PROCEEDING OF THE

International Conference on Life Sciences with Future Perspectives on World Challenges and Developments

(ICLS-FPWCD-2025)

Organized by

PG DEPARTMENT OF BOTANY

Sri Vidya Mandir Arts & Science College (Autonomous)

Katteri - 636 902, Uthangarai, Krishnagiri District,
Tamil Nadu, India

In association with

Silapathar Science College

Amritpur, Silapathar - 787 059, Dhemaji District,
Assam, India.

Editors

Dr. V. Chinnadurai & Dr. S. Ansar Ali

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Chief Patron	:	**Thiru. V. Chandrasekaran**
Patron	:	**Dr. N. Gunasekaran & Dr. Ranjit Saikia**
Convener	:	**Dr. V. Chinnadurai & Dr. Jitu Gogoi**
Organizing Secretaries	:	**Dr. S. Ansar Ali & Dr. Zakir Hussain Malik**
Editors	:	**Dr. V. Chinnadurai & Dr. S. Ansar Ali**
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ORGANIZING COMMITTEE MEMBERS

Mrs. N. Pushpalatha
Assistant Professor,
PG Department of Botany,
Sri Vidya Mandir Arts & Science College
Katteri, Uthangarai, TN, India

Dr. M. Mathiyazhagan
Associate Professor,
Department of Botany,
Silapathar Science College,
Silapathar, Dhemaji, Assam, India

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PG Department of Botany,
Sri Vidya Mandir Arts & Science College
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Silapathar, Dhemaji, Assam, India

Dr. V. Tamilselvan
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Katteri, Uthangarai, TN, India

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PG Department of Botany,
Sri Vidya Mandir Arts & Science College
Katteri, Uthangarai, TN, India

MESSAGES

SRI VIDYA MANDIR ARTS & SCIENCE COLLEGE
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[An Autonomous College Affiliated to Periyar University, Salem, Tamil Nadu]
[Accredited by NAAC with 'A' Grade with CGPA of 3.27]
[Recognized 2(f) & 12(B) Status under UGC Act of 1956]
Katteri – 636 902, Uthangarai (Tk), Krishnagiri (Dt),
Tamil Nadu, India

Thiru. V. CHANDRASEKARAN
Founder & Secretary

Date: 01-02-2025

Foreword

It gives me immense pleasure to extend my warm greetings to the esteemed delegates, distinguished Speakers, Researchers and participants of the **International Conference on Life Sciences with Future Perspectives on World Challenges and Developments (ICLS-FPWCD-2025).** Sri Vidya Mandir Arts & Science College (Autonomous) always stands as a beacon of excellence in academics and Research, fostering innovation and nurturing intellectual growth. Hosting this international conference reflects our unwavering commitment to advancing knowledge and addressing our time's most critical global challenges. Life sciences' dynamic and interdisciplinary nature holds transformative potential in tackling pressing issues such as environmental sustainability, global health, food security, and climate change.

This conference serves as a confluence of great minds, igniting discussions, collaborations and ground breaking innovations that will illuminate pathways for a better future. I deeply appreciate the relentless efforts of the organizing committee, the invaluable contributions of the participants and the distinguished presence of our guests and speakers. Together, Let us chart a course toward a future where science, innovation and humanity unite to overcome challenges and achieve sustainability and progress. **Wishing the ICLS-FPWCD-2025 resounding success and a lasting impact on the scientific community and society.**

Sincerely

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Katteri – 636 902, Uthangarai (Tk), Krishnagiri (Dt),
Tamil Nadu, India

Dr. N. GUNASEKARAN, M.A. M.Phil., Ph.D

Principal

Date: 01-02-2025

Foreword

I am delighted to extend my warmest greetings to all the esteemed speakers, researchers, and participants of the **International Conference on Life Sciences with Future Perspectives on World Challenges and Developments (ICLS-FPWCD-2025)**. It is a moment of immense pride for our institution, Sri Vidya Mandir Arts & Science College (Autonomous), to host this prestigious event that brings together the brightest minds to address global challenges through the lens of life sciences. In a world confronted by critical issues such as climate change, food security, environmental degradation, and global health crises, the role of life sciences has never been more crucial.

This conference provides a platform to foster interdisciplinary collaboration and share innovative ideas that will undoubtedly contribute to creating a sustainable and equitable future. I commend the organizing team for their tireless efforts in making this event a reality and express my heartfelt gratitude to all participants for their contributions. May the discussions and deliberations during this conference inspire new avenues of Research and practical solutions to the challenges that humanity faces. **Wishing the ICLS-FPWCD-2025 a grand success and a meaningful impact on the global scientific community.**

Sincerely

Silapathar Science College

... think scientifically, ... act scientifically ...

Estd. - 1996

✆ 9954422019 (M) Principal

Ref. No. : S.Sc.C/...Foreword/Message /2025/1406

Date :28/01/2025.....

FOREWORD

On behalf of Silapathar Science College, I am delighted to welcome you all to the International Conference on Life Sciences with Future Perspectives on World Challenges and Developments **(ICLS-FPWCD - 2025)**. This prestigious event, organized by the Department of Botany at **Sri Vidya Mandir Arts & Science College (Autonomous)** in collaboration with Department of Botany (UG & PG) , brings together leading scholars, researchers, practitioners, and policymakers from across the globe.

We are honored to collaborate with Sri Vidya Mandir Arts & Science College (Autonomous), a renowned institution known for its excellence in teaching and research, particularly in Plant Morphology and Development & Embryology. This combined effort underscores our commitment to fostering knowledge exchange and advancing the field of life sciences.

Silapathar Science College, established in 1996, is a premier institute offering science education in Assam. Our picturesque rural setting fosters a stimulating learning environment. We offer Bachelor of Science (B. Sc) programs and Master of Science (M. Sc) programs in Botany and Zoology, and are committed to providing quality education while keeping pace with the evolving scientific landscape.

The ICLS-FPWCD - 2025 centers around the theme of "Life Sciences with Future Perspectives on World Challenges and Developments." We aim to explore the crucial role life sciences play in addressing pressing global issues like *Global Health Crises, Environmental Sustainability, Food Security, Climate Change impact.*

The conference program encompasses a wide range of topics in life sciences, including biotechnology, genomics, medical sciences, agriculture, environmental sciences, and the transformative power of technological advancements like Artificial Intelligence and Data Science.

