and habitat restoration etc.

Keywords- Aquatic ecosystem, Ecosystem services, Invasive plant species effective management, Restoration of aquatic ecosystem.

NATURE'S PHARMACY AND PERFUME: A COMPARATIVE STUDY OF MEDICINAL AND AROMATIC PLANTS IN INDIA AND BEYOND

V. RAMYA SUDHA, B.Sc., B.Ed., M.A.(Lit.)
School Assistant (Biology), ZPP High School, Rangampeta, East Godavari Dt., Andhra Pradesh,
Ph: 8179491911

Abstract

Medicinal and aromatic plants were studied for their therapeutic, cultural, and economic value in both Indian and global contexts. The aim was to compare traditional uses, modern applications, and cultivation trends. A survey was conducted among 200 respondents, including farmers, herbalists, and consumers, to assess awareness, usage patterns, and preferences. Indian species such as *Ocimum tenuiflorum* (tulsi), *Withania somnifera* (ashwagandha), and *Cymbopogon citratus* (lemongrass) were compared with global species like *Lavandula angustifolia* (lavender), *Panax ginseng* (ginseng), and *Mentha piperita* (peppermint). Data analysis revealed that 78% of respondents used medicinal plants regularly, while aromatic plants were preferred by 64% for wellness and commercial purposes. Literature review findings confirmed that medicinal plants were historically embedded in Ayurveda, Traditional Chinese Medicine, and Western herbalism. It was concluded that combined promotion of traditional knowledge with modern scientific validation could enhance sustainable use and international trade. The results also suggested that government support, quality control, and farmer training were essential for large-scale cultivation. Both Indian and global case studies demonstrated that medicinal and aromatic plants had significant potential in health, cosmetics, and the export market.

Keywords*: Medicinal plants, Aromatic plants, India, Global trade, Traditional medicine*

EFFECT OF FEEDING MINERAL MIXTURE ON THE WOOL MORPHOLOGY IN SMALL RUMINANTS

Dr. Divya Vishweshwariah
Keladi Shivappa Nayaka University of Agricultural and Horticultural Sciences, Shimoga

Abstract

Small ruminants like sheep and goat are reared for the meat, wool and milk purpose all over the country. The goats and sheep are the moving banks for the landless and poor farmers. The improved husbandry practices like scientific feeding have proved to be very important criteria to increase the production quality and quantity. In attempt of it, the present study was conducted with selection of 60 Kenguri sheep breeds divided into two groups. One Control and one treatment group. The treatment group was fed with mineral mixture at the rate of 1% of the concentrate feed fed to the sheep for 60 days. Wool sample were collected from random 10 animals from each group and the study was done on the morphology and width of the fibre measured from 3 different regions of the wool fibre (Base region, Middle region and Base of the tip region). The control group average width was 113.73 µm and treatment group average width was 121.02 µm taking average from all the three regions. Statistical analysis with unpaired T test statistically resulted as insignificant with P value= 0.3327. Thus, the study could be concluded as, for a significant difference to occur on the quality and the quantity of wool production continues feeding of the mineral mixture at least for a period of 6-8 months will be more significant.

Keywords: *Wool Quality, Kenguri, Mineral mixture*

SOIL HEALTH DYNAMICS UNDER VARYING SPACING AND NUTRIENT MANAGEMENT LEVELS IN MEDICINAL CROP GARDEN CRESS

Vandana Khandelwal[1], Baldev Raj Kamboj[1], Pawan Kumar[1] and Rajesh Kumar Arya[2]
Department of Agronomy[1], Department of Genetics and Plant Breeding[2],
CCS Haryana Agricultural University, Hisar-125004, India
Email: vandana.bhankhar@gmail.com

Abstract

Garden cress (*Lepidium sativum*) locally known as chandershur is an annual, fast-growing, edible herbaceous plant. It belongs to the Brassicaceae family and shares many characteristics with mustard and watercress. Several pre-clinical studies have shown that different parts of *Lepidium sativum* exhibit promising health benefits, including antimicrobial, antioxidant, anticancer, anti-diabetic and anti-asthmatic effects. The present study on Garden cress was conducted during the rabi (winter) seasons of 2022-23 and 2023-24 at the research farm of the Medicinal, Aromatic and Potential Crops (MAP) Section, CCS HAU, Hisar, to evaluate the impact of different plant spacing and nutrient management treatments on performance of garden cress crop. The experiment was laid out in split plot design consisting of three row spacing levels in the main plot and seven nutrient management levels in sub-plots. Soil properties such as Soil pH, Electrical conductivity (EC), Organic carbon (OC) and Available NPK after harvest of the crop were analyzed. Based on the two years data it was found that soil pH, electrical conductivity and organic carbon after harvest of garden cress crop were not influenced significantly by different row spacing and nutrient management except organic carbon. Based on pooled mean of both years, significantly higher organic carbon was recorded under treatment N7 (100% N through vermicompost) which was at par with N6 (100% N through FYM). Available N and available K after harvesting was maximum in N5 i.e., application of 50% N through inorganic fertilizer + 25% N through FYM + 25% N through vermicompost, which were at par with the treatment N2 i.e., NPK @ 80:40:40 kg ha-1 and N4 i.e., 50% N through inorganic fertilizer + 50% N through vermicompost. Minimum available N after harvesting was recorded in N1 treatment (control). The available P in soil after harvesting of garden cress was not influenced by nutrient management levels in both the years.

Keywords*: Garden cress, Lepidium sativum, soil properties, nutrient management*.

A NOVEL GREEN APPROACH FOR CU–ZN BIMETALLIC NANOPARTICLE SYNTHESIS AND CHARACTERIZATION USING *CUMINUM CYMINUM* SEED EXTRACT.

Kiran
Department of Zoology
Maharshi Dayanand university. Rohtak-124001, Haryana
Email: 24kiranlohchab@gmail.com

Abstract

Plant-based nanomaterials are cutting edge and beyond the existing state of technology. Recently, green synthesis methods for synthesizing nanomaterials have gained a lot of interest due to their numerous applications and environmental friendliness. Bimetallic nanoparticles (BNPs), which are nanoscale mixtures of two distinct metals, have unique properties and functionalities because of the synergistic effect of two metal which makes them promising for a range of applications. BNPs show boost the antibacterial activity of nanoparticles, making them more effective against a variety of bacteria and fungus. By delivering antidiabetic medications, some BNPs are being investigated for their ability to treat diabetes, while others show antioxidant function. A novel green synthesis of Cu-Zn bimetallic nanoparticles using *Cuminum cyminum* seeds is investigated for the first time through the current study. The characterization of bimetallic nanoparticles is done by TEM, UV-Visible spectroscopy, FTIR and Zeta potential. The functional groups associated with the nanoparticles were analysed using FTIR showing peaks in cm-1 around 686 shows presence of aromatic out-of-plane C-H bending benzene derivative, peaks around 955 shows C=C bending of alkene group, 1056 shows S=O stretching of sulfoxide group, 1138 and 1179 peaks show C-N stretching of amine group, 1690 shows C=O stretching of conjugated aldehyde, 2996 shows O-H stretching of alcohol group, 2112 show C≡C stretching of alkyne group. Their size and morphology studied by Transmission Electron Microscopy (TEM) shows results of nanoparticles synthesized in range of 20-90 nm and the results of Zeta potential shows remarkable stability of nanoparticles with value of -8.65.

A REVIEW ON PESTICIDE POLLUTION IN INDIA

Bindra Bihari Singh
Associate Professor, Dept. of Ag. Entomology, JMV Ajitmal, Auraiya (U.P.)

Abstract

The term pesticide covers a wide range of compounds including insecticides, fungicides, herbicides, rodenticides, molluscicides, nematicides, plant growth regulators and others. Among these, organochlorine (OC) insecticides, used successfully in controlling a number of diseases, such as malaria and typhus, were banned or restricted after the 1960s in most of the technologically advanced countries. The introduction of other synthetic insecticides – organophosphate (OP) insecticides in the 1960s, carbamates in 1970 and pyrethroids in 1980s and the introduction of herbicides and fungicides in 1970s – 1980s contributed greatly in pest control and agricultural output. Pesticide residues in food are of concern. Their concentration in food samples varies greatly not only from region to region and year to year but also from one specific food item to another within the same food group.

Perusal of the residue data on pesticides in samples of fruits, vegetables, cereals, pulses, grains, wheat flour, oils, eggs, meat, fish, poultry, bovine milk, butter and cheese in India indicates their presence in sizeable amounts Hexachlorobenzene (HCB, a fungicide) was identified in water, human milk and human fat samples collected from Faridabad and Delhi (Nair *et al*., 1989). The highest level of DDT residues found was 2.2 mg/kg. The proportion of the samples with residues above the tolerance limit was maximum in Maharastra (74%) followed by Gujarat (70%), Andhra Pradesh (57%), Himachal Pradesh (56%) and Punjab (51%). In the remaining states, this proportion was less than 10%. Data on 186 samples of 20 commercial brands of infants formulae showed the presence of residues of DDT and HCH isomers in about 70% and 94% of the samples with their maximum level of 4.3 and 5.7 mg/kg (fat basis) respectively.

ETHNOBOTANICAL INSIGHTS FROM MEGHALAYA: TRADITIONAL PLANT-BASED HEALING PRACTICES IN SOUTH WEST KHASI HILLS AND WEST JAINTIA HILLS DISTRICTS

Eldon P. Sohsley[1]*, Mebari V.R. Dorphang[2], Wanshwa Law[3], Marvellous Kharumnuid[4]
[1]Department of Education, Education College, Basantapur, Murshidabad, West Bengal 742406
[2]Department of Zoology, St. Edmund's College, Laitumkhrah, Shillong, Meghalaya 793003
[3] Assam Don Bosco University, Tapesia Garden, Sonapur, Assam 782402
[4]Department of Forestry, Sam Higginbotton University of Agriculture, Technology and Sciences, Naini, Prayagraj, Uttar Pradesh 211007

Abstract

Meghalaya represents a vibrant example of traditional knowledge which convolute with an everyday rural life. Majority of the community people engaged in agriculture and rely heavily on the environment for food, medicine, fodder and cultural practices. The community people demonstrate a rich repository of Traditional Knowledge (TK), especially in the areas of medicinal plant use. This paper will emphasize the most plant-based knowledge passed orally across generations, including practices such as the use of different parts of the plant of Herbs, Shurbs and Creepers. Plants such as *Ageratina adenophora, Schima wallichii* and *Myrica sp*. are used to treat stomach ailments and diarrhoea, *Piper longum* and *Zingiber* species are used for respiratory issues treatment, and *Citrus macroptera* for fevers. The leaves of *Eriosema chinense* and *Mikania micrantha* are usually ground into a paste and applied on wounds, cuts and also treat skin rashes. *Balanophora sp.* is believed to possess properties that may aid in the treatment of cancer. While these claims remain undocumented in formal scientific literature, they warrant further ethnobotanical and pharmacological investigation. Such knowledge underscores the untapped potential of indigenous practices in contributing to modern medical research and highlights the urgent need for systematic validation and conservation of these traditional health systems. Moreover, self-trainee traditional practitioners play key roles in primary healthcare, using indigenous plants from home gardens and forests, rooted in centuries-old knowledge systems that are integral to their identity.

Keywords*: Traditional Knowledge, Traditional Practitioners, Ethno medicine.*

MADHUCA LONGIFOLIA (L.) J.F. MACBR.: AN ECONOMICALLY IMPORTANT TREE WITH CONSERVATION NOTES

Somendra Verma[1] & Shweta Shekhar[2]*
[1]Research Scholar, Department of Botany, University of Allahabad, Prayagraj-211001
[2]Assistant Professor, Department of Botany, University of Allahabad, Prayagraj-211001

Abstract

Madhuca longifolia is an important ethnomedicinal, deciduous tree that belongs to the family Sapotaceae. It has ethnomedicinal, pharmaceutical, and ethnopharmacological properties. It is effective against various diseases such as cancer, ulcers, and snakebite. Almost all parts of the tree are medicinally important. The bark is used for treating ulcers, tonsillitis, and bleeding. The flowers exhibit hepatoprotective properties and are also used for making beverages. The fruits of Mahua are used as vegetables, and the seeds are rich in edible fats. Seed oil is used in the manufacturing of laundry products and detergents, and is also used as a cooking oil in various tribal regions in India. The tree is considered a blessing by the tribal people living in the forest. In the present study a population survey was conducted in the eastern part of Uttar Pradesh. It was observed during the study that due to the indiscriminate development, overexploitation, and habitat loss the population of mahua trees are decreasing. The fruit set is also low in many areas. As, different parts are consumed by the tribals as well as the local villagers for ethnomedicinal purposes, it is crucial to understand their ecology, reproductive biology ensuring their conservation, and improving their cultivation. It will also aid in maintaining biodiversity and develop effective strategies for tree improvement and conservation.

Keywords*: Mahua, Ethnomedicine, Conservation, Biodiversity, Survey, Uttar Pradesh.*

BOVINE COCCIDIOSIS IN A FEMALE HOLSTEIN FRIESEN CALF: A CASE REPORT

Dipesh Kumar Dabi, Abhishek Verma and Geeta Devi Leishangthem
Department of Veterinary Pathology, College of Veterinary Science
Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana-141004

Abstract

Bovine coccidiosis is an economically important protozoan disease caused by various species of Eimeria. It affects the calves leading to significant losses in livestock productivity. The present study reports a postmortem case in a 45-day-old female Holstein Friesen calf with a history of persistent diarrhea unresponsive to treatment. Clinical examination revealed pale mucous membranes and rigor mortis in hindlimbs. Necropsy findings revealed enlarged mesenteric lymph nodes, diffusely corrugated and thickened intestinal mucosa, pulmonary emphysema, and a fibrinous layer on the liver. Impression smears from the intestine stained with Ziehl-Nelsen acid-fast method revealed coccidial oocysts. Histopathological examination (H&E stain) showed coccidial sporozoites and merozoites in the lamina propria, severe villous sloughing, multifocal congestion, and mixed inflammatory cells infiltration. This case highlights coccidiosis as a persistent challenge in calf rearing, often exacerbated by environmental stressors such as poor hygiene and overcrowding. Emerging drug resistance in Eimeria spp. underscores the need for innovative control strategies integrating early diagnosis, targeted therapeutics, and farm-level biosecurity measures.

Keywords*: Coccidiosis, calf, Eimeria, pathology, sustainable livestock health*

SURVEY FOR INCIDENCE OF CURVULARIA LEAF SPOT DISEASE OF PEARL MILLET (*PENNISETUM GLAUCUM* L) IN AGRA REGION

Ambrish Kumar, and Saroj Singh Chahar
Department of Botany, Raja Balwant Singh College, Agra, UP

Abstract :

A survey was conducted to assess the incidence and distribution of Curvularia leaf spot disease on pearl millet (*Pennisetum glaucum* L) across the Agra region. Systematic field visits were carried out during the growing season, sampling representative farms across different villages and agro-ecological pockets. In each field, plants were examined along transects and disease incidence (percentage of infected plants) and severity (percent leaf area affected) were recorded. Symptomatic leaf samples were collected for laboratory confirmation through morphological observation and fungal isolation. Results indicated that Curvularia leaf spot was widely distributed in the Agra region with variable incidence among locations, influenced by crop stage, planting density, and recent weather patterns. Fields with higher plant density and those adjacent to irrigated fields showed comparatively greater disease levels. Laboratory identification confirmed *Curvularia penniseti* as the major causal agent, with isolated cultures matching the characteristic conidial morphology. The survey highlights the need for integrated disease management to combining resistant cultivars, optimized spacing, sanitation, and fungicide application timing to reduce yield losses. The findings provide a baseline for targeted extension activities and future epidemiological studies in the region.

Keywords*: Survey, Fungal Isolation, Morphology, Observation, Disease, and Cultivars.*

SALICYLIC ACID-MEDIATED ENHANCEMENT OF PHOTOSYNTHETIC EFFICIENCY, REGULATION OF REACTIVE OXYGEN SPECIES, AND ACTIVATION OF ANTIOXIDATIVE DEFENSE MECHANISMS FOR SUSTAINING CARBOHYDRATE AND ION METABOLISM IN *ABELMOSCHUS ESCULENTUS* UNDER SALT-INDUCED OXIDATIVE STRESS

Yamshi Arif and Shamsul Hayat*
Department of Botany, Plant Physiology Section, Faculty of Life Sciences, Aligarh Muslim University, Aligarh 202002, India
*Corresponding author
Designation: Professor
email: hayat_68@yahoo.co.in
Corresponding author ORCID ID: 0000–0002–2476–5409

Abstract

This experiment was conducted with an aim to analyze the effect of foliar application of SA on the NaCl induced changes in two *Abelmoschus esculentus* varieties (Sakata-713 and Neelam). The two different concentrations of NaCl (30 or 60 mM) were applied through soil. At stage of 25 DAS, foliage of the resulting plants were sprayed with varying concentrations (10-4, 10-5 or 10-6 M) of SA, except the control set which received DDW instead of SA. The plant samples were collected at 30 and 45 DAS to analyze several parameters such as growth biomarkers, photosynthetic attributes, enzyme activities, proline content, carbohydrate, secondary metabolite content, ROS content and nutrient status, and at 60 DAS yield attributes were analysed. The exogenous application of 10-5 M of SA ameliorated the adverse effects generated by NaCl stress and improved above-mentioned parameters. Moreover, SA application maintained redox homeostasis in plants subjected to salt stress. The yield characteristics, assess at harvest also affected by the treatments. Among two varieties Sakata-713 showed more pronounced responses than Neelam.

Keywords*: Carbohydrate, enzyme activities, photosynthesis, ROS, secondary metabolite*

WITHANIA SOMNIFERA: ANTIBACTERIAL AND IMMUNE BOOSTER MEDICINAL PLANT

Netra Pal Singh
Assistant Professor, Department of Botany
Government PG College, Fatehabad, Agra.

Abstract

Medicinal plants are gifts from nature to treat infinite number of diseases between human beings, play an essential role in local communities all over the world. *Withania somnifera,* plant of Solanaceae family is an important healing short-woody evergreen shrub recognized as Ashwagandha that naturally growing at Braj region of western Uttar Pradesh. It is also known as Prince of Herbs in Indian system of Ayurveda because it has a markedly broad range of therapeutic effects and provides potential benefits for human healthiness. Several parts of *W. somnifera* include root has many biochemical activity and wonderful medicinal properties which used in Indian system of Ayurveda and Siddha and Unani system of medicine from ancient times. Ashwagandha root is among the prominent part used in Ayurveda, a holistic system of medicine that originated in India. Antibacterial testing of methanolic root extracts revealed effectiveness against pathogens such as E. coli, Pseudomonas aeruginosa, Staphylococcus aureus, and *Bacillus subtilis*. These findings corroborate the traditional medicinal use of *Withania somnifera* for combating microbial infections, underscoring the potential of plant-based products as sources of antimicrobial Agents. Ashwagandha (*Withania somnifera* L. Dunal) is an Ayurvedic medicinal herb that has been known for its therapeutic properties for millennia. Ashwagandha contains several bioactive compounds, including withanolides, alkaloids, and saponins. They make ashwagandha a potent adaptogen and a versatile herb that can maintain optimal health and overall well-being. Ashwagandha reduces stress and anxiety, as well as boosts the immune system. Its anti-inflammatory properties treat arthritis, asthma, diabetes, and inflammatory bowel disease. Ashwagandha produces an immunomodulatory effect on natural killer cells, lymphocytes, and leukemia cells. It enhances the activity of natural killer cells, increases lymphocyte function, and induces apoptosis in leukemia cells. However, its mechanism of action still remains understudied. In Ayurvedic classics Acharya's has mentioned a lot of immune boosters, both single drugs and formulations. Ashwagandha, is one among them, which has got immense popularity recently, due to its ability to boost body immunity and also, it can increase body's natural ability to fight viruses. Ashwagandha, a special herb, used extensively in Ayurveda and is known for its capacity to boost the immunity. The pharmacodynamic action of Aswagandha itself proves the immunomodulatory effects. The herb is ushna in potency thereby reduces Kapha Vata, providing more strength to the immune system of our body.

COURTSHIP BEHAVIOUR OF THE YELLOW-WATTLED LAPWING, *VANELLUS MALABARICUS* (BODDAERT, 1783) IN NORTHERN INDIA

Prateek* & Ashish Kumar
Animal Diversity and Ecology Laboratory, Department of Zoology
University of Lucknow, Lucknow, U.P., India
Email- prateek6657@gmail.com

Abstract

Courtship behaviour plays a key role in mate selection, pair formation and reproductive success in ground-nesting birds. The Yellow-wattled Lapwing (*Vanellus malabaricus*), a monogamous species of the Indian subcontinent, has received limited attention for its reproductive displays. This study documents the courtship behaviour of *V. malabaricus* during the 2024 and 2025 breeding seasons (February to June) across four different habitat types, such as uncultivated, cultivated, pond and river in Lucknow District, Uttar Pradesh. Systematic observations were conducted using focal animal sampling and continuous recording methods across multiple nesting sites. Results showed that both sexes were equally involved in displays, consistent with the absence of sexual dimorphism. Courtship elements included aerial chases, ground displays, vocalizations, and mutual preening, often followed by territorial defense and nest-site selection. Activities were most frequent in early mornings and evenings, aligning with peak activity and reduced disturbance. The findings highlight the reliance on behavioral and acoustic cues for pair formation in the absence of morphological differences. This study provides one of the first systematic accounts of courtship in *V. malabaricus* from Northern India, offering insights into its breeding ecology. Such behavioral documentation is critical for species-specific conservation planning in rapidly changing landscapes.

Keywords*: Yellow-wattled Lapwing, courtship behaviour, sexual dimorphism absent, breeding ecology, Lucknow District*

ENVIRONMENTAL POLLUTION BY INDUSTRIAL EFFLUENT

Dr. Seema Agarwal- Professor & Head
Dr. Shalini Pant-M.V.Sc student
Dr. D.K Agarwal-Retd. Professor
Department of Pathology, College of Veterinary and Animal Sciences,
G.B. Pant University of Agriculture and Technology, Pantnagar-263 145
Udham Singh Nagar (Uttarakhand) INDIA

Abstract

Environment is referred to as the sum of all social, biological, physical or chemical factors, which make up the surrounding of all creatures. Since old times, pollution of the environment has been an undesirable part of man's activity. Industrialization and technologies have added another dimensions to environmental pollution. Effluents from industries are released abundantly into the environment many times without proper treatment. The present study was conducted to study the physico-chemical analysis of chemical industry effluent. The composite samples of effluent were collected from the source of discharge (site -1) and the kaccha naala about one km. away from the chemical industry (site-2). These samples were collected in clean plastic containers and brought to the laboratory and stored in refrigerator at 4° C till used for analysis. The physico-chemical analysis of effluent samples showed significantly ($P<0.05$) increased levels of COD, BOD, TS, TDS, TSS, sodium, potassium, chloride, nitrate and heavy metals (Co, Cd, Pb and Zn) as compared to control. From the present investigation, it is concluded that the effluent from chemical industries has increased the heavy metal concentration in and around the areas of these industries, thus polluting our water, soil and fodder.

Keywords: *chemical industry effluents, physico-chemical parameters, mice*

PLANT TISSUE CULTURE AS A TOOL FOR BIODIVERSITY CONSERVATION OF ENDANGERED AROMATIC FLORA

Dr. Lalit Kumar,
Department of Botany,
Dharam Samaj College, Aligarh, 202001, Uttar
Pradesh

Abstract

Plant tissue culture has emerged as a pivotal biotechnological tool for the conservation and sustainable utilization of endangered aromatic plant species. Many aromatic taxa, such as *Vetiveria zizanioides* (vetiver), *Valeriana jatamansi* (Indian valerian), *Saussurea costus* (kuth), *Rauvolfia serpentina* (Indian snakeroot), and *Cinnamomum verum* (true cinnamon), face severe threats of extinction due to overharvesting, habitat loss, and low seed viability. In vitro propagation techniques, including callus culture, organogenesis, somatic embryogenesis, and micropropagation, provide efficient means for rapid clonal multiplication, germplasm conservation, and secondary metabolite production. Optimization of culture conditions using defined nutrient formulations such as Murashige and Skoog (MS) medium supplemented with appropriate plant growth regulators (e.g., auxins like 2,4-D, IAA and cytokinins like BAP, kinetin) has shown significant potential in enhancing regeneration frequency and biomass yield. Furthermore, the application of encapsulation techniques for synthetic seed production and cryopreservation of shoot apices and somatic embryos offers long-term conservation strategies. The integration of elicitor-induced in vitro cultures also facilitates enhanced biosynthesis of aromatic essential oils, such as vetiver oil (*Vetiveria zizanioides*), jatamansone (*Valeriana jatamansi*), costunolide (*Saussurea costus*), and cinnamaldehyde (*Cinnamomum verum*). Thus, plant tissue culture not only provides an alternative approach for the conservation of endangered aromatic species but also ensures sustainable production of high-value phytochemicals for pharmaceutical, cosmetic, and perfumery industries.

***Keywords**: Plant Tissue Culture, Micropropagation, In vitro Conservation, Endangered Aromatic Plants, Essential Oils, Shoot Multiplication, Somatic Embryogenesis*

DIVERSITY OF CAESALPINIACEAE FROM KHANDESH REGION OF MAHARASHTRA

Tanveer Akhtar Khan
Department of Botany, H. J. Thim College of Arts and Science Mehrun,
Jalgaon-Maharashtra

Abstract

India is one of the 34 mega-biodiversity hotspots of the world, having vast variety of flora and fauna and ranks 10th in the global biodiversity of flowering plants. It is a home for threatened and endemic species that have immense ecological and commercial value. A thorough investigation of our flora has become an urgent necessity not only because of the economic and ecological importance of biodiversity but also of accelerated genetic erosion occurring as a consequence of destruction of the forest and other habitat (Manilal, 1998). The present need of the hour is sustainable use of biodiversity. There are certain under explored areas in our country, Khandesh is one such region in Maharashtra. Khandesh region comprises three districts that are Jalgaon, Dhule and Nandurbar. Total area of Khandesh is 10,431 square miles. The region exhibits very rich and diverse monocot flora due to peculiar topographic and climatic features, which includes part of Satpuda ranges, which is one of the major hotspot of plants in India. Survey of Caesalpiniaceae of region has been carried out. The outcome is of over 35 species of Caesalpiniaceae have been identified. Of these some rare plants like Bauhinia foveolata Dalz. *Bauhinia malabarica Roxb*., *Bauhinia roxburghiana* Voigt., *Bauhinia vahlii Wight* & Arn., *Caesalpinia mimosoides* Lam., *Cassia italica* (Mill.) Spreng., Cassia mimosoides L., *Cassia timoriensis* DC. etc.

Keywords*: Diversity, Caesalpiniaceae, Khandesh, rare plants, new records.*

ENHANCEMENT OF ANTIOXIDANT ENZYME ACTIVITY BY HEAT PRIMING AND GLYCINE BETAINE APPLICATION IN MUNGBEAN (*VIGNA RADIATA L. WILCZEK*) UNDER HIGH-TEMPERATURE STRESS

Surjeet, Dr Sridevi Tallapragada
Department of Botany and Plant Physiology, CCS Haryana Agricultural University, Hisar

Abstract

High temperatures during the summer season severely reduce mungbean (*Vigna radiata L.Wilczek*) productivity due to stress-induced physiological and biochemical damage. This study evaluated the effect of heat priming of seeds and foliar application of glycine betaine (GB) on the activities of key antioxidant enzymes in three mungbean genotypes (MH 421, MH 1762, IPM 312-19) under two sowing environments (normal and late sown), simulating temperature stress.

Ten treatments were imposed, including control, heat priming at 40°C and 45°C, and foliar spray of GB at 25 mM and 50 mM, under both normal and late sown conditions. Antioxidant enzymes superoxide dismutase (SOD), catalase (CAT), and peroxidase (POX) showed a marked increase in activity under late sown (stress) conditions compared to normal sowing. Exogenous application of GB (particularly at 25 mM) and heat priming at 40°C further enhanced these enzyme activities across all genotypes, with the highest enzymatic induction observed in MH 1762. The data indicated that while both 25 mM GB and 40°C heat priming improved antioxidant defense significantly, foliar application of 25 mM GB consistently gave the best results for stress alleviation.

These findings demonstrate that targeted heat priming and optimized GB sprays can bolster the antioxidant defense system in mungbean, with notable genotypic variation—MH 1762 being the most responsive genotype. Such interventions offer a promising approach for mitigating heat-stress-induced oxidative damage and sustaining yield in mungbean cultivation under rising global temperatures.

Keywords*: Superoxide dismutase (SOD), Catalase (CAT), Peroxidase (POX), Heat priming, Glycine betaine*

SALINITY-INDUCED PHYSIOLOGICAL AND BIOCHEMICAL RESPONSES IN *TRITICUM AESTIVUM* L.

Ashmi Ahmad and Qazi Fariduddin*
Department of Botany,
Faculty of Life Sciences, Aligarh Muslim University, Aligarh 202002, India
E-mail : qazi_farid@yahoo.com

Abstract :

Salinity is an important abiotic stress limiting productivity of Wheat by impairing physiological, biochemical and histochemical functions. This study aimed to assess the differential responses of two wheat varieties PBW343 and KRL-19 to salt stress. NaCl (0, 50, or 100 mM) was applied through soil. At 30 days after sowing (DAS) for five consecutive days, and observations were recorded on the 40th DAS. Salt stress triggered a significant decline in shoot and root length, shoot fresh and dry mass, relative water content (RWC) whereas hydrogen peroxide (H_2O_2) accumulation, malondialdehyde (MDA) content, electrolyte leakage, and antioxidant enzyme activities increase with salt stress. The results underscore the sensitivity of PBW 343 to salt stress, in contrast to the superior adaptive potential of KRL-19 in mitigating salt-induced oxidative damage and maintaining physiological stability, highlighting its suitability for inclusion in breeding programs aimed at improving salinity tolerance in wheat.

TRACING MICROPLASTIC PATHWAYS IN THE HIMALAYAS: BASELINE EVIDENCE FROM THE RIVER NAYAR, A SPRING-FED TRIBUTARY OF THE RIVER GANGA

Sakshi Nautiyal and Deepak Singh
Freshwater Biodiversity Laboratory, Department of Zoology, H.N.B. Garhwal University, Srinagar (Garhwal), 246 174, Uttarakhand, India

---

Abstract

Himalayan River systems are increasingly acknowledged as pathways for microplastic (MP) pollution. However, the north-western Himalayan rivers remain largely unexplored, despite experiencing rapid urban growth and rising tourism pressures. This study was done on the River Nayar, a spring-fed tributary of the River Ganga flowing through densely inhabited valleys, agricultural zones, and popular tourist destinations. The River Nayar serves as a likely reservoir for both primary and secondary microplastics derived from household wastewater, textile fiber shedding, and tourism-related plastic waste. In this study, the river water samples were collected from three different sampling sites in the Nayar River. The samples were digested, filtered, and analyzed to quantify MP abundance and its polymer composition. Further, standardized high-vacuum filtration and FTIR spectroscopy were employed for the identification of MPs. A total of 114 MP particles were recorded from 8 samples, among which fibers with particle sizes less than 1mm were the most dominant type, followed by fragments. The findings provide a critical baseline for assessing MP contamination in mountain-fed river systems and inform future monitoring and management strategies.

BIOCONTROL POTENTIAL OF TRICHODERMA HARZANIUM IN SUPPRESSING ROOT-KNOT NEMATODE (*MELOIDOGYNE INCOGNITA*) IN CUCUMBER CULTIVATION

Sonia waqar[1]*, Abrar Ahmad Khan[2]
1,2Section of Environmental Botany and Plant Pathology, Department of Botany, Aligarh Muslim University, Aligarh, 202002

Abstract

Root-knot nematodes represent a significant challenge to the cucumber crop, causing extensive yield and economic losses. As chemical nematicides and pesticides face increasing restrictions, the development of sustainable management practices is urgently needed. This study evaluates biocontrol fungus (*T. harzanium*) for its efficacy to control root-knot nematodes and enhance cucumber yield at different spore suspension: 1 × 106, 1 × 107, 1 × 108, and 1 × 109 using a combination of morphological, biochemical, physiological, and microscopic techniques. Treatments were applied under greenhouse conditions, and comprehensive assessments were conducted to determine plant health and nematode suppression. The results indicate that applying *T. harzanium* significantly reduced the galls, egg masses, and *M. incognita* population in the rhizosphere, while enhancing the plant's growth, yield, and photosynthetic performance relative to the untreated uninoculated control. Moreover, *T. harzanium* application enhanced antioxidant defense enzymes SOD (superoxide dismutase), POX (peroxidase), and CAT (catalase) to combat nematode-induced biotic stress. Furthermore, in vitro studies demonstrated potent, dose-dependent inhibition of egg-hatching and juvenile mortality, highlighting the biocontrol potential of Trichoderma harzanium.

Keywords*: Biocontrol; Cucumber; Root knot nematode; Sustainable agriculture*

FASCIOLIASIS CONTROL BY PLANT-BASED MOLLUSCICIDES TARGETING VECTOR SNAIL (*LYMNAEA* SPP.)