We believe that the ICLS-FPWCD - 2025 will serve as a valuable platform for exchanging ideas, fostering collaboration, and propelling the field of life sciences towards a brighter future. We are confident that the stimulating discussions and presentations over the next two days will lead to significant advancements in tackling global challenges.

On behalf of Silapathar Science College, I extend my best wishes for a productive and enriching conference experience.

Sincerely,

Dr. Ranjit Saikia
Principal
Silapathar Science College

Save Poba
... Save Nature

Amritpur, Silapathar - 787059
Dhemaji, Assam, India
E-mail : silapatharsciencecollege@gmail.com
ranjitsaikia09@rediffmail.com
Website : www.silapatharsciencecollege.com

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Tamil Nadu, India

Dr. D. KAVITHA, M.Sc. M.Phil., Ph.D., SET., **Date: 01-02-2025**

Vice - Principal

Message

I take immense pleasure in extending my warm greetings to all the dignitaries, scholars, researchers, and participants of the **International Conference on Life Sciences with Future Perspectives on World Challenges and Developments (ICLS-FPWCD-2025)**. Our institution, Sri Vidya Mandir Arts & Science College (Autonomous), is privileged to host this significant event, which stands as a testament to the power of collaboration and innovation in addressing the global challenges of our time. Life sciences, with its interdisciplinary approach, plays a pivotal role in shaping solutions for issues such as environmental sustainability, food security, climate resilience, and global health. This conference provides an invaluable platform for sharing knowledge, exploring advancements, and fostering partnerships that will pave the way for transformative research and applications. I am confident that the insights and contributions of this gathering will leave a profound impact on both the academic and global communities. I congratulate the organizing committee for their dedication and extend my heartfelt wishes for the grand success of the ICLS-FPWCD-2025. Let this conference inspire new ideas, collaborations, and breakthroughs for a brighter and more sustainable future.

Sincerely

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Tamil Nadu, India

Dr. V. CHINNADURAI, M.Sc., B.Ed., M.Phil., PhD
Convener (ICLS-FPWCD-2025)
Assistant Professor and Head
PG Department of Botany

Date: 01-02-2025

Message

It is with great pride and joy that I welcome all the distinguished guests, eminent speakers, researchers, and participants to the **International Conference on Life Sciences with Future Perspectives on World Challenges and Developments (ICLS-FPWCD-2025)**. The field of life sciences holds the key to addressing some of the most pressing challenges facing humanity today. From ensuring global food security to combating climate change and advancing healthcare solutions, life sciences continue to shape the future of our world.

This conference aims to provide a dynamic platform for the exchange of ideas, presentation of ground breaking research, and collaboration across disciplines to tackle these global issues. As the Head of the PG Department of Botany, I take immense glee in being a part of this academic endeavor, which reflects our institution's commitment to fostering excellence in education, research, and innovation. I extend my sincere gratitude to all the participants and organizing committee members for their dedication and effort in making this event a success. Let this conference inspire us to explore new frontiers in life sciences and work collectively towards a sustainable and prosperous future.

Wishing the ICLS-FPWCD-2025 resounding success!!!

Sincerely

OFFICE OF THE DEPARTMENT OF BOTANY

Silapathar Science College

ESTD:1996

Dr. JITU GOGOI, M.Sc., PhD
Convener (ICLS-FPWCD-2025)
Assistant Professor and Head

Date: 01-02-2025

Foreword

It is my privilege to share a message for the International Conference on Life Science with Future Perspectives on World Challenges and Developments (ICLS-FPWCD-2025). This esteemed conference is organized by the PG Department of Botany, Sri Vidya Mandir Arts & Science College, Tamil Nadu, in collaboration with the Department of Botany, Silapathar Science College, Assam, has provided a vibrant platform for researchers and students to engage in meaningful discussions on pivotal issues and advancements in life sciences.

The publication of this proceeding is a testament to the organizers dedication to disseminating knowledge and ideas presented during the conference. I extend my warmest congratulations to the organizers, participants and authors for their tireless efforts.

I wish this proceeding great success in inspiring future research and collaborations, ultimately contributing to the betterment of our world.

Sincerely

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Dr. S. ANSAR ALI, M.Sc., PhD
Dr. ZAKIR HUSSAIN MALIK, M.Sc., PhD
Organizing secretaries (ICLS-FPWCD-2025)
Assistant Professors
PG Department of Botany

Date: 01-02-2025

On behalf of the Organizing committee, we are honoured to welcome all the distinguished guests, renowned speakers, researchers, and participants to the **International Conference on Life Sciences with Future Perspectives on World Challenges and Developments (ICLS-FPWCD-2025)**. This conference serves as a unique platform to bring together brilliant minds from across the globe to discuss and explore the transformative role of life sciences in addressing critical global challenges. From environmental sustainability and food security to advanced medical innovations and climate resilience, the scope of this event reflects the interdisciplinary nature of life sciences and its vast potential to shape the future. As organizing secretaries, we extend our fullest gratitude to the dedicated organizing team, respected dignitaries, and all the participants for their invaluable contributions and enthusiasm. It is your collective efforts and innovative ideas that will make this conference a success and a memorable experience for everyone involved. We hope the discussions, presentations, and collaborations at ICLS-FPWCD-2025 ignite new ideas and inspire ground breaking research that will leave a lasting impact on the scientific and global communities.

We wish everyone, the best wishes and sincere Congratulations!!!