Dr. Arundhati Singh
Assistant Professor
Department of Zoology
Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur

Abstract

Fascioliasis is a worldwide zoonotic disease caused by *Fasciola hepatica* and *Fasciola gigantica*. *F.hepatica* has worldwide distribution but predominates in temperate zones while *F. gigantica* is found primarily in tropical regions. The definite host is very broad and includes many herbivorous mammals including humans. Human fascioliasis has been reported in 51 different countries from five continents. Incidence of Fascioliasis below a certain threshold level may be achieved by decreasing the number of the intermediate host. One of the solutions to reduce the problem of fascioliasis and schistosomiasis is to disrupt the life cycle of the fluke by eliminating the vector snails. Additional research is needed to identify more effective, affordable, and environmentally sound control of harmful slugs and snails. There is very few controls option for snails (cultural, chemical, and biological).
Use of synthetic pesticides for their control has caused various environmental hazards. Consequently, molluscicides of plant origin are gaining more acceptances among researches and formers. plant extracts are essentially composed of numerous secondary metabolites (alkaloids, steroids, flavonoids, phenol mixes, tannins, and so forth). Few plants have been demonstrated to have molluscicidal properties against snail. Use of synthetic pesticides for their control has caused various environmental hazards. Consequently, molluscicides of plant origin are gaining more acceptances among researches and formers. The use of native plants with molluscicidal properties is generally considered to be simple, inexpensive and appropriate technology for local control of snail vector. Plant -based molluscicides control vector snail by disruption of enzymatic activities (e.g., acetylcholinesterase inhibition), damage to snail cellular membranes, interference with reproduction and egg hatching, leads to paralysis and mortality of snails.

Use of these plant products in aquatic environment is safe, cheap as well as easily available to livestock's keepers of this area. No mortality in non-targeting aquatic animals indicate that treatment of these plant products in water is safe for fish which shared the same habitat with snail.

21ST CENTURY RESEARCH WORK ON *DROSOPHILA* IN INDIA - A BIBLIOMETRIC ANALYSIS

Mythra N. [1]*, Sindhura Y.M. [1a], Usma Khanum[1b], and Kokilamani A. L. [1c]
1Department of Studies and Research in Zoology, Tumkur University, Tumkur, India

Abstract

Drosophila, as an alternate to human system in many of the biological concerns across the world has become one of the important materials of interest. To know the current trend of research topics, scientists, Universities/institutions, funding organizations in the *Drosophila* research the present study had been conducted. The current study includes the collection of research articles published between 2000 to 2024 (July) particularly from Indian Authors on *Drosophila* research through online databases-PubMed, Scispace, and Web of Science, further transformed the collected bibliometric data into quantitative data and analysed it by using software tool RStudio-Biblioshiny-Bibliomatrix. From the study it has revealed that a total of 2966 documents published from 2000 to 2024 in 769 journals, books etc., at 4.89% of annual growth rate with 18.98 average citations per document involving 9586 authors from various institutions/University across the nation. The top 10 most relevant institutions/University - BHU, TIFR, JNCASR Bengaluru, IISc, CCMB, University of Mysore, Aligarh Muslim University, University of Delhi, NCBS and IISER- Pune respectively have published the maximum number of articles. The top 5 prominent journals like Journal of Genetics, PLOS One, Current Science, Journal of Biosciences and Scientific Reports were preferred for article publications. The top 10 most cited articles have globally cited more than 350 times. UGC, DST, DBT are the leading funding organizations in India for fly base research. The fly scientists have made tremendous achievements in both the fundamental and applied sciences further contribute to the advancement of core biological knowledge and tackles larger implications for human health and illness. Our study provides a comprehensive and current trend on *Drosophila* research in India and enhances the enthusiasm in young researchers to conduct their research and publish their articles in well indexed and worldwide circulated journals.

***Keywords**: Drosophila, Bibliometric analysis, model organism, Drosophila research in India*

RADIOLYTICALLY-PROCESSED CARRAGEENAN AMELIORATES ADVERSE EFFECT OF HEAT STRESS ON PHYSIOLOGY AND ESSENTIAL OIL PRODUCTION IN *CYMBOPOGON FLEXUOSUS*.

Akshay Chauhan*, M. Masroor A. Khan
Department of Botany, Faculty of Life Sciences, Aligarh Muslim University, Aligarh, India

Abstract

Carrageenan, especially in its oligomeric variant, has demonstrated effectiveness in enhancing plant development. Nevertheless, there exists a shockingly inadequate comprehension of how it aids plants in withstanding the adverse effects of heat stress. A pot experiment was conducted on lemongrass (*Cymbopogon flexuosus* Steud.) under heat stress at different temperatures (control, 40°C, and 45°C) and treated with a foliar application of 80 mg L-1 of gamma-irradiated carrageenan (ICA). The utilization of ICA through foliar spray markedly enhanced the biochemical characteristics, qualitative properties, and active compounds (geranial and neral) of lemongrass, while alleviating the adverse impacts of heat stress to differing extents. Heat stress at both 40°C and 45°C adversely affected most measured characteristics, with 45°C demonstrating greater harm than 40°C throughout various growth stages. The foliar application of ICA at 80 mg L-1 significantly enhanced both the activity and essential oil (EO) content by 30.28% and 39.20% at 40°C and 45°C, respectively. Furthermore, the application of ICA reduced TBRAS and H_2O_2 levels in *Cymbopogon* plants subjected to stress at 40°C by 22.39% and 22.35%, respectively, and at 45°C by 15.24% and 20.64%, respectively. Therefore, we suggest that ICA may function as an effective tool to mitigate temperature stress in lemongrass and other commercially significant crops.

Keywords: *Carrageenan, H2O2, Essential oil, Geranial, Neral.*

HERBAL BIO-MEDICINAL ALTERNATIVES FOR HEALTHY FISH & SUSTAINABLE YIELDS

Adita Sharma[1], Tanushri Ghorai[1], Viabhav Kumar Upadhayay[2] and P.P. Srivastava[1]
[1] College of Fisheries, Dholi, Dr. Rajendra Prasad Central Agricultural University, Pusa, Muzaffarpur, Bihar-843 121
[2] College of Basic Science and Humanities, Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur, Bihar-848 125

Abstract

Fisheries represent one of the fastest-growing activities, significantly contributing to national economic development and food security. Fish production in India has increased from 24.42 lakh tonnes in the year 1980-81 to 175.45 lakh tones in the year 2022-23. Average fish production growth rate is 7.98% (Handbook on Fisheries Statistics, 2023). Despite remarkable growth in the Indian fisheries sector over the past decade, aquaculture production faces major constraints such as disease outbreaks, low growth, reduced fecundity, harmful effects of synthetic drugs, and weed fishes in culture systems. Conventional remedies, including hormones, antibiotics, and chemicals, though effective, are limited by residual toxicity and environmental hazards. Herbal bio-medicinal products have emerged as promising alternatives due to their growth-promoting ability, immune-boosting effects, and antimicrobial and anti-stress properties. Several medicinal plants, including *Kigelia africana*, *Withania somnifera*, *Azadirachta indica*, *Ocimum sanctum*, *Mucuna pruriens*, *Asparagus adscendens*, *Ficus benghalensis*, *Ochrocarpus longifolius*, *Myrobalan indica*, *Quillaja saponaria*, *Aloe vera*, and *Tinospora cordifolia*, have shown potential as eco-friendly substitutes for synthetic compounds. The integration of such herbal products in aquaculture can enhance sustainable fish production.

Keywords*: Herbal Bio-medicinal alternatives, Fish and Sustainable Yields*

GREEN SYNTHESIS AND CHARACTERIZATION OF COPPER NANOPARTICLES USING *AZADIRACHTA INDICA* LEAF EXTRACT

Ankit deval, Humaira Rani*, Nisha Dinker, Mohd Faheem Khan.
Department of Bio-technology, KCMT College, Bareilly
Email: humairaprincess450@gmail.com

Abstract

Nanotechnology, which explores materials within the 1–100 nm size range, has attracted significant interest due to the unique physicochemical properties of nanoparticles compared to their bulk counterparts. Among different synthesis approaches, green synthesis provides an environmentally benign, sustainable, and cost-effective alternative to conventional physical and chemical methods. In this study, copper nanoparticles (CuNPs) were synthesized at room temperature using *Azadirachta indica* (neem) leaf extract as a natural reducing and stabilizing agent, with copper sulfate ($CuSO_4$) serving as the precursor. The phytochemicals present in neem extract facilitated nanoparticle formation while eliminating the need for hazardous chemicals, thus aligning with the principles of green chemistry. The synthesized CuNPs were characterized using UV–Vis spectroscopy to confirm their optical properties, and their antimicrobial activity was evaluated. The findings highlight that neem-mediated synthesis offers a simple, eco-friendly, and efficient route for producing copper nanoparticles, with promising applications in biomedical, environmental, and industrial domains.

Keywords*: Copper nanoparticles; Green synthesis; Azadirachta indica; Neem; Antimicrobial activity; Nanotechnology; Eco-friendly synthesis*

INVESTIGATING THE ROLE OF MELATONIN ON THE GROWTH AND PHOTOSYNTHESIS OF INDIAN MUSTARD

Rizwana Kouser* and Shamsul Hayat
Department of Botany, Aligarh Muslim University, Aligarh
Email: rizwanakhan4461@gmail.com

Abstract

Brassica juncea (Indian mustard) is a vital oilseed crop with substantial economic importance in Asia and Africa, and its leaves are valued for their nutritional properties. The application of melatonin (MEL) has the potential to enhance yield and quality, thereby contributing to improved food security and nutrition. MEL is a naturally occurring antioxidant that plays a key role in modulating plant growth and development in response to various biotic and abiotic stresses. In consideration of the above role, this study aims to investigate the impact of MEL on the morphological, physiological, and biochemical parameters of *B. juncea*. Leaves were sprayed with MEL (0, 20, 40, 60, or 80 µM) 25 days after germination (DAG), and sampling was done at 45 DAG. The results indicated a concentration-dependent increase in all the measured parameters, with 40 µM of MEL demonstrating the most notable effects. Notably, MEL application led to wider stomata aperture and increase in photosynthesis-related parameters (analyzed with SPAD, IRGA, and Junior PAM), promoting greater CO_2 diffusion and assimilation. These findings suggest that melatonin application can substantially enhance the performance of *B. juncea*, offering a promising strategy to boost agricultural sustainability and economic viability.

EXPLORATION OF COMBINATIONS OF IN VITRO SPERM-FUNCTION TEST FOR THE PREDICTION OF FERTILITY IN BUFFALO BULL

Raushan K Singh [1*] & Meemansha Sharma[2]
[1*] KVK, SVPUA & T, Meerut
[2] Division of Pharmacology & Toxicology, ICAR-IVRI, Izatnagar

Abstract

The population of buffalo bulls has shown a drastic decline highlighting the urgent need for efficient fertility assessment tools. Cryopreservation, though essential for genetic resource conservation, induces subtle damage to spermatozoa which cannot be reliably detected through routine semen evaluation. As a result, conventional semen quality parameters often fail to predict field fertility precisely. This necessitated the development of advanced functional assays using specific fluorescent dyes to evaluate sperm functions directly related to fertilizing ability. In this study, frozen–thawed semen samples from nine Murrah buffalo bulls (sourced from three freezing operations) were analyzed. Based on adjusted field fertility, bulls were categorized as high (n=2), medium (n=5), and low (n=2) fertile. Multiple sperm functions were assessed: membrane integrity (CFDA-PI), acrosome reaction status (FITC-PNA), apoptosis (Annexin-V), protamine deficiency (Chromomycin A3), membrane stability (Merocyanine 540), and lipid peroxidation (BODIPY). Results indicated that the proportion of live-acrosome-intact (LAI) spermatozoa had a significant positive correlation with fertility ($r = 0.59$; $P = 0.001$). Conversely, higher proportions of moribund, necrotic, early necrotic, unstable-membrane, and apoptotic spermatozoa showed significant negative correlations with fertility. Protamine deficiency also showed a negative but non-significant association. Importantly, combinations of functional tests, particularly LAI spermatozoa and lipid peroxidation status, demonstrated the strongest predictive relationship with field fertility (adjusted $R^2 = 0.73$, $C[p] = 0.80$). These findings suggest that integrating functional assays may provide a more reliable tool for predicting buffalo bull fertility, pending validation in larger populations.

Keywords*: Buffalo bull, Sperm-function test, Fluorescent probes*

FOLIAR-FEEDING OF RADIATION-PROCESSED OLIGO-CHITOSAN ENHANCES CAPSAICIN BIOSYNTHESIS IN CHILLI PEPPERS (*CAPSICUM ANNUUM* L.), POTENTIALLY MODULATING THE ACTIVITIES OF METABOLIC ENZYMES.

Sangram Singh*[1], Moin Uddin[2].
1 Department of Botany, Faculty of Life Sciences, Aligarh Muslim University, Aligarh, India
2 Botany Section, Women's College, Aligarh Muslim University, Aligarh, India
Email: sangramsinghbachchan@gmail.com

Abstract

Capsaicin (trans-8-methyl-N-vanillyl-6-nonenamide), the principal bioactive compound found in chilli peppers, is well recognized for its diverse pharmacological properties, encompassing antioxidant, anti-inflammatory, and anticancer effects. Despite its therapeutic potential, the limited yield of natural capsaicin, coupled with the challenges associated with large-scale production, restricts its broader industrial and clinical applications.

The present study aimed to explore the effect of foliar application of different concentrations [0, UCH-40 (unirradiated chitosan applied at 40 mg L-1), 40, 80, 120, and 160 mg L-1] of γ-rays-irradiated chitosan (ICH) on the production of capsaicin alkaloid of chili pepper (*Capsicum annuum* L.). Of the foliar-spray treatments, 80 mg L-1 of ICH (ICH80) performed as the best treatment, resulting in the highest values of all of the parameters studied, as compared to the water-spray control and rest of the treatments. The optimal treatment (ICH80) markedly increased the activities of metabolic enzymes, specifically phenylalanine ammonia lyase (PAL) by 157.3%, cinnamic-4-hydroxylase (Ca4H) by 87.7%, p-coumaric acid-3-hydroxylase (Ca3H) by 90.4%, caffeic acid-O-methyl transferase (CaOMT) by 90.3%, and capsaicin synthase (CS) by 87.1%, with regard the control group.

According to HPLC analysis of the ethanolic extract of dried fruit of chili pepper (*Capsicum annuum* L.), the optimum treatment (ICH80) significantly enhanced the fruit-content of capsaicin alkaloid. The respective concentration (ICH80) led to an augmented level of capsaicin alkaloid (6.74 mg g^{-1} of fruit DW) compared to that obtained due to the water-spray control (4.56 mg g^{-1} of fruit DW).

***Keywords**: Capsaicin alkaloid, Capsaicin synthase, HPLC analysis, Depolymerized chitosan, Elicitor, Chlorophyll-fluorescence.*

PHYTOCHEMICAL DIVERSITY, THERAPEUTIC POTENTIAL, AND BIOTECHNOLOGICAL APPROACHES TO THE MICROPROPAGATION OF *ACACIA SINUATA*

Hina Fatima, Anwar Shahzad
Plant biotechnology section, Department of Botany,
Aligarh Muslim university, Aligarh, Uttar Pradesh, 202002, India
E-mail - hinadiamondstar@gmail.com

Abstract

Acacia sinuata is a medicinally important leguminous plant with diverse pharmacological applications and a rich phytochemical profile. Bioactive metabolites, including flavonoids, alkaloids, tannins, phenolic acids, and saponins, underpin its antimicrobial, antioxidant, anti-inflammatory, and wound-healing properties, making it a promising source for therapeutic and nutraceutical development. Rising industrial demand and overexploitation of wild populations necessitate sustainable propagation strategies. Advances in in vitro culture systems, particularly callus induction, shoot proliferation, and somatic embryogenesis, have enabled efficient micropropagation of *A. sinuata*, facilitating large-scale production of genetically stable, metabolite-rich plant material. This review synthesizes current evidence on the phytochemical diversity, pharmacological potential, and micropropagation methodologies of *A. sinuata*, emphasizing its value in pharmaceutical research and conservation biotechnology.

ARSENIC STRESS MODULATES PHOTOSYNTHESIS, ANTIOXIDANT MECHANISMS, AND ESSENTIAL OIL COMPOSITION IN *OCIMUM BASILICUM* L.

Asif Hussain Hajam
Section of Environmental Botany and Plant Physiology, Department of Botany,
Aligarh Muslim University, Aligarh, 202002.
Email ID: asif07176@gmail.com

Abstract

Arsenic (As) contamination in soil poses serious threats to plant growth, agricultural productivity, food safety, ecosystem stability, and human health. This study evaluated the impact of different As concentrations (1, 5, 10, and 25 mg kg^{-1} soil) on the medicinal herb *Ocimum basilicum* L. cultivar "CIM-Saumya" through physiological, biochemical, and microscopic analyses. Controlled experiments assessed photosynthetic performance, gas exchange, and the activities of key enzymes, including carbonic anhydrase (CA), Rubisco, and nitrate reductase (NR). Antioxidant responses were examined by measuring both enzymatic (superoxide dismutase, catalase, peroxidase) and non-enzymatic (proline, flavonoids, phenolics) components. In addition, changes in glandular trichomes, essential oil (EO) yield and composition, as well as root cell viability and reactive oxygen species (ROS) accumulation were analyzed using confocal laser scanning microscopy (CLSM). Results indicated that As exposure significantly inhibited physiological and biochemical activities. At lower concentration (1 mg kg^{-1}), EO content increased, whereas higher concentrations (25 mg kg^{-1}) triggered severe oxidative stress, evidenced by elevated malondialdehyde (MDA) levels, excessive ROS accumulation, reduced trichome size and density, smaller stomatal apertures, and decline in EO content. Overall, *O. basilicum* exhibited concentration-dependent responses to As stress, with low levels enhancing EO biosynthesis, while high levels caused oxidative damage and reduced EO productivity. These findings provide valuable insights into the plant's adaptive strategies and the potential implications of As contamination on its aroma and therapeutic properties.

DIRECT ORGANOGENESIS FROM NODAL SEGMENTS OF *CAESALPINIA BONDUC*: AN EFFICIENT MICROPROPAGATION PROTOCOL USING OPTIMIZED HORMONAL COMBINATIONS

Siddiqa Javed[1] and Anwar Shahzad[1]
[1]Plant Biotechnology Section, Department of Biology, Aligarh Muslim University, Aligarh 202002, Uttar Pradesh, India

Abstract

Caesalpinia bonduc is a highly valued medicinal plant with significant pharmacological properties, but its natural propagation is restricted due to poor seed germination and overexploitation. The present study aimed to establish an efficient in vitro regeneration system through direct organogenesis using nodal segments as explants. Murashige and Skoog (MS) medium supplemented with 2.5 µM 6-benzylaminopurine (BA) and 1 µM indole-3-butyric acid (IBA) produced the maximum shoot multiplication, resulting in multiple healthy shoots per explant. The elongated shoots were successfully rooted on half-strength MS medium containing 1 µM indole-3-acetic acid (IAA), which induced robust and well-developed roots. Acclimatization of the regenerated plantlets under greenhouse conditions showed high survival rates, confirming the efficiency of the protocol. This method demonstrates the critical role of cytokinin-auxin balance in promoting organogenesis and rooting. The optimized protocol offers a reliable, cost-effective, and sustainable approach for large-scale propagation and conservation of *C. bonduc*, ensuring its continued availability for pharmaceutical applications.

Keywords: *Caesalpinia bonduc, direct organogenesis, nodal segments, BA, IBA, micropropagation*

FOLIAR CALCIUM FEEDING: A KEY TO SUSTAINABLE GROWTH AND PRODUCTIVITY OF *FOENICULUM VULGARE* MILL.

Parnika Jindal*, Krishan Kant, Navneet Kaur, Shalu Gupta and Akbar Ali *
Plant Physiology and Biochemistry Lab, Department of Botany, Dayalbagh Educational Institute (Deemed to be University), Agra- 282005, India

Abstract

Fennel (*Foeniculum vulgare* Mill.) is an important medicinal and aromatic plant of the Apiaceae family. It is widely used in culinary, therapeutic and industrial applications because of its richness in bioactive compounds such as anethole and fenchone. Due to its increasing demand in the spice and herbal medicine sectors, it is the need to improve its growth and productivity. Calcium (Ca), an essential macronutrient, plays a vital role in maintaining plant cell wall structure, membrane stability, and various physiological processes. An experiment was conducted to investigate the effect of foliar application of Ca at different concentrations of 0, 16, 32, 64, 128, and 256 mg L^{-1}, which were applied three times at seven-day intervals, on the growth, physiological, biochemical and yield attributes of fennel. Among the tested concentrations, 64 mg L^{-1} Ca proved to be the most effective, resulting in significant improvements in plant height (13.7%), number of branches (61.7%), stem diameter (40.8%), while both fresh and dry biomass per plant increased by 50.9% and 56.6%, respectively. Yield parameters, including the number of umbels per plant (35.1%), umbel diameter (15.7%) and weight of umbels per plant (79.4%), as well as the number of umbellates per umbel (35.1%), were markedly enhanced over the control. Seed quality attributes such as seed yield (136.6%) and 1000-seed weight (21.7%) also increased. Physiological and biochemical parameters, including total chlorophyll (34.9%), total carotenoids (41.6%), normalized difference vegetation index (NDVI) value (27.5%) and total soluble solids (TSS) (46.2%), showed notable increased under @ 64 mg L^{-1} treatment. These findings emphasize the potential of foliar-applied Ca to enhance fennel growth and productivity.

Keywords- *Calcium, Fennel, Foliar application, Seed and Umbel*

NANOVESICLES FROM *TINOSPORA CORDIFOLIA* L.: COMPARATIVE ANALYSIS OF STRUCTURAL AND BIOACTIVE PROPERTIES.

Author Name: Ms. Rishita Rai
Department of Engineering, Jaipur national university, Jaipur, Rajasthan
Email: rishurai40058@gmail.com

Abstract

Plant-derived nanovesicles (PDNVs) are emerging as a revolutionary class of biomaterials with immense potential in drug delivery, therapeutics, and nanomedicine. *Tinospora cordifolia* L., a revered medicinal plant in traditional medicine, harbors a rich reservoir of bioactive compounds that may influence the formation and function of these nanovesicles. This study aims to conduct a comparative analysis of PDNVs isolated from different anatomical parts of *T. cordifolia*—leaves, stems, and roots—by examining their physicochemical properties, structural characteristics, and biochemical composition. Advanced characterization techniques such as dynamic light scattering (DLS), transmission electron microscopy (TEM), and spectroscopic analyses will be employed to determine size distribution, structural integrity, and biomolecular signatures. Furthermore, the study will evaluate the biofunctional potential of these nanovesicles by assessing their antioxidant capacity, anti-inflammatory properties, and suitability for biomedical applications. This research is expected to contribute to the advancement of plant-derived nanovesicles in nanotechnology and natural medicine, paving the way for future innovations in plant-based therapeutics.

Keywords*: Extracellular Vesicles, Transmission Electron Microscopy (TEM), Dynamic Light Scattering (DLS), Plant-Derived Nanovesicles (PDNVs).*

NUTRITIONAL AND THERAPEUTIC POTENTIAL OF CAMEL MILK: IMPACT OF PARASITIC INFECTIONS

Bhaveshwari Yadav and Prof. Shabad Preet
Department of Zoology, Faculty of Science,
Dayalbagh Educational Institute (Deemed to be University), Dayalbagh, Agra-282005
(Email: bhaveshwariyadav8699@gmail.com.; shabdpreet@dei.ac.in)

Abstract

Camel milk has long been valued in arid and semi-arid regions not only as a staple food but also as a therapeutic agent with wide-ranging health benefits. Rich in medium-chain fatty acids, low in allergenic β-lactoglobulin, and abundant in bioavailable vitamin C and iron, camel milk exhibits distinct compositional advantages over cow milk. Numerous in vitro and in vivo studies support its antidiabetic, antihypertensive, immunomodulatory, anticancer, and antimicrobial properties. These benefits are largely attributed to the presence of bioactive components such as lactoferrin, immunoglobulins, lysozymes, and antioxidant enzymes, as well as the generation of health-promoting peptides during gastrointestinal digestion. However, the functional promise of camel milk is significantly threatened by parasitic infections—an overlooked yet critical factor in public and veterinary health. Endoparasites such as *Trypanosoma*, *Giardia*, and *Cryptosporidium*, along with ectoparasites including ticks and mites, not only compromise animal health and milk yield but also alter milk composition, especially protein and lipid profiles. Furthermore, the presence of parasitic stages in raw milk poses a zoonotic risk to humans, particularly in communities where unpasteurized milk consumption is common. As camel milk gathers global interest for its medicinal properties, it is imperative to understand and mitigate the parasitic threats that compromise its safety and functional potential. Future research must unravel how parasitic infections influence the pharmacologically active components of camel milk, and how these interactions affect its use in clinical nutrition and zoonotic disease prevention.

THE IMPACT OF URBANIZATION AND INDUSTRIALIZATION ON THE LIFE OF LOCAL FISHERMEN COMMUNITY IN JALGAON REGION, (M.S.).

Dr. Shaikh Hafiz Mahmad
Department of Zoology, Iqra, H.J. Thim College of Arts and Science Jalgaon.

Abstract

The present study deals with the impact of urbanization and industrialization on the life of local fishermen community in Jalgaon region, (M.S.). The local fishermen community are significantly impacted by the rapid urbanization and industrialization which increased pollution and freshwater habitat damage. These elements have contributed to the decrease in freshwater fish population and the disappearance of crucial freshwater habitat for several species from breeding and feeding grounds. The livelihoods of the local fishermen Community have suffered as a result. Fishermen Community GIS (Geographic Information System) study was carried out by primary data survey through questionnaire, at different locations from different regions of Jalgaon among 15 participants. Water Quality parameters was estimated seasonally as secondary data from different freshwater localities. The increasing urbanization has led to a reduced freshwater ecosystem. There is an urgent need to monitor urbanization to provide the data needed to support policies and regulations aimed at promoting sustainable development in the Jalgaon region Overall, the effects of urbanization and industrialization on the life of local fishermen community show the need for more sustainable development strategies that strike a balance between economic growth, environment, and social welfare in the Jalgaon region in Maharashtra.

Keywords*: Urbanization, industrialization, Fishermen community, Sustainable development, freshwater ecosystem.*

ENHANCING YIELD IN DIRECT-SEEDED RICE THROUGH PLANT GROWTH-PROMOTING RHIZOBACTERIA: ISOLATION, CHARACTERIZATION AND FIELD EVALUATION

Baby[1], Jupinder Kaur[1], S S walia[2]
[1]Department of Microbiology, College of Basic Science and Humanities, Punjab Agricultural University, Ludhiana, Punjab, India
[2]School of Organic Farming, Punjab Agricultural University, Ludhiana, Punjab, India.

Abstract

This study explores the potential of plant growth-promoting rhizobacteria (PGPR) to enhance yield in Direct-Seeded Rice (*Oryza sativa* L.) by developing an efficient microbial consortium. Rhizospheric soil samples collected from rice-growing regions of Punjab, Haryana, Himachal Pradesh and the Western Ghats led to the isolation of 56 morphologically distinct bacterial strains. These isolates were screened for key plant growth-promoting traits, including ACC deaminase activity, gibberellic acid production, nitrogen fixation and solubilization of phosphate, zinc, and iron, as well as siderophore, auxin and ammonia production. Several isolates exhibited multiple beneficial traits, with strains B-44 and B-50 showing exceptional ACC deaminase and gibberellic acid activity, respectively. Molecular characterization using 16S rDNA sequencing identified the most promising isolates as *Priestia aryabhattai*, *Kosakonia* sp., *Pseudomonas vancouverensis* and *Pseudomonas* sp. These strains also showed strong biofilm formation and exopolysaccharide production, indicating high root colonization potential and none exhibited pathogenicity. Field trials at Punjab Agricultural University and a farmer's field in SAS Nagar demonstrated significant improvements in agronomic parameters such as plant height, panicle length, grain number and biomass with PGPR inoculation. The results highlight *Priestia aryabhattai* and *Pseudomonas vancouverensis* as effective bioinoculants for improving productivity in direct-seeded rice systems.

Keywords*: DSR, Bio-fertilizer, PGPR, Cultural Characterization, Functional Traits, Molecular Identification, Yield Enhancement*

PROGRESS AND PRIORITIES; UTERINE CANCER

YASHI BHARDWAJ
M.Sc. Biotechenology. 1ST YEAR
KCMT COLLEGE BAREILLY [MJPRU UNIVERSITY BAREILLY U.P.]

Abstract

Uterine corpus cancer is the most common type of invasive gynecologic cancer among U.S. women. Approximately 90 percent of all uterine cancers comprise by the study of endometrial cancers. In this we can identified numerous risk many of which reflect high levels of estrogen in the absence of progesterone. Recent advances indicated that the disease is etiologically heterogenous consist of mainly two major subgroups, the heterogeneity shows partially attribute to genetic factors. According to research we cannot find the valid reason for uterine cancer. something happens and stimulate changes in the cell of uterus. The mutated cells grow and multiply out of control, which can form a mass called tumour. Some risk factors can increase the risk of cancer like polycystic ovarian syndrome and lynch syndrome etc. It is not possible to completely prevent from uterine corpus cancer [also known as endometrial cancer] ,some different strategies can reduce the risk .These include maintaining the healthy weight through diet and regular exercise , managing diabetes for keeping blood sugar level maintained and considering several types of hormonal contraception like some oral contraceptives [contain both estrogen and progestin and some have only progastrin] and progestrone therapy for women using hormone replacement therapy [HRT] after menopause , using a combination of estrogen and progesterone may reduce the risk of uterine cancer. Recent research indicates a rise in uterine cancer incidence and mortality rates, particularly among Black women and those with non-endometrioid subtype es. Immunotherapy, including pembrolizumab and durvalumab, shows promise in treating advanced cases with specific genetic mutations. Additionally, studies are exploring the potential of targeted therapies and personalized approaches based on molecular subtypes like; drug targeted therapies, sentinel lymph node biopsy, immunotherapy advancements etc. Recent research and guidelines for uterine cancer management emphasize a shift towards personalized treatment strategies based on tumour biology and molecular profiling, alongside advancements in surgical techniques and adjuvant therapies. These advancements aim to improve both survival rates and quality of life for patients.

DISTRIBUTION, DIVERSITY AND STATUS OF SWALLOWTAIL BUTTERFLIES (FAMILY: PAPILIONIDAE) ASSOCIATED WITH THE OAK FOREST OF KUMAUN HIMALAYA, UTTARAKHAND

Ambika Tiruwa* and Manoj Kumar Arya

Insect Biodiversity Laboratory, Department of Zoology, D.S.B. Campus,
Kumaun University, Nainital-263002, India
Email: ambikatiruwa23@gmail.com

Abstract

Among butterflies, swallowtails hold particular significance in the forest ecosystems as sensitive indicators of forest health and biodiversity. Swallowtails, known for their large size and vivid colorations, are highly valued both aesthetically and commercially. The Papilionidae family, though the smallest in species richness, includes these magnificent butterflies, making their conservation and ecosystem preservation vital. This study focuses on the distribution, diversity, and conservation status of swallowtail butterflies in the oak forests of Kumaun Himalaya, Uttarakhand during the year 2023-24. Field sampling was conducted across eight transects from the four sites (SS-1 to SS-4), covering elevations from 1892 m to 2680 m, using line transects and the Pollard Walk method. A total of 11 species and five genera, encompassing 617 individuals, were recorded from subfamily Papilioninae of the Papilionidae family. The study revealed *Byasa polyectes* as the most abundant species (22.04%), followed by *Graphium chloanthus* (17.34%) and *Papilio polytes* (13.93%). The Golden Birdwing, *Troides aeacus*, the largest butterfly in India, was the least abundant (1.45%). Shannon's diversity index was applied to calculate species richness, while seasonal fluctuations were tracked using the seasonal index. Species richness was highest at SS-2 (1.90), followed by SS-1 (1.55), SS-3 (1.56), and SS-4 (1.08). Notably, *Byasa latreillei* is listed under Schedule II (Part II) of the Indian Wildlife (Protection) Act, 1972, highlighting the need for focused conservation efforts. Our findings underscore the importance of safeguarding the swallowtail butterfly populations in the oak ecosystems of the Western Himalayas, providing critical insights for their conservation and effective management.

Keywords: *Bioindicator, Butterflies, Oak Forest, Papilionidae, Swallowtails.*

IMPACT OF HOT WATER TREATMENT ON DISEASE CAUSED BY PHYTOPLASMA ON SUGARCANE

Nilesh Singh[1], S.S. Tripathi[1], Pankaj Rai[2], A.K. Tiwari[3], and Akil Ahmad Khan[4]*
[1]Department of Agronomy, Invertis University, Bareilly 243123, Uttar Pradesh, India
[2]Department of Biotechnology, Invertis University, Bareilly 243123, Uttar Pradesh, India
[3]UPCSR-Sugarcane Research and Seed Multiplication Center, Gola, Kheri 262802, Uttar Pradesh, India
[4]Dept. of Botany, G.F. P.G. College, Shahjahanpur 242001, Uttar Pradesh, India

Abstract

Sugarcane diseases like white leaf and grassy shoot disease, caused by phytoplasma and insect vectors, significantly reduce yield and quality in Uttar Pradesh. These diseases affect millable canes and ratoon crops, affecting yields by up to 50%. Healthy, vigorous seed is crucial for good quality and production of sugarcane crops. Sugarcane grassy shoot disease, a major disease associated with India, significantly impacts the quality and yield of sugarcane, necessitating the use of healthy and vigorous seeds. The SCGS is spread through propagating materials and in insect vectors. To mitigate the infection of SCGS from the propagating materials and production of SCGS free sugarcane nursery, the HWT 50ºC for 2 h is being utilized regularly in three tier breeder seed programme and it is being suggested to the growers, sugar mill through various extension activities to utilize the HWT which not only eliminate the SCGS from symptomatic plants also improves the germination of the setts. The use of HWT at aforementioned temp not only eliminates the phytoplasma disease of sugarcane, it also prevents the leaf scald disease and smut disease of sugarcane. The study suggests that regular use of HWT in sugarcane will ensure the healthy seed nurseries and will be helpful in eliminating the disease from sugarcane cultivated area which will ultimately contribute in sugarcane yield.

MITIGATION OF ABIOTIC STRESS IN MENTHA USING SILICON DIOXIDE (SiO_2) NANOPARTICLES

Ananya Mishra[1] and Taiba Saeed*[1]
[1] Department of Biosciences, Integral University, Lucknow, Uttar Pradesh, India
Ananya Mishra
Email: ananyaspn11@gmail.com
Alternative email: ananyaspn@student.iul.ac.in

Abstract

Mentha species, which are widely grown for their medicinal and aromatic qualities, are severely limited in their growth, productivity, and essential oil content by abiotic conditions like drought, salinity, and temperature extremes. Nanotechnology has been shown to be helpful in managing plant stress in recent studies, and silicon dioxide (SiO_2) nanoparticles have emerged as promising agents for improving tolerance to unfavorable climatic circumstances. SiO_2 nanoparticles can improve physiological and biochemical responses in Mentha, reducing abiotic stress, according to experimental results. The use of nano-silicon has been demonstrated to stabilize chlorophyll pigments, maintain a greater relative water content, and improve photosynthetic activity in stressful situations. In addition, SiO_2 nanoparticles decrease reactive oxygen species (ROS) and lipid peroxidation levels while increasing the activity of antioxidant enzymes like peroxidase (POD), catalase (CAT), and superoxide dismutase (SOD). In times of salt stress or water shortage, these protective effects help to preserve cellular equilibrium. SiO_2 nanoparticles also promote the buildup of osmolytes, such as proline and soluble carbohydrates, which aid in osmotic adjustment and enhanced stress tolerance. There have also been reports of increased biomass, leaf area, and root development, which indicate improved growth performance under saline or water-limited conditions. Significantly, the use of SiO_2 nanoparticles enhances the output of essential oils and improves the composition of important metabolites such as menthol and menthone, which are critical to Mentha's economic worth. According to recent study, SiO_2 nanoparticles modulate physiological, biochemical, and metabolic pathways in Mentha under abiotic stress, hence acting as efficient bio-stimulants. In agroecosystems that are prone to stress, this nano-enabled method shows promise as a sustainable way to preserve the yield and quality of aromatic and medicinal plants.

Keywords*: Mentha, abiotic stress, silicon dioxide nanoparticles, oxidative stress, essential oil, nano-bio-stimulant*

IMPACT OF ABIOTIC STRESSES ON OXIDATIVE STRESS AND ANTIOXIDANT SYSTEM IN PLANTS

Geeta Yadav
Kashi Naresh Government Post Graduate College Gyanpur, Bhadohi, U. P., India

Abstract

Due to Industrialization, urbanization, geochemical weathering of rocks, volcanic eruptions, use of agricultural pesticides and insecticides huge amount of chemicals are introduced to soil and groundwater. These chemicals contain heavy metals and other toxic substances which interact with plants roots and are absorbed through the root system. The environmental factors like quality and quantity of light, temperature, soil pH, salinity, humidity and rain fall also affect the physiological activities in plants. After entering to the plants, the heavy metals bind or affect the plant metabolism. Plants possess a well-developed antioxidant system having enzymes (super oxide dismutase-SOD, peroxidise-POD, Catalase-CAT, glutathione-S- transferase-GST, Glutathione reductase-GR, ascorbate peroxidise-APX etc) and non-enzymatic molecules (Ascorbate and Glutathione) to mitigate the oxidative stress (super oxide radical-SOR, hydrogen peroxide-H2O2, lipid peroxidation, and carbonyl group) caused by any abiotic stress. During the normal conditions the plants have the balanced array of this antioxidant system. But in stress situation due to generation of oxidative stress the antioxidant molecules and enzymes are enhanced to cope up with the enhanced oxidative stress at certain extent. But when they are not completely able to scavenge the oxidative stresses, the physiological effects are seen in terms of reduced growth, photosynthetic and yield.

Keywords-Heavy metals, abiotic stresses, oxidative stress, antioxidant system, photosynthesis

***Keywords**: Globalization, climate change, greenhouse gases, extreme weather event, biodiversity loss*

RECONSTRUCTING MIDDLE MIOCENE CLIMATE THROUGH PLANT DIVERSITY IN THE KATHGODAM REGION, HIMALAYAN FOOTHILLS OF UTTARAKHAND

Alok
S.K.B.B. Govt. P.G. College, Harakh, Barabanki, U.P,
Email: alok.sharma13@gmail.com

Abstract

Morphotaxonomical study on the plant fossils recovered from Lower Siwalik (Middle Miocene) sediments of the Kathgodam area, Uttarakhand has revealed the occurrence of 66 species belonging to 28 families of angiosperm and a pteridophyte. The family Fabaceae is the most dominant family represented by 12 species in this assemblage followed by Euphorbiaceae (5 species), Meliaceae, and Ebenaceae (4 species), and Anonaceae, Cluciaceae and Dipterocarpaceae (3 species). The family Fabaceae that appeared in Upper Palaeocene became a major constituent of the evergreen forest during Miocene times all along the Himalayan foothills. The predominance of evergreen and moist deciduous taxa in this fossil assemblage indicates the prevalence of tropical warm humid climate with plenty of rainfall during the Middle Miocene.

The present-day distribution of comparable modern species of all the fossils recovered from the Kathgodam area indicate that they are mostly known to occur in South east Asia, Indo-Malayan and North-east Indian regions, wherever favorable climatic conditions exist. Only about 12% taxa of the fossil assemblage are found to grow presently in the Himalayan foothills and the remaining taxa are locally extinct most probably due to change in climate after Miocene. Study of the structural features of fossil leaf-impressions suggests that the Kathgodam area in the Himalayan foothills of Uttarakhand enjoyed a tropical climate along with plenty of rainfall during the Middle Miocene times. Coexistence /Nearest Living Relative (NLR) method further suggests that the area enjoyed a tropical climate with the Mean Annual Temperature (MAT) MAT 21-290C and Mean Annual Precipitation (MAP) 2000 -3200 mm during the Middle Miocene.

Keywords*: Floristic analysis, Kathgodam area, Himalayan foot hills, Uttarakhand. Palaeoclimate, Plant diversity, Middle Miocene,*

Sensitivity of Global tropospheric ozone and its relevance on the habitability of earth like planets

Mr. Ram Prakash Pal
Assistant professor Zoology
Smt. Indira Gandhi Rajkiya Mahavidyalaya, Lalganj, Mirzapur, Uttar Pradesh, india

Abstract

The ozone layer is a band of natural gas called "ozone". It is found between 9.3 and 18.6 miles (15–30 kilometers) above the Earth, the stratosphere and as a shield against harmful ultraviolet B (UVB) radiation emitted by the sun. Atmospheric ozone plays an important role on the temperature structure of the atmosphere. Ozone is a molecule that contains three oxygen atoms. Ozone molecules are constantly being created and destroyed in the stratosphere at any given time. Most significantly, it absorbs UV-B radiation. Impact of UV-B have many pessimistic effects viz., including skin cancers, cataracts, and harm to some crops and marine life. Ozone levels in the atmosphere naturally change with sunspot activity, the seasons, and latitude. These procedures are predictable and well understood. Every time the amount of ozone naturally decreased, it was then recovered. But starting in the 1970s, scientific proof suggested that human activity was outpacing natural processes in the ozone shield's deterioration. At present there is a general concern that the ozone layer is being depleted by the release of pollutants contained in chemical products. The release of these contaminants upsets the delicate balance in the natural production and decomposition of ozone molecules by eliminating the molecules faster than they can be replenished.

Keywords *– ozone, stratosphere, cancer, Ozone molecules.*

THE EFFECT OF ECOLOGICAL FACTOR ON DISTRIBUTION, GROWTH AND REPRODUCTION OF CHAROPHYTES IN NAKUR BLOCK OF DISTRICT SAHARANPUR, WESTERN UTTAR PRADESH.

Sunil Kumar and Dr. Kamal Singh
Department of Botany, Dharam Samaj College (Affiliated to Raja Mahendra Pratap Singh University), Aligarh - 202001, Uttar Pradesh, India
Corresponding author: Sunil Kumar

Abstract

Charophytes, a group of submerged green macroalgae, play a crucial role in maintaining water clarity, nutrient balance, and ecological stability in shallow freshwater ecosystems. The present study investigates the effect of ecological factors on the distribution, growth, and reproductive biology of Charophytes across village ponds, and irrigation canals in the Nakur block of Saharanpur district, Western Uttar Pradesh. Field surveys conducted across multiple water bodies revealed that Charophyte abundance was strongly correlated with water quality parameters such as light availability, alkalinity, calcium concentration and water conductivity. Sites exhibiting high hardness of calcium carbonate high pH and low nutrient enrichment of phosphorus supported dense Charophyte meadows, while eutrophic and turbid systems were dominated by phytoplankton and vascular macrophytes. Seasonal hydrology exerted significant influence, with post-monsoon stabilization promoting high growth and gametangial development, whereas summer drawdown enhanced oospore maturation and sediment bank replenishment. Reproductive structures were abundant in clear, shallow waters and sediment analyses confirmed high oospore density in stable, calcium-rich habitats, indicating successful sexual reproduction. Conversely, nutrient inflow from agriculture, livestock activity, and excessive fish stocking were associated with reduced cover, fragmentation, and diminished reproductive effort. The findings highlight that light availability, nutrient status, and hydroperiod act as primary determinants of Charophyte distribution and reproductive success in freshwater systems of Block Nakur. This study emphasizes the role of Charophytes as bioindicators of water quality and provides a scientific basis for wetland management, restoration, and biodiversity conservation in Western Uttar Pradesh.

Keywords: *Ecological factor, Calcium Concentration, Water Conductivity Charophytes Distribution , Gametangial Development, Bioindicator, Wetland Management.*

A COMPREHENSIVE ANALYSIS OF BIOTECHNOLOGICAL ADVANCEMENTS: IMPLICATIONS FOR ECOLOGY AND SOCIETY

Dr. Anushka Chhonkar
Assistant Professor & Head, Department of Zoology,
Dr. B. R. Ambedkar Govt. Girls' P.G. College, Fatehpur, U.P., India

Abstract :

Biotechnology and genetic manipulation represent transformative scientific fields with far-reaching implications for medicine, agriculture, and environmental management. Biotechnology broadly encompasses the use of living organisms or biological systems to develop innovative products, while genetic manipulation refers specifically to the deliberate modification of genetic material to achieve desirable traits. Historical milestones, from the discovery of DNA's structure to recombinant DNA technology and, more recently, CRISPR-Cas9, have expanded the possibilities of genetic engineering, leading to breakthroughs such as genetically modified crops, gene therapies, and bioremediation strategies. These technologies offer significant benefits, including improved food security, reduced environmental footprints, targeted medical treatments, and advances in sustainable agriculture. However, they also raise pressing concerns about biosafety, biodiversity, ethical boundaries, and socioeconomic inequalities. Issues such as unintended ecological impacts, cross-contamination of crops, patenting of genetic resources, and disparities in access highlight the need for careful regulation and inclusive dialogue. Current case studies, ranging from Bt cotton to Golden Rice and gene therapy applications, illustrate both the promise and controversies surrounding these advancements. Moving forward, the integration of emerging technologies such as synthetic biology and AI-driven bioinformatics presents new opportunities alongside novel challenges. To maximize benefits while mitigating risks, it is essential to balance innovation with responsibility through robust regulatory frameworks, environmental stewardship, and public engagement. Ultimately, biotechnology and genetic manipulation, if guided by transparency and equity, hold the potential to create a sustainable and healthier future for humanity and the planet.

Keywords: *Biotechnology, Genetic Manipulation, CRISPR-Cas9, Sustainable Agriculture, Bioethics*

DIETARY ACRYLAMIDE EXPOSURE IN CENTRAL UTTAR PRADESH: A RISK ASSESSMENT OF PROCESSED FOOD CONSUMPTION AMONG ADOLESCENTS.

Dr. Anjana Jadon
Asst. Prof Zoology
Government Girls Degree College Kurawali, Mainpuri

Abstract :

This study investigates the dietary habits of adolescents in the Central region of Uttar Pradesh, with a specific focus on the consumption of processed and fried foods, and the resulting exposure to acrylamide, a potential carcinogen. Adolescence is a crucial period for establishing lifelong dietary patterns, and the increasing trend of consuming energy-dense, nutrient-poor foods like fast food and packaged snacks in India raises significant public health concerns. Acrylamide is a chemical compound that forms naturally in starchy foods during high-temperature cooking methods like frying, baking, and roasting. Previous studies have indicated a potential link between acrylamide exposure and an increased risk of cancer in animal models, and a high level of exposure in children and adolescents, who are particularly vulnerable due to their lower body weight.

A cross-sectional survey was conducted to assess the dietary preferences and food consumption frequency of adolescents. Simultaneously, an analysis of common food products consumed by this demographic, including French fries, biscuits, and potato chips, was performed to quantify their acrylamide content. The results revealed a high frequency of junk food consumption among the study participants, with a significant proportion of the analyzed food products exceeding the benchmark levels for acrylamide established by international food safety organizations. The findings highlight a substantial dietary acrylamide exposure among adolescents in Central Uttar Pradesh. This study underscores the urgent need for targeted public health interventions, nutritional education programs, and regulatory monitoring to mitigate the health risks associated with a diet high in processed foods and to promote healthier eating habits in this vulnerable population.

Keywords*: Acrylamide, Dietary Habits, Adolescents, Junk Food, Uttar Pradesh, Public Health*

INCREASED RISK OF HUMAN INFECTION DUE TO BIODIVERSITY LOSS

Dr. Shilpy Shakya
Assistant Professor, Department of Zoology,
L.S.S.S.S. Government Degree College Mant, Mathura

Abstract

Human infectious disease that originates from pathogen transmitted via non-human animals is known as a zoonotic disease. These pathogens (viruses, bacteria, parasites, etc.) may infect in many ways like direct contact, indirect contact (from the environment), contaminated food and drinking water, insects and ticks. In early times, naive ecological areas with high biodiversity had abundant zoonotic pathogens, because of which there were less adverse effects on human health. Moreover, biodiversity has positive impact on human health by reducing the transmission of some pathogens that already infected human populations. The transmission process, called as zoonotic spillover is known for approximately 65-75% of human infectious diseases such as dengue fever, swine flu, bird flu, monkeypox, Covid-19, Ebola, Lyme disease, and Zika virus. Enormous growth in human population has increased land clearance for agricultural and development projects, that has led to biodiversity loss. People working in such areas remain prone of direct or indirect contact with wild animals, livestock, and their pathogens. Land clearance causes more connectivity from rural and remote regions to densely populated urban areas. Many wild animals are advancing closer to human accommodations, leading to higher disease transmission and human–wildlife encounters. In a nutshell, all these factors escalate the spread of zoonotic diseases. Biodiversity loss appears to increase the risk of human exposure to both fresh and well-established zoonotic pathogens.

CONCENTRATION-DEPENDENT EFFICACY OF METHANOLIC LEAF AND SEED EXTRACTS OF PONGAMIA PINNATA AGAINST THE BROAD MITE, *POLYPHAGOTARSONEMUSLATUS* (BANKS) IN CHILLI

Monika Jangra[1], Rachna Gulati[2] and Sonika[3]
Department of Zoology[1], Chaudhary Bansi Lal University, Bhiwani
Department of Zoology[2,3] CCS Haryana Agricultural University, Hisar

Abstract

In present investigation, the bioefficacy of methanolic leaf and seed extracts of Karanj (*Pongamia pinnata*) were tested to evaluate their toxic effects at different concentration (10.0, 7.5, 5.0, 2.5, 1.25, 0.75 and 0.37 %) against mixed population of *Polyphagotarsonemus* latus on chilli during 2016 under in vitro conditions. P. pinnata responded to the mite in a concentration dependent manner i.e. lowest number of live mites and highest mortality in population was obtained with highest concentration tested (10.0 %). Out of an initial number 10 mite, significantly less number of mites were recorded at 10.00 percent concentration of P. pinnata seed extract followed by 7.50, 5.00, 2.50 and 1.25 per cent concentration than 0.75, 0.37 percent treatment and control (CD=0.10; p=0.05). The mean number of live mites were (3.61 to 6.61 mites) out of the initial 10 mites in different treatments of P. pinnata leaf extract were significantly lower (CD=0.11; p=0.05) than the water alone (9.89 mites) treatments. The number of mites recorded in treatments 2.50 and 1.25 percent concentrations were at par with each other. The methanolic seed and leaf extract of P. pinnata caused 67.27 and 63.89 percent mortality of P. latus at 10.00 percent concentration.

***Keywords**: Pongamia pinnata, Polyphagotarsonemus latus, pest management*

Γ-AMINOBUTYRIC ACID (GABA) COUNTERACTS NACL-INDUCED TOXICITY BY INFLUENCING PHOTOSYNTHETIC PROCESSES, ULTRA-STRUCTURE OF CHLOROPLAST, AND REGULATES REDOX BALANCE IN SALT-TOLERANT AND SENSITIVE VARIETIES OF TOMATO

Saif Ahmad and Qazi Fariduddin*
Plant Physiology and Biochemistry Section, Department of Botany, Faculty of Life Sciences, Aligarh Muslim University, Aligarh, 202002, India
Corresponding author:
Designation: Professor
ORCID ID:0000-0001-5523-8057

Abstract

GABA serves as the major metabolite and signaling molecule for plant growth and development under fluctuating environmental conditions. In the present study, the effect of different concentrations of GABA (0, 0.25, 0.5, or 0.75 mM) as foliar spray or seed soaking treatment on K-21 and S-22 varieties of tomato (*Solanum lycopersicum* L.) under normal and NaCl stress (150 mM) was studied. At 40 days after transplantation (DAT), NaCl stress impaired the photosynthetic apparatus, elevated reactive oxygen species (ROS) and malondialdehyde (MDA) levels, and reduced photosynthetic traits and related enzymes, and consequently compromised plant growth and development. However, among the different concentrations of GABA tested 0.5 mM of GABA applied through foliar mode proved best in improving growth, photosynthetic traits, and enzyme activities (Rubisco, succinate dehydrogenase, and fumarase activity), maintained organization of chloroplast in the leaves, and also improved lycopene, and β -carotene contents in fruits of tomato plants. Moreover, treatment of GABA (0.5 mM) reduced levels of ROS and cell death compared to non-treated tomato plants. Foliar application of GABA (0.5 mM) also was more effective than seed soaking to overcome the adverse effects of salt stress specifically in K-21 than S-22 variety.

Keywords*: Antioxidants; Chloroplast; Photosynthesis; Reactive oxygen species, TCA cycle*

IMPROVING RICE YIELD THROUGH ZINC SOLUBILIZING BACTERIA: FROM LAB-SCALE BIOASSAYS TO FIELD APPLICATION

Arshdeep Singh[1], Jupinder Kaur[1*], Baby[1], Sohan Singh Walia[2] and Neeraj Rani[2]
[1]Department of Microbiology, College of Basic Sciences and Humanities, Punjab Agricultural University, Ludhiana-141004, Punjab, India
[2]School of Organic Farming, College of Agriculture, Punjab Agricultural University, Ludhiana-141004, Punjab, India.

Abstract

The present study evaluated zinc-solubilizing rhizobacteria (ZSB) for enhancing rice growth, soil fertility, and nutrient uptake under controlled and field conditions. Fifteen rhizobacterial isolates were recovered from diverse agro-ecological zones of India and screened for their zinc-solubilizing ability on zinc oxide, zinc phosphate, and zinc carbonate media. Isolates RZSB24, RZSB25, and RZSB44 exhibited the highest solubilization efficiency and multiple plant growth-promoting traits including auxin production, phosphate solubilization, siderophore production, nitrogen fixation, and ammonia excretion. Molecular identification confirmed them as *Priestia aryabhattai* (RZSB24), *Pseudomonas putida* (RZSB25), and *Pseudomonas vancouverensis* (RZSB44). Greenhouse pot experiments revealed that consortium inoculation with these three ZSB strains significantly enhanced plant height, biomass, chlorophyll content, soil enzyme activity, and nutrient uptake compared to single inoculations and uninoculated controls. Field trials under both zinc-sufficient and zinc-deficient soils demonstrated that full zinc application combined with ZSB (T5: 100% Zn + RDF + ZSB) resulted in the highest grain yield and nutrient uptake. However, a 25% reduction in zinc fertilizer (T6: 75% Zn + RDF + ZSB) produced statistically comparable outcomes, with grain yield reduction limited to ~1% and zinc uptake differing by only ~2%. This highlights the potential of ZSB integration to improve zinc-use efficiency, maintain high yields, and reduce fertilizer input, offering a sustainable strategy for zinc-deficient rice production systems.

Keywords*: Plant growth-promoting rhizobacteria, Rice, Zinc deficiency, Soil fertility, Sustainable agriculture*

Isolation of Zinc Solubilizing Bacteria from Pulse Rhizosphere and their Effect on Growth, Nodulation and Yield of Lentil (Lens culinaris L.) Under Calcareous Soil Condition

Ajeet Kumar*, Ramjas Meena, Sunita Kumari Meena, Sanjay Kumar Singh, Amaresh Chandra and Sudhir Paswan

ABSTRACT

Zinc deficiency is one of the most prevalent micronutrient constraints in Indian soils, particularly in pulse-growing regions, resulting in poor nodulation, impaired growth and reduced yields in legumes. Calcareous soils often suffer from zinc (Zn) deficiency due to high pH and carbonate content, severely limiting pulse productivity. This study aimed to isolate and screen indigenous zinc solubilizing bacteria (ZSB) from rhizospheres of major pulses (mung bean, urd, pigeon pea, lentil, chickpea) grown in Bihar, India. Ten bacterial isolates (RJM-1 to RJC-10) were obtained via serial dilution from rhizosphere soil and screened using Tris-minimal agar containing. Isolates RJL-8 and RJP-6 showed superior Zn solubilization with halo zone diameters of 27 mm and 26 mm, and solubilization efficiencies of 337.55% and 325.00%, respectively. Broth assays confirmed maximum Zn release (249.75 mg/L for RJP-6) and notable pH reduction (5.53 for RJL-8). Lentil (Lens culinaris L.), a major pulse crop valued for its protein content and biological nitrogen fixation ability is highly sensitive to zinc nutrition. Conventional correction with inorganic Zn fertilizers, such as zinc sulphate ($ZnSO_4 \cdot 7H_2O$), suffers from low recovery efficiency and rapid immobilization in soils, highlighting the need for sustainable alternatives. In this context, zinc-solubilizing bacteria (ZSB) offer a promising eco-friendly strategy to mobilize native and applied zinc for plant uptake. The present investigation was carried out during rabi 2023–24 under pot culture conditions in a Completely Randomized Design with nine treatments and three replications, at RPCAU, Pusa, Bihar, revealed significant increases in grain yield (22.02 g/pot) and Zn content in grains (24.27 mg/kg) in T9 (ZSB1 + ZSB2 + 75% RDF $ZnSO_4$) treatment, performing equivalently to 100% RDF Zn. These findings demonstrate the potential of ZSB in enhancing Zn availability and lentil productivity while reducing chemical input. Thus it is finally Concluded that Zinc solubilizing bacteria RJL-8 and RJP-6, isolated from lentil and pigeon pea rhizospheres, demonstrated remarkable Zn solubilization. Their application in lentil cultivation, combined with reduced $ZnSO_4$ (75% RDF), significantly improved yield, Zn uptake, and soil health, offering a sustainable alternative to full-dose chemical fertilization

Key Words: Zinc solubilizing bacteria (ZSB), calcareous soils, Lentil, Nodulation, Grain yield, Sustainable agriculture, Micronutrient.

SIHDA9 NEGATIVELY REGULATES DROUGHT IN *ARABIDOPSIS THALIANA*

Verandra Kumar[1,3*], Babita singh[2], Manoj Prasad[1,4]
[1] National Institute of Plant Genome Research, Aruna Asaf Ali Marg, New Delhi-110067.
[2] CSIR-National Botanical Research Institute, Rana Pratap Marg, Lucknow-226001.
[3] Present address: Department of Botany, Manyvar Kanshiram Government Degree College, Ninowa, Farrukhabad-209602.
[4] Present address: Department of Genetics, University of Delhi, New Delhi-110021.

Abstract

Drought stress poses a critical challenge to plant growth and productivity, particularly under the increasing unpredictability of global climate patterns. According to FAO and IPCC reports, drought has contributed to over 30% of crop yield reductions in developing regions over the past decade. Major crops affected include rice, maize, wheat, soybean, and sorghum. Epigenetic regulation has emerged as a key mechanism through which plants modulate stress-responsive gene expression. Therefore, understanding the epigenetic control of drought tolerance is essential for improving crop performance under water-limited conditions. In our previous work, we identified that Histone Deacetylase 9 (SiHDA9) negatively regulates dehydration stress in Setaria italica, a C_4 panicoid crop. SiHDA9 forms a multiprotein repressor complex (SiHDA9–HAT3.1–SiHDA19) that suppresses dehydration-responsive genes through histone deacetylation. In the present study, we functionally characterized SiHDA9 in the dicot model plant *Arabidopsis thaliana*. Transgenic Arabidopsis lines overexpressing SiHDA9 exhibited increased water loss and heightened sensitivity to dehydration and drought stress, characterized by reduced survival rates, impaired stomatal closure, and decreased expression of key drought-responsive genes including RAB18, RAP2.4, P5CS2, RD22, PIP1;4, and LHCB2.3. These findings demonstrate that SiHDA9 functions as a conserved negative regulator of drought stress responses by modulating chromatin accessibility, even across monocot and dicot species. The targeted manipulation of SiHDA9 presents a promising strategy for engineering drought-resilient crops.

SYNTHESIS, CHARACTERIZATION AND APPLICATIONS OF VINCA ROSEA DERIVED NANOPARTICLES AS PLANT GROWTH PROMOTER AND BIOCONTROL OF *FUSARIUM OXYSPORUM CICERIS*

Janki N Thakker[1], Jhanvi Patel[1], Bhasha Choksi[1] and Pinakin Dhandhukia[2]
[1]Departement of Biological Science, P D Patel Institute of Applied sciences, Charotar university of Science and Technology, Changa, Anand, Gujarat, 388421
[2]Department of Microbiology, School of science and Technology, Vanita vishram Women's University, Atwagate, surat, 395001, Gujarat, India

Abstract :

Plants such as *Vinca rosea* are rich in bioactive compounds like alkaloids and flavonoids which can aid in nanoparticle synthesis while enhancing their bioactivity. These biologically synthesized nanoparticles can have promising antifungal, antimicrobial and plant growth-promoting properties, making them potential candidates for biocontrol and sustainable agriculture. Iron oxide nanoparticles were synthesised from Vinca rosea using co-precipatation method and had size of 5.10nm as confirmed by DLS with polydispersity index of 0.255. Further characterization was done using Fourier transformed infrared spectroscopy and Scanning electron microscopy. Thermogavimetric analysis showed, weight loss of 36% at temperatures ranging between 25°C to 700°C caused by the thermal decomposition of biomolecules. Antifungal activity was observed against *Fusarium oxysporum ciceris* (FOC), pathogen of chickpea plant which may cause losses upto 60-90%. Antifungal activity of iron oxide nanoparticles was confirmed by spread plate technique with increasing concentration of NPs there was a decrease in fungal growth compared to control. Biomass of FOC decreased with increasing concentration of nanoparticles as observed by SEM and confirmed by MDA assay. Nanoparticles supported the seed germination and increased the vegetative parameters confirming its potential to be used as plant growth promoter and plant protector. Further defense markers and growth-related parameters like proline, SOD, Carotenoids, chlorophyll were also analyzed from the plants and confirmed its potential in controlling the pathogen and promoting the growth.

QUANTITATIVE ESTIMATION OF PLANKTON DIVERSITY IN KHADKPURNA DAM. DEULGAON MAHI, DIST. BULDHANA, (M. S.), INDIA

Nagmote S. R. and M. R. Tandale*
Department of Zoology, Late B. S. Arts, Prof. N. G. Science & A. G. Commerce College, Sakharkherda, Tq. Shindkhed Raja, Dist. Buldhana, Maharashtra, India
*Department of Zoology, Shri Vyankatesh Arts, Commerce and Science College, Deulgaon Raja, Dist. Buldhana, India.

Abstract

Planktonic communities of Khadkpurna dam was comprised all four categories of zooplanktons belonging to Rotifers, Cladocera, Copepods and Ostracods. Near about 34 species of zooplanktons was observed from all six different sampling sites. From Which Rotifers are 18 different species was observed from all six sampling sites throughout the study periods. Cladocera observed 08 different species, Copepods are 05 species while the ostracods are 03 species was observed. The dominance of Rotifers was observed; highest number of species was observed during the winter season while lowest was observed during the summer season throughout the study periods. Onsome sampling sites the *Karetella* species was observed, such species is a pollutant indicator species, which accumulate organic matter and it reported dominant in polluted fresh water bodies.

Keywords*: Zooplankton, Khadkpurna, Dam.*

KALANAMAK RICE AND ITS HEALTH BENEFITS

Dr. Deependra Bahadur Singh
Department of Botany
Government Degree College, Pachmohani, Siddharth Nagar (U.P.)-272152, India

Abstract

Kalanamak is a traditional variety of rice (*Oryza sativa* L.). The name Kalanamak Rice has been derived due to its black husk (Kala = Black and the suffix Namak means Salt). It is widely grown in the terai area of an aspirational district Siddharth Nagar and ten neighbouring districts like Basti, Sant Kabir Nagar, Maharajganj, Gorakhpur, Deoria, Kushinagar, Gonda, Balrampur, Shravasti of northeastern Uttar Pradesh. Kalanamak rice has been cultivated since the Buddhist period (600 BC). The cabonized rice grains resmbling Kalanamak were found from the excavation of Aligarhwa (Kapilvastu; district Siddharth Nagar,U.P.,India) located at Nepal border. Chinese monk Fa-hain wrote that when lord Gautam Buddha visited Kapilvastu for the first time after attaining enlightenment, he was stopped at Mathla village by people. The villagers asked them to give a prasad. He took the rice and gave to the people, asking them to sow it in marshy place. The rice thus produce will have a typical aroma which will always remind people of me.

It is famous for its taste, palatability and aroma. It is also featured in especially rices of the world by Food and Agricultural Organisation (FAO) of the United Nations. In 2013, the Geographical Indication tag was given to Kalanamak rice. The Government of Uttar Pradesh promoting Kalanamak rice under One District One Product (ODOP) scheme and established a common facility centre -Shivansh Siddharth Nagar Agriculture Development Producer Company Limited.

Kalanamak rice is rich in micronutrients like Iron, Zink, low glycemic index and higher protein content. Due to this, it help to regulate diabetes, blood pressure, skin damage and also helps in strengthen, regrow, galvanise the body etc.

Keywords*: Kalanamak, FAO,ODOP, Diabetes.*

EFFECT OF AIR, WATER, AND SOIL POLLUTION ON INSECT POLLINATORS AND POLLINATION EFFICIENCY

Miss Anjana Chaudhuri [1], Dr. Shikha Srivastava [2], Dr. Divya Kumudini Minj[3]
[1]Govt. V.Y.T, P.G, Autonomous College, Durg Chhattisgarh
[2]Indira Gandhi PG College, Vaishali Nagar Drug Chhattisgarh,
[3]Govt. VYT P. G Autonomous College, Drug Chhattisgarh
Email id-anjana.korba@gmail.com

Abstract

Insect pollinators are critical to ecological balance and agricultural productivity, yet their populations are increasingly threatened by environmental pollution. The industrial city of Korba, Chhattisgarh—popularly known as the "*Power Capital of India*"—hosts several large-scale coal-based thermal power plants, including the Korba Super Thermal Power Plant, which are major sources of air, water, and soil pollution. This region thus provides a relevant case study for assessing pollution-driven stress on pollinator health and efficiency. The present study explores the effect of pollutants released from the Korba power plant complex on insect pollinators, particularly bees, butterflies, and other hymenopterans, which serve as primary agents of pollination in both natural and agricultural ecosystems. Air pollution from fly ash, particulate matter ($PM_{2.5}$ and PM_{10}), sulfur dioxide (SO_2), and nitrogen oxides (NO_x) has been shown to disrupt insect foraging behavior by masking floral scents, altering plant–pollinator interactions, and reducing visibility. Continuous exposure to airborne pollutants can impair the olfactory system of bees, reduce their foraging distance, and ultimately lower pollination efficiency. Similarly, deposition of heavy metals and ash particles on flowers diminishes nectar and pollen quality, thereby discouraging insect visitation. Water pollution from effluent discharge and fly ash slurry contamination in local streams further contributes to bioaccumulation of toxic substances within pollinators, affecting larval development, reproductive success, and lifespan. Soil pollution caused by ash deposition and leaching of trace metals (e.g., lead, cadmium, mercury) modifies the nutrient profile of flowering plants, reducing floral diversity and abundance, which indirectly affects pollinator populations. In Korba, where large tracts of land are under cultivation of oilseeds, pulses, and horticultural crops, the decline in insect pollinator activity due to industrial pollution directly threatens agricultural productivity and local livelihoods. Field observations and secondary data suggest that pollinator density near the Korba power plant is significantly reduced compared to relatively cleaner zones in the periphery. Moreover, crop yield patterns indicate lower fruit- and seed-set in areas most exposed to emissions, highlighting the tangible link between power plant pollution and

diminished pollination services. The findings underscore the urgent need for mitigation strategies, including stricter emission control measures, eco-restoration of ash-affected soils, establishment of pollinator-friendly green belts, and promotion of alternative clean energy options to reduce environmental load. Protecting pollinators in industrially stressed regions like Korba is vital not only for sustaining biodiversity but also for ensuring food security and agricultural sustainability in Chhattisgarh and beyond. This study contributes to the growing body of evidence that environmental pollution from coal-based thermal power generation poses a severe threat to pollinator survival and efficiency. Unless immediate interventions are implemented, the compounded effects of air, water, and soil contamination may accelerate pollinator decline, with cascading ecological and socio-economic consequences.