Sincerely

S. ANSAR ALI

ZAKIR HUSSAIN MALIK

PROGRAMME SCHEDULE

SRI VIDYA MANDIR ARTS & SCIENCE COLLEGE

(Autonomous)
Katteri - 636 902, Uthangarai, Krishnagiri, Tamil Nadu, India
In Association with

SILAPATHAR SCIENCE COLLEGE

Amritpur, Silapathar – 787 059, Dhemaji, Assam, India

INTERNATIONAL CONFERENCE

ON

LIFE SCIENCES WITH FUTURE PERSPECTIVES ON WORLD CHALLENGES AND DEVELOPMENTS (ICLS-FPWCD-2025)

04th & 05th February 2025

Organized by

PG DEPARTMENT OF BOTANY

PROGRAMME SCHEDULE

Venue: SVMC Auditorium

DAY- I (04.02.2025)	
TIME	**PROGRAM**
09.00AM	**Spot Registration**
10.00AM -11.00 AM	**INAUGURAL FUNCTION**
11.00 AM - 11.15 AM	**REFRESHMENT**
	SESSION – I
11.15 AM - 12.15 PM	**Dr. G.M. ALAGU LAKSHMANAN,** Associate Professor Annamalai University, Chidambaram -608002 **Invited Lecture: 1** ***Plants - Medicine Factories -Future Opportunities and Challenges*** **Chair Person** **Dr. V. Tamilselvan** Assistant Professor PG Department of Botany Sri Vidya Mandir Arts & Science College (Autonomous), Uthangarai
12.15PM - 01.00 PM	**LUNCH BREAK**
	SESSION – II
01.00 PM -02.00PM	**Dr. MUTHUSAMY RAMAKRISHNAN** Professor Bamboo Research Institute, Nanjing Forestry University, Nanjing, China **Invited Lecture 2** ***Dynamics and Function of Transposable Elements (TEs) and their Role in Plant Development*** **Chair Person** **Mrs. J. Fathima** Assistant Professor PG & Research Department of English Sri Vidya Mandir Arts & Science College (Autonomous), Uthangarai

02.00 PM – 02.15PM	**REFRESHMENT**
02.15 PM – 03.15 PM	**Dr. M. GOMATHINAYAGAM** Associate Professor Annamalai University, Chidambaram - 608002 **Invited Lecture: 3** **Plants Warfare Tactics Against its Predators** **Chair Person** **Dr. KM. Prabhu** Assistant Professor PG & Research Department of Physics Sri Vidya Mandir Arts & Science College (Autonomous), Uthangarai
03.15 PM -03.40 PM	**Oral Presentation / Poster Presentation**
DAY- II (05.02.2025)	
TIME	**SESSION – III**
10.00AM-11.00 AM	**Dr. PARASURAMAN PAVADAI** Associate Professor of Pharmaceutical Chemistry, Faculty of Pharmacy, M.S. Ramaiah University of Applied Sciences, Bengaluru-560054, Karnataka, India. **Invited Lecture: 4** **Application of Computational Tools in Plant based Drug Discovery** **Chair Person** **Dr. M. Manikandan** Assistant Professor PG Department of Zoology Sri Vidya Mandir Arts & Science College (Autonomous), Uthangarai
11.00AM- 11.15AM	**REFRESHMENT**
	SESSION – IV
11.15AM–12.25PM	**Dr. MYTHILI SARAVANAN** Research Scientist, Department of Pharmaceutical Sciences, North Carolina Central University, Durham, USA **Invited Lecture: 5** **Plant Neurodegenerative Models: A Sustainable Path for Huntington 's Disease Research** **Chair Person** **Dr. P. Vino** Assistant Professor PG Department of Botany Sri Vidya Mandir Arts & Science College (Autonomous), Uthangarai
12.25PM–01.15PM	**LUNCH BREAK**
	SESSION – V
01.15PM–02.15PM	**Dr. ANOOSH VARGHESE** Assistant Professor Department of Botany, St. Johns College Kollam, Kerala

	Invited Lecture: 6 **A Prelude to Plant Reproductive Biology** **Chair Person** **Dr. S. Saravanan** Assistant Professor PG Department of Zoology Sri Vidya Mandir Arts & Science College (Autonomous), Uthangarai
02.15PM–02.30PM	**REFRESHMENT**
02.30PM–03.00PM	**Oral Presentation / Poster Presentation**
03.00PM – 3.40PM	**VALEDICTORY FUNCTION**

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INVITATION

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04th & 05th February 2025

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PG DEPARTMENT OF BOTANY

Date: 04/02/2025 **Time: 10.00 AM - 11.00 AM**

INAUGURAL FUNCTION **Venue:** SVMC Auditorium

Lighting the Kuthuvilakku & Prayer Song	
Welcome Address	**Dr. V. CHINNADURAI** Convener & Head, (ICLS-FPWCD-2025) PG Department of Botany, Sri Vidya Mandir Arts & Science College (Autonomous) Uthangarai, Tamil Nadu
Presidential Address	**Thiru. V. CHANDRASEKARAN** Chief Patron Sri Vidya Mandir Educational Institutions, Uthangarai, Tamil Nadu.
Felicitations	**Dr. N. GUNASEKARAN** Chairman & Principal Sri Vidya Mandir Arts & Science College (Autonomous), Uthangarai, Tamil Nadu
	Dr. D. KAVITHA Co - Chairman & Vice Principal, Sri Vidya Mandir Arts & Science College (Autonomous), Uthangarai, Tamil Nadu.
	Dr. JITU GOGOI, Convener & Head, (ICLS-FPWCD-2025) Department of Botany, Silapathar Science College, Assam
Theme of the Conference	**Dr. ZAKIR HUSSAIN MALIK,** Organizing Secretary (ICLS-FPWCD-2025), PG Department of Botany, Silapathar Science College, Assam.
Chief Guest Intro	**Dr. S.ANSAR ALI** Organizing Secretary (ICLS-FPWCD-2025), PG Department of Botany, Sri Vidya Mandir Arts & Science College (Autonomous), Uthangarai, Tamil Nadu.
	Release of Souvenir
Chief Guest Inaugural Address **&** **Keynote Address** .	**Dr. G.M. ALAGU LAKSHMANAN** Associate Professor Annamalai University, Annamalai Nagar – 608002, Chidambaram. & **Dr. M. GOMATHINAYAGAM** Associate Professor Annamalai University, Annamalai Nagar – 608002, Chidambaram
Vote of Thanks	**Dr. P. Vino** Assistant professor PG Department of Botany, Sri Vidya Mandir Arts & Science College (Autonomous) Uthangarai, Tamil Nadu