Keywords*: insect pollinators, Korba power plant, air pollution, water pollution, soil contamination, pollination efficiency, coal-based industries,*

ISOLATION AND CHARACTERIZATION OF NOVEL AZO DYE DEGRADING MICROORGANISM

Saima Islam[1], Dr. Tanzeel Ahmad[2]
[1]School of Biotechnology, IFTM University, Moradabad, Uttar Pradesh
Corresponding Author: - Saima Islam
[2]Research Scholar, School of Biotechnology IFTM University, Moradabad

Abstract

The extensive use of azo dyes in textile and related industries has led to serious environmental concerns due to their recalcitrant and toxic nature. Conventional physico-chemical methods for dye removal are often inefficient, costly, and may generate secondary pollutants. In this context, the exploration of microbial resources provides a sustainable and eco-friendly alternative for azo dye degradation. The present study focuses on the isolation and characterization of novel microorganisms capable of degrading azo dyes from contaminated industrial effluents. Samples were collected from dye-polluted sites and screened for microbial strains with high dye-decolorization potential. The selected isolates were subjected to morphological, biochemical, and molecular characterization for identification. Growth kinetics and decolorization assays were performed to evaluate their efficiency under varying environmental conditions. The results revealed that the isolated strain exhibited significant decolorization efficiency, indicating its potential application in bioremediation of azo dye-contaminated wastewater. This study highlights the importance of harnessing microbial diversity for developing effective, sustainable solutions to industrial pollution.

Keywords*: Azo dye, Bioremediation, Microbial isolation, Industrial effluent, Novel microorganisms, Dye decolorization*

ASPIRATION INDUCED PULMONARY BRONCHOPNEUMONIA IN A CROSSBRED MALE BUFFALO

Pranesh M*, Vishal Mahajan[1], Nittin Dev Singh[2]
*Corresponding Author: Pranesh M, M.V.Sc student (1st year), Department of Veterinary Pathology, Guru Angad Dev Veterinary And Animal Sciences University, Ludhiana-141004.
[1,2]Department of Veterinary Pathology, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana-141004

Abstract

A 2-year-old crossbred male buffalo was presented to the Department of Veterinary Pathology for necropsy with a history of severe respiratory distress for the past 6 days. Necropsy examination revealed congested mucous membranes, froth mixed with undigested feed material in the severely congested trachea, and markedly congested, consolidated cranioventral lung lobes. The pleural surface was covered with a discrete amount of fibrin, and the interalveolar septa were thickened, resulting in loss of the normal pulmonary architecture. A fibrinous layer was also observed around the apex of the heart. Microscopic examination revealed acute to subacute fibrinous necrotizing bronchopneumonia along with fibrinous epicarditis. The presence of fibrin was further confirmed using Masson's Trichrome staining method. Based on the clinical history, gross lesions, and microscopic findings, the condition was diagnosed as pulmonary bronchopneumonia secondary to accidental regurgitation of ruminal contents.

Keywords: *Necropsy, mucous membrane, bronchopneumonia, epicarditis*

BIOREMEDIATION: A TECHNOLOGICAL APPROACH FOR POLLUTION CONTROL

Dr. Rajni Singh and Dr. Anupama Gaur
Department of zoology, M.M.H College, Ghaziabad

Abstract

Environmental pollution has been rising in the past few decades due to increased human activities. It is a serious issue that affects the planet's soil, water, and air, a significant threat to ecosystems and living organisms. Major destructive impacts of pollutants are perinatal, respiratory, cardiovascular and mental disorders, mortality, allergy, cancer etc. Bioremediation is an effective cleaning technique for removing toxic waste from polluted environment. It is an eco-friendly method in which hazardous wastes and pollutants are eliminated, degraded, detoxified, and immobilized. The main principle of bioremediation is degrading and converting pollutants to less toxic forms. Various microorganism including aerobes and anaerobes, are used in bioremediation to treat contaminated sites. Bioremediation can be carried out ex-situ and in-situ depending on several factors such as cost, pollutant types, and concentration. Bioremediation is cost-effective, promotes soil conservation, and reduces toxicity. It offers significant benefits for communities by reducing pollution, improving public health, and promoting sustainable practices.

Keywords*: Bioremediation, environment, ecosystems microorganism, pollutant*

MELATONIN MITIGATES HIGH TEMPERATURE STRESS IN TOMATO

Barket Hussain and Qazi Fariduddin*
Department of Botany, Faculty of Life Sciences, Aligarh Muslim University, Aligarh 202002, India

Abstract

High-temperature (HT) stress is a critical abiotic factor limiting crop productivity by disrupting key physiological and metabolic processes in plants. This study investigates the role of exogenous melatonin (MT) in alleviating HT-induced stress in two tomato varieties (S-22 and PKM-1) of tomato, under controlled environmental conditions. Treatments were given in this pattern: Control (25 °C/18 °C) (day/night), T1 (30 °C/28 °C), and T2 (35 °C/30 °C), T3 MT (50 µM), or T4 (30 °C/28 °C) and T5 (50 µM), or T6 (35 °C/30 °C) and MT (50 µM). Growth parameters, photosynthetic performance, stress biomarkers, and metabolic responses were assessed to evaluate cultivar-specific thermotolerance. Results revealed that HT stress significantly impaired biomass accumulation, chlorophyll content, and photosynthetic efficiency, with S-22 exhibiting greater sensitivity compared to PKM-1. MT application markedly enhanced thermotolerance in both varieties by improving photosynthetic traits and reducing oxidative damage. Enzymatic antioxidant activity, including catalase (CAT), peroxidase (POX), and superoxide dismutase (SOD), was significantly elevated in MT-treated plants, indicating strengthened reactive oxygen species (ROS) scavenging capacity. Metabolomic profiling further revealed MT-induced modulation of key metabolic pathways, including the glutathione cycle, glycolysis, and amino acid metabolism, contributing to enhanced stress adaptation. Notably, PKM-1 demonstrated a more robust thermoprotective response, attributed to its inherent tolerance mechanisms and greater responsiveness to melatonin. These findings highlight the differential thermotolerance strategies between tomato cultivars and underscore the potential of melatonin as a promising agent for improving crop resilience to rising temperatures in the context of climate change.

ANTI-PREDATOR BEHAVIOUR OF INDIAN GAME BIRD *ORTYGORNIS PONDICERIANUS*

Anshu Mishra* & Ashish Kumar
Animal Diversity and Ecology Laboratory
Department of Zoology, University of Lucknow, Lucknow, U.P., India, 226007

Abstract

Antipredator behaviour refers to the strategies and adaptations that animals use to avoid predation and increase the chances of survival. *Galliformes* and other bird species avoid predation by raptors by means of crouching and freezing, while their response to terrestrial predators involves more active reactions such as vigilance and escape. Anti-predator behaviours were also found to vary according to sex in many bird species, males are generally more vigilant than females in species living in family as well as in foraging groups. In the monogamous *Galliformes*, males spend more time in vigilance than females. Our study aimed to investigate antipredator behavioural differences between sexes during the breeding seasons. This study was conducted during the two-breeding season in the year 2023 and 2024, spanning from April to September in every year. For this study we observed the response of 108 grey francolins (*Ortygornis pondicerianus*) (54 males and 54 females). Our results (independent t test) showed a significant difference ($t=2.86$, $p<0.005$) in antipredator behaviour.

Keywords*: antipredator behaviour, galliformes, vigilance, breeding season*

IMPORTANCE OF SUSTAINABLE CONSUMPTION IN ECONOMIC BOTANY

Dr. Ritika Misra
Department of Botany
Constituent Government College, Bhadpura, Nawabganj, Bareiily.

Abstract

Sustainable consumption in economic botany is crucial for maintaining ecological balance while supporting economic development and human well-being. Economic botany explores the relationship between people and plants, focusing on the utilization of plant resources for food, medicine, clothing, shelter, and other economic purposes. However, overexploitation, habitat destruction, and unsustainable harvesting practices have led to the depletion of many valuable plant species. Sustainable consumption addresses these issues by promoting the responsible use of plant-based resources, ensuring their availability for future generations. It encourages practices such as ethical sourcing, biodiversity conservation, traditional ecological knowledge, and circular economies in plant-based industries. Integrating sustainability into economic botany not only safeguards plant diversity but also strengthens food security, supports indigenous communities, and contributes to climate change mitigation. This abstract emphasizes that a shift towards sustainable consumption patterns is vital for preserving plant resources and fostering long-term ecological and economic resilience.

Keywords*: Sustainable consumption, economic Botany*

ENTOMOPATHOGENIC FUNGI AND PHYTOEXTRACTS: DUAL-ACTION ECO-TOOLS FOR VECTOR CONTROL

Dr. Prejwltta Maurya*
Assistant professor
*Department of Zoology, Faculty of Science
Government Degree College, Targawan, Jaithra, Etah (UP)
E-mail: singh_prejwltta@yahoo.co.in

Abstract

Mosquito-borne diseases remain a major public health challenge worldwide, and the growing resistance to chemical insecticides has made controlling these vectors even harder. Eco-friendly alternatives are now in the spotlight, and combining entomopathogenic fungi (EPF) with plant-based extracts offers a promising solution. EPF, like *Beauveria bassiana* and *Metarhizium anisopliae*, naturally infect and kill mosquitoes by penetrating their outer surface, targeting larvae and adults without harming other organisms. Meanwhile, phytoextracts from plants such as *Ocimum basilicum*, *Azadirachta indica*, and *Momordica charantia* show strong larvicidal, pupicidal, and mosquito-repelling effects thanks to their bioactive compounds like terpenoids and flavonoids. Using these two approaches together creates a synergistic effect—mosquito populations are reduced more effectively, their reproduction is disrupted, and the chances of resistance developing are lower. Beyond effectiveness, these bio-based tools are biodegradable and environmentally safe, making them a perfect fit for integrated vector management strategies. This work investigates the synergistic effects of fungal metabolites in combination with phytoextracts (*Ocimum basilicum*, *Cannabis sativa*) against *Anopheles stephensi* and *Culex quinquefasciatus*. Larvicidal assays revealed significant enhancement in efficacy under combined treatments compared to individual applications. These findings indicate that integrating fungi with plant-based larvicides may reduce reliance on synthetic insecticides, delay resistance onset, and provide a sustainable path toward mosquito-borne disease control.

Keywords: *Entomopathogenic fungi, Phytoextracts, Larvicides, Mosquito, Synergistic approach*

FOLIAR FEEDING OF NINPS IMPROVES GROWTH AND PHYSIOLOGICAL PERFORMANCE AS WELL AS PRODUCTION OF BIOACTIVE COMPOUNDS OF *STEVIA REBAUDIANA* (BERTONI).

Rajat Kumar Gautam[1], Mukesh Kumar Bhardwaj[1], Sangram Singh[2], Chandra Kant[1]*
[1]Department of Botany, Dharma Samaj College, Aligarh, India
[2]Department of Botany, Faculty of Life Sciences, Aligarh Muslim University, Aligarh, India
*Corresponding author: Rajat Kumar Gautam (Ph.D. Student), Department of Botany, Dharma Samaj College, Aligarh, India
Mob. Nos: 9412878401, 9528168917.

Abstract

Leaves of *Stevia rebaurdiana* (Bertoni) are the source of several medicinally important bioactive compounds, including steviol glycosides, which are responsible for the sweet taste of the plant, and phenolic compounds, which offer a wide variety of therapeutic and pharmacological potential against various diseases such as cancer, diabetes mellitus, obesity, inflammation and hypertension. A pot experiment was conducted to investigate the effect of different concentrations (25, 50, 75, and 100 mg L-1) of NiNPs on the growth characteristics, physiological parameters, and production of steviol glycosides (SGs) and other bioactive constituents of *Stevia rebaudiana* (Bertoni). Foliar-spray treatments of NiNPs at varying concentrations significantly improved all parameters studied. Of the applied foliar-spray treatments, 75 mg L-1 of NiNPs mg L^{-1} proved to be the most effective, enhancing all studied parameters maximally compared to the deionized water-spray control.

GC-MS analysis of methanol leaf-extract of *Stevia rebaudiana* (Bertoni) on an area-percentage basis revealed that the optimal treatment, of NiNPs at 75 mg L-1 increased the contents of bioactive compounds, viz., stevioside (6.20%) and 'Rebaudioside A' (3.3%) compared to the water-spray control (3.6% and 1.7%, respectively). The NiNPs at 75 mg L-1 improved D-allose (43.2%), neophytadiene (3.8%), hexadecenoic acid (0.86%), and β-amyrin (5.4%) compared (27.7%, 2.21%, 0.47%, and 4.2%) with those (27.7%, 2.2%, 0.47%, and 4.2% respectively) recorded with regard to water-spray control.

Keywords: *Stevia rebaurdiana, NiNPs, GC-MS analysis, Stevioside, Rebaudioside A', D-allose.*

IMPACT OF CLIMATE CHANGE AND GLOBAL WARMING

Dr. Prvesh Kumar
Assistant Professor, Department of Zoology
Feroze Gandhi College, Raebareli, U.P. (INDIA)

Abstract

Climate change involves variability in the overall earth's climate or variation in the overall state of the atmosphere over long durations, ranging from decades to millions of years. However, there is a lack of attention on monitoring, measuring, and communicating climate change's impact on human mortality. The consequences of climate change extend beyond just the environment and have far-reaching effects on human health, social and economic systems, and the natural world. Global warming is just one aspect of climate change. Climate scientists return the cause of global warming to humans. Global warming occurs when carbon dioxide (CO_2) and other air pollutants and greenhouse gases collect in the atmosphere and absorb sunlight and solar radiation that have bounced off the earth's surface. In fact, they say that global warming refers to the rise in global temperatures due mainly to the increasing concentrations of greenhouse gases (CO_2, CFC, CH_4, N_2O, H_2O (g)) in the atmosphere. Global warming and related changes in natural systems and have a strong influence on human societies, including water resources and food supplies, economic issues, health and wellbeing, energy production, migration of people and potentially geopolitical conflicts. There is a broad range of studies investigating the different aspects of these impacts and the potential adaptation strategies, synthesized in reports such as those provided by the IPCC. Climate change also causes impacts on human health through warming temperatures, changes in precipitation, extreme events, degradation of the air quality and rising sea-levels. These impacts may directly affect the health of human beings (e.g. heat-related mortality or deaths and injuries from flooding or storms). There are also indirect effects from climate change, such as those acting on vector-borne diseases, food security and water quality. The severity of these risks is expected to increase in the future and will vary depending on where people live and to what extent they are exposed to climate risk, their economic status and how they are sensitive to health risks. It will also depend on the ability of public health and safety systems to address these new threats.

Keywords:- *Climate Change, Global Warming, Environment, Temperature, Migration etc.*

QUANTITATIVE ANALYSIS OF FLOWER-VISITING INSECTS ASSOCIATED WITH *RUBUS ELLIPTICUS* SMITH. IN A HIMALAYAN ECOSYSTEM

Mayank Mahara, Manoj Kumar Arya*
Insect Biodiversity Laboratory, Department of Zoology, D. S. B. Campus, Kumaun University, Nainital – 263002, Uttarakhand, India

Abstract

Medicinal plants are important components of both the traditional and modern healthcare systems, and their pollination is largely dependent on insects. The present study investigates the diversity and visitation patterns of flower-visiting insects on *Rubus ellipticus*, a medicinal shrub native to the Western Himalaya. Field observations were conducted during the flowering season (March–April 2025) at the Himalayan Botanical Garden, Nainital. Though limited to one site, the Himalayan Botanical Garden was selected because of its botanical richness, controlled access, and high representation of native flora, making it suitable for standardized insect sampling. A total of 475 insect individuals representing ten species across six families and three orders were documented. The order Hymenoptera showed the highest species richness and abundance, with *Apis cerana* emerging as the dominant floral visitor. Diversity indices, including Shannon-Wiener (2.08) and Simpson's Index (0.853), indicated a diverse and stable and pollinator community. Visitation rate analysis highlighted *Apis cerana*, *Eristalinus taeniops* and *Heliophorus sena* as the most frequent visitors. Cluster analysis and heat mapping further revealed grouping of species with similar ecological roles, suggesting niche overlap or similar resource use. Thus, besides the medicinal properties of *R. ellipticus*, the present study also highlights the ecological significance of this medicinal shrub as key floral resource for a diverse assemblage of functionally significant insect pollinators. These finding also underscores the need to conserve this flora and its associated pollinator species, and to maintain semi-natural habitats that sustain mutualistic plant–insect interactions in Himalayan ecosystems.

TRITERPENOIDS FROM NEEM: POTENT ANTIMICROBIAL AND ANTIVIRAL AGENTS

Pushpendra Soni*, Shom Prakash Kushwaha, Syed Misbahul Hasan, Kuldeep Singh, Arun Kumar
Corresponding Author: pushpendrasoni6952@gmail.com
Faculty of Pharmacy, Integral University, Dasauli, Kursi Road, Lucknow, Uttar Pradesh, 226026, India

Abstract

Neem (*Azadirachta indica*) contains bioactive compounds such as triterpenoids that exhibit antimicrobial and antiviral properties. This chapter focuses on the chemical characteristics and categorization of the neem-derived triterpenoids particularly concerning their medicinal uses. These compounds exhibit a broad spectrum of antimicrobial activity due to their interference with bacterial and fungal cell membranes thus preventing the growth of the pathogens. Neem triterpenoids have antiviral properties because they prevent viral reproduction concerning both DNA and RNA viruses. This study considers the impact of these compounds on the molecular level and provides some insight into the functions of the extracts as antimicrobial and antiviral agents. There are also positive interactions between neem triterpenoids and other phytochemicals that are considered the potential to enhance the efficiency of therapeutic use. The anti-microbial and antiviral effects of these triterpenoids are discussed and analyze their therapeutic application in the management of infections and as therapeutic agents. The toxicities and safety of neem triterpenoids are discussed based on preclinical and clinical studies to determine the therapeutic potential of these compounds in humans. However, challenges exist in the synthesis of standardized neem triterpenoids for general therapeutic applications. This review concludes with an analysis of the trends in the further work and fate of neem triterpenoids in modern pharmacology.

***Keywords**: Azadirachta indica, antiviral compounds, triterpenoids, antimicrobial activity, Bacterial inhibition*

SCREENING AND EVALUATION OF ANTI-AMYLOID KERATINASE

Bragadish Iyer and Narayani Vyas
Department of Biological Sciences
P D Patel Institute of Applied Sciences
Charotar University of Science and Technology, CHARUSAT Campus, Changa-388 421

Abstract

Amyloid fibrils are ordered β-sheet protein aggregates linked to neurodegenerative disorders and bacterial biofilm stability. In this study, the potential of keratinase to break down amyloid was assessed. A screening of bacterial colonies Congo Red agar revealed a culture N29 showing the highest biofilm formation capacity. Amyloid presence was confirmed using Congo red and thioflavin T staining, and native PAGE analysis. 16 keratinase-producing cultures were isolated using a feather broth culture. Multiple amino acid spots were observed on TLC when partially purified keratinase was incubated with amyloid (Rf range of 0.12-0.76), indicating that the keratinase caused degradation of the amyloid. Spectral scanning further confirmed the breakdown of amyloid by reversing the binding shifts in Congored stained amyloids. Microscopic analysis using fluorescence microscopy confirmed these findings, with amyloid breakdown observed, whereas scanning electron microscopy revealed disrupted biofilm structures rich in amyloid in treated samples, as opposed to controls. Inhibition assays with PMSF validated that keratinase is the active enzyme responsible for the degradation. Overall, the keratinase effectively degraded bacterial amyloids and weakened the biofilm matrices under laboratory conditions (30°C, 72 h). This eco-friendly enzymatic approach represents a novel strategy for targeting amyloid-associated biofilms, and it has broad potential applications in healthcare, food safety, and industry where conventional antimicrobial strategies are ineffective.

RECENT INNOVATIONS IN PLANT AND ANIMAL RESEARCH FOR FOOD SECURITY AND CLIMATE RESILIENCE

Sachin Kumar Vishwakarma, Assistant Professor
B.R.D. Govt Degree College Duddhi, Sonbhadra, UP 231208

Abstract

Recent progress in plant and animal research is offering transformative solutions to the dual challenges of food security and climate resilience. As climate change intensifies and populations grow, agriculture increasingly relies on innovations such as CRISPR/Cas9 and molecular breeding to develop climate-smart crops with greater drought tolerance, pest resistance and enhanced nutritional quality. Genomic tools and precision breeding are similarly advancing livestock productivity by improving heat tolerance, feed efficiency, and disease resistance, while next-generation vaccines and microbiome-based feed innovations are reducing mortality and methane emissions, aligning animal farming with sustainability goals. Integrated approaches that merge precision agriculture, data science, and remote sensing are enabling real-time management of crops and livestock, ensuring better adaptability under changing environments. Strengthened by public–private partnerships, research investments, and farmer-oriented dissemination, these innovations highlight that achieving long-term food and environmental security will require not only scientific breakthroughs but also supportive policies and capacity-building initiatives.

Keywords-*Food security, Climate resilience, Gene editing, Genomic selection, Sustainable farming*

ELECTROCHEMICAL BIOSENSOR PLATFORM WITH GRAPHENE NANOSHEETS DECORATED ITO ELECTRODE FOR FOLIC ACID SENSING

Minakshi Sharma
MAHARSHI DAYANAND UNIVERSITY, ROHTAK (HARYANA)

Abstract

A novel and highly sensitive amperometric nano sensor was fabricated by immobilizing reductase (DHFR) onto (PtNPs) and graphene (GrNs) decorated tin oxide (ITO) electrode for (FA) level detection. The modified working ITO electrode (i.e. DHFR NPs/PtNPs/GrNs/ITO) was characterized by scanning electron microscope (SEM), (CV) and (EIS) at each steps of its construction. The nano sensor (DHFR NPs/PtNPs/GrNs/ITO) demonstrated a wide linear detection range of 5–100 nM and a low detection limit of 0.52 nM along with better reproducibility. Its optimal performance was observed at a pH of 7.0 and a temperature of 30 °C. The fabricated nano sensor showed excellent sensitivity and stability, and was successfully applied for quantification of FA in human serum samples.

AXILLARY SHOOT BUD DIFFERENTIATION THROUGH NODAL SEGMENT CULTURE OF *CITRUS LIMON* L. BURM.F.

Mohd Zaid, Anwar Shahzad
Maulana Azad Urdu National University
Email-mohdzaidkvc@gmail.com

Abstract

This study presents an efficient and simple reliable micropropagation protocol for axillary shoot bud differentiation and regeneration from nodal segment explant of *Citrus limon* L. Burm.f., using different concentrations of cytokinin, auxin, and gibberellic acid (GA_3) , for enhanced shoot multiplication and differentiation. Nodal explants cultured on MS basal medium supplemented with benzyladenine (BA) exhibited varied morphogenic responses. Among the tested concentrations, BA (2.5 μM) was found to be the most effective, yielding a 90% shoot regeneration rate and the initiation of shoot buds within 20 days. The study also found that shoot length and growth were slow, with an average of seven shoots per explant and mean shoot length of 2 cm after six weeks.
Higher or lower concentrations of BA resulted in reduced regeneration efficiency. Auxin (IAA) at lower concentrations supported bud initiation but was less effective compared to BA. The addition of GA_3 in combination with BA significantly enhanced shoot regeneration and elongation. The combination of BA (2.5 μM) with GA_3 (0.5 μM) produced the best response, yielding up to nine shoots per explant with a mean shoot length of 3.5 cm.

These findings demonstrate that BA plays a key role in axillary shoot initiation, while GA_3 synergistically improves shoot elongation and proliferation efficiency. The optimized combination of BA (2.5 μM) + GA_3 (0.5 μM) provides a reproducible and efficient protocol for micropropagation of *Citrus limon*. This protocol can be effectively utilized for large-scale clonal propagation, conservation, and future genetic improvement programs in lemon.

IMPACT OF NICKEL CONTAMINATION ON GERMINATION, GROWTH, AND PHYSIOLOGY OF *LENS CULINARIS* L. (LENTIL)

Prof. Preeti Singh and Aradhana Pandey
Department of Botany
S.S. Khanna Girls' P.G. College, Prayagraj, Uttar Pradesh, India.

Abstract

Lens culinaris (lentil), a vital leguminous crop, is increasingly threatened by heavy metal contamination in agricultural soils. While certain metals like nickel (Ni) are essential micronutrients in small amounts, their elevated levels—primarily from industrial and agricultural activities—pose a significant phytotoxic risk. This study examined the dose-dependent effects of heavy metal exposure on lentil plants by treating them with varying concentrations of metals such as Ni and lead (Pb). The study evaluated a range of physiological and biochemical markers, including seed germination, root and shoot growth, biomass accumulation, total protein content, and photosynthetic pigment concentrations, to assess the impact of heavy metal exposure on plant performance. The results revealed a distinct dual response to heavy metal exposure. At low concentrations (10-5 mM), the plants showed a beneficial or non-inhibitory effect, with a slight increase in early growth and pigment levels compared to the control. However, at higher concentrations (10-2 and 10-1 mM), the metals proved to be highly toxic. These elevated levels caused substantial growth inhibition, reduced biomass, delayed germination, and a sharp decline in both pigment and protein content, indicating severe cellular damage.

In conclusion, our findings underscore the critical dose-dependent nature of heavy metal toxicity in *Lens culinaris*. There is a narrow threshold between a metal's beneficial and toxic effects, emphasizing the urgent need for stringent regulation of heavy metal levels in agricultural soils to safeguard crop productivity and ensure food quality.

Keywords *: Lens culinaris, Heavy metal, photosynthetic pigments and protein contents.*

FROM WASTE TO WRAPPER: DEVELOPING *AEGLE MARMELOS* FRUITS SHELL-DERIVED MICRO-FIBRILLATED CELLULOSE BIOFILM FOR ECO-FRIENDLY PACKAGING

Prince Kumar Sonu[1], Umesh Kumar*[1], Vidyullatha Peddireddy*[1]
[1]Department of Nutrition Biology, School of Interdisciplinary & Applied Sciences, Central University of Haryana, Jant-Pali, Mahendragarh, Haryana 12031, India

Abstract

The increasing global interest in sustainable packaging has spurred the exploration of biodegradable materials sourced from nature. Among these, micro-fibrillated cellulose, known for its renewability and biodegradability, is being considered for food packaging uses. This research focuses on using micro fibrillated cellulose, extracted from waste shells of *Aegle marmelos* (bael), as a component in composite films designed for food packaging. The study primarily explores how cellulose, chitosan, and gum interact within these composite films using molecular bonding techniques. Films were crafted through the solvent casting method with varying concentrations of cellulose from *Aegle marmelos* shells (CAM) to observe their effects on the films' surface properties. Various analytical methods, such as FT-IR spectroscopy, XRD analysis, and FE-SEM imaging, are employed to analyze the structural and physical properties of the films. In addition, the study evaluates the ' antioxidant abilities of the films to determine their ability to maintain food quality. This research aims to advance eco-friendly packaging solutions by investigating how agricultural waste products can be applied to create functional and sustainable food packaging.

CYTOGENETIC STUDY OF FRESHWATER PRAWN, *MACROBRACHIUM LAMARREI* FROM JAMMU AND KASHMIR

Raman Jasrotia*, Pallavi Shrikhandia and Meenakshi Bandral
Cluster University of Jammu, Jammu and Kashmir, India

Abstract

Macrobrachium lamarrei is one of the important shellfish found in the stream ecosystems of Jammu region. In the present study, karyotypic characteristics of *Macrobrachium lamarrei* has been worked out by conventional Giemsa staining and chromosomal banding techniques. The diploid number 2n was found to be 118. The karyotypic formula deduced to be 2n=44m+18sm+32st+24t. Ag-NOR banding was also attempted which produced characteristic NOR patterns. Different meiotic stages observed were leptotene, zygotene, pachytene, diplotene and diakinesis. This was the first report of chromosomal banding in *Macrobrachium lamarrei* from India.

***Keywords**: Shellfish, karyotype, chromosomal banding, meiosis, Jammu*

THE RELATIONSHIPS BETWEEN FISH LENGTH AND OTOLITH SIZE OF THE STRIPED SNAKEHEAD, *CHANNA STRIATA* (BLOCH, 1793), COLLECTED FROM THE RIVER GANGA AND ITS TWO TRIBUTARIES IN INDIA

Salman Khan[1], Laith A. Jawad[2]
[1] Department of Zoology, School of, Life Science and Technology, IIMT University, Meerut, Uttar Pradesh, India
[2] School of Environmental and Animal Sciences, Unitec Institute of Technology, Auckland, New Zealand

Abstract

The relationship between the total length of fish and the morphometric characteristics of their otoliths (length, width, and weight) was examined in striped snakehead (*Channa striata*, Bloch, 1793) specimens collected from the River Ganga and its two tributaries in India. *Channa striata*, a commercially valuable species in India, was the focus of this study, which aimed to analyse the statistical correlations between the fish's total and standard lengths and their corresponding otolith measurements, with the expectation that the data will contribute to future research on the species' biology, particularly its age, and growth patterns. Both linear and non-linear regression models were applied, and the regression equations varied significantly between the three collection sites. These findings represent the first investigation into the relationship between otolith morphology and total fish length for striped snakehead from the River Ganga and its tributaries in India.

Keywords: *Channidae, fish length, linear regression, morphometrics, non-linear regression, otolith, size*

GENETIC AND BIOCHEMICAL CHARACTERIZATION OF HIGH-YIELDING M_3 MUTANTS OF *LINUM USITATISSIMUM* L. USING SCOT MARKERS AND GC-MS ANALYSIS

Nidhi Sharma[1],*, Sana Choudhary[1], Nazarul Hasan[1], Neha Naaz[1], Parul Verma[1]
[1] Cytogenetics and Plant Breeding Lab, Department of Botany
Aligarh Muslim University, Aligarh, Uttar Pradesh, India (202002)

Abstract

Linum usitatissimum L. (flax) is a valuable oilseed crop, and enhancing its yield and nutritional quality through induced mutagenesis and genetic analysis is crucial for crop improvement. In this study, M_0 seeds were treated with caffeine, sodium azide, lead nitrate, and cadmium nitrate to induce mutations. The M_1 generation was grown, and seeds were collected to raise the M_2 population. Based on yield and phenotypic traits, 25 high-yielding M_2 mutants were selected and advanced to the M_3 generation, from which 10 high-performing mutants were evaluated further. Agronomic, physiological, genetic, and biochemical traits were assessed in the M_3 lines alongside the control. Significant improvements were observed, with an inverse relationship between oil and protein content across most mutants. The highest oil content was in Mutant B2 (45.62%), protein in B1 (24.32%), and iron in H2 (14.68 mg g^{-1}). Mutant B2 also showed the highest chlorophyll (1.95 mg g^{-1}) and carotenoids (1.11 mg g^{-1}), while proline was highest in M2 (21.32 µg g^{-1}). Genetic diversity analysis using SCoT markers yielded 79 bands with 16% average polymorphism. The highest polymorphism was found in SCoT19 (31.00%) and SCoT17 (30.00%), with Jaccard's similarity coefficients ranging from 0.883 to 1.000. GC-MS profiling of methanolic seed extracts revealed key bioactive compounds, including palmitic, stearic, oleic, and linoleic acids, γ-tocopherol, stigmasterol, and β-sitosterol. Mutants A, B2, and G had the richest phytochemical profiles. This study highlights the agronomic and genetic potential of high-yielding flax mutants for developing improved cultivars with better yield, nutrition, and stress resilience.

***Keywords**: Linum usitatissimum; Mutagenesis; High-yielding mutants; SCoT markers; Genetic variability; GC-MS analysis*

GREENLY SYNTHESIZED SILICON NANOPARTICLE MITIGATES THE ADVERSE EFFECT OF CADMIUM ON PHYSIOLOGICAL AND ESSENTIAL OIL PRODUCTION IN (*MENTHA ARVENSIS* L) AND (*MENTHA PIPERITA* L).

HARISH, SHAHLA FAIZAN
Department of Botany, Faculty of Life Sciences, Aligarh Muslim University, Aligarh, India
E-mail address: Sashawat09@gmail.com

Abstract

The present study aimed to explore the effect of green synthesized Silicon nanoparticles to mitigate the deleterious effect of various concentrations (80 and 100 mg kg^{-1}) of Cadmium (Cd) on two species of Mentha; (*Mentha arvensis* L and *Mentha piperita* L.) with regard to these growth and productivity. The uses of foliar application of silicon NPs enhance the physiology and biochemical traits, in (*Mentha arvensis* L) and (*Mentha piperita* L). The foliar application of Si NPs at 160 mg L^{-1} ameliorates the essential oil content by 20.49% and 26.23% at 80 mg kg^{-1} and 17.37% and 19.87% at 100 mg kg^{-1} of Cadmium in (*Mentha arvensis* L) and (*Mentha piperita* L) respectively . Therefore, the Si NPs foliar application is effective tools in mitigate the deleterious effect of Cadmium at 80 mg kg^{-1} and 100 mg kg^{-1} in Mentha crop.

Keywords*: Mentha arvensis, Mentha piperita, cadmium, Silicon Nanoparticle Antioxidant activity, Essential oil content.*

TRACING ADAPTATION IN FLOWING WATERS: HAEMATO-BIOCHEMICAL PERSPECTIVES ON SONG RIVER FISHES

Renu Rawat[1], Veena Maurya[2], and J.V.S Rauthan[3]
[1, 2] Department of Zoology, SGRR University, Dehradun
[3] Department of Zoology, DAV (PG) College, Dehradun

Abstract

Flowing through the Doon Valley, the Song River sustains a delicate network of life, where each species plays a role in maintaining ecological balance. Among these, native freshwater fishes are not only indicators of aquatic health but also adaptive survivors in a changing environment. This study examines how blood chemistry reflects the ecological strategies of three such species—*Xenentodon cancila, Barilius bendelisis*, and *Garra gotyla gotyla*—linking physiological traits to feeding habits and habitat conditions. Sampling across multiple sites provided specimens for laboratory assessment of haemoglobin concentration, erythrocyte and leukocyte counts, packed cell volume, mean corpuscular haemoglobin, and haematocrit levels. Findings revealed distinct adaptive patterns: *Xenentodon cancila* recorded the highest haemoglobin percentage and erythrocyte count, suggesting greater oxygen-carrying capacity, while *Garra gotyla gotyla* showed elevated leukocyte counts, indicative of heightened immune readiness.