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04th & 05th February 2025

Organized by

PG DEPARTMENT OF BOTANY

Date: 05/02/2025 **Time: 03.00 PM - 3.40 PM**

VALEDICTORY FUNCTION **Venue:** SVMC Auditorium

Welcome Address	**Dr. V. CHINNADURAI** Convener & Head, (ICLS-FPWCD-2025) PG Department of Botany, Sri Vidya Mandir Arts & Science College (Autonomous),Uthangarai, Tamil Nadu
Presidential Address	**Dr. N. GUNASEKARAN** Principal, Sri Vidya Mandir Arts & Science College (Autonomous) Uthangarai, Tamil Nadu.
Felicitation	**Dr. D.KAVITHA** Vice Principal, Sri Vidya Mandir Arts & Science College (Autonomous) Uthangarai, Tamil Nadu. & **Dr. JITU GOGOI,** Convener & Head, (ICLS-FPWCD-2025) Department of Botany, Silapathar Science College, Assam
Valedictory Address	**Thiru. V. CHANDRASEKARAN** Chief Patron Sri Vidya Mandir Educational Institutions, Uthangarai, Tamil Nadu.
Report of Conference	**Dr. ZAKIR HUSSAIN MALIK,** Organizing Secretary (ICLS-FPWCD-2025), PG Department of Botany, Silapathar Science College, Assam
	AWARD/CERTIFICATE DISTRIBUTION
	FEEDBACK
Vote of Thanks	**Dr. S.ANSAR ALI** Organizing Secretary (ICLS-FPWCD-2025), PG Department of Botany Sri Vidya Mandir Arts & Science College (Autonomous), Uthangarai, Tamil Nadu.
	National Anthem

INVITED LECTURE ABSTRACTS

INVITED LECTURE

Invited Lecture I

PLANTS - MEDICINE FACTORIES -FUTURE OPPORTUNITIES AND CHALLENGES

Dr. G.M. ALAGU LAKSHMANAN

Associate Professor, Department of Botany, Annamalai University,

Annamalai Nagar, Chidambaram - 608 002

Email : gmalakshmanan@gmail.com

ABSTRACT

Medicinal plants have been used as a therapeutic modality with an unbelievable history in terms of serving humanity in almost all continents of the world. Traditional healers have transferred that incredible knowledge from generation to generation for thousands of years through their personal rich experiences, even now, the modern medicine have not altered the in-depth wisdom of this natural medical paradigm. To support this understanding about the uses of medicinal plants, the recent Archaeological studies have also been provided valuable and reasonable evidences about the healing properties of medicinal plants were known to peoples during prehistoric time. In the light of modern science, the plant based pharmaceutical products are explored using modern techniques because they could be produced enmass with cost effective, and more importantly without any secondary ill health effects. The recent findings based on plant products like Tobacco derived antibodies have been tested and used against Ebola virus outbreak in Africa, which set as tremendous use and example where the plants are the rich source of such a great diversity of pharmaceutical products. But , the challenges in using plants are the sources of medicinal property products includes such as complex chemical composition with multiple active ingredients, difficulty in standardizing quality and dosage, potential for variability depending on growing conditions, poor bioavailability, lack of robust scientific data on efficacy and safety, concerns about environmental impact from large-scale cultivation, and rigorous regulatory hurdles to overcome before market approval; making it difficult to develop consistent and reliable medications compared to synthetic drugs. The future developments in this field should focus on these challenges into easy target of opportunities for mankind to use plants as factories of pharmaceutical products.

Invited Lecture II

THE MULTIFACETED ROLE OF TRANSPOSABLE ELEMENTS IN STRESS RESPONSES AND DEVELOPMENTAL REGULATION OF MOSO BAMBOO

PROF. MUTHUSAMY RAMAKRISHNAN

Bamboo Research Institute,

Room No. 60817, Biotechnology Building,

Nanjing Forestry University, No.159 Longpan Road,

Xuanwu District, Nanjing city 210037

Jiangsu Province, China.

Email : ramkyeri@gmail.com

ABSTRACT

Transposable elements (TEs), including mariner-like elements (MLEs) and long terminal repeat retroelements (LTR-REs), play a significant role in the genome dynamics of Moso bamboo (*Phyllostachys edulis*), impacting stress responses and developmental processes. This summary integrates key findings from recent studies exploring the diverse regulatory functions of these elements. Mariner-like elements (MLEs), specifically *Ppmar1* and *Ppmar2*, have been shown to contribute to genetic variation through transposition. Research on *Ppmar2* revealed that terminal inverted repeat (TIR) affinity to the DNA-binding domain (DBD) significantly influences transposition activity. Mutant TIRs with higher affinities demonstrated 1.5–2 times the transposition frequency of wild-type TIRs, suggesting a strong correlation between TIR-DBD interaction and transpositional efficiency. Similarly, nuclear export signals (NES) in transposases of *Ppmar1* and *Ppmar2* regulate nuclear export and transposition activity. Mutations increasing NES leucine content enhanced nuclear export and transposition, while reduced leucine content suppressed these processes. These findings highlight NES as a crucial regulator of transposition, maintaining genomic stability in moso bamboo. LTR retroelements (LTR-REs) further illustrate the role of TEs in moso bamboo's genomic response to environmental stimuli. Studies of two LTR retrotransposons, *PHRE1* and *PHRE2*, under heat stress revealed enhanced transcriptional and transpositional activity. The 5'LTR sequence, acting as a promoter, exhibited higher activity than the CaMV35s promoter, driven by interactions with heat-responsive transcription factors. These

elements were observed to amplify in transgenic plants under heat stress, indicating their adaptability to environmental challenges. Furthermore, investigations into genetic and epigenetic reprogramming by induced LTR-RE mobility have unveiled their profound influence on stress responses and development. Thousands of active LTR-REs were identified, particularly near stress-response and developmental-regulation genes. Adjacent genes exhibited increased expression under stress, linked to reduced DNA methylation. Mapping of LTR-RE insertions and methylation patterns revealed a dual effect: altering local epigenetic landscapes and enhancing transcriptional activity, supporting stress resilience and growth in moso bamboo. Collectively, these findings underscore the dual role of TEs in genetic diversification and adaptive evolution. MLEs and LTR-REs in moso bamboo provide insights into how transposable elements contribute to stress tolerance and developmental robustness through intricate regulatory mechanisms. These discoveries pave the way for leveraging TEs in genetic engineering and improving crop resilience to environmental challenges.

Invited Lecture III

PLANTS WARFARE TACTICS AGAINST ITS PREDATORS

Dr. M. GOMATHINAYAGAM

Associate Professor, Department of Botany, Annamalai University,

Annamalai Nagar, Chidambaram - 608 002

Email : gomsnayagam@gmail.com

ABSTRACT

Plants are ubiquitous, and which requires it's ability to survive in all habitats expose them against its natural spectrum of enemies to make plants life without any question on their life it must possess a best defence mechanism and strategies to stay strong in its habitat. A staggering number of animal species eat plants including large grazing mammals, the plants defend themselves from these animals attack possess a bevy of strategies. Plants evolved to overcome the constant onslaught of animals that would devour of them as food. Plants have developed physical and chemical defenses to protect themselves against herbivores, which are wholly drive life by eating plant tissues. Most physical and chemical defenses are likely effective against a range of natural enemies.

Physical defenses are a first line of protection for many plants. These defenses make it difficult for herbivores to eat plants, hurt the herbivores to and stop them from eating plants stems or leaves. Some species have armature such as thorns or spines that ward off slavering herbivores. Some are loaded with poisons to sicken or kill them. Some plants do emit compounds that warn their compatriots of approaching threats, the botanical equivalent of a smoke signal.

Some grasses take up the element silicon from the soil. Hard silicon particles make the grass leaves abrasive. This defence works by wearing down the teeth of large grazing mammals and mandibles of grasshoppers. Trichomes are tiny dense projections from leaf surface makes it harder for insects or mites to reach cells in the plant leaf. They form structural barriers that hinder small arthropods in their mobility. Glandular hairs secrete protective coatings that prevent fungal spores from germinating. The sensitive plant *Mimosa pudica* closes its leaves when they are touched making them appear dead and therefore unappetizing.

Plants that are attacked by browsers or insect pests may warn other plants of the impending crisis by releasing volatile organic compounds which precipitate

physiological reactions in nearby plants. They may increase concentrations of toxic compounds to ward off the enemy or they may release compounds of their own that attract the enemies communicate through chemicals released by their roots.

Plants also use a diverse arsenal of chemicals that ward off herbivores. Many of these compounds are toxic, repelling or even killing grazing herbivores. The impact these defenses are indirect. Some plants produce nectar that attracts ants. The ants feed on the nutritious nectar the plant makes. In return, the ants defend the plant from herbivorous insects that eat the plant leaves.

Invited Lecture IV

APPLICATION OF COMPUTATIONAL TOOLS IN PLANT-BASED DRUG DISCOVERY

Dr. PARASURAMAN PAVADAI

Associate Professor
Department of Pharmaceutical Chemistry, Faculty of Pharmacy, M S Ramaiah University of Applied Sciences, Bangalore-560054, Karnataka, India
Email : pvpram@gmail.com

ABSTRACT

The integration of computational tools in plant-based drug discovery represents a transformative approach in modern pharmaceutical research, enabling the systematic exploration of nature's vast chemical diversity. Plants have long been a source of bioactive compounds, providing leads for developing drugs targeting various diseases. However, the traditional drug discovery process from plants is often time-consuming and resource-intensive. Computational methodologies address these challenges by expediting the identification, optimization, and validation of bioactive compounds with high therapeutic potential.

This presentation highlights the pivotal role of computational tools across various stages of plant-based drug discovery. Initially, cheminformatics and bioinformatics platforms facilitate the curation and analysis of phytochemical databases, offering insights into the chemical diversity and biological relevance of plant-derived compounds. Molecular docking and virtual screening enable the identification of potential drug candidates by simulating their interactions with specific protein targets, significantly reducing the dependency on extensive experimental assays.

Machine learning (ML) and artificial intelligence (AI) techniques enhance the prediction of pharmacological activity, toxicity, and ADMET (Absorption, Distribution, Metabolism, Excretion, and Toxicity) profiles, aiding in the optimization of lead compounds. Additionally, molecular dynamics (MD) simulations provide a deeper understanding of the stability and behavior of ligand-receptor interactions under physiological conditions. Tools such as QSAR (Quantitative Structure-Activity

Relationship) modeling allow for the prediction of bioactivity based on molecular descriptors, further narrowing down potential drug candidates.

The presentation also emphasizes the application of network pharmacology to explore the multi-target effects of plant-derived compounds, aligning with the holistic approach of traditional medicine. Furthermore, advancements in systems biology and omics technologies, coupled with computational tools, facilitate the discovery of novel pathways and molecular targets. By integrating computational methods, researchers can accelerate the transition of bioactive phytochemicals from bench to bedside. This approach not only conserves resources but also promotes sustainable utilization of plant biodiversity. Ultimately, computational tools are redefining the landscape of plant-based drug discovery, offering immense potential for the development of innovative and effective therapeutics.

Invited Lecture V

PLANT NEURODEGENERATIVE MODELS: A SUSTAINABLE PATH FOR HUNTINGTON'S DISEASE RESEARCH

Dr. MYTHILI SARAVANAN

Research Scientist, Department of Pharmaceutical Sciences

North Carolina Central University, Durham, USA

ABSTRACT

Huntington's Disease (HD) is a progressive neurodegenerative disorder caused by mutant huntingtin (mHtt), which was identified as the causative factor in 1993. Despite extensive studies using cell and animal models, the sequence of early pathophysiological events leading to HD onset and progression remains elusive. To uncover novel insights into early pathogenic mechanisms, we developed a plant-based HD model system, proving its efficacy in studying mHtt-mediated dysregulation of cellular pathways. Our findings revealed that mHtt exon 1 (mHttex1) induces protein aggregation and disrupts plant growth, particularly root and root hair development, in a polyQ length-dependent manner. Proteomic analysis of Httex1Q63 (abnormal) and Httex1Q21 (normal control) plants showed widespread proteomic remodeling, including changes in proteins previously implicated in other HD models. Importantly, plants' autotrophic nature enabled the discovery of novel mHtt-mediated impairments in folate biosynthesis and one-carbon (C1) metabolism, with reduced levels of GTP cyclohydrolase I (GTPCH), SAM-dependent methyltransferases, and C1 metabolism-associated proteins. Validation studies in R6/2 HD mice confirmed these disruptions, showing reduced GTPCH and DHFR levels and impaired C1 and BH4 metabolisms at an early asymptomatic stage. These disruptions may affect transcription, translation, and corticostriatal connectivity. Ongoing studies aim to longitudinally analyze GTPCH and DHFR expression in R6/2 mice to correlate these changes with disease progression. Targeting C1 and BH4 metabolic pathways could provide sustainable and innovative therapeutic strategies for HD treatment.