By interpreting blood as a biological record of environmental adaptation, this research underscores the role of haemato-biochemical studies in freshwater conservation. The insights gained here not only deepen our understanding of fish ecology but also guide sustainable management of riverine ecosystems facing growing anthropogenic and climatic pressures.

***Keywords**: Freshwater fish adaptation, haemato-biochemical analysis, Song River biodiversity, ecological monitoring, conservation physiology.*

FISH DIVERSITY OF INDIA WITH REFERENCE TO UTTAR PRADESH

Dr. Rustam Ali (Assistant Professor, Department of Zoology)
Dr. Shyama Prasad Mukherjee Govt. Degree College, Bhadohi (U.P.)
Email: rustamali670@gmail.com

Abstract

India is one of the mega diverse countries in the world enriched with varied taxonomic, genetic and ecosystem diversity. It is endowed with different riverine system; with tributaries, streams, canals, lakes, ponds, and reservoirs etc. that are rich in fish. In India, 3523 fish species belonging to 1097 genera and 272 families of 55 orders are recorded. Uttar Pradesh (UP), located in the fertile Indo-Gangetic plains, contributes significantly to this diversity due to its extensive network of rivers, lakes, and reservoirs The state of Uttar Pradesh, lying in the heart of the Ganga River basin, has a pivotal role in conserving freshwater fish biodiversity. Uttar Pradesh is enriched by a complex network of freshwater ecosystem: Rivers Ganga, Yamuna, Gomti, Ghaghra, Rapti etc. distributaries. Lakes and reservoirs: Ramgarh Tal, Belha reservoir, Matatila dam etc. Canals and ponds are widely used in aquaculture and fisheries. Uttar Pradesh (UP) is one of the most populated state and blessed with vast potential of aquatic bio-resources that exhibit rich genetic and vivid freshwater fish diversity. UP contributes nearly 14.68% of Indian fish biodiversity and offers considerable scope for inland fisheries development and aquaculture (Lakra 2010). Presently, UPFBase provides taxonomy, synonyms, local name, common name, morphology, biology, distribution, habitat, economic importance, conservation status and other fishery information on 129 fishes belonging to 11 orders and 27 families.

Keywords*: Fish Diversity, India, Uttar Pradesh*

HOW CLIMATE CHANGE IS TRANSFORMING SPECIES AND ECOSYSTEMS

Asha Poonia, Ph.D.
Assistant Professor, Faculty of Life Sciences
Chaudhary Bansi Lal University, Bhiwani

Abstract

Climate change is emerging as one of the most pervasive drivers of biodiversity loss, altering species physiology, phenology, distribution, and interactions at unprecedented rates. Rising global temperatures, shifting precipitation regimes, increased frequency of extreme weather events, and ocean acidification are disrupting ecological niches and reshaping community structures. Many species are responding through range shifts towards higher latitudes and elevations, altered migratory routes, and changes in reproductive timing, often leading to phenological mismatches with food availability or pollinator activity. Thermal stress and habitat degradation are intensifying mortality risks, particularly for stenothermal species with limited adaptive capacity. At the same time, climate-induced changes are facilitating biological invasions, disease spread, and hybridization, further threatening native populations. These shifts have profound implications for ecosystem functioning, food web stability, and the provision of ecosystem services. Understanding the multifaceted impacts of climate change on species requires integrating long-term ecological monitoring with predictive modelling to inform adaptive conservation strategies. Urgent policy interventions and climate-resilient management frameworks are essential to mitigate biodiversity loss and ensure the persistence of species under rapidly changing environmental conditions.

Keywords*: Climate change, biodiversity, phenology, range shifts, species adaptation, ecosystem functioning*

QUALITY OF CONSUMABLE WATER FOR HUMAN BEINGS IN SAMBHAL DISTRICT

Punkaj Kumar
Department of Industrial Microbiology
S.M. College, Chandausi, Uttar Pradesh

Abstract

The quality of consumable water is essential for human health and is determined by various physical, chemical and biological parameters. Water must meet specific standards to be considered safe and acceptable for human consumption. Some chemicals are responsible for large-scale health effects through drinking-water exposure (e.g. arsenic, fluoride, lead, nitrate, selenium and uranium) and some microorganisms mainly -*E. coli*, *Pseudomonas aeruginosa* and *Salmonella typhi*. The Ideal Qualities for Drinking Water is Clear, colorless, and odorless, pleasant taste free from pathogens and harmful chemicals safe for long-term consumption, low in TDS (Total Dissolved Solids) and toxic metals. On the basis of Recommended Standards as World Health Organization (WHO), United States Environmental Protection Agency (EPA), Bureau of Indian Standards (BIS: 10500), European Union Drinking Water Directive etc. we want to analyses the qualitative and quantitative analysis of drinking water in 30 villages of Sambhal was "heavily contaminated." Villages such as Sharifpur, Sharifabad, and Kurkawali were specifically mentioned. The UP government to urgently provide clean drinking water to these affected villages. It also directed that no hand-pump discharging contaminated water should be used, and called for a comprehensive supply plan. After a petition claimed the water was yellow-colored, contaminated and causing illness in children, farmers and the elderly.

The Jal Shakti Abhiyan program under local authorities measure including rainwater harvesting, rejuvenating traditional ponds, and groundwater recharging in such areas like Bahjoi, Pawasa, Baniakhera, etc. These efforts were aimed at improving water sustainability.

Keywords: *E.coli, Pseudomonas aeruginosa, Salmonella typhi in microbiology and arsenic, fluoride, lead, nitrate, selenium , uranium in chemistry*.

EFFECT OF SEED BORN FUNGI ON THE GERMINATING SEEDS OF MAIZE VAR. R-9902 AND THEIR CONTROL

Shveta Malhotra
Department of Botany, Gandhi Faiz-e-Aam College, Shahjahanpur.U.P.

Abstract

An experiment was conducted on maize variety R-9902 to study the effect of seed born fungi on seed germination and also check the efficacy of fungicides (thiram and bavistin) in controlling seedborne fungal diseases of maize (*Zea mays*). In laboratory experiment, the seeds of maize were tested by blotter method. The 7 genera of fungi were identified viz *Aspergillus*, *Alternaria*, *Curvularia*, *Fusarium*, *Mucor*, *Penicillum* and *Rhizopus*. In which *Aspergillus* and *Fusarium* were most prominent. When the seeds were treated with fungicides Thiram and Bavistin to control the seed-borne pathogens the effective results were recorded. Both the fungicides proved to be more effective and inhanced seed germination besides this no fungi were obtained after the treatment with both fungicides. Thiram prove to be more effective in comparision to bevistin.

UNDERSTANDING PLANT STRESS PHYSIOLOGY: MECHANISMS, ADAPTATIONS, AND APPLICATIONS

Dr. Rajeev Kumar Yadav[1], Nisha Verma[2], Shikha Yadav[3]
[1,2]Department of Botany, Bareilly College, Bareilly, Uttar Pradesh, India
[3]Department of Botany, V.R.A.L. Rajkiya Mahila Mahavidhyalaya, Bareilly, Uttar Pradesh, India
Email: rajeevbotany@rediffmail.com

Abstract

Plants are continually exposed to various environmental stresses that impact their growth, productivity, and survival. Stress physiology explores the complex responses of plants to abiotic (drought, salinity, temperature extremes) and biotic (pathogen attack, herbivory) stressors. This paper highlights the molecular, physiological, and biochemical mechanisms underlying stress perception, signalling, and tolerance in plants. Emphasis is placed on the role of phytohormones, reactive oxygen species (ROS), stress proteins, and antioxidant defence systems. The integration of omics approaches and genetic engineering is also discussed as a means to enhance stress tolerance. Understanding these physiological adaptations is essential for developing stress-resilient crops in the face of climate change and food insecurity.

Keywords*: Plant stress, abiotic stress, stress signalling, ROS, phytohormones, plant defence, climate resilience*

ENDOMETRIOSIS AND ITS CONSEQUENCES

Prem Chand, Ajay Kumar
Department of Zoology
Tilak Dhari Post Graduate College, Jaunpur 222002
Affiliated to Veer Bahadur Purvanchal University, Jaunpur
Email- *premcpatel@gmail.com*

Abstract

Endometriosis is a chronic, often debilitating gynecological condition characterized by the presence of endometrial-like tissue outside the uterine cavity, commonly affecting the ovaries, fallopian tubes, and pelvic peritoneum. This ectopic tissue responds to hormonal cycles, leading to inflammation, scarring, and the formation of adhesions. The condition affects approximately 10% of reproductive-aged women globally and is a leading cause of pelvic pain, dysmenorrhea, dyspareunia, and infertility. The consequences of endometriosis extend beyond physical symptoms, often resulting in psychological distress, reduced quality of life, and socioeconomic burden due to missed work and decreased productivity. Despite its prevalence, diagnosis is frequently delayed due to nonspecific symptoms and the need for invasive procedures such as laparoscopy. Current treatments include hormonal therapies and surgical interventions, but recurrence is common, and a definitive cure remains elusive. Advancing research into the pathophysiology, early detection, and individualized treatment strategies is essential to improve outcomes for those affected.

Keywords*: dysmenorrhea, dyspareunia, ovaries, fallopian tubes, pelvic peritoneum*

ASSOCIATION BETWEEN NON-ALCOHOLIC FATTY LIVER DISEASE AND VITAMIN D LEVELS: A CLINICAL PERSPECTIVE

Isha Patel, Suchit Swaroop*
Department of Zoology, University of Lucknow, Lucknow, 226007

Abstract

Non-Alcoholic Fatty Liver Disease (NAFLD) has emerged as the most common chronic liver disorder worldwide, closely linked with obesity, insulin resistance, type 2 diabetes, and cardiovascular disease. Despite its rising prevalence, the molecular and metabolic mechanisms contributing to NAFLD progression remain incompletely understood. Among the nutritional and endocrine factors implicated, vitamin D has gained attention due to its diverse roles in metabolic regulation, inflammation, and hepatic function. Vitamin D deficiency is widely reported in NAFLD patients and is suggested to contribute to disease initiation and progression. Low vitamin D levels are associated with increased hepatic steatosis, fibrosis, and heightened pro-inflammatory cytokine activity. The active form of vitamin D interacts with the vitamin D receptor (VDR), which regulates lipid metabolism, glucose homeostasis, and immune response in hepatocytes. Furthermore, inadequate vitamin D may exacerbate insulin resistance, oxidative stress, and systemic inflammation, thereby accelerating NAFLD pathogenesis. Clinical and epidemiological studies have demonstrated an inverse relationship between serum vitamin D levels and severity of NAFLD, although the causal link remains debated. Interventional trials suggest that vitamin D supplementation may improve insulin sensitivity and liver function, but results remain inconsistent due to variations in dosage, study populations, and diagnostic criteria. Given the increasing global burden of NAFLD, further research is essential to clarify the mechanistic pathways linking vitamin D deficiency to hepatic injury and to determine the therapeutic potential of vitamin D supplementation in disease management. This association highlights vitamin D as a promising biomarker and adjunct in NAFLD prevention and treatment strategies.

***Keywords**: Non-Alcoholic Fatty Liver Disease (NAFLD), Vitamin D Deficiency, Hepatic Steatosis, Insulin Resistance*

ENVIRONMENTAL BIOLOGY, GLOBAL POLLUTION PROBLEMS

Km Tannoo Pandey
Kashi Naresh Govt. P.G College, Gyanpur, Bhadohi
Email Id - sp3566307@gmail.com

Abstract

Environmental biology is the study of interaction between living organisms and their surroundings, focusing on the balance that sustains life on Earth. One of the most pressing issues affection this balance today is the rapid growth of the global population. With more than eight billion people currently inhabiting the planet, the pressure on natural resources, ecosystems, and biodiversity has reached unprecedented levels. Population growth directly influences environmental challenges such as deforestation, climate change, soil degradation, water scarcity, and the loss of species. The increasing demand for food, energy, and shelter accelerates the exploitation of resources, open beyond the Earth's capacity to regenerate them. From an environmental biology perspective, unchecked population growth disrupts ecological equilibrium and contributes to pollution, greenhouse gas emissions, and habitat destruction. These consequences not only threaten the stability of ecosystems but also endanger human health and survival. Furthermore, unequal population distribution, particularly high densities in developing countries, intensifies poverty, urban overcrowding, and inadequate sanitation, amplifying environmental stress. Sustainable solutions require integrating population control measures with education, renewable energy adoption, and conservation strategies. Raising awareness about family planning, empowering women, and promoting sustainable lifestyles can reduce the pressure on ecosystems.

The most important message is that pollution itself is not the real problem; the real problem is our inability to control it. With such a large global population, the existence of pollution is natural and perhaps unavoidable. However, it is essential for people to understand that its control lies in our own hands. For example, deforestation is one of the major causes of pollution and environmental imbalance. Cutting down trees to meet human needs is not, in itself, the problem. The real issue is that we are not replacing the trees we remove, nor are we making adequate efforts to restore nature. In other words, the lack of responsibility and action in maintaining ecological balance is what turns a basic human necessity into an environmental crisis.

ROLE OF BIOINFORMATICS IN BIOLOGICAL SCIENCES

Dr. Manisha Tripathi
Department of Zoology, S. P. M. Govt. Degree College, University of Allahabad, Prayagraj -211013, India.

Abstract

Bioinformatics is defined as the application of computational and analytical tools to acquire and interpret the biological data. Biological data basically includes nucleic acids (DNA/RNA) and protein sequences. Bioinformatics is basically based on tools and algorithms to tackle biological problems. In recent decades technological advances in the field of biological sciences have led to the generation of large amount of biological data. Bioinformatics plays an important role in managing, processing and extracting meaningful information from massive databases generated by genomics, transcriptomics and proteomics. It also contributes significantly to the upcoming fields like nutrigenomics, cheminformatics, molecular phylogenetics and system biology which have progressed due to the integration of information technology, mathematics, chemistry and omic sciences. Specifically, bioinformatics tools are used for development of biological databases, genome analysis, 3D structure prediction, drug discovery, clinical applications and mathematical modelling of metabolic processes. Bioinformatics has become a crucial part of modern biological sciences driving advancement in various fields and offering powerful tools for understanding the complexities of life. As technology continues to evolve, bioinformatics will undoubtedly play a significant role in addressing global health challenges, including agricultural practices and understanding of the biological world.

ISOLATION AND CHARACTERIZATION OF *BACILLUS SUBTILIS* AS A PLANT GROWTH PROMOTING RHIZOBACTERIA (PGPR) FOR SUSTAINABLE AGRICULTURE

Pinakin Dhandhukia[1*], Hency Patel[1], Janki Thakker[2]
[1] Department of Microbiology, School of Science and Technology, Vanita Vishram Women's University, Athwagate, Surat- 395001, Gujarat, India
[2] Department of Biological Sciences, P. D. Patel Institute of Applied Sciences, Charotar University of Science and Technology, CHARUSAT Campus, Changa, Anand, Gujarat 388421, India.
* Presenting and Corresponding author: pinakin.dhandhukia@vvwusurat.ac.in

Abstract

The overuse of chemical fertilizers and pesticides leads to adverse environmental effects and soil degradation. Plant Growth Promoting Rhizobacteria (PGPR) offer a sustainable alternative. This study isolated and characterized a potent PGPR from the rhizospheric soil of the Gulf of Khambhat, Gujarat. From twelve initial isolates, *Bacillus subtilis* HP 1 emerged as the most promising candidate due to its multifunctional traits.

The isolate was screened and found to produce indole-3-acetic acid (IAA) (8.0µg/ml) and effectively solubilize phosphate (53µg/ml), potassium, and zinc. These traits increase nutrient availability for plants. It also demonstrated nitrogen-fixing capabilities, a crucial function for reducing the need for synthetic nitrogen. The isolate did not produce ammonia or hydrogen cyanide (HCN).

Pot trials were conducted with chickpea (*Cicer arietinum*) to assess its in vivo efficacy. Seeds treated with the *Bacillus subtilis* HP 1 bioformulation showed improved vegetative parameters, including increased root and shoot lengths and a greater number of leaves compared to untreated controls. These results confirm the effectiveness of *Bacillus subtilis* HP 1 in promoting plant growth through its multiple beneficial mechanisms.

In conclusion, the isolated *Bacillus subtilis* HP 1 strain is a strong candidate for a biofertilizer. Its combined abilities to produce IAA, solubilize nutrients, and fix nitrogen offer a viable, eco-friendly alternative to chemical inputs, contributing to improved crop yield, soil health, and environmental sustainability. Further research is needed to conduct field trials and develop a commercial formulation.

HEAVY METALS POLLUTION IN THE HOLY RIVER GANGA

Kaish Miyan[1]*, Dr. Naresh Kumar[1] and Dr. Neha Nagpal[1]
[1]Department of Zoology, Govt. Raza P.G. College, Rampur 244901, India
*Presenting Author: E-mail: kaishmiyan@gmail.com

Abstract

The current review focuses on heavy metal pollution in the sacred river Ganga. The Ganga river water is a source of life, yet water contamination is a big threat in modern India. A variety of heavy metals, some of which are potentially harmful, are moved to the surrounding water environment via several paths. Water quality has become a serious concern as a result of increased industrial development, urbanization, E-Waste, wastewater irrigation, and sewage. Municipal and industrial waste water are regarded as important sources of pollution in the river Ganga. Heavy metals like Pb, Cd, Cr, and As etc. are toxic elements. The Government of India has initiated a variety of measures, however the state of the water remains inadequate. When compared to national and international organizations such as WHO and USEPA, the amounts detected were higher than the maximum permissible and recommended limit. Heavy metal exposure has been related to chronic and acute toxicity, including retardation, neurotoxicity, kidney damage, different malignancies, liver damage, lung damage, and weak bones, as well as mortality in extreme cases. This review paper summarizes all of the findings of the several researchers.

Keywords*: Heavy metal, E-waste, urbanization, Ganga river, India*

ASSESSMENT OF INDIAN MUSTARD (*BRASSICA JUNCEA* L.) IN THE PRESENCE OF SILICON APPLIED THROUGH SOIL.

Shakeeb Ahmad*, Bushra Rehman, and Shamsul Hayat
Department of Botany, Aligarh Muslim University, Aligarh 202002, India

Abstract

Silicon (Si), though not classified as an essential nutrient for higher plants, but also recognized for its role in promoting growth, enhancing physiological functions, and improving stress resilience. The present study evaluated the effect of soil-applied silicon (0.2–1.6 mM) on different varieties of Indian mustard (*Brassica juncea* L.). Silicon was applied as sodium metasilicate ($Na_2Si_2O_3$). The data were recorded at 30 days after sowing (DAS) to assess the growth parameters, SPAD value, photosynthetic parameters, antioxidant enzymes and proline content. Among the tested concentrations, 0.8 mM Si proved best and increased most of the measured parameters. Among the varieties, T-59 responded most strongly, showing superior growth and physiological performance compared with the other varieties, whereas Chapka Rohini showed minimal improvement. It can be concluded from the present observation that the response of varieties differ to the concentration of Si due to the genetic makeup of the varieties.

HEAVY METAL TOXICITY IN GOMTI RIVER WATER AND ITS EFFECTS ON *SOLANUM LYCOPERSICUM* L.

Dr. Kanchan Awasthi
Maharishi School of Science
Email: kanchanawasthi1702@gmail.com

Abstract

In developing countries like India, the global process of industrialisation has many benefits but with the black spot of innumerable hazards too. In this, the problem that comes out as one of the major issues and persists for long periods of time is Toxicity in the River system which in turn affects the environment, ecology and even farming in several ways.

Thus, this study aims to observe how the current status of toxicity level in the Gomti river system effects plants, mainly related to farming. This experimental research on "Heavy Metal Toxicity in Gomti river water and its effects on *Solanum lycopersicum* L." determines to identify the effects of the toxicity in the river water to the nearby farms and crops, as the Indian farming is heavily based on irrigation from river water. This experiment analyses different concentrations of the Gomti river and finds whether it is completely harmful or some amount of the metal presence helps the plant growth.

To find answers to developing questions, this work analysed the effects on the plants of *Solanum lycopersicum* using self-based local equipment and earlier proved methodologies in various research works done on the same theme. The seasonal plant has been used to reach to conclusions in stipulated duration of time with minimal scientific equipment and depending more upon natural methodologies.

The results mainly showed that the 40% concentration of the Gomti river water is beneficial for the all-round development of the plant. This work reached to many more conclusions which will be further discussed. These results suggest that some amount of the metal presence is beneficial for the fields especially near the Gomti river system whereas increased level causes the same to be harmful. On this basis, the irrigation of the farming fields should be based and farmers should be made aware of such facts.

Keywords*: Metal toxicity, Gomti river water, Plants, Solanum lycopersicum, Industrialisation effects, Growth, Harmful*

THE STUDY OF DIVERSITY, GEOGRAPHIC DISTRIBUTION, AND MUTUALISTIC INTERACTIONS BETWEEN *COLOCASIOMYIA* FLIES AND AROID PLANTS IN THE UTTARAKHAND HIMALAYAS

Sanjay Singh[1], R. S. Fartyal[1], and Anant Kumar[2]
[1]Fly lab, Department of Zoology, H.N.B. Garhwal Central University, Chauras campus, Srinagar Garhwal, 246174, Uttarakhand
[2]Department of Botany and Microbiology, H.N.B. Garhwal Central University, Chauras campus, Srinagar Garhwal, 246174, Uttarakhand

Abstract

The Uttarakhand Himalayas, part of a globally recognized biodiversity hotspot, harbor a rich array of ecological interactions, particularly between insects and plants. This study examines the diversity, geographic distribution, and mutualistic relationships between *Colocasiomyia* flies (Diptera: Drosophilidae) and their host aroid plants (Araceae) across a range of elevations and habitats in the region. Field surveys were conducted across multiple sites spanning elevations from 500 m to 2500 m, employing standardized trapping, the use of an aspirator, and direct observation methods. Species were identified through a morphological analysis. Results indicate a high diversity of *Colocasiomyia* species, many exhibiting strong host specificity and clear altitudinal preferences. Behavioral studies and pollination trials confirmed mutualistic associations, where the flies not only utilize aroid inflorescences for breeding but also function as key pollinators. Biogeographic patterns revealed distinct species assemblages influenced by climatic gradients and vegetation zones. These findings underscore the ecological and evolutionary significance of insect–plant mutualisms in montane ecosystems and provide a foundation for further studies on co-evolution, conservation, and the potential impacts of climate change on these finely tuned relationships.

Keywords*: Colocasiomyia, Mutualism, Host aroid, Pollination, Interaction*

INTEGRATED ECO-FRIENDLY STRATEGIES FOR THE MANAGEMENT OF *MELOIDOGYNE INCOGNITA* IN TOMATO (*SOLANUM LYCOPERSICUM* L.) CULTIVATION

Andleeb Anjum, Moh Sajid Ansari, Abrar Ahmad Khan.
Plant Pathology, Department of Botany, Aligarh Muslim University, Aligarh, 202002, U.P., India
Email: gm2540@myamu.ac.in

Abstract

Root-knot nematodes (*Meloidogyne* spp.) are globally recognized as one of the most destructive plant-parasitic nematodes, causing substantial economic losses in numerous horticultural and field crops. In tomato (*Solanum lycopersicum*), infestations result in severe root galling, stunted growth, and significant yield reductions. This study aimed to develop an eco-friendly, integrated management strategy to suppress root-knot nematodes while promoting plant growth and soil health. A field experiment was conducted over one growing season using four treatments: neem leaves (50 g and 100 g), mustard cake (50 g and 100 g), fly ash (10% and 20%), and *Trichoderma viride* (1 g and 2 g). Nematode population density in soil and roots, root galling index, plant growth parameters, and fruit yield were recorded. Results revealed that all treatments significantly reduced nematode populations and gall formation compared to the untreated control. The most pronounced suppression was achieved with T. viride (2 g) and neem leaves (100 g), which also delivered the highest improvements in plant height, biomass, and yield. Mustard cake and fly ash provided moderate but consistent nematode control and contributed to enhanced soil fertility. This study highlights the potential of combining biological control agents and organic amendments for sustainable nematode management in tomato cultivation. The approach minimizes dependence on synthetic nematicides, reduces environmental hazards, and supports long-term soil productivity. Adoption of such integrated strategies can be a practical solution for farmers seeking cost-effective and environmentally safe nematode control, aligning with modern principles of sustainable agriculture and green pest management.

***Keywords**: Root-knot nematodes, Solanum lycopersicum, Trichoderma viride, eco-friendly management, green pest management, sustainable agriculture*

PHYTOCHEMICAL PROFILE AND THERAPEUTIC APPLICATIONS OF *CYMBOPOGON CITRATUS* (LEMON GRASS)

Sakshi Verma, Ambrish Kumar, and Saroj Singh Chahar
Department of Botany, Raja Balwant Singh College, Agra, UP

Abstract

Cymbopogon citratus (lemon grass) is a widely recognized medicinal and aromatic plant valued for its rich phytochemical profile and diverse therapeutic potential. The plant contains a variety of bioactive constituents, including essential oils (notably citral, myrcene, and geraniol), flavonoids, tannins, phenolic compounds, and alkaloids, which collectively contribute to its pharmacological activities. Phytochemical investigations have revealed that these metabolites exhibit potent antimicrobial, antioxidant, anti-inflammatory, analgesic, antipyretic, and anticancer properties. In traditional medicine, *Cymbopogon citratus* has long been employed for the treatment of fever, digestive disorders, infections, and hypertension, while modern pharmacological studies further validate its broad-spectrum therapeutic applications. The essential oil, particularly citral, plays a pivotal role in its use as a natural preservative, insect repellent, and supportive agent in aromatherapy. This study emphasizes the importance of phytochemical analysis as a foundation for understanding the therapeutic efficacy of *Cymbopogon citratus*, highlighting its potential for the development of novel plant-based pharmaceuticals and functional products.

***Keywords**: Cymbopogon citratus, metabolites, phytochemicals, essential oil, and antioxidant.*

MEDICINAL HERBS AND DAILY HABITS FOR HORMONAL BALANCE IN LIFE: REVIEW

Vinita Ahirwar
Deparment of Zoology, Govt Model College, Pulwara, Lalitpur (UP) 284123

Abstract

Many herbs & plant constituents and its supplements are necessary for supporting our hormone balance and its metabolism. The ageing process is quite complex and can affect a variety of hormone which are important for physical performance, body composition, metabolic health and cognition (Mark *et al*, 2021). The most effective things you can do for hormone health are in the choices you make day to day life. One of most important is adequate hydration of the body, focus on always take healthy foods, maintain your healthy weight with exercises & movements, reduce stress, support quality sleep & gut health. Our endocrine system circulates hormones, which perform various functions throughout the day. If we see at our busy schedule, it is necessary that we first focus on our hormonal health. Other than it, this study also focusing on some herbal medicine having no side effects such as sulforaphane, chasteberry, saw palmetto, maca, black cohosh etc. Many herbs, nutrient and supplements can treat & resolve symptoms associated with hormonal imbalance. However, making dietary & lifestyle changes can help restore a healthy hormonal balance.

Keywords*: Hormonal balance, adequate hydration, sleep, reduce stress & herbal medicines.*

A SURVEY ON CACTI DIVERSITY IN PRAYAGRAJ DISTRICT, UTTAR PRADESH

Meenu[1], Shraddha Singh[2] & Shweta Shekhar[3*]
[1] M.Sc. Student, Department of Botany, University of Allahabad, Prayagraj-211001
[2] Research Scholar, Department of Botany, University of Allahabad, Prayagraj-211001
[3] Assistant Professor, Department of Botany, University of Allahabad, Prayagraj-211001

Abstract

The Cactaceae family belongs to the order Caryophyllales, consisting of 145 genera and approximately 1500 to 1800 species. This family exhibits a complex interplay of structural, anatomical, and functional traits that support their remarkable adaptation to harsh environments. Cacti show considerable diversity in growth forms, with adaptations that ensure survival in arid conditions. Although not native to India, many species are cultivated in gardens, nurseries, and institutional campuses for their low maintenance, drought resilience, and ornamental appeal. A field study was conducted in Prayagraj district to document the diversity, distribution, and cultivation status of the Cactaceae family. Online resources such as E-herbaria and virtual herbaria were also used for correct identification. A total of 28 genera and 45 species were documented, with *Mammillaria* and *Opuntia* being the dominant genera. The presence of species like *Opuntia microdasys*, *Mammillaria*, *Astrophytum*, and *Schlumbergera truncata* indicates a rising interest in drought-tolerant ornamental plants among garden enthusiasts.

Keywords*: Cactaceae family, Diversity, Survey, Prayagraj district*

DEVELOPMENT OF IN VITRO MICROPROPAGATION SYSTEM AND GENERATION OF VARIABILITY THROUGH IN VITRO MUTAGENESIS USING EMS IN *BACOPA MONNIERI* L.

Shaziya Siddiqui, Sabaha Tahseen, Anwar Shahzad*
Plant Biotechnology Section, Department of Botany, Aligarh Muslim University, Aligarh, Uttar Pradesh, 202002, India

Abstract

Bacopa monnieri (L.) Pennell, commonly known as "Brahmi", belonging to the family Scrophulariaceae, is a medicinal herb with global interest. It is mainly used for the treatment of neurological disorders as a nerve tonic, improves memory and mental functions. Traditional use of brahmi is widespread but one of its therapeutic benefits is tremendous ensuing mental enhancement within few hours or a few days depending on the dosage used by an individual. With increasing demand for *B. monnieri* in pharmaceutical industries, there has been over exploitation of native plants in various systems of Indian medicine and therefore these plants are on the verge of extinction. So, there is a need to enhance the stocks of this plant through biotechnological approaches. In the present study, a successful in vitro regeneration protocol along with in vitro mutagenesis has been developed for the generation of variability in *B. monnieri*. Leaf segment excised from in vitro regenerated plant cultured on optimized MS + mT (1.0 µM) along with different concentration of EMS (0.01% - 0.10%). Mutagenic treatments cause morphological and phytohemical variations among the cultures treated with different concentrations of EMS as compared to the control. These results may act as a preliminary finding for further biotechnological interventions for improvement of *B. monnieri*.

SECONDARY METABOLITES FROM SESAME SEED CAKE WITH BIOCONTROL AGENT: A SUSTAINABLE MANAGEMENT OF ROOT-KNOT NEMATODE, *MELOIDOGYNE JAVANICA*

Saba Fatima and Mansoor Ahmad Siddiqui
Department of Botany, Aligarh Muslim University, Aligarh, India (202002)
Email: ***fatimasaba8272*@gmail.com**

Abstract

One of the major pests of the vegetables is root-knot nematodes, which can cause significant crop losses worldwide. Using synthetic nematicides remarkably promotes environmental pollution; organic and biocontrol inputs are the best alternative to nematicides. The current study emphasizes the management of *Meloidogyne javanica* using sesame oil seed cake with the biocontrol agent *Serratia marciscens*. *In vitro* results conclude that the maximum mortality (97.3%) and the highest egg hatching inhibition (80.4%) of second-stage juveniles were found at $1.5*10^4$ CFU/ml concentration of *S. marciscens*, whereas sesame oil seed cake showed 86.0% mortality and 83.9% hatching inhibition at 100% concentration. Hence, sesame oil seed cake was used to identify the potential nematicidal compounds against *M. javanica.* In pots, the combined application of *S. marciscens* with sesame oil seed cake against *M. javanica* showed that all the treatments significantly reduced the nematode population to a varying extent and improved plant growth. The combined formula of *S. marciscens* and sesame cake can be used in sustainable nematode management due to their nematotoxic potency, this formula is not only eco-friendly but also keeps the *M. javanica* population below the economic threshold level.

Keywords: *Root-knot nematodes; LCMS; Secondary metabolites; Biocontrol agent; Sesame oil seed cake*

PLANT-BASED MILK ALTERNATIVES AND THEIR NUTRITIONAL ADEQUACY FOR LACTOSE-INTOLERANT POPULATIONS

Vikas Bharti[1], Dr. Suchit Swaroop[2]
Authors Affiliation:
[1,2] Experimental & Public Health Laboratory, Department of Zoology, University of Lucknow, Lucknow-226007, India, Email:

Abstract

Lactose intolerance is a common gastrointestinal disorder caused by reduced expression of lactase-phlorizin hydrolase in the small intestine. Inadequate hydrolysis of lactose results in colonic fermentation, producing hydrogen, methane, and short-chain fatty acids that trigger abdominal pain, bloating, and diarrhea. Avoidance of bovine milk, though effective in symptom management, restricts intake of high-quality protein, calcium, vitamin D, and riboflavin, necessitating nutritionally comparable alternatives.

Plant-based milk analogues—derived from soy, almond, oat, rice, and coconut—are increasingly adopted by lactose-intolerant populations. Soy milk provides protein content and amino acid composition similar to cow's milk, whereas nut- and cereal-based milks are generally lower in protein and micronutrients. Fortification with calcium, vitamin D, and vitamin B12 is widely practiced, but inconsistency in standards and limited bioavailability may compromise nutritional adequacy. Moreover, processing and added sugars raise concerns regarding metabolic health. Evidence suggests that fortified soy and oat formulations can adequately meet nutrient requirements when integrated into balanced diets. However, reliance on unfortified varieties increases risk of deficiencies, particularly of calcium and vitamin D, with implications for bone health. Nutritional counseling and regulatory guidelines ensuring standardized fortification are critical to optimize benefits.