Invited Lecture VI

A PRELUDE TO PLANT REPRODUCTIVE BIOLOGY

Dr. ANOOSH VARGHESE

Assistant Professor

St. John's College Anchal, Kollam Kerala 691 306

Email : anooshvarghese@gmail.com

ABSTRACT

The survival, establishment and perpetuation of plant species is very crucial to sustain life on Earth; being autotrophs. Plant reproductive biology addresses how plants perpetuate on Earth. Plant reproduction is a complex and specific process which is controlled by a number of either internal physiological or genetic factors or external environmental specificities. This branch of plant science is a pre-requisite to understand evolution, diversity, and utility of plant species. Plants, during the course of evolution have developed a wide spectrum of strategies for their reproduction to ensure survival and adaptation to diverse habitats. Plant can reproduce by vegetative means such as cutting, layering etc. that will produce clones having the same genetic constitution of their parents. Tissue culture or mass-propagation is also an extended vegetative propagation. Lower plants usually propagate by asexual spores. The higher plants exhibit advanced sexual reproductive strategies. The primary focus of plant reproductive biology is on the mechanisms that involves in pollination, subsequent fertilization, seed development, and the interplay between plant physiology and environmental factors. Sexual reproduction in plants involves the fusion of male and female gametes, typically facilitated by pollination, which may be mediated by either biotic vectors like birds, insects, bats etc. or by means of abiotic factors such as wind, water etc. The pollination process is followed by fertilization, where the male gamete (sperm) fuses with the female gamete (egg) within the ovule, leading to the formation of seeds. The resulting seed contains the genetic material of both parents, ensuring genetic diversity. The factors influencing pollination include morphology of flower, time of anthesis, stigma receptivity, pollen fertility and viability, environmental conditions like temperature, light etc.

The molecular and genetic mechanisms also regulate reproductive development. Genes that govern flower development, sex determination, and the timing of reproductive events are areas of active research. Recent advances in genomics and

molecular biology have shed light on the complex signaling pathways that control these processes, offering potential applications in crop improvement and conservation. Understanding plant reproductive biology is essential for crop improvement and biodiversity conservation. Investigating how plants reproduce under various environmental stresses, as well as their adaptation to changing conditions have implications on sustainable agriculture and ecosystem conservation.

ABSTRACTS

Proceedings of **ICLS –FPWCD -2025** *held on 4th and 5th February, 2025 at SVMC, Uthangarai, Tamil Nadu, India*

OP-01

SYSTEMATIC STUDY OF SELECTED ANGIOSPERMS OF CHARAIDEO DISTRICT, ASSAM - A MORPHOLOGICAL APPROACH

Lipi Mohan* and Swapnali Saikia

PG Department of Botany, Silapathar Science College, Assam, India

***Corresponding Author: lipimohan6@gmail.com**

ABSTRACT

The present study focuses on the systematic investigations of selected angiospermic species in Charaideo district, Assam with an emphasis on their morphological characteristics. The regions known for its unique biodiversity and ecological significance offer a rich repository of Angiosperms that contribute to the socio -economic and ecological balance. This study aimed to document and analyzes the morphological traits of selected species to understand their taxonomy and ecological adaptation. Standard taxonomic methodologies were employed for species identification and morphological assessment, which include the examination of vegetative and reproductive structures. A total of 50 angiospermic species belonging to 25 families were systematically documented .Notable adaptations to the tropical climatic conditions and their ecological roles in sustaining local biodiversity were highlighted. The findings provide a comprehensive morphological framework, facilitating accurate species identification strategies for the regions floral diversity. This study underscores the importance of systematic botany in bridging ecological knowledge gaps and promoting sustainable utilization of plant resources.

Keywords: Angiosperms, Biodiversity Conservation, Charaideo, Ecological adaptation, Morphology, Systematic Botany.

OP-02

ETHNO-MEDICINAL PLANT DOCUMENTATION AND TRADITIONAL KNOWLEDGE SYSTEMS IN DIBRUGARH DISTRICT OF ASSAM: A STUDY ON CONSERVATION AND SUSTAINABLE USE

Nibedita Barman* and Neha Shah
P.G Department of Botany
Silapathar Science College, Amritpur, Silapathar - 787 059
Dhemaji, Assam, India
***Corresponding Author:** nibeditabarman100@gmail.com

ABSTRACT

The documentation of ethno-medicinal plants and the preservation of associated traditional knowledge systems are critical for conserving biodiversity and fostering sustainable resource use. This study focuses in the Dibrugarh district of Assam, a region rich in cultural heritage and plant diversity. The primary aim is to identify, document and analyze the ethno-medicinal plants used by local communities including indigenous tribes for health care practices. Ethno-botanical surveys were conducted across various villages employing structured interviews, participatory discussions and direct field observations to record local knowledge. A total of 50 ethno-medicinal plant species belonging to 17 families were documented. Key species included *Curcuma longa* (Haldi), *Cantella asiatica* (Gotu Kola), *Lucas aspera* (Thumbai or Durun Bon), *Ricinus communis* (Castor bean Plant or Era) among others. The findings highlight the urgent need for conservation strategies to protect these plants and the indigenous knowledge associated with them. This research contributes to understanding the role of ethno-medicinal plants in local health care systems and offers a foundation for integrating traditional knowledge with modern conservation and sustainable development initiatives.