In conclusion, plant-based milk alternatives represent effective dietary substitutes for lactose-intolerant individuals, but their adequacy is contingent upon formulation quality, fortification practices, and consumer awareness.

Keywords: *Lactose Maldigestion, lactase, Fortified products, Nutritional adequacy*

TRADITIONAL AND EMERGING RISK FACTORS OF CORONARY ARTERY DISEASE WITH A FOCUS ON OBSTRUCTIVE SLEEP APNEA

Shashwat Singh, Suchit Swaroop*
Department of Zoology, University of Lucknow, Lucknow, 226007
Email: ephlab19@gmail.com, singhshashwat94@gamil.com

Abstract

Coronary artery disease (CAD) remains a leading cause of mortality worldwide, responsible for nearly 18 million deaths annually. In India, CAD has become a pressing health concern with rising prevalence across both urban (7–13%) and rural (2–7%) populations, reflecting regional and socioeconomic disparities. Conventional risk factors including hypertension, diabetes mellitus, obesity, smoking, and dyslipidemia continue to drive disease progression, while regional differences are further shaped by genetics, culture, diet, and lifestyle. Factors such as air pollution, limited healthcare accessibility, and rapid urbanization compound the burden. Alongside these established risks, newer biochemical indicators—such as high-sensitivity C-reactive protein (hs-CRP), Lipoprotein(a), Glycated Hemoglobin (HbA1c), and homocysteine—are gaining importance. Elevated plasma homocysteine, often associated with MTHFR gene variants, is particularly recognized as an independent determinant in Indian populations. Obstructive Sleep Apnea (OSA), marked by intermittent hypoxia and systemic inflammation, is increasingly identified as an underappreciated contributor to CAD. The coexistence of OSA with traditional and novel biochemical factors highlights the multifaceted nature of CAD. Addressing this growing burden requires integrated strategies for prevention and management tailored to India's diverse population.

***Keywords**: Coronary Artery Disease, Obstructive Sleep Apnea, Risk Factors, Biochemical Markers, India*

MOLECULAR TAXONOMY: A MODERN APPROACH TO PLANT CLASSIFICATION

Mahim Fatima,
Department of Botany, Bareilly College, Bareilly

Abstract

Plant taxonomy is the branch of science concerned with the identification, naming, and classification of plants. Traditional taxonomy mainly based on morphological features, generally faced some shortcomings because of different environmental conditions. To overcome this modern taxonomy trends used advanced approaches such as numerical, cytological, chemotaxonomic and molecular techniques. Among these, molecular taxonomy has become the most powerful tool, as it uses DNA sequences like (rbcL and matK) for accurate identification. Molecular techniques such as DNA barcoding and molecular phylogenetics have greatly improved our understanding of plant diversity, conservation and authentication of medicinal plants. This presentation will discuss modern trends in plant taxonomy with a special focus on molecular approaches.

SOUND-BASED INTERVENTIONS IN DIABETES: THERAPEUTIC POTENTIAL OF MUSIC

Rohit Yadav and Kalpana Singh*
Department of Zoology, University of Lucknow, Lucknow (UP), India
*Email: biomusicology.india@gmail.com

Abstract

Diabetes mellitus is a long-term metabolic disorder marked by chronic hyperglycemia that continues to be a pressing public health issue with approximately 537 million people affected globally in 2021. Arising from deficiencies in insulin secretion or its action, the disease contributes to life-threatening complications such as cardiovascular disorders, kidney damage, and neuropathies while simultaneously exerting significant psychological and socioeconomic strain. Although modern medicine has advanced considerably, achieving optimal control of diabetes remains a challenge, highlighting the importance of innovative and supportive strategies. Music therapy is a clinically validated non-pharmacological intervention which has emerged as a valuable complement to conventional treatments. By influencing neuroendocrine function, decreasing stress, and promoting emotional resilience, music therapy offers potential benefits in stabilizing blood glucose levels and enhancing overall health. Its capacity to engage neural circuits and counteract stress-driven hormonal disturbances provides a holistic dimension to diabetes care. This chapter discusses the emerging role of music therapy in the management of diabetes with special attention to its impact on stress regulation, psychological well-being, and quality of life improvement.

VERMICOMPOST AS EMERGING ORGANIC NEMATICIDES AGAINST ROOT-KNOT DISEASE CAUSED BY *MELOIDOGYNE ARENARIA* VIA PROMOTING GROWTH, YIELD AND BIOCHEMICAL PERFORMANCE OF GROUNDNUT CROP

Sandeep Kumar Yadav*[1], Amir Khan[2] and Kamal Singh[1]
[1] Department of Botany, Dharam Samaj College (Affiliated to Raja Mahendra Pratap Singh University), Aligarh - 202001, Uttar Pradesh, India
[2] Plant Pathology and Nematology Section, Department of Botany, Aligarh Muslim University, Aligarh – 202002, Uttar Pradesh, India
*Corresponding author: Sandeep Kumar Yadav
Email id. – kumaryadav2701@gmail.com

Abstract

Root-knot nematode, *Meloidogyne arenaria* is one of the most damaging, soil endoparasite infecting almost all vegetables, including groundnut crop. Management strategies including the use of chemical nematicides against this pathogen are unsafe because of its negative impact on both soil and environment. The present study revealed the efficacy of vermicompost as emerging organic nematicides against *M. arenaria*. Pot study showed that the plants cultivated in vermicompost (at 10, 20, 30, 40 and 50% levels) amended soil significantly experienced the reduction in nematode disease in terms of number of galls, number of egg mass/root system, root-knot index and reproduction factor. Furthermore, vermicompost at 40% showed the maximum growth, yield, photosynthetic pigments (chlorophyll 'a', 'b' and carotenoids) and nitrate reductase activity (NR activity) of groundnut crop by reducing nematode disease. Moreover, an improvement in the number of stomata and stomatal pore size was also seen in vermicompost at 40% treated plants by scanning electron microscopy (SEM). These findings suggest the importance of vermicompost as an eco-friendly organic nematicide that effectively restricted the damaging impacts of *M. arenaria* on groundnut crop.

Keywords*: Meloidogyne arenaria, Vermicompost, Groundnut crop, Growth, Yield, Biochemical parameters, Scanning electron microscopy, Eco-friendly management*

BIOLOGICAL CONTROL OF *SCLEROTINIA SCLEROTIORUM* CAUSING STEM ROT DISEASE OF SUNFLOWER USING BACTERIAL ENDOPHYTES

Rajwinder Kaur*, Pratibha Vyas* and Sandeep Sharma
Department of Microbiology,
Department of Soil Science,
Punjab Agricultural University, Ludhiana, Punjab (India)

Abstract

The present study was conducted to screen antagonistic bacterial endophytes against *Sclerotinia sclerotiorum* causing stem rot disease in sunflower. Out of 42 endophytic bacterial isolates, four isolates exhibited antagonistic activity varying from 20.0 to 36.6% in dual plate assay and 35.4 to 92.0% in liquid media against *S. sclerotiorum*. The effect of bacterial endophytes on the ultrastructure of *S. sclerotiorum* was observed by scanning electron microscopy which showed thinning, rupturing and shrinkage of the fungal hyphae. The endophytes also exhibited phosphate solubilization, production of siderophores, HCN, auxins, ammonia, lipase, cellulose and amylase. The isolates were identified as *Sphingobacterium spiritivorum* EB1, Bacillus sp. EB6, *Pseudomonas aeruginosa* EB21 and Serratia liquefaciens EB23 with MALDI-TOF-MS analysis. The bacterial strains exhibited ability to produce volatile organic compounds with the highest number of VOCs produced by Bacillus sp. EB6. The bacterial treatments singly or in combinations also significantly enhanced the vigour index. A significant increase in growth parameters, chlorophyll content, and nutrient content of shoot and soil was also observed with the bacterial treatments in sunflower grown in glasshouse conditions. The disease control by the bacterial treatments varied from 66.7 to 88.9%. The results indicated that the consortium of four strains was statistically not different from the consortium of SsEB1+ BaEB6 +SlEB23, indicating thereby the potential of these strains as biocontrol agent against *S. sclerotiorum*. As the future line of recommendation, the formulation containing the consortium of these strains may be developed and tested in sunflower to control *Sclerotinia sclerotiorum* in field conditions.

Keywords*: Biocontrol; Antagonism; Sclerotinia sclerotiorum; Sunflower; Endophytes; Volatile organic compounds.*

VITAMIN D AND OBESITY: MECHANISTIC UNDERSTANDING AND CONSEQUENCES FOR NUTRITIONAL NEEDS

Suchit Swaroop[1]*, Arti Yadav[1]
[1]Experimental & Public Health Laboratory, Department of Zoology, University of Lucknow, Lucknow-226007

Abstract

Given the growth in overweight and obesity worldwide and their link to numerous metabolic problems, the relationship between vitamin D status and obesity has become a crucial research topic. The rising prevalence of vitamin D deficiency and insufficiency in obese people raises the possibility of a connection between micronutrient metabolism and body composition. This connection has been explained by a number of factors, such as volumetric dilution, which lowers circulating amounts due to increased body mass, and sequestration of vitamin D within adipose tissue, which decreases its bioavailability. The intricacy of interpreting vitamin D levels in persons with excess adiposity is highlighted by these physiological interactions. While intervention studies on vitamin D supplementation in obese individuals show variable outcomes and frequently require higher doses to achieve sufficiency compared to non-obese counterparts, observational studies consistently show an inverse relationship between body mass index (BMI) and serum 25-hydroxyvitamin D concentrations. These results highlight the need of taking body size and adiposity into account when developing dietary reference intakes and supplementation recommendations. Furthermore, improving vitamin D levels in obese populations may have clinical significance for reducing the risk of insulin resistance, metabolic dysfunction, and chronic illnesses that are frequently linked to obesity. To prove causation and improve supplementation techniques, more carefully planned randomized controlled studies are required. The significance of incorporating nutrient-obesity interactions into clinical practice and public health nutrition policies is highlighted by this expanding body of evidence.

Keywords*: vitamin D, obesity, adipose tissue, metabolic health, dietary requirements.*

THE IMPACT OF CLIMATE CHANGE ON NATURAL RESOURCES AND BIODIVERSITY

[1] Supriya Sharma & [2]Dr Atul Kumar Tiwari
[1]Research Scholar, Department of Environmental Biology, APS University Rewa, MP
[2]Head & Associate Professor, Dept. of Environmental Biology, APS University Rewa, MP

Abstract

Climate change has become a defining environmental issue, exerting significant pressure on natural resources and biodiversity worldwide. Rising global temperatures, unpredictable precipitation patterns, and increasing frequency of extreme weather events have accelerated the degradation of ecosystems. Natural resources such as water, soil, and forests are under severe stress, leading to scarcity, reduced productivity, and ecosystem imbalance. Biodiversity is equally threatened, as many species face habitat loss, altered migration patterns, and increased risk of extinction due to changing climatic conditions. These disruptions not only endanger ecological stability but also undermine essential services such as food security, clean water supply, and carbon sequestration that sustain human well-being. This paper examines the interlinked impacts of climate change on natural resources and biodiversity, highlighting the urgent need for adaptive strategies, conservation measures, and sustainable management practices to mitigate risks and ensure environmental resilience for future generations.

Keywords*: Biodiversity, adaptive strategies, conservation measures, mitigate risks etc.*

EFFECT OF PANCHAGAVYA AND ORGANIC MANURES ON GROWTH AND YIELD OF MUNG BEAN (*VIGNA RADIATA* L.)

Jaydev Ojha and Krishan Pratap Singh
Department of Botany, R.B.S. College, Agra (U.P.)
Affiliated to Dr. Bhimrao Ambedkar University, Agra (U.P.), INDIA
Email ID: ojhajd10@gmail.com

Abstract

The potential of organic inputs to increase crop productivity was evaluated by examining the effects of Panchagavya and organic manures on the growth and yield of mung bean (*Vigna radiata* L.). Under field conditions, mung bean crops were treated with Panchagavya, a traditional organic mixture formed from cow-derived products, and different organic manures such compost, farmyard manure (FYM), and vermicompost. Plant height, branch count, pod count, pod weight, seed yield, and general plant health were all assessed during the trial. The findings showed that, in comparison to the control group, both Panchagavya and organic manures considerably increased plant growth. Plants treated with Panchagavya exhibited significant improvements in leaf area, root development, and pest and disease resistance, which increased pod formation and seed yield. Healthy plant growth was further supported by the improvements made to the soil's structure, fertility, and water retention by organic manures. The combination of Panchagavya and organic manures produced the highest biomass and superior mung bean among the organic treatments. This study shows how well Panchagavya and organic manures work as sustainable substitutes for synthetic fertilisers, offering a workable strategy for raising mung bean quality, yield, and growth while boosting soil health and encouraging environmentally responsible farming methods.

***Keywords**: Panchagavya, organic manures, mung bean, growth, yield, sustainable agriculture, soil fertility.*

EFFECT OF *SENNA ALATA* LEAF EXTRACTS ON DERMATOPHYTES CAUSING RINGWORM IN INDIA

Neena Sharma
Department of Microbiology, C V Raman University Kargi Road Kota, Chhattisgarh
Email: neenabhatli@gmail.com

Abstract

Medicinal plants have been an integral part of human healthcare since ancient times. They are realistic sources of bioactive compounds that possess therapeutic properties and have been traditionally used for the treatment of various diseases and infections. According to the World Health Organization (WHO), nearly 80% of the world's population still relies on traditional plant-based medicines for their main healthcare needs, especially in rural and tribal communities.

With thousands of species used in Ayurvedic, Siddha, Unani, and folk medicine, India is known as one of the world's hotspots for biodiversity. Numerous phytochemical groups, including alkaloids, flavonoids, tannins, terpenoids, and glycosides, are found in these plants. These compounds have pharmacological properties that include antibacterial, antifungal, anti-inflammatory, and antioxidant properties.

Great pick—*Senna alata* (syn. *Cassia alata*, "ringworm bush") is one of the most documented ethnomedicinal plants for dermatophytosis. A superficial fungal infection of the skin, hair, and nails, ringworm (dermatophytosis) is frequently brought on by *Trichophyton*, *Microsporum*, and *Epidermophyton* species. *Senna alata* (L.) Roxb., also referred to as the "ringworm bush," has long been used in tropical traditional medicine to treat fungal skin conditions.

Aqueous, methanol, and ethyl acetate solvents of increasing polarity were used to collect, authenticate, shade-dry, and extract fresh *S. alata* leaves. Using agar well diffusion and broth microdilution techniques, the extracts' antifungal efficacy against dermatophytes (*Trichophyton rubrum*, *T. mentagrophytes*, *Microsporum gypseum*, and *Epidermophyton floccosum*) was evaluated in vitro.

Keywords: *Senna alata, Evaluated, Extracts, antifungal, polarity*

IMPORTANCE OF SUSTAINABLE CONSUMPTION IN ECONOMIC BOTANY

Dr. Ritika Misra
Department of Botany
Constituent Government College, Bhadpura, Nawabganj, Bareiily

Abstract

Sustainable consumption in economic botany is crucial for maintaining ecological balance while supporting economic development and human well-being. Economic botany explores the relationship between people and plants, focusing on the utilization of plant resources for food, medicine, clothing, shelter, and other economic purposes. However, overexploitation, habitat destruction, and unsustainable harvesting practices have led to the depletion of many valuable plant species. Sustainable consumption addresses these issues by promoting the responsible use of plant-based resources, ensuring their availability for future generations. It encourages practices such as ethical sourcing, biodiversity conservation, traditional ecological knowledge, and circular economies in plant-based industries. Integrating sustainability into economic botany not only safeguards plant diversity but also strengthens food security, supports indigenous communities, and contributes to climate change mitigation. This abstract emphasizes that a shift towards sustainable consumption patterns is vital for preserving plant resources and fostering long-term ecological and economic resilience.

Keywords*: Sustainable consumption, economic Botany*

CARBON NANOTUBES INDUCED ENHANCEMENT OF PHOTOSYNTHESIS AND ANTIOXIDANT DEFENSE IN *SOLANUM LYCOPERSICUM* L.

Zeba Parveen* and Shamsul Hayat
Department of Botany, Aligarh Muslim University, Aligarh 202002, India

Abstract

Sustainable agriculture plays a crucial role in ensuring global food security. Carbon nanotubes (CNTs), owing to their nanoscale dimensions, high surface area, mechanical strength, and thermal conductivity, have emerged as a promising nanotechnological tool. The present study examines the influence of foliar applied CNTs on the morphological and physio-biochemical performance of *Solanum lycopersicum* L. CNTs of different concentrations (0, 20, 40, 60, and 80 mg/L) were applied at 25 days after transplantation (DAT) for five days (25-29 DAT) and sampling was done at 40 DAT. Results showed that all concentrations of CNTs improved growth, and photosynthetic traits (like net photosynthetic rate, stomatal conductance, internal CO2 concentration and transpiration rate) in *Solanum lycopersicum* L. Furthermore, CNTs regulated redox homeostasis, by maintaining a balance between reactive oxygen species (ROS) and the antioxidant defense system. However, among the various concentrations of CNTs tested, 40 mg/L of CNTs proved best in improving all the above parameters studied. These findings highlight the potential of foliar application of CNTs as an effective approach to enhance crop performance under adverse environmental conditions.

MORPHO-PHYSIOLOGICAL AND YIELD ATTRIBUTES OF MEDICINAL PLANT *TRIGONELLA FOENUM-GRAECUM* L. (FENUGREEK) UNDER DROUGHT STRESS

Saima Akhter and Qazi Fariduddin*
Department of Botany, Faculty of Life Sciences, Aligarh Muslim University, Aligarh 202002, India

Abstract

Drought is one of the major limiting factors in crop production worldwide. Which impairs normal growth, disturbs water relations, and reduces water use efficiency in plants. A study was conducted to access the changes induce by drought in fenugreek plants. Fenugreek is an important plant containing trigonelline that plays an osmoregulatory role in abiotic stress. This study was conducted with an aim to access the impact on morphological, physiological, biochemical and yield attributes. The findings revealed that drought stress decreased shoot and root length, fresh and dry mass, pigment content but triggered proline content of five different drought stress levels imposed on fenugreek and subsequent alterations in CAT, peroxidase (POX) and superoxide dismutase (SOD). Moreover, concentrations of hydrogen peroxide and malondialdehyde increased under severe drought stress. These findings revealed that fenugreek exhibited varied responses to different stress level and reflected edaphic strategies to cope with drought stress.

FROM HERITAGE TO HIGH-TECH: INNOVATIONS IN PLANT PATHOLOGY.

[1]Shubhankar Srivastav (UG student)
[2]Dr. Rashmi Singh (Associate Professor)
K. N. Govt. PG. College Gyanpur, Bhadohi, Uttar Pradesh,India.

Abstract

Plant pathology is witnessing rapid advancements, but true transformation lies in translating research into field ready solutions. Innovative approaches that align with recent global trends while addressing local agricultural challenges are-

- Leafsence portable scanner
- Mobile application
- Bio enhancer nanofilm spray

Leafsence portable scanner is a low cost, handheld device that will use multispectral imaging and AI to detect early disease symptoms directly in fields. This idea builds on advances in UPE imaging but adapts them into a farmer friendly solution.

The mobile app aims to bridge the traditional knowledge with modern scientific methods to support farmers in diagnosing and managing plant dissolution. owned as a platform that integrates indigenous remedies alongside advanced technological tools. The app would enable farmers, students and researchers to upload real time images of diseased plants. This real time database cloud gauid regional alerts of disease and predictive management strategies.

Bioenhancer nanofilm spray is a product infused with *Trichoderma* spores which not only treat the plant disease but also ensures the plant growth by decomposing naturally and enriching the soil microbiome.

These concepts reflect how we can complement modern research, turning high-tech advancements into accessible, sustainable and socially impactful solutions.

Keywords*: Innovation, Plant Pathology, New Technology*

IN SILICO STUDY OF PHYTOCOMPOUNDS FROM SELECTED WEED FOR SUSTAINABLE MOSQUITO CONTROL

Basudha Rani and Prof. Shabad Preet
Department of Zoology, Faculty of Science,
Dayalbagh Educational Institute (Deemed to be University)
Dayalbagh, Agra-282005
(Email: rani.basudha@gmail.com & shabdpreet@dei.ac.in)

Abstract

Dengue, Yellow fever, Chikungunya and Zika virus are mosquito-borne diseases widely distributed in tropical and subtropical regions. Globally, these viral disease remain a major global health concern and are predominantly transmitted by the *Aedes aegypti* and *Aedes albopictus* mosquitoes. The increasing resistance of mosquitoes to synthetic insecticides and their environmental impact necessitates the search for alternative, eco-friendly control methods. This study explores the potential of phytoconstituents from a selected weed *Digera muricata* as bioactive agents against *Aedes aegypti* mosquitoes using in silico approach. *Digera muricata* weed is rich in bioactive compounds like alkaloids, flavonoids, and terpenoids which may possess larvicidal and adulticidal properties. Molecular docking was employed to evaluate the binding affinities of these phytocompounds with mosquito-specific proteins i.e. odorant-binding proteins (OBPs). The study also included ADMET (absorption, distribution, metabolism, excretion, and toxicity) analysis to predict the pharmacokinetics and safety profiles of the compounds. Results indicated that compounds exhibited strong repellent activity. The findings underscore the potential of phytoconstituents from selected weed as sustainable alternatives to synthetic insecticides. This in silico approach not only reduces the time and cost of drug discovery but also provides a foundation for future experimental validation and field application. By leveraging weeds as a resource for vector control, this study contributes to the development of environmentally safe and effective mosquito management strategies.

Keywords*: Digera muricata, phytoconstituents, molecular docking, ADMET analysis, sustainable mosquito control.*

PERSISTENCE OF CYANTRANILIPROLE IN AGRICULTURAL SOILS FOLLOWING SEED TREATMENT AND ITS RESIDUAL IMPACT ON SOIL ENZYMATIC ANALYSIS

Ashok Kumar Parida[1], Sanjay Kumar Sahoo[1]*, Sanhita Chowdhury[1], Priya[1], Katta Subramanya Sai Teja[1], Niladri Bihari Mohapatra[2]
[1]Department of Entomology, Post Graduate College of Agriculture, Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur, Bihar, India, 848125
[2]School of Crop protection, College of Post Graduate Studies in Agriculture Science, CAU(I), Umiam, Meghalaya, India, 793104
Email: sksahoo@rpcau.ac.in

Abstract

This study investigated the persistence of cyantraniliprole 600FS in soil and its effects on soil enzymatic activities following seed treatment at different application rates. Soil samples were analyzed for residue persistence and enzymatic activity following treatments at recommended dose (RD, 1.44 g a.i./kg), 1.25 times RD (1.80 g a.i./kg), and double the RD (2.88 g a.i./kg). Residue analysis demonstrated dose-dependent persistence patterns, with detectable residues persisting for 7 days at RD and 1.25 RD, while extending to 14 days at 2 RD. Evaluation of soil biological function revealed significant inhibitory effects on enzymatic activities with varying recovery periods. Dehydrogenase activity was suppressed for 21 days at RD, while phosphatase activity demonstrated extended inhibition for 30 days at the same application rate. Both enzymes exhibited prolonged inhibition periods of 45 days at higher application rates (1.25 RD and 2 RD). GMean index analysis confirmed significant negative impacts on soil biochemical processes in treated soils compared to controls. These findings indicate that cyantraniliprole seed treatments, particularly at higher-than-recommended rates, potentially disrupt essential nutrient cycling processes, which may have cascading effects on soil fertility and crop productivity.

Keywords: *Cyantraniliprole, seed treatment, soil persistence, enzymatic activity, dehydrogenase, phosphatase, soil health, residual effects*

INVESTIGATING THE EFFICACY OF CITRAL AS NOVEL ANTIFUNGAL AGENT AGAINST *ASPERGILLUS FLAVUS* CAUSING QUALITATIVE DETERIORATION OF STORED CORN SAMPLES

Anand Kumar Chaudhari*
Department of Botany, Rajkiya Mahila Snatkottar Mahavidyalaya, Ghazipur, 233001, Uttar Pradesh, India.

Abstract

The study explores the potential of citral as novel antifungal agent against *Aspergillus flavus* (toxigenic strain AF-LHP-VS8) causing qualitative deterioration of corn (*Zea mays* L.) samples during storage. During in vitro investigation, citral completely inhibited the growth and aflatoxin B1 production at 1.2 and 0.8 µL/mL respectively. The antifungal mode of action was assessed in terms of reduction in ergosterol and elevation of cellular cations (Ca^{2+}, Mg^{2+} and K^{+}). The antiaflatoxigenic mode of action was tested in terms of methylglyoxal inhibition. The compound exhibits strong antioxidant potential with IC50 value 0.82 and 0.315 µL/mL for DPPH and ABTS respectively. The citral show high total phenolic content (15.28µg/mL equivalent of gallic acid). Based on strong antifungal, antiaflatoxigenic, and antioxidant potential, citral could be recommended as a novel plant-based preservative for enhancing the shelf life of corn samples.

Keywords*: Citral; Aspergillus flavus; Aflatoxins B1; Methylglyoxal; Antioxidant*

BEHAVIORAL TOXICITY OF FLUAZIFOP-P-BUTYL IN *EISENIA FETIDA*: AN ECOTOXICOLOGICAL ASSESSMENT

Sanju Yadav
Department of zoology, Maharshi Dayanand University (rohtak-124001)
Email id-sanjuyad11021999@gmail.com

Abstract

Fluazifop-p-butyl, a selective post-emergence herbicide widely used for the control of annual and perennial grasses, is increasingly applied in modern agriculture. While effective in weed management, its non-target effects on beneficial soil organisms remain poorly understood. *Eisenia fetida*, commonly known as the red wiggler earthworm, is a standard bioindicator species employed in ecotoxicological studies due to its sensitivity to soil pollutants and its ecological role in nutrient cycling, soil aeration, and organic matter decomposition. The present study investigates the impact of fluazifop-p-butyl on *E. fetida*, with special emphasis on behavioural responses. Behavioural endpoints such as burrowing activity, surface avoidance, and reproduction are rapid and sensitive indicators of sublethal toxicity, often preceding measurable biochemical or histopathological alterations. Exposure to contaminated soils may lead to avoidance of treated substrates, reduced burrowing efficiency, inducing oxidative stress, and changes in reproductive behaviour, which collectively influence soil structure and fertility. Such alterations not only compromise earthworm survival and reproduction but also disrupt ecosystem functions dependent on their activity. Understanding behavioral toxicity provides early warning signals of ecological risk and highlights the need for responsible herbicide application practices. Given the crucial role of earthworms in maintaining soil health, these findings underscore the importance of incorporating behavioral biomarkers into ecotoxicity assessments. In summary, this comprehensive review highlights the current state of knowledge regarding sustainable weed management strategies that minimize adverse effects on non-target soil fauna while ensuring agricultural productivity.

PLANT-DERIVED NANO EXTRACELLULAR VESICLES AS A SUSTAINABLE PLATFORM FOR NEXT-GENERATION NANOMEDICINE

Narendra Bhadauria[1], Dr. Anuradha Negi[2]
Department of Botany, Agra College, Agra.

Abstract

Plant-derived nano extracellular vesicles (P-NEVs) are gaining increasing attention as a novel category of naturally occurring, biocompatible nanoparticles with versatile biomedical potential. These nanosized vesicles, released by different plant species, closely resemble mammalian extracellular vesicles in structure and typically measure between 30–200 nm. They are naturally enriched with functional biomolecules, including lipids, proteins, nucleic acids, and secondary metabolites, which collectively enhance their therapeutic efficacy and biological stability. Unlike synthetic nanocarriers, P-NEVs are eco-friendly, safe, and inherently biocompatible, making them a sustainable alternative for nanomedicine and targeted drug delivery. Evidence from recent research highlights their ability to traverse biological barriers, deliver functional molecules into recipient cells, and regulate key pathways linked to immunity, inflammation, and tissue repair. Moreover, P-NEVs show high stability under physiological conditions and can be isolated efficiently from common edible plants such as Ginger, Grapefruit, and *Tinospora cordifolia*. Their plant origin further reduces ethical issues and minimizes risks of immunogenicity often associated with vesicles derived from animal systems. Beyond medical applications, P-NEVs are being explored in food science, cosmetics, and agriculture as natural bioactive carriers. Nevertheless, critical challenges persist, including the need for standardized isolation procedures, scalable production, comprehensive molecular characterization, and deeper mechanistic insights. Integration of advanced nanotechnology and omics-based tools is essential to address these limitations. Collectively, P-NEVs represent an emerging, safe, and sustainable nanoplatform with remarkable promise for future therapeutic innovations and interdisciplinary applications.

***Keywords**: P-NEV, Nanoparticle, Extracellular Vesicles*

MOLECULAR DOCKING INSIGHTS INTO PFDHODH INHIBITION

Iqra Hasan[1], Swapna Kumar Srivastava[1], Mohd Usman Mohd Siddique[2]
[1]School of Biotechnology, IFTM University, Moradabad, Uttar Pradesh
[2]SVKM's Institute of Pharmacy Dhule, Maharashtra
Corresponding Author: - Iqra Hasan (Research Scholar)
School of Biotechnology, IFTM University, Moradabad
Email- iqrahasan419@gmail.com

Abstract

Plasmodium falciparum dihydroorotate dehydrogenase (PFDHODH) plays an important role in the biosynthesis of novo pyrimidines, which are required for parasite growth and survival. Unlike human DHODH, plasmodium enzymes have a variety of structural and functional properties that make them attractive targets for selective development of antimalarial drugs. This study is dedicated to a molecular approach to tethering to study the interaction of links between PFDHODH and a certain number of well-known novel inhibitors. Using structures based on drug and computer dock design, potential ligands are actively validated in the PFDHODH section to assess their connection, interaction profile, and drug dependence. In this study, we used a complete molecular approach to study the communication interactions between PFDHODH and various inhibitors of small molecules, including established compounds and novel derivatives. The high-resolution PFDHODH crystal structure is used as a tethering receptor to ensure accurate modelling of the active site environment. Structure-based virtual screening was performed using molecular tools such as Autodock Vina and Schrödinger Glide, and link affinity was assessed based on membership and interaction energy.

Several lead compounds have been discovered for additional modifications and validation, and molecular mooring results provide important information on the structural requirements for effective inhibition of PFDHODH. These results demonstrate the value of molecular mooring as a rapid and effective in silico method for early detection of anti-Japanese drugs. It also serves as the basis for the logical development of selective PFDHOD inhibitors with potential for therapeutic use.

Keywords*: "Molecular Docking", "Antimalarial Drug Discovery, "PfDHODH", "Computational Drug Design".*

FAMILY ASTERACEAE AS A PROMISING SOURCE FOR THE FUTURE FOOD INDUSTRY

Dr Shweta Shekhar[1]*& Preeti Gupta[2]
[1] Assistant Professor, Department of Botany, University of Allahabad, Prayagraj
[2] Research Scholar, Department of Botany, DDU Gorakhpur University, Gorakhpur

Abstract

Family Asteraceae is one of the largest families, with over 1600 genera and 2500 species worldwide. Many members of this family have been used as sources of medicine since ancient times. In addition to health benefits, various plants from the family Asteraceae have been utilized by different ethnic communities in traditional cooking, including the preparation of cocktails, desserts, and savory dishes. The present study aims to document the wild edible plants of the family Asteraceae found in Uttar Pradesh. A total of 69 genera and 100 species belonging to 16 tribes of the family Asteraceae are edible in different parts of Uttar Pradesh. Of these, 83 species are wild, and 17 species are ornamental but are also used as food sources in other countries. Different plant parts, such as roots, leaves, stems, shoots, and seeds, are consumed as food. Additionally, many phenolic compounds, essential oils, and sesquiterpene lactones have been reported from the family Asteraceae, which can play a vital role in developing functional foods for society. As increasing globalization intensifies the food crisis, wild edible plants can become important supplementary foods and potential alternative sources for humans. Including various edible plants from this family in food formulations may also offer valuable benefits in combating different illnesses.

Keywords*: Asteraceae, Wild edible plants, Uttar Pradesh*

IN VITRO REGENERATION OF *VERNONIA AMYGDALINA DELILE*.: A COMPREHENSIVE STUDY ON SECONDARY METABOLITES ANALYSIS, PHYSIOCHEMICAL EVALUATION AND GENETIC FIDELITY ASSESSMENT USING SCOT MARKERS

Sabaha Tahseen and Anwar Shahzad*
Department of Botany, Aligarh Muslim University, Aligarh

Abstract

Vernonia amygdalina Delile. is a small tree familiar for its potential medicinal values and widely used in traditional medicine within the genus *Vernonia*. The present study focuses to standardize the micropropagation protocol of *V. amygdalina* using young nodal segment explants. The ideal medium for shoot initiation was determined to be Murashige and Skoog (MS) medium containing 5.0 µM 6-benzylaminopurine (BAP). The highest shoot proliferation (24.00 ± 0.05 shoots/nodal segment) with average shoot length (6.86 ± 0.10 cm) was accomplished on MS + 5.0 µM BAP + 0.5 µM α-naphthalene acetic acid (NAA). Subsequent to in vitro regeneration, microshoots were successfully rooted on ½ MS + 1.0 µM indole-3-butyric acid (IBA). Acclimatization of rooted plantlets in Soilrite™ resulted in a 95% survival rate upon transfer to the greenhouse. Start codon targeted (SCoT) primer-based molecular analysis was done to corroborate the genetic compatibility of regenerated plantlets. During acclimatization, gradual change in net photosynthetic rate, chlorophyll content, stomatal conductance, and transpiration rate was investigated. Additionally, changes in antioxidant enzyme activities, including superoxide dismutase (SOD), catalase (CAT), ascorbate peroxidase (APX), and glutathione reductase (GR), were also screened. The plantlets' healthy adaptation to their surroundings was also demonstrated by the leaves' scanning electron microscope (SEM) analysis. Furthermore, Gas Chromatography and Mass Spectrometry analysis (GC–MS) was used to compare the secondary metabolites profile from the mother and regenerated plantlets.

Keywords*: Micropropagation, Genetic compatibility, Secondary metabolites, Acclimatization, SCoT, GC–MS*

EXPLORING NEURODEGENERATIVE DISORDERS IN ANIMALS: A COMPARATIVE PATHOLOGICAL PERSPECTIVE

Akshita Tyagi,
Swami Vivekanand Subharti University, Meerut

Abstract

Neurodegenerative disorders such as Alzheimer's-like syndromes, Parkinsonism, and prion-related diseases are increasingly being recognized in a wide range of animal species. This study explores how these conditions present clinically, progress pathologically, and operate at the molecular level in animals, offering valuable insights for both veterinary care and comparative neuroscience. By analysing clinical records, tissue samples, and molecular data from animals including dogs, cats, sheep, and rodents, the research identifies common features like protein buildup, nerve cell loss, and movement impairments. Techniques such as immunohistochemistry, MRI scans, and behavioural testing were used to track these changes, while genetic screening and protein analysis helped uncover mutations and misfolded proteins linked to disease development. The findings show that although each species displays unique traits, there are shared patterns of degeneration—dogs with cognitive decline resemble human Alzheimer's cases, scrapie in sheep reflects prion disease mechanisms, and rodents consistently exhibit inflammation and synaptic damage, reinforcing their role in lab-based studies. Notably, early indicators like GFAP and phosphorylated tau were found across species, pointing to common molecular pathways. Understanding these disorders in animals not only improves veterinary diagnostics and treatment but also strengthens the bridge to human neurological research. Ongoing studies into shared biomarkers and long-term disease tracking will be key to deepening our grasp of neurodegeneration across species.

***Keywords**: Protein aggregation, motor dysfunction, immunohistochemistry, GFAP, canine cognitive dysfunction*

POLLUTION PROBLEMS

Mr. Harsh Shakya
Department of Biotechnology
H.P Institute of Higher Education, Budaun, U.P

Abstract

Pollution has emerged as one of the most pressing environmental challenges of the 21st century, significantly impacting human health, biodiversity, and climate stability. This abstract examines the multifaceted problems associated with various types of pollution, including air, water, and soil pollution, and their interconnections. The adverse effects of pollutants—ranging from respiratory diseases caused by airborne particulates to the degradation of aquatic ecosystems from industrial runoff—illustrate the urgent need for comprehensive regulatory frameworks and innovative solutions. Additionally, this paper highlights the role of socio-economic factors in exacerbating pollution levels, particularly in low-income communities that disproportionately bear the brunt of environmental degradation. Through a review of current literature and case studies, we explore effective strategies for mitigating pollution, emphasizing the importance of public awareness, technological advancements, and collaborative policy initiatives. Ultimately, addressing pollution challenges requires a multidisciplinary approach that integrates scientific research, public health considerations, and sustainability practices. This synthesis aims to contribute to the ongoing discourse on environmental resilience and the shared responsibility of individuals, industries, and governments in fostering a healthier planet for future generations.

LARVICIDAL, GROWTH REGULATORY AND HISTOPATHOLOGICAL EFFECTS OF METHOXYFENOZIDE AGAINST *AEDES AEGYPTI*: A SUSTAINABLE VECTOR MANAGEMENT APPROACH

Sanjay Kumar[1*], Roopa Rani Samal[2], Sarita Kumar[3] and Arvind Kumar Shakya[4]

[*1]Research Scholar, Discipline of Biochemistry, School of Sciences (SOS), Indira Gandhi National Open University, New Delhi-110068

[2]Department of Zoology, Dayal Singh College, University of Delhi

[3] Insect pest and Vector Laboratory, Department of Zoology, Acharya Narendra Dev College, University of Delhi

[4]Discipline of Biochemistry, School of Sciences (SOS), Indira Gandhi National Open University. New Delhi

Abstract

Aedes aegypti, a known vector of critical arboviral diseases such as dengue, chikungunya, and Zika, presents global public health challenges due to limited vaccine availability and treatment options. Over-reliance on chemical interventions has not only made mosquito populations resistant but also raised environmental concerns, highlighting the need for alternative control methods. The present study assesses the methoxyfenozide, an insect growth regulator that disrupts mosquito endocrine pathways, for its larvicidal effects, growth regulatory potential and the histopathological effects on the midgut of *Ae. aegypti*. The early fourth-instars of *A. aegypti* were exposed to a series of methoxyfenozide concentrations for 24 and 48 hours, revealing dose-dependent mortality, with respective LC50 values of 6.326 mg/L and 4.180 mg/L. Treated larvae exhibited behavioral changes, including lethargy, convulsions and tremors. Methoxyfenozide treatment also delayed larval development and significantly inhibited adult emergence (IE30: 0.002 mg/L; IE90: 1.209 mg/L) indicating significant strong growth-regulatory effects. Additionally, systematic histopathological analysis of methoxyfenozide-treated larval midgut tissues showed dose-dependent cellular and histological disruption with detachment of epithelium and peritrophic membrane, disintegrated cells and vacuolization indicating affected nutrient uptake and thus larval growth. Integrating these findings provide a comprehensive understanding of the mode of action of methoxyfenozide on mosquito larvae and validate its potential as a powerful and environmentally sustainable alternative within integrated vector management programs, offering a strategic approach to mitigating arboviral disease transmission globally. Future field studies assessing its ecological safety will further establish its utility in vector control efforts.

Keywords*: Aedes aegypti, Methoxyfenozide, Larvicidal activity, Histopathology, Insect growth regulator.*

BIOGENIC SYNTHESIS AND PHYSICOCHEMICAL CHARACTERIZATION OF COPPER NANOPARTICLES USING *PSIDIUM GUAJAVA* LEAF EXTRACT

Salman, Humaira Rani, Nisha Dinker, Mohd Faheem Khan
*Corresponding author: humairaprincess450@gmail.com

Abstract

Green synthesis of nanoparticles has emerged as a sustainable alternative to conventional chemical and physical approaches, owing to its simplicity, commercial scalability, cost-effectiveness, and environmental compatibility. Plant-mediated synthesis utilizes phytochemicals and bioactive compounds present in extracts as natural reducing and stabilizing agents, enabling the formation of non-toxic nanoparticles with significant biomedical and pharmaceutical potential. Copper, in particular, is a versatile metal with applications in catalysis, toxic waste remediation, superconductors, paints, refractory additives, and drug development. Its intrinsic properties such as thermal stability, electrical conductivity, and catalytic activity can be further enhanced at the nanoscale. In the present study, copper nanoparticles (CuNPs) were synthesized using aqueous leaf extract of *Psidium guajava* (guava) as a biogenic reducing agent, with copper sulfate pentahydrate ($CuSO_4 \cdot 7H_2O$) as the precursor salt.

The guava leaf extract was prepared by boiling fresh leaves at 100 °C for 30 min, followed by filtration through Whatman No. 1 filter paper. Successful nanoparticle formation was indicated by a color change of the reaction mixture from light yellow to dark green within 30 min. UV–Vis spectroscopy revealed a distinct absorption peak at 520 nm, confirming the presence of CuNPs, while Raman spectroscopy provided further insights into chemical bonding and crystalline quality. Optimization studies showed that parameters such as precursor concentration, extract volume, reaction time, temperature, and pH significantly influenced nanoparticle formation.

The biosynthesized CuNPs displayed strong antimicrobial activity against *Escherichia coli* and demonstrated efficient catalytic activity in the reduction of methylene blue (MB), suggesting their potential applications in biomedical, industrial, and environmental remediation fields.

Keywords*: Copper nanoparticles; Psidium guajava; Green synthesis; UV–Vis spectroscopy; Raman spectroscopy; Antimicrobial activity; Catalysis*

BIOACTIVE COMPOUNDS FROM MARINE ALGAE: A NEW WAVE TOWARDS NUTRACEUTICALS

Tanushri Ghorai,[1]*Adita Sharma,[2] and P. P. Srivastava[3]
[1] Assistant Professor, Department of Fish Processing Technology
[2] Assistant Professor, Department of Fisheries Resource Management
[3] Professor, Department of Aquaculture
College of Fisheries, Dholi, Muzaffarpur
Dr Rajendra Prasad Central Agricultural University, Pusa, Bihar

Abstract

Marine algae have been identified as an underexploited resource of nutraceuticals and functional foods. Both microalgae and macroalgae are gaining attention of scientific community due to their biochemical composition. Marine algae are rich in structurally diverse bioactive compounds including polysaccharides, protein, peptides, fatty acids, polyphenols and alkaloid. For coping up with the challenging environmental condition like fluctuating water level, salinity, solar radiation and temperature marine algae produces different types of bioactive compounds and metabolites which helps them to survive in adversity and maintain their biomass. These bioactive compounds are having various nutraceutical and pharmaceutical properties which helps people to recover from diseases. Scientists and processing technologists are paying attention to develop innovative technologies and process for optimum utilization of resource and exploring biological properties of the compounds for food and nutraceutical purpose. Not only the drugs are being synthesised from marine algae extract but also being used in preparation of seaweed incorporated food products like soup, tea, wine, noodles etc. Marine algae extracts, mainly polysaccharides, are also being used in cosmeceutical products. Some red algae especially *Porphyra* sp. is having therapeutic properties as it containing iodine, bioactive substance and antifungal substance. *Undaria pinnatifida* enhances the sensory quality of food due to the presence of fucoxanthin and fucosterol and it also have antioxidant property. Marine algae also an important source of nonanimal sulphated polysaccharides (SPs). The major SPs found in marine algae include fucoidan, laminarans, carrageenan, ulvan etc. Carotenoids pigments like fucoxanthin and astaxanthin are also found in seaweeds. Furthermore, mycosporine-glycine and mycosporine-taurine have properties of protecting cell damage and some other mycosporine like amino acid can protect organisms against UV radiation. There are much more to explore and research is still going on to discover new bioactive compounds for utmost utilisation of marine algae.

Keywords*: Marine algae, Nutraceutical, Bioactive compounds, Protein, Polysaccharides.*

ETHNOBOTANICAL INSIGHTS FROM MEGHALAYA: TRADITIONAL PLANT-BASED HEALING PRACTICES IN SOUTH WEST KHASI HILLS AND WEST JAINTIA HILLS DISTRICTS

Eldon P. Sohsley[1]*, Wanshwa Law[2], Marvellous Kharumnuid[3], Mebari V.R. Dorphang[4]
[1] Department of Surgical Oncology, NEIGRIHMS, Mawdiangdiang, Shillong – 793 018
[2, 3] Independent Researcher
[4] Department of Zoology, St. Edmund's College, Laitumkhrah, Shillong, Meghalaya 793 003

Abstract

Meghalaya represents a vibrant example of traditional knowledge which convolutes with an everyday rural life. A majority of the community people are engaged in agriculture and rely heavily on the environment for food, medicine, fodder, and cultural practices. The people demonstrate a rich repository of Traditional Knowledge (TK) especially in medicinal plant use. This paper will emphasize the most plant-based knowledge passed orally across generations, including practices such as the use of different parts of a plant. Plants such as *Ageratina adenophora*, *Schima wallichii* and *Myrica* sp. are used to treat stomach ailments and diarrhoea, *Piper longum* and *Zingiber* sp. are used for respiratory issues treatment, and *Citrus macroptera* for fevers. The leaves of *Eriosema chinense* and *Mikania micrantha* are used to treat wounds, cuts, and skin rashes. *Balanophora* sp. is believed to possess properties that may aid in the treatment of cancer. While these claims remain undocumented in formal scientific literature, they warrant further ethnobotanical and pharmacological investigation. Such knowledge underscores the untapped potential of indigenous practices in contributing to modern medical research and highlights the urgent need for systematic validation and conservation of these traditional health systems. Moreover, self-trainee traditional practitioners play key roles in primary healthcare, using indigenous plants from home gardens and forests, rooted in centuries-old knowledge systems that are integral to their identity.

***Keywords**: Traditional knowledge, Medicinal plant, Traditional practitioners*

STUDY OF FISH POPULATION IN GOMATI RIVER SPECIFICALLY IN JAUNPUR

Arvind Kumar Yadav[1] and Ajay Kumar[1]
[1]Department of Zoology TDPG College, Jaunpur

Abstract

In the current scenario, it is estimated that the freshwater fisheries and fishes are most affected, and their population in natural freshwater environment is highly vulnerable resources that impact not only on human population but it also the biodiversity of the freshwater ecosystem. Uttar Pradesh, which includes a huge area for freshwater in both lentic and lotic ecosystems, is one of the largest states in India, has enormous potential for aquatic resources, and provides a huge opportunity for inland fisheries development and aquaculture. A major problem with freshwater ecosystems is that the riverine ecosystems of India have suffered from intense human intervention, through household product, agricultural waste and through industrial waste, resulting in water pollution, habitat loss, and degradation, and that causes many freshwater fish species, amphibians, and freshwater insect populations to become heavily endangered, particularly in Gomti river. Gomti river is a tributary of river Ganga and it flow entirely in Uttar Pradesh only. In River Gomati as per our study, it is estimated through intense fish capturing methods, only 15 species of fishes are survived.

POTENTIAL OF *STENOTROPHOMONAS MALTOPHILIA* GP-1 IN BIOREMEDIATION OF GLYPHOSATE CONTAMINATED SOIL

Vidhi Bhatt*[1] and Bragadish Iyer[2]
[1] Assistant Professor, Department of Biological Sciences, P. D. Patel Institute of Applied Sciences, Charotar University of Science and Technology, Anand – 388421, Gujarat, India.
[2] Associate Professor and Head, Department of Biological Sciences, P. D. Patel Institute of Applied Sciences, Charotar University of Science and Technology, Anand – 388421, Gujarat, India.
E-mail: vidhibhatt.as@charusat.ac.in, bragadish.as@charusat.ac.in

Abstract

The naturally occurring *Stenotrophomonas* sp. have promising applications in bioremediation, as these bacteria can metabolise a wide range of organic compounds present in the rhizosphere. *Stenotrophomonas maltophilia* GP-1, capable of growth on glyphosate as the sole phosphorus source, was isolated from soil through a liquid enrichment technique. The bioremediation potential of this isolate was studied in the soil microcosm with a glyphosate dosage of 0.5 g glyphosate/Kg soil. Although the recommended dose of this herbicide applied singly in the field is no more than 10 L/ha (3.6 Kg of glyphosate), due to multiple applications of glyphosate in agricultural fields and sorption in the soil matrix, the concentration of glyphosate in soil is expected to be much higher than the recommended dose. Hence, in the present study, the glyphosate dose used in soil microcosms was tenfold higher than the recommended dose. Using *S. maltophilia* GP-1, nearly 71.0% of glyphosate removal in soil microcosm was observed after 5 days of treatment, while complete biodegradation in this case was achieved after 16 days. Complete biodegradation of glyphosate could be achieved in soil microcosms using *S. maltophilia* GP-1 through a bioaugmentation approach.

Keywords: *Glyphosate, Bioremediation, Rhizosphere, Bioaugmentation, Microcosms*

NEMATICIDAL EFFICACY OF MUSTARD OIL CAKE AGAINST ROOT-KNOT NEMATODE, *MELOIDOGYNE JAVANICA*, INFECTING EGGPLANT

[1]*Asgar Ali and [2] Kamal Singh

[1] Glocal University, Delhi Yamnotri Marg, Mirzapur Pole, Saharanpur, Uttar Pradesh-247121

[2] Department of Botany, D. S. College Aligarh, RMPSS University, Aligarh (U. P.), India - 202001

Abstract

The application of cake into soil has been examined as an alternative strategy for control of nematode. The impact of adding to soil with mustard oil cake (MOC) obtained from seeds of mustard plants at varying concentrations (0, 1, 2, 3, 4, 5... to 10%) on various inoculum levels (0, 500, 1000... to 4000) of the root-knot nematode, *Meloidogyne javanica*, infecting eggplant has been investigated. The lower dose of MOC (1 to 5%) significantly boosted plant growth (length, fresh and dry weight of shoot and root) compared to controls, even with different inoculum levels. However, compared to controls, all of the studied growth parameters decreased significantly at higher dose (6% to 10%). The most substantial improvements in measurement parameters for growth were reported at 5% MOC concentrations, and this strategy was used throughout all treatments using varied amounts of nematode inoculum. Plant growth was significantly reduced in the presence of nematodes onwards at 6% of MOC. The effects of MOC along with soil amendments on root-knot nematode reproductive characteristics were also studied. MOC, across all dose, decreased the quantity of galls and egg masses on eggplant roots. To summarise, it may be argued that, on the one hand, the MOC increased plant growth at lower dose, but the reverse occurred at larger levels due to the nematode piling. As a result, lesser dose of MOC will most likely be recommended as a growth stimulant for eggplants as well as a method of combating the root-knot nematode that has accumulated in the soil.

***Keywords**: MOC, Eggplant, Growth, Nematode, Meloidogyne javanica*

ROLE OF PEER REVIEW IN PAPER WRITING IN SCIENTIFIC JOURNALS AND IT'S IMPORTANCE

Dr. Richa Pandey, Professor
Department of Botany, Govt. Girls' Degree College, Mishrikh, Sitapur, U.P.

Abstract

'Peer Review' simply refers to judging the quality and content level of a manuscript for publication in a Scientific journal as a Research Paper. It is usually done by an individual having an expertise or specialization in any field. Peer reviewing helps in providing fair and candid comments and opinions related to the Correctness of the script, it's appropriateness of the content that truly serves the aim and objectives of the Journal in which it has to be published and it also fulfills the purpose of originality and uniqueness in an article by discouraging Plagiarism. It is based on the idea that only true peers or true friends can show one the right path. It checks the relevance, significance of the research and correctness of the methodology of an experiment, elevating the quality of the Journal. Prerequisites for Peer Reviewing include giving comments and reviews on time, suggesting ways and methods to improvise on the deficiencies and lacunae in the manuscript. A paper, rejected once, can be submitted again but to another Journal after revisions or after a time gap.

PLANT EXTRACT-BASED FUNGITOXICITY FOR REDUCING OIL CROP LOSSES IN INDIA

Dr. Vikas Verma Patel
Assistant Professor
P.G. Department of Botany, V.R.A.L. Government Girls Degree College, Bareilly, UP-243005
M.J.P. Rohilkhand University, Bareilly-243006

Abstract

Oilseed crops are a vital component of India's agricultural economy, contributing significantly to edible oil production and rural livelihoods. However, their productivity is often threatened by fungal pathogens, leading to substantial yield losses. Conventional chemical fungicides, while effective, raise environmental and health concerns, emphasizing the need for eco-friendly alternatives. Plant-derived extracts have emerged as promising fungitoxic agents due to their bioactive compounds, biodegradability, and minimal ecological impact. This study explores the fungitoxic potential of various plant extracts against major fungal pathogens affecting oil crops in India. Laboratory and field evaluations indicate that extracts from selected botanicals can inhibit pathogen growth, reduce disease incidence, and enhance crop health. The findings suggest that plant-based fungicides can serve as sustainable components of integrated disease management strategies, reducing dependency on synthetic chemicals while maintaining crop productivity. Further research on formulation, dosage optimization, and large-scale application could enhance the adoption of these green alternatives in Indian agriculture.

Keywords*: Plant extracts, fungitoxicity, oilseed crops, fungal pathogens, disease management, eco-friendly fungicides*

INTEGRATING MUSIC AS A THERAPEUTIC TOOL IN HYPERTENSION: BRIDGING SCIENCE AND COMPLEMENTARY MEDICINE

Shraddha Yadav and Kalpana Singh*
Department of Zoology, University of Lucknow, Lucknow (UP), India

Abstract

Hypertension is a leading contributor to cardiovascular disease and premature death worldwide. While medications remain essential for treatment, there is growing interest in complementary strategies that are safe, affordable, and culturally adaptable. Music therapy has emerged as a promising intervention for regulating blood pressure and reducing stress-related cardiovascular risks. Evidence suggests that music influences multiple physiological pathways, including autonomic nervous system balance, increased parasympathetic activity, lowered cortisol secretion, and enhanced nitric oxide production, leading to vascular relaxation. Clinical studies and meta-analyses consistently demonstrate reductions in both systolic and diastolic blood pressure, along with improvements in heart rate variability and anxiety management. Musical forms such as classical pieces, Indian ragas, traditional Chinese tonal patterns, and nature-inspired sounds have shown significant therapeutic potential. Despite these encouraging findings, further research is needed to optimize individualized music prescriptions, evaluate long-term outcomes, and integrate music therapy into mainstream hypertension care. Future directions point toward AI-driven personalization and biofeedback-assisted interventions. Overall, music therapy stands out as a non-invasive, cost-effective, and enjoyable tool to complement pharmacological treatment in hypertension management.

***Keywords**: Hypertension, Music Therapy, Stress, Cardiovascular Health, Complementary Medicine*

EVALUATION OF ANTIDIABETIC PROPERTIES OF POLYSACCHARIDES EXTRACTED FROM *SARGASSUM* SPECIES

Sayyed Iliyas[1], Mahammad F. Patel[2]
[1] Department of Botany, Poona College Camp, Pune- 411001, Maharashtra, India
[2] Department of Botany, Prof. Ramkrishna More AC & Sc College, Akurdi, Pune-411044, Maharashtra, India.
Email: mpatelbiotech07@gmail.com

Abstract

Diabetes mellitus can be categorized into two types: Type I diabetes mellitus, which is caused by autoimmune-mediated disintegration of pancreatic β-cells, and Type II diabetes mellitus, which is caused by abnormal synthesis of hepatic glucose, which can be attributed to hyperglycemia (excess glucose in the blood). *Sargassum* is a marine brown algae with a variety of species. The vast resources of natural and cultivated marine algae can provide bioactive substances rich in variety and abundant in quantity, which are being increasingly explored in the health industry for their novel bioactivities. Fucoidan is a water-soluble, negatively charged polysaccharide abundant in marine brown algae. Antidiabetic activity was assessed at different polysaccharide concentrations (100µg/mL, 200µg/mL, 300µg/mL, 400µg/mL, 500µg/mL), and found 87% α-glucosidase inhibition at a 500µg/mL polysaccharide concentration of *Sargassum tenerrimum*. *S. tenerrimum* was a more potent inhibitor of α-glucosidase than those from *Turbinaria ornata*, 62% at 500µg/mL. The ability of polysaccharides to inhibit α-amylase and α-glucosidase varies according to algae species. Thus, *Sargassum tenerrimum* is more suitable than *Turbinaria ornata* as a source of polysaccharides to reduce glucose by inhibiting α-amylase and α-glucosidase activity.

Keywords*: Polysaccharide, α-amylase, α-glucosidase, Diabetes, Sargassum spp.*

PHARMACOLOGICAL ACTIVITIES OF *CATHARANTHUS ROSEUS*: AN UPDATED REVIEW

Azahar Sajjad and Akil Ahmad Khan
Department of Botany, Gandhi Faiz-e-Aam College, Shahjahanpur, U.P. 242001

Abstract

Catharanthus roseus, commonly known as Madagascar periwinkle is a perennial herb with glorious flowers which is commonly used as an ornamental plant. Important alkaloids like as vinblastine and vincristine are key ingredient of the plant. Apart from these, it is also reported for rich in phenolic compounds, organic acids and amino acids. The plant exhibits different biological activities like as anti-hypertensive, antidiabetic, antioxidant, anticancer and antibacterial. Two main anticancer drugs isolated from *Catharanthus roseus* are Oncovin and Velban already marketed globally. This article discusses the evidence for the clinical effectiveness and toxicity of approved phytochemicals.

In the present study we have tried to collect traditional uses, phytochemical constituents and pharmacological importance of the plant. This study helps to understand the health promoting properties of this useful plant and it may also envisages for discovery of new lead compounds of pharmaceutical significance.

Keywords*: Alkaloids, Catharanthus roseus, Pharmacological*

ANALYSIS OF GENETIC DIVERSITY AND AGRONOMIC TRAIT VARIATION IN M2 MUTANTS OF *NIGELLA SATIVA* L. INDUCED BY EMS AND MMS MUTAGENESIS

Parul Verma*, Dr. Sana Choudhary
Cytogenetics and Plant Breeding Lab, Department of Botany, Aligarh Muslim University, Aligarh, UP, India- 202002

Abstract

Black cumin (*Nigella sativa* L.) is a multibranched annual herb with a diploid chromosome number (2n = 2x = 12) and is highly valued for its medicinal applications. Seeds of AN-20 cultivar of *Nigella sativa* L. (black cumin) were treated with a range of concentrations of the chemical mutagens ethyl methane sulphonate (EMS) (0.1%, 0.25%,0.50%, 0.75%, and 1.0%) and methyl methane sulphonate (MMS) (0.1%, 0.2%, 0.3%, 0.4% and 0.5%). The objective was to evaluate their impact on qualitative and quantitative traits in the M1 and M2 generations. The experiment was conducted over two successive seasons using a Complete Randomized Block Design (CRBD) with appropriate replication. An analysis of the M2 progeny revealed a significant frequency of induced phenotypic variations, leading to the identification and isolation of a broad spectrum of mutants. Mutagenic effectiveness and efficiency were determined to be highest at the lower concentrations for both agents, with EMS proving to be the more potent mutagen. A wide array of morphological mutants with altered characteristics for leaf morphology, plant architecture, and capsule and seed traits was cataloged. EMS induced a wider spectrum and a higher total number of viable mutants than MMS. The most frequently observed mutation categories affected leaf morphology, followed by plant stature, growth habit, and capsule and seed characteristics. The identified high-yielding mutants represent valuable germplasm for future breeding programs aimed at developing elite cultivars with enhanced productivity and economic value.

Keywords*: Nigella sativa L., Ethyl Methane Sulphonate (EMS), Methyl Methane Sulphonate (MMS), Mutants, Mutagenic effectiveness.*

PHYSIOLOGICAL AND MOLECULAR RESPONSES OF FLAVONOID BIOSYNTHESIS IN MEDICINAL PLANTS UNDER ABIOTIC STRESS

Shraddha Saxena[1]*, Alok Kumar Khare[1]
[1]Department of Botany, Bareilly College Bareilly, MJPRU, Bareilly U.P.

Abstract

Nowadays changing climatic conditions leads to impairment of normal growth and productivity of plants making them vulnerable to stress conditions. In India, abiotic stressors like heat, drought, salinity and heavy metals are the most prevalent stressors affecting plants and these may induce phytochemical production leading to better stress tolerance in plants. Flavonoids are a subtype of phenolic compounds or plant secondary metabolites (PSM), not required for normal growth and development rather than needed for interaction of plants with their environment and particularly mitigating abiotic stress and have numerous therapeutic properties like antioxidant, anti-inflammatory and neuroprotective etc., important for medicinal potential of plants. Many studies suggests that flavonoid content may increase or decrease in response to specific stressor depending upon specific plant part and species. In real-time conditions, plants tolerate a variety of stresses rather than a particular stress and flavonoids play an important role in minimizing stress-induced ROS production and upregulation of flavonoid biosynthesis related genes has been reported during stress conditions, that provides a overview of relation between increasing stress conditions and its impact on flavonoid content that might be valuable for increasing phytochemical content in plants even under stress conditions, which will provide a way for efficient and sustainable production of plant-based therapeutics.

Keywords*: Flavonoids, Therapeutics, Abiotic stress, Phytochemical, Antioxidant.*

COMPARATIVE EFFECT OF SILICON AND TITANIUM DIOXIDE NANOPARTICLES ON THE PERFORMANCE OF *OCIMUM SANCTUM*- A MEDICINAL PLANT

Havza Imtiaz[1*], Shamsul Hayat[2]
Department of Botany, Plant Physiology Section, Faculty of Life Sciences, Aligarh Muslim University, Aligarh 202002, India
Email: havzaimtiaz@gmail.com

Abstract

Nanoparticles (NPs) have gained considerable interest among researchers in the field of plant biology, particularly in the agricultural sector. The objective of this study was to investigate the effect of silicon dioxide (SiO_2) or titanium dioxide NPs (TiO_2) through root dipping and foliar spray on lemongrass (*Cymbopogon flexuosus*) on the growth, physiological, and biochemical parameters. Different concentrations 0 (control), 50, 100, 150 and 200 mg/L of SiO_2 or TiO_2 NPs were applied; at 120 days after planting, the sampling was performed to evaluate various parameters. The results demonstrated that both SiO_2 and TiO_2NPs improved the growth, photosynthetic traits, elemental content in a dose dependent manner. SiO_2 or TiO_2NPs application stimulated activity of several enzymes and reduced oxidative stress by promoting antioxidant machinery. According to our findings, the best concentration of SiO_2 and TiO_2 were determine to 150 mg/L and 100 mg/L respectively, as it shown the most significant effects among others concentrations evaluated. Moreover, in between the two modes, the root dipping treatment was found to be less significant than the foliar application.

Keywords*: Nanoparticles, Growth, Photosynthesis, Oxidative stress*

ASSESSMENT OF HEAVY METALS POLLUTION IN RIVER RAMGANGA, SHAHABAD, DISTRICT RAMPUR (U.P.)

Mohammad Tazeem Khan[1] Dr. Neeraj Malik[2]
[1,2]S.M. Degree College Chandausi, Sambhal
(Affiliated to Guru Jambheshwar University, Moradabad)

Abstract

Water is an essential natural resource for all living forms and has multiple roles in every field, including agriculture, industry, hydropower production, and so on. Though, the world is facing problems with a wide variety of pollutants both inorganic and organic in nature. Healthy as well as clean water is the basis of life on Earth. As a matter of concern Every day, the water on Earth becomes less appropriate for life. However, heavy metals are primarily responsible for water pollution in water bodies. Furthermore, Heavy metals are the most hazardous compounds to human life forms and Nature because of their toxic and carcinogenic properties. On the contrary, Over the last several decades, the concentration of these heavy metals in river water and sediments has rapidly increased, which may create disturbing impacts on the ecological equilibrium of the aquatic environment, ultimately affecting grains and vegetables grown with contaminated soil and water. Heavy metal poisoning in rivers brings a major hazard to aquatic life due to their high toxicity, persistent presence in the environment, and accumulation in water bodies. The Ramganga River is a tributary of the Ganga that originates in the high-altitude zone that receives a large volume of untreated wastewater including hazardous heavy metals from industrial and urban outflow. The current study seeks to examine the heavy metal contamination (Fe, Cd, Zn, Cr, and Pb) in the Ramganga River.

Keywords: *heavy metals, water pollution, hazardous, aquatic environment*

THE BIOPHYSICAL IMPACT OF AQUATIC POLLUTION ON WATER HOMEOSTASIS IN FRESHWATER ORGANISMS

Swalih Mohammed
Centre for interdisciplinary research for Basic Science,
Jamia Millia Islamia, New Delhi

Abstract

Aquatic pollution is a critical global issue with profound effects on the physiology of freshwater organisms. This study investigates the biophysical mechanisms by which common aquatic pollutants, such as heavy metals and microplastics, disrupt cellular water homeostasis. Using both in vitro and in vivo models of freshwater fish, we examine the pollutants' impact on the function of aquaporins (AQPs), the primary water-regulating membrane channels. Our research utilizes advanced biophysical techniques, including fluorescence spectroscopy to measure channel activity and atomic force microscopy to analyze changes in membrane fluidity. The findings indicate that exposure to even low concentrations of pollutants significantly impairs AQP function, leading to a breakdown in cellular osmotic regulation and inducing cellular stress. This disruption is a direct contributor to compromised organ function and overall physiological decline in aquatic animals. By bridging the fields of biophysics and environmental biology, this work provides a molecular-level understanding of how aquatic pollution compromises the health and survival of organisms. This research contributes to the conference's objective to address global issues related to environmental stress and provides a scientific basis for developing strategies to mitigate the harmful effects of water pollution

Keywords*: Aquatic pollution, Water homeostasis, Freshwater organisms, Heavy metals, Microplastics, Aquaporins (AQPs), Cellular osmotic regulation, Biophysical techniques, Fluorescence spectroscopy, Atomic force microscopy*

HEAVY METAL TOXICITY DECREASES THE FRESH WATER FISH POPULATION IN GOMATI RIVER OF JAUNPUR DISTRICT

Dr. Ajay Kumar (Assistant Professor)
Department of Zoology, TDPG College, Jaunpur

Abstract

The Gomti River originates from the Gomat Taal, otherwise called Fulhaar Jheel, which is found near the Madho Tanda in the Pilibhit district in Uttar Pradesh. Sai river, Chowka River, Kathina River and Saryu River are important tributaries of Gomati River. The river is perennial. The river has a slow flow all year long, with the exception of the monsoon season, when a lot of rain increases the discharge significantly. From its origin Gomati River faces multiple irreversible pollution causing conditions as like industries, house hold pollutant and agricultural waste and changes in natural population by introductions of exotic species and diseases. According to the most recent study, there are roughly 124 species, 74 genera, and 28 families of biodiversity in Uttar Pradesh's waterways. About 14.11 percent of India's freshwater fish variety can be attributed to this diversity. Compared to the 56 species previously recorded by Sarkar *et al*. (2010), the River Gomti displayed a total species variety of 68 species. The most populous state, Uttar Pradesh (UP), is endowed with an abundance of aquatic bioresources, including a diverse range of freshwater fishes with great genetic diversity. UP offers significant potential for the development of inland fisheries and aquaculture, and it accounts for about 14.68% of India's fish biodiversity. Due to the growing demand for high-quality water globally, whether for drinking, sanitation, agriculture, or industrial use, there has been a growing concern in recent years about water treatment and reuse, which calls for the strictest standards. The Environmental Protection Agency has identified certain of these elements as priority contaminants to be managed because they are non-biodegradable, such as arsenic (As), Cadmium (Cd), Chromium (Cr), Nickel (Ni), Lead (Pb), and Zinc (Zn). Sewage water and untreated or purportedly treated industrial effluents include varying concentrations of heavy metals as lead, arsenic, copper, nickel, cadmium, mercury, zinc, and chromium. In Our study we calculated the Cd level, using atomic absorption spectroscopy in Gomati River is 0.05ppm, that is 10m times more than WHO standard limit. Due to increased heavy metal toxicity, in river water causes decrease in fish species diversity. As per our finding, suggest that, with controlled effluent flow in river will increase the water quality and biodiversity in the same.