Keywords: Ethno-medicinal plants, Traditional knowledge, Biodiversity Conservation, Dibrugarh, Sustainable use.

OP-03

BIODIVERSITY AND ETHNOMEDICINE: A STUDY OF MEDICINAL PLANTS IN THE DIBRUGARH DISTRICT OF ASSAM

Neha Shah* and Nibedita Barman

PG Department of Botany
Silapathar Science College, Amritpur, Silapathar - 787 059
Dhemaji. Assam, India
***Corresponding Author:** ns2491680@gmail.com

ABSTRACT

The Dibrugarh region of Assam, situated in the north- eastern biodiversity hotspot of India is home to a rich variety of medicinal plants that form an integral part of local ethnomedicinal practices. This study aims to document and analyze the diversity of medicinal plants utilized by indigenous communities in the region, focusing on the traditional knowledge, therapeutic uses and conservation status. Through field surveys interviews with the traditional healers and collaboration with local communities, the research identified 45 species belonging to 15 families of medicinal plants commonly used for treating ailments such as fever, skin allergies, gastro- intestinal issues and respiratory diseases. The study also examines the preparation methods, dosage forms and cultural significance of these plants in local healthcare systems. The finding highlights the urgent need for the conservation of these valuable ethnomedicinal knowledge as rapid urbanization, deforestation and changing socio- economic conditions threatens its continuity. This research contributes to understanding the intricate relationship between biodiversity and traditional medicine in the Dibrugarh region and paves the way for future pharmacological studies and conservation strategies.

Keywords: Biodiversity, Ethnomedicine, Conservation, health care, Dibrugarh.

OP-04

ASSESSMENT OF PHYTOREMEDIATION POTENTIAL OF AFRICAN MARIGOLD (*TAGETES ERECTA* L.) IN CHLORPYRIFOS POLLUTED SOIL

M. Santhoshkumar, R. Rooban and M. Arivazhagan

Department of Botany, Sishya Arts and Science College, Tiruvannamalai, 606 806, Tamil Nadu, India.

ABSTRACT

The aim of this study to assess the phytoremediation potential of African marigold (*Tagetes erecta* L.) in chlorpyrifos polluted soil. In an experiment, the garden soil was spiked with four different concentrations of chlorpyrifos (0.5, 1.0, 2, and 2.5%). The treatment without chlorpyrifos spiked in to the soil represented as the control. The plant samples were collected periodically at 30, 60, and 90 days for biochemical analysis. At end of 90th day plant sample were collected Gas Chromatography Mass Spectrum studies (GC-MS). The low level (0.5%) of chlorpyrifos exhibit that enhance the protein content of tested plant, as compared to control plant. However, at higher concentrations (2.5%) of chlorpyrifos were decreased the protein content. The amino acid and proline were elicited with the increasing concentration of chlorpyrifos as compared to control. Maximum increases in amino acid and proline was noted at the highest concentration (2.5%) of pesticide treatment. The GC-MS study showed that disappearance of chlorpyrifos by African marigold (*Tagetes erecta* L.) may be assigned to the uptake potential of these plants.

Keywords: Pesticides, Chlorpyrifos, African marigold, GC-MS, proline

OP-05

BIOLOGICAL ACTIVITIES OF *SENNA ALATA* - A REVIEW

Jayavalishvaran J[1], Sandhiya[2] and P.Vino[2*]

Department of Botany, Sri Vidya Mandir Arts & Science College (Autonomous), Katteri, Uthangarai, Krishnagiri District - 636 902, TN, India

***Corresponding Author:** pvino726@gmail.com

ABSTRACT

Senna alata is a medicinal herb of the Fabaceae family. It is distributed in the tropical and sub-tropical regions. The plant is traditionally used in the treatment of typhoid, diabetes, malaria, asthma, ringworms, tinea infections, scabies, blotch, herpes, and eczema. The review is aimed at revelation the ethnobotanical description and pharmacological activities of *S. alata*. Different parts of the plant are reported in folk medicine as therapeutic substances for the remediation of various diseases and infections. The extracts and isolated compounds displayed pronounced pharmacological activities. Display of antibacterial, antioxidant, antifungal, dermatophytic, anticancer, hepatoprotective, antilipogenic, anticonvulsant, antidiabetic, antihyperlipidemic, antimalarial, anthelmintic, and antiviral activities could be due to the array of secondary metabolites i.e., alkaloids, flavonoids, tannins and terpenoids derivatives. The review reveals the ethnobotanical and pharmacological activities of the plant and also justifies the ethnomedical claims. The significant medicinal value of this plant requires a scientific adventure into the bioactive metabolites which constitute various extracts.

Keywords: *Senna alata*, Fabaceae, bioactive metabolites and pharmacological activities.

OP-06

IMPACT OF CLIMATE – INDUCED STRESS IN ORCHID PHYSIOLOGY OF ASSAM: A FOCUS ON DHEMAJI'S ECOSYSTEM

Prandeep chutia, Debasikh Baruah and Jay Prakash Chetry

Department of Botany, Silapathar Science College, Assam, India

***Corresponding Author:** prnadeepchutia12@gmail.com

ABSTRACT

The impact of climate induced stress on Orchid physiology in assam particularly within Dhemaji's Eco system has become a significant area of concern due to the reason's vulnerability to changing climate condition. Orchid being sensitive to environmental fluctuations are highly affect by temperature shifts, alter rainfall pattern and the increasing frequency of extreme weather event. This study investigate how such climate induce stress's influence the physiological process of Orchids. Dhemaji located Northeastern part of the Assam serves as anideal location to study the effect of this environmental changes due to it's rich Biodiversity and varied climatic condition. The findings aim to provide a comprehensive understanding of how climate change influences Orchid population of in Dhemaji and contribute to the development of conservation strategies for this sensitive species.