EFFECT OF MELATONIN ON PHYSIOLOGICAL AND BIOCHEMICAL ATTRIBUTES OF SOLANUM NIGRUM

Noore Hera and Qazi Fariduddin*
Department of Botany, Faculty of Life Sciences, Aligarh Muslim University, Aligarh 202002, India

Abstract

Solanum nigrum belongs to the Solanaceae family and possesses great medicinal value. Melatonin (MEL) is a potential plant growth regulator that significantly influences various physiological, biochemical and molecular functions of plants. A study was conducted to investigate the impact of MEL (25, 50, 75 or 100) on physiological, biochemical and histochemical attributes of *Solanum nigrum* applied at 30 days after transplantation (DAT). Foliar treatment of MEL improved growth, gas exchange parameters (PN, gs, E, Ci), SPAD value, antioxidant activity, proline and protein content. Out of various concentrations of MEL 50 μM MEL was most effective in augmenting plant length, fresh and dry masses, photosynthetic attributes, chlorophyll content, stomatal morphology, antioxidant activity, proline and protein content. Moreover, MEL treatment further boosted the activity of antioxidant enzymes such as catalase (CAT), peroxidase (POX), and superoxide dismutase (SOD), signifying its potential role in optimising crop yield and fruit quality of the *Solanum nigrum* which has immense potential in the pharmaceutical industry.

ENHANCING YIELD IN DIRECT-SEEDED RICE THROUGH PLANT GROWTH-PROMOTING RHIZOBACTERIA: ISOLATION, CHARACTERIZATION AND FIELD EVALUATION

Baby[1], Jupinder Kaur[1a]
[1]Department of Microbiology, College of Basic Science and Humanities, Punjab Agricultural University, Ludhiana, Punjab, India

Abstract

This study explores the potential of plant growth-promoting rhizobacteria (PGPR) to enhance yield in Direct-Seeded Rice (*Oryza sativa* L.) by developing an efficient microbial consortium. Rhizospheric soil samples collected from rice-growing regions of Punjab, Haryana, Himachal Pradesh and the Western Ghats led to the isolation of 56 morphologically distinct bacterial strains. These isolates were screened for key plant growth-promoting traits, including ACC deaminase activity, gibberellic acid production, nitrogen fixation and solubilization of phosphate, zinc, and iron, as well as siderophore, auxin and ammonia production. Several isolates exhibited multiple beneficial traits, with strains B-44 and B-50 showing exceptional ACC deaminase and gibberellic acid activity, respectively. Molecular characterization using 16S rDNA sequencing identified the most promising isolates as *Priestia aryabhattai*, *Kosakonia* sp., *Pseudomonas vancouverensis* and *Pseudomonas* sp. These strains also showed strong biofilm formation and exopolysaccharide production, indicating high root colonization potential and none exhibited pathogenicity. Field trials at Punjab Agricultural University and a farmer's field in SAS Nagar demonstrated significant improvements in agronomic parameters such as plant height, panicle length, grain number and biomass with PGPR inoculation. The results highlight *Priestia aryabhattai* and *Pseudomonas vancouverensis* as effective bioinoculants for improving productivity in direct-seeded rice systems.

Keywords*: DSR, Bio-fertilizer, PGPR, Cultural Characterization, Functional Traits, Molecular Identification, Yield Enhancement*

PHYSIOLOGICAL AND BIOCHEMICAL RESPONSE OF WHEAT (*TRITICUM AESTIVUM* L.) VARIETIES TO VARYING LEVELS OF SALT STRESS

Sofiya Anjum and Qazi Fariduddin*
Department of Botany, Faculty of Life Sciences, Aligarh Muslim University, Aligarh 202002, India
E-mail: qazi_farid@yahoo.com

Abstract

Salinity is a major abiotic stress, limiting wheat productivity worldwide. This study was conducted to evaluate the physiological and biochemical responses of ten varieties of *Triticum aestivum* L. subjected to different levels of salt stress (0, 50, 100 or 150 mM NaCl) at 35 days after sowing (DAS). Salt stress led to significant variation in different wheat varieties. Salt stress decreased growth and photosynthetic attributes, whereas proline content and activity of antioxidant enzymes were increased. Among the varieties some varieties exhibited enhanced tolerance by maintaining higher relative water content (RWC), chlorophyll content and antioxidants under high salinity, whereas some varieties have found very prone to salt stress. These findings could helpful for identifying salt-tolerant wheat varieties adopted for breeding programs with improved crop performance under saline conditions.

SYNTHESIS OF NONEMBRYONIC SYNSEED, SHORT TERM CONSERVATION, PHYTOCHEMICAL EVALUATION AND ASSESSMENT OF GENETIC STABILITY THROUGH SCOT MARKERS IN *DECALEPIS SALICIFOLIA*

Adla Wasi[1], Anwar Shahzad[1]
[1]Plant Biotechnology Section, Department of Botany, Aligarh Muslim University, Aligarh, Uttar Pradesh 202002, India
E-mail addresses: adlawasi97@gmail.com & ashahzad.bt@amu.ac.in*

Abstract

The current work specifies an effort to conserve the highly endangered plant *Decalepis salicifolia* by utilizing encapsulation technology for high plantlet recovery, short-term storage, and conservation. In order to determine the best culture conditions for maximizing the ability of synseeds to develop into complete plantlets, nodal segments (NS) were encapsulated in a sodium alginate (SA) matrix. The best solution for creating isodiametric beads was determined to be a 3 % sodium alginate with 100 mM CaCl2 solution. Regeneration of the encapsulated segment was reported directly or after storage at 4°C for up to 8 weeks. The highest shoot regrowth frequency (90.8%) and highest microshoots per encapsulated nodal segment i.e. 4.90 were recorded when Murashige and Skoog (MS) basal medium was supplemented with 5.0 μM 6-benzyl adenine (BA) + 1.0 μM indole-3-butyric acid (IBA) and encapsulated nodal segment were inoculated onto the nutrient medium comprised of MS + 5.0 μM BA. Microshoots rooted effectively on MS medium augmented with indole-3-butyric acid IBA (2.5 μM). Plantlets achieved from preserved synthetic seeds were acclimatized and relocated in the natural condition successfully with an immortality rate of 87.1 %. Subsequently, it was planted in garden soil and exhibited no morphological changes. Gas Chromatography and Mass Spectrometry (GC-MS) of leaf extract, obtained from the donor plant as well as in vitro derived encapsulated regenerated plantlets shows the presence of diverse chemical compounds of immense pharmacological properties and number of biochemical compounds are almost similar in both, which established the biochemical similarity between them. Genetic similarity between the donar plant and the synseed-derived plant was confirmed by the presence of monomorphic bands produced with the help of the start codon targeted (SCoT) marker.

NEURAL ADAPTATIONS ACROSS INSECT ORDERS: EXPLORING THEIR ROLE IN HEMIPTERA AS A KEY AGRICULTURAL PEST

Zuhal Khan, Research Scholar
Section of Entomology, Department of Zoology, Aligarh Muslim University, Aligarh

Abstract

The evolutionary success of insects is closely tied to the diversity and flexibility of their nervous systems, which facilitate adaptive behaviors and ecological specialization. This study focuses on comparative nervous system modifications across major insect orders, emphasizing their role in driving functional adaptations and survival strategies. The structure of the adult Ventral Nerve Cord is variable both within and between insect orders, families, and genera, and even between castes and sexes of the same species. Variation occurs in the positions of ganglia, which may shift relative to the segments that they innervate and relative to other ganglia, and also in the pattern of fusions between neuromeres from neighboring segments to form composite ganglia. Hemiptera, a group of significant agricultural pests, offers a compelling case for understanding the link between neural adaptations and pest behavior. Hemipterans exhibit remarkable diversity in feeding habits and are characterized by specialized mouthparts adapted for piercing and sucking. These feeding adaptations are mirrored by modifications in their central and peripheral nervous systems, particularly in sensory and motor control regions. A comparative analysis of neural architectures across representative insect orders, including Diptera, Coleoptera, and Lepidoptera, with an emphasis on the unique neural configurations in Hemiptera. In Hemiptera, the mushroom bodies display reduced complexity, consistent with their reliance on simpler foraging strategies, while the subesophageal ganglion shows expansion correlating with the motor coordination required for their piercing-sucking feeding mechanism. This study explores Hemiptera's neural specialization in the context of insect nervous system evolution, highlighting its relevance to ecological adaptation and pest management.

ALLELOPATHIC POTENTIALITY OF AQUEOUS EXTRACTS OF LEAF, STEM AND ROOT OF *AMARANTHUS VIRIDIS* L. AND *NICOTIANA PLUMBAGINIFOLIA* VIV. INFLUENCING SAPLING GERMINATION IN SOME PLANT SPECIES

Uzma Parveen*1 and M. B. Siddiqui1
1Aligarh Muslim University, Faculty of Life Sciences, Department of Botany (Aligarh)
Tel/Fax No - (+91)75127 02016

Abstract

The purpose of the study that followed was to closely examine the phytotoxic effects of different parts of *Amaranthus viridis* L., and *Nicotiana plumbaginifolia* Viv., specifically the leaf, stem, and root, on the germination of seeds and the growth of seedlings of crops and a weed. Aqueous extracts amended soils were made because *A. viridis* and *N. plumbaginifolia* both inhibited the growth of seedlings in weeds and crops. In contrast to the control, sapling germination (branch length, root length, and dry biomass) of both weeds and crops decreased at various concentrations (4%, 2%, 1%, and 0.5%) of aqueous extracts amended soils of root, stem, and leaf.

When it comes to *Amaranthus*, the leaf aqueous extract (LAE) amended soils was found to be more detrimental than the stem extract (SAE) in Nicotiana. The study's findings imply that *Nicotiana* and *Amaranthus* may contain phytochemicals that mixed with the soil can inhibit the growth of weeds (*Eclipta alba* L.) and crops (*Daucus carota* subsps. *sativus* and *Solanum melongena* L.). Because the leaves of *Amaranthus* and the stems of *Nicotiana* contribute significantly to the plant's biomass and phytotoxicity, they have the potential to be used as a natural weedicide in agro-ecosystems, thereby leading to an environmentally friendly ecosystem.

Keywords*: Aqueous extracts amended soils, phytochemicals, phytotoxicity, natural weedicide, environmentally friendly*

MICROPROPAGATION OF *AJUGA BRACTEOSA* VIA DIRECT ORGANOGENESIS USING INTERNODAL EXPLANTS

Arisha Kausar, Anwar Shahzad*
*ashahzad.bt@amu.ac.in
*Plant Biotechnology Section, Department of Botany, Aligarh Muslim University, Aligarh, Uttar Pradesh 202002, India

Abstract

Ajuga bracteosa is a herb with high medicinal value and a limited distribution range. It is used in several herbal and traditional medicines, including diabetes. We developed a methodology for the micropropagation of *A. bracteosa* via direct organogenesis using internodal segments. The highest shoot multiplication was achieved on Murashige and Skoog (MS) medium supplemented with 6-benzyl-amino-purine (5.0 µM) + indole-3-acetic acid (1.5 µM) + adenine sulphate (15.0 µM), which produced the maximum number of 20.45 ± 0.12 shoots/explants with 6.43 ± 0.006 cm shoot length. Rooting in the microshoots was attained on half-strength MS medium containing indole-3-butyric acid (1.5 µM), with the highest root number of 16.44 ± 0.015 roots/shoot, and root length of 2.25 ± 0.011 cm. Genetic fidelity of the in vitro regenerated plantlets was verified using SCoT marker analysis, which showed uniform monomorphic banding patterns across all samples, indicating true-to-type propagation. SEM analysis further confirmed normal stomatal development, suggesting that the plantlets had undergone proper physiological acclimatization. Additionally, GC–MS profiling revealed the consistent presence of key phytochemicals in both the regenerated and mother plants, demonstrating maintained phytochemical integrity. These findings highlight the effectiveness of the developed protocol for large-scale propagation, offering a reliable solution for conservation and medicinal use of this threatened species.

ANTIOXIDANT POTENTIAL OF *MURRAYA KOENIGII* LEAVES AGAINST OXIDATIVE DAMAGE

Jayanti Jatav
Department of Zoology, University of Rajasthan, Jaipur
Email: jayanti5043@gmail.com

Abstract

Oxidative damage, arising from the excessive generation of reactive oxygen species (ROS) and an imbalance in endogenous antioxidant defenses, plays a critical role in the onset and progression of various chronic and degenerative disorders, including neurodegenerative, cardiovascular, metabolic, and inflammatory diseases. *Murraya koenigii* (curry leaf), a widely used culinary and medicinal plant in Asia, is rich in diverse phytochemicals such as carbazole alkaloids, flavonoids, phenolic acids, terpenoids, and essential oils, all of which exhibit potent antioxidant properties. These bioactive constituents function through multiple mechanisms, including free radical scavenging, metal ion chelation, and upregulation of endogenous antioxidant enzymes, thereby mitigating oxidative stress at the cellular and molecular levels. Experimental evidence from in vitro and in vivo studies demonstrates the ability of *Murraya koenigii* leaf extracts to protect biomolecules such as lipids, proteins, and DNA from oxidative damage, while also modulating key signaling pathways involved in oxidative stress response. Furthermore, its antioxidant potential contributes to its broader pharmacological activities, including neuroprotective, cardioprotective, antidiabetic, and anti-inflammatory effects. This review highlights the current understanding of the phytochemical profile of *Murraya koenigii,* summarizes its antioxidant mechanisms, and discusses its potential applications in preventive and therapeutic strategies against oxidative stress-related disorders. The findings underscore the importance of *Murraya koenigii* as a promising natural antioxidant source with significant health benefits, underscoring the need for further exploration for its clinical and nutraceutical applications.

Keywords*: Murraya koenigii, Phytochemicals, Oxidative stress, Antioxidant activity, Neuroprotection, Natural therapeutics*

THREATS TO AVIAN BIODIVERSITY AND THE NEED FOR SUSTAINABLE CONSERVATION

Monika and Ashok Kumar
Department of Zoology, BSNVPG College, University of Lucknow, Lucknow
Email: ashokbsnv11@gmail.com

Abstract

Avian biodiversity plays a critical role in maintaining ecological balance, serving functions such as pollination, seed dispersal, pest control, and acting as bioindicators of environmental health. However, bird populations worldwide are facing unprecedented threats due to habitat loss and fragmentation, driven primarily by urbanization, agriculture, and deforestation, remain the leading causes of species decline. Other significant threats include climate change, pollution (especially pesticide use and plastic waste), invasive species, and illegal wildlife trade. These factors not only reduce bird population but also disrupt the balance of the ecosystem. The urgent need for sustainable conservation is paramount to reverse these trends. This involves integrated strategies such as habitat protection and restoration, community engagement, environmentally responsible policy-making, and international cooperation. Embracing sustainable practices ensures that conservation efforts address both ecological and socio-economic dimensions, safeguarding avian biodiversity for future generations.

Keywords*: Avian Biodiversity, Bird Conservation, Threats, Sustainability, Climate Change.*

NRG-1 AS THERAPEUTIC TARGETS IN SKIN DEPIGMENTARY DISORDER: VITILIGO

Seema Rani, Ravinder Kumar
Assistant Professor, Department of Zoology, Chaudhary Bansi Lal University, Bhiwani
Assistant Professor, Department of Zoology, Panjab University, Chandigarh

Abstract

Paracrine cross-talk exists between the fibroblasts of dermis and epidermal cells through secretions of various growth factors. Melanocytes present at the basement layer of the epidermis respond to various factors secreted by underlying dermal fibroblasts in the dermis to regulate the function and phenotype of the skin. Therefore the study was planned to check the expression of fibroblasts derived factor Neuregulin1 (NRG1) in vitiligo skin and its effect on melanocytes.

For this study, relative gene expression at mRNA level of NRG1 in the vitiligo skin was analysed by quantitative real time PCR (qRT-PCR) and immunohistochemistry technique was used for protein analysis. Effect of different concentrations of NRG1 was checked on the cultured melanocytes by proliferation assay, melanin content assay, tyrosinase assay and on the level of melanocyte specific genes (MITF, TYR, c-KIT, DCT). Expression of NRG1was significantly less in lesional dermis of vitiligo patients as compared to non lesional and healthy control dermis both at mRNA as well as protein level. NRG1treatment showed significant increase in proliferation, melanin content, tyrosinase level and gene expression level of melanocyte specific genes. Treatment of NRG1 to the cultured melanocytes increases proliferation and pigmentation. Lower expression of NRG1 in the lesional dermis of vitiligo patients inhibits the melanocytes growth. Therefore this study hypothesized that low expression of NRG1 in lesional skin of vitiligo patients can have a possible role in the melanocyte loss and vitiligo pathogenesis.

NANO BIOCHAR AS A NOVEL CARRIER FOR BENEFICIAL SOIL MICROBES IN SUSTAINABLE FARMING: A REVIEW

Om Shiwani
Department of Botany, Rajkiya Mahila Snatkottar Mahavidyalaya, Ghazipur

Abstract

The overexpanding human population has led to the growing demand for sustainable and eco-friendly agricultural practices. It has increased the exploration for effective soil amendments that can boost the crop yield while maintaining the environmental health. Nano biochar has emerged as a useful and ecofriendly option to carry and support beneficial microbes in sustainable agriculture. Recent technological advancements have facilitated the production of nano biochar. Nano biochar is biochar that is reduced to the nanoscale, ranging from 1-100nm. Reduced size led to the high porosity, increased surface area, improved adsorption sites, and long-term stability in soils. Nano biochar with these qualities is ideal for encapsulation and delivery of useful soil microbes like *Azotobacter*, *Rhizobium*, *Pseudomonas* and *Trichoderma*. The interaction between nano biochar & microbe contributes to improved soil fertility, nutrient availability, and plant growth, while also reducing use of harmful chemical fertilizers. Additionally, it also helps in soil carbon sequestration, water retention, and soil improvement, thus addressing the growing food demand with supporting a healthy environment.

This review study provides insights about the potential of nano biochar as a novel microbial carrier i.e. endorsing microbial survival, colonization, and sustained release into the rhizosphere. However very few studies have been done in this field to infer the negative aspect of nano biochar as a microbial carrier, that can be addressed by long term field based interdisciplinary research.

Keywords*: Nano biochar, biofertilizer, rhizosphere, sustainable agriculture, soil amendment*

PHYTOCHEMICAL ANALYSIS AND ANTIMICROBIAL POTENTIAL OF *PLEUROTUS DJAMOR*

Poonam Dehariya
Lab of Mushroom Biology, Department of Botany,
Dr. Harisingh Gour Vishwavidyalaya, Sagar (MP)

Abstract

The present investigation aims to explore the phytochemical properties and antimicrobial effects of dried pink oyster mushroom (*Pleurotus djamor*) powder. Although various mushroom species have already been studied, there remains significant scope for further investigation into the phytochemical composition and antimicrobial potential of *Pleurotus djamor*. This species represents a valuable resource, particularly for cultivators in underdeveloped regions, due to its thermophilic nature and rapid growth rate, which enable cultivation with minimal capital and labour input. Its ability to thrive on untreated, raw cellulosic waste makes it an eco-friendly option for producing both nutritious food and enriched ruminant feed, thereby supporting food and economic security in developing countries. *Pleurotus djamor* is also known for its diverse therapeutic properties, including anti-inflammatory, antipyretic, analgesic, antioxidant, and antimicrobial activities. It has shown promise in combating diseases associated with free radicals and oxidative stress. Furthermore, its bioactive compounds particularly polysaccharides have been reported to offer protective effects for vital organs such as the liver, kidneys, and brain. These compounds contribute to its potential in managing age-related ailments, cancer, and various degenerative diseases, highlighting the medicinal significance of this versatile mushroom.

Keywords*: Pharmaceutica, antimicrobial, Pleurotus djamor, antioxidant.*

A RELIABLE MICROPROPAGATION PROTOCOL THROUGH ORGANOGENESIS AND SOMATIC EMBRYOGENESIS OF THE ENDANGERED HIMALAYAN HERB *ATROPA ACUMINATA* ROYLE EX LINDL

Aashiq Yousuf Bhat and Anwar Shahzad*
Plant Biotechnology Section, Department of Botany,
Aligarh Muslim University, Aligarh, Uttar Pradesh, 202002, India
E-mail address: ashahzad.bt@amu.ac.in*

Abstract

Atropa acuminata is an endangered and endemic Himalayan herb of prime importance in pharmaceutical companies. The chemical ingredients of *A. acuminata* and other related plants of the genus are present in many over-the-counter life saving drugs. To address its propagation, we developed a reliable and reproducible micropropagation procedure using Murashige and Skoog (MS) medium with various types and concentrations of Plant Growth Regulators (PGRs) to assess its in vitro seed germination and morphogenetic response of leaf and root explants. Our results showed that gibberellic acid (GA3) improved seed germination (93.3 ± 0.7 %) irrespective of the media strength, with 10 µM GA3 achieving the shortest mean germination time (MGT) of 14.9 ± 5.6 days in full strength medium. Young leaf and root explants when cultured with cytokinins such as thidiazuron (TDZ), 6-benzyladenine (BA), and meta-topolin (mT) effectively induced the formation of adventitious shoots and somatic embryos.MS medium enriched with 7.5 µM TDZ effectively supported both adventitious shoot organogenesis producing an average of 9.8 ± 14 shoots and somatic embryogenesis yielding an average of 15.0 ± 0.21 somatic embryos per leaf segment. For root explants, MS medium augmented with mT 10 µM was optimum yielding a mean of 11.06 ± 0.14 somatic embryos per culture vial Further, for adventitious shoot organogenesis MS medium supplemented with TDZ 5.0 µM proved effective inducing a peak mean number of 12.24 ± 0.15 shoots per vial. Micro-shoots and emblings achieved 100% rooting in MS medium supplemented with 2.0 µM indole-3-butyric acid (IBA) averaging 10.50 ± 0.37 rootsper micro-shoot/embling. Transplanted into various substrates, pure soil rite yielded 100% survival, while as garden soil:soilrite (3:1) proved to be best substrate for overall plant growth, despite having a low percentage survival of 75.0 ± 0.16%. The well acclimatized plants were successfully grown in their natural habitat in Kashmir, India.

CLIMATE CHANGE AND LIVESTOCK ADAPTATION: STRATEGIES TO ENHANCE RESILIENCE OF FARM ANIMALS TO HEAT STRESS AND ENVIRONMENTAL CHALLENGES

Ms. Saloni Sharma
Department of Biotechnology
Khandelwal College of Management Science and Technology, Bareilly U.P

Abstract

Climate change presents challenges to livestock production worldwide, affecting animal health, productivity, and its welfare. Increase in temperatures, extreme changes in weather events, and changing precipitation patterns increase the risk of heat stress, reduced feed efficiency, reproductive issues, and susceptibility to diseases. This study looks at various adaptive strategies to improve the flexibility in farm animals under rapidly changing environmental conditions in the current scenario. These approaches include genetic selection for producing heat-tolerant breeds, nutritional interventions, and studies to improve the thermoregulation, housing and management modifications, and the use of accuracy livestock farming technologies for the real-time monitoring. In addition, physiological, biochemical, and behavioral indicators are evaluated to assess animal adaptation and stress overcoming. By combining the modern biotechnological breeding techniques, nutritional, and management strategies, this study aims to provide practical, sustainable solutions for sustaining livestock productivity and welfare under climate commutability. The findings and discussion highlight the importance of dynamic adaptation measures to ensure sustainable livestock farming, overcome the economic losses, and improve and support global food security in the face of ongoing climate change.

ASSESSMENT OF ANTIBACTERIAL ACTIVITY OF LEAF EXTRACTS OF *STREBLUS ASPER* LOUR. AGAINST SELECTED GRAM-POSITIVE AND GRAM-NEGATIVE BACTERIAL STRAINS

Mouli Pal
Department of Zoology, University of Burdwan

Abstract

Streblus asper, a medicinal plant belonging to the Moraceae family, has been traditionally used in ayurveda and folk medicine for treating various ailments like filariasis, leprosy, toothache, diarrhoea, dysentery, infections including cancer. Recent studies suggest that its antibacterial activity may be linked to the presence of bioactive compounds, including flavonoids, tannins, alkaloids, and terpenoids. The present study evaluated the antibacterial activity of various solvent extract fractions (Hexane, Chloroform, Ethyl acetate, Methanol) from *S. asper* leaf extract against a range of Gram-positive and Gram-negative bacterial strains using the agar well diffusion method to select the effective antibacterial fraction. The minimum inhibitory concentration (MIC) of the effective extract was determined on agar plates to assess the lowest concentration required to inhibit visible bacterial growth with Tetracycline as the standard reference antibiotic. The extract produced distinct zones of inhibition, indicating notable antibacterial potential. Results indicate inhibitory effects against bacteria such as *Bacillus cereus*, *Staphylococcus aureus*, *Escherichia coli* and *Pseudomonas aeruginosa*, suggesting a broad-spectrum antibacterial potential. The findings support the therapeutic prospects of S. asper as a natural antimicrobial agent and underline its relevance in the development of plant-based alternatives to conventional antibiotics in combating drug-resistant pathogens.

The impact of Encapsulated mace essential oil and their antifungal properties in the food industry.

Dr. Amrita Yadav*
Mahamaya Govt. Degree College, Dhanupur Handia, Prayagraj U.P. India

Abstract

Aflatoxin is a hepatotoxic, mutagenic, carcinogenic, difuran-containing, polyketide- derived avoidable food contaminants by WHO and even present in cooked food also. The consumption of food containing aflatoxin concentrations of 1 mg/kg or higher has been suspected to cause aflatoxicosis. Stored food commodities viz., wheat, maize, legumes are prone to molds contamination. International Agency for Research on Cancer has been classified Aflatoxin B1 as class-1 human carcinogenic agents Therefore, the regulatory authorities related to food safety have established strict regulations on trading practices, storage methods and monitoring of food to reduce the negative health risk related to aflatoxin B1. Nowadays, application of plant derived phytochemicals such as essential oils and possesses strong preservative potential in the management of food borne molds and mycotoxin contamination. Essential oils showed strong antifungal and antioxidant activity. The present study revealed the antifungal and preservative potential of nano-encapsulated mace essential oil with probable mode of action. Free and nano-encapsulated exhibited strong Antifungal and antiaflatoxigenic activity with minimum inhibitory concentration and minimum aflatoxin inhibitory concentration of 1.5 µL/mL and 1.25µL/mL respectively. The mechanism of action was elucidated via targeting the membrane integrity using AAS assay and ergosterol measurement carbohydrate catabolism. The finding could be great significance in suppressing the growth and Aflatoxin produced by *A. flavus* in food system.

ECONOMIC ZOOLOGY: INTEGRATING BIODIVERSITY CONSERVATION AND SUSTAINABLE RESOURCE MANAGEMENT

Ms. Vanshita
Department of Zoology, Chaudhary Charan Singh University

Abstract

Economic zoology is pivotal in tackling global issues by merging biodiversity conservation with the economic benefits obtained from biological resources. Recent advancements in this field highlight the discovery of new species with economic potential, fresh insights into animal behavior and ecology, and a deeper understanding of animal-human interactions, all propelled by technological progress in research and development. This discipline aids in combating climate change through animal-based strategies for mitigation, adaptation, and carbon storage within ecosystems. It also bolsters food security by investigating sustainable protein sources from insects and novel animals, enhancing livestock productivity and resilience, and employing natural predators for integrated pest management. Economic zoology addresses biodiversity loss by attributing economic value to biodiversity and ecosystem services, thereby shaping conservation policies and economic strategies. Nonetheless, the field encounters challenges related to ethical considerations, balancing economic interests with conservation objectives, and emerging research areas alongside technological advancements. The interdisciplinary nature of economic zoology, which involves the integration of ecology, economics, and technology, is crucial for fostering sustainable practices in sectors like fisheries, agriculture, and tourism. Collaborative efforts from governments, businesses, and communities are essential to devise innovative strategies that harmonize economic growth with ecological preservation, ensuring resource sustainability and the socioeconomic resilience of communities.

ISOLATION AND COMPREHENSIVE CHARACTERIZATION OF A BIOACTIVE COMPOUND FROM MEDICINAL PLANT *GARCINIA NERVOSA*: SINGLE-CRYSTAL X-RAY DIFFRACTION, ANTIOXIDANT AND PROTEIN-BINDING

Avadhesh Kumar[1], Uzma[2], Mehtab Parveen[2],
[1]Department of Pharmaceutical Chemistry, D.S. College of Pharmacy, Aligarh-202001, India
[2]Department of Chemistry, Aligarh Muslim University, Aligarh-202002, India

Abstract

The study the phytochemical composition and bioactive properties from medicinal plant *Garcinia nervosa*. Mainly focusing on the structural elucidation of isolated compounds and their therapeutic potential. Three bioactive compounds, Gn-01 (1), Gn-02 (2), and Gn-03 (3), were isolated from the leaves of *Garcinia nervosa*. Gn-01, an isoflavone, is reported for the first time from this plant, while Gn-03 is newly identified in this species. These all-isolated compounds were characterized by using UV-Vis, FT-IR, NMR, and MS. Single-crystal X-ray diffraction revealed compound 1's orthorhombic space group P212121, with Hirshfeld surface analysis showing significant O···H/H···O interactions. Gn-01 demonstrated potent antioxidant activity with an IC_{50} of 23.438 µg/mL, comparable to ascorbic acid. Protein-binding studies with human serum albumin (HSA) indicated strong interaction, with a Stern-Volmer constant (KSV) of 168.195 × 10^4 M^{-1} and a binding constant (Kb) of 3.1606 × 10^4 M^{-1}. Molecular docking predicted a binding affinity of -7.364 kcal/mol. Gn-01 also exhibited selective chemosensing properties towards Cu^{2+} ions, enhancing fluorescence upon complexation. These findings highlight *Garcinia nervosa* as a valuable and potency source of bioactive molecules with antioxidant, protein-binding, and metal-sensing capabilities, molecular doching, securing further pharmacological exploration.

Keywords: *Garcinia nervosa*; *Antioxidant Activity; Human Serum Albumin (HSA) Binding; Metal Sensing (Cu^{2+}); Molecular docking.*

INFLUENCE OF CHEMICAL FERTILIZERS ON HUMAN HELATH AND ENVIRONMENT

Dr. Shubhra Shukla
Assistant Professor, Department of Botany
Constituent Government Degree College, Sahasvan, Badaun, Uttar Pradesh,
M.J.P. Rohilkhand University, Bareilly, Uttar Pradesh, India

Abstract

Pollution is one of the crucial concerns on earth today. Farmers use fertilizers to increase production and manage weeds and insect pests in order to meet the demand for agricultural products and to feed the rising population. Fertilizers are either organic or inorganic. Organic Fertilizers include manure (cow or horse, poultry), bone fertilizers, cotton seeds or other naturally occurring materials, but inorganic fertilizers are man-made products. Synthetic fertilizers and pesticides have been used by farmers excessively which had a negative impact on both environment and human health. Excessive fertilization causes serious environmental problems such as loss of biodiversity, heavy metal accumulation, water pollution, toxicity of different beneficial micro-organisms, accumulation of nitrate, gases containing nitrogen and sulfur, giving and can lead to problems such as greenhouse effect or global warming. In this review, aims to make known environmental and health problems caused by unsuitable fertilization and provides recommendation towards solving these problems.

Keywords: Chemical fertilization, environment, health problems, organic fertilizer.

A PUBLIC HEALTH PERSPECTIVE ON NUTRITION TRANSITION AND ITS EFFECT ON OBESITY AND THE RISK OF CHRONIC DISEASES

Arti Yadav[1]*, Suchit Swaroop[1]
[1]Experimental & Public Health Laboratory, Department of Zoology, University of Lucknow, Lucknow-226007, E-mail: yadav.arti2018@gmail.com

Abstract

The global change in dietary and lifestyle patterns brought about by urbanization, economic growth, and globalization is referred to as the nutrition transition phenomena. Energy-dense, highly processed meals high in refined carbs, saturated fats, added sugars, and salt are replacing traditional diets, which were mostly high in fiber, whole grains, legumes, and foods produced locally. The prevalence of obesity has dramatically increased across all populations as a result of this nutritional shift and people's increasingly sedentary lifestyles. Undernutrition and micronutrient deficiencies coexist with overweight, obesity, and diet-related non-communicable diseases (NCDs) in low- and middle-income countries, where the impacts of malnutrition are especially severe. One major effect of the nutrition shift is obesity, which is closely linked to insulin resistance, type 2 diabetes, hypertension, heart disease, dyslipidemia, chronic renal disease, and some types of cancer. These shifts have a significant impact on public health worldwide, as they raise healthcare expenses and increase the burden of morbidity and mortality. In addition to regulatory measures like food taxes, nutrition labeling, public education, and the promotion of traditional diets that are fit for the culture, addressing this issue calls for comprehensive treatments that include individual-level tactics to encourage healthier diets and active lifestyles. Designing focused preventative efforts and halting the growing obesity pandemic and its related chronic diseases require an understanding of the dynamics of the nutrition change.

***Keywords*:** nutrition transition, obesity, chronic diseases, dietary patterns, non-communicable diseases.