Keywords: Biodiversity, Conservation, Climate change, Environmental stress, Orchid physiology

OP-07

IDENTIFICATION OF ENDOPHYTIC MICROBES ASSOCIATED WITH *ALOE VERA* LEAVES

Minakshi Borah[1], Tina Moni Saikia[1], Indrani Baruah[2], and Geetanjali Baruah[1]*

[1]Department of Biotechnology, The Assam Kaziranga University, Jorhat, Assam, India

[2]Department of Plant Breeding and Genetics, Assam Agricultural University, Jorhat, Assam, India

***Corresponding Author:** geetanjali@kazirangauniversity.in

ABSTRACT

Endophytic microbe's are mostly bacteria and fungi, that colonize the intercellular spaces of plant tissues without causing any symptoms in the host plant. Endophyte population is highly variable and influenced by a number of factors, including the host species, host developmental stage, inoculums density and environmental conditions in every plant species. *Aloe vera* is a xerophytes species of plant that can flourish and endure extremely harsh conditions. *Aloe vera*is very well known in the field of herbal medicine and cosmetic industry due to its antimicrobial, antifungal, anti-inflammatory, antidiabetic properties. The objective of the study was to identify the endophytic microorganisms associated with *Aloe vera* leaf and gel using leaf disc-based laboratory experiments. The criteria for selection of the plant part for the experiments were based on the importance of the parenchymatous tissue of the fleshy parts of the *Aloe* leaves containing pharmacologically significant chemicals. After isolation of the endophytic bacteria as well as endophytic fungi using three different media, biochemical tests and morphological observations were recorded followed by molecular identification based on 16S and 18S universal primers. The isolated microbes were then screened for their Plant Growth Promoting (PGP) activities. This study could be further extended to evaluate the role of these microbes in enhancing the antimicrobial and anti-inflammatory properties, if any.

***Keywords*:** Endophytic microbes, Aloe vera, PGP, Antimicrobial

OP-08

CHALLENGES AND FUTURE DIRECTIONS IN UTILIZING *AEGLE MARMELOS* FOR NANOPARTICLE SYNTHESIS

B. Manjula, M. Sowmiya, P. Rindhiya, P. Pavithra and S. Ansar Ali*

PG Department of Botany

Sri Vidya Mandir Arts and Science College (Autonomous), Katteri - 636 902,

Uthangarai, Krishnagiri (Dist), India.

***Corresponding Author:** dransar1993@gmail.com

ABSTRACT

Plant-mediated nanoparticle synthesis has become a focal point in sustainable and environmentally friendly nanotechnology. *Aegle marmelos*, a plant known for its medicinal properties, has shown significant promise in nanoparticle biosynthesis owing to its abundant phytochemicals. However, the practical implementation and large-scale production of nanoparticles synthesized using *Aegle marmelos* face several obstacles. This review highlights critical challenges, including variations in phytochemical content influenced by environmental and seasonal conditions, a lack of standardized methods for extraction and synthesis, and difficulties in scaling up production processes. Moreover, issues such as nanoparticle stability and consistency, alongside limited insights into the molecular pathways involved in their formation, remain unresolved. Future research should prioritize advanced analytical methods to refine and standardize synthesis protocols. The application of bioinformatics and machine learning tools can offer deeper understanding of phytochemical interactions and reaction dynamics. Additionally, combining *Aegle marmelos* with other biological or chemical agents could improve the stability and performance of synthesized nanoparticles. Overcoming these challenges will enable broader applications of *Aegle marmelos* - based nanoparticles in fields like medicine, agriculture, and environmental management, advancing cost-effective and sustainable nanotechnology solutions.

Keywords*: Aegle marmelos*, Nanotechnology, Phytochemicals and Sustainable development.

OP- 09

PHARMACOINFORMATICS AND MOLECULAR DOCKING STUDIES ON *PSORALEA CORYLIFOLIA* (L.) SEED COMPOUNDS AGAINST DIABETIC INDUCED PROTEIN

B. Priyadharshini[1]., S. Manikandan[2] and M. Prakash[3*]

[1] JSA College of Agriculture & Biotechnology, Ma.Podaiyur, Avatti, Cuddalore Dt 606 108, Tamil Nadu.

[2]Department of Botany, Govt. Arts & Science College, Tittagudi 606 106

[3]Department of Genetics & Plant Breeding, Faculty of Agriculture, Annamalai University, Annamalai Nagar 608 002, Tamil Nadu.

***Corresponding Author:** geeth_prakash@yahoo.co.in

ABSTRACT

Psoralea corylifolia (Linn.) belongs to the family Fabaceae and is widely distributed tropical and sub-tropical areas. The seeds of *P.corylifolia* have found in rich amount of secondary metabolites. There is an increasing recognition that Pharmacoinformatics and molecular docking technologies can be effectively used for drug discovery and drug development from *P.corylifolia* Phytocompounds. In this study, there are different extracted biological compounds from *P.corylifolia* were selected for Pharmacoinformatics and molecular docking analyses to find out active compounds against tumor induced cancer disease. The identified biological compounds of *P.corylifolia* species were investigated. Seven major biological compounds were selected for virtual screening analysis to find out the drug - likeness activity. Out of these seven compounds five compounds are drug - likeness in nature. Based on the ADMET analysis, Isopsoralen showed a low toxicity level and it represents the Lipinski rule of five. The molecular docking results of Isopsoralen interact with target protein used in the study showed the docking energy was obtained against tumor induced cancer protein -10.9505kcal/mol. The result was concluded that, *P.corylifolia* seeds derived compound Isopsoralen was showed significant tumor induced anti-cancer activity. Pharmacoinformatics and molecular docking study was providing valuable inputs to developing the active component Isopsoralen into potential drug in future.

Keywords: Pharmacoinformatics; ADMET; Docking; Phytocompounds; *P.corylifolia*.

OP- 10

Mathematical Equation Of Intelligence and Memory Working By RNN

Nur Rafi Abdurohman

[1] JSA College of Agriculture & Biotechnology, Ma.Podaiyur, Avatti, Cuddalore Dt 606 108, Tamil Nadu.

[2]Department of Botany, Govt. Arts & Science College, Tittagudi 606 106

[3]Department of Genetics & Plant Breeding, Faculty of Agriculture, Annamalai University, Annamalai Nagar 608 002, Tamil Nadu.

***Corresponding Author:** geeth_prakash@yahoo.co.in

ABSTRACT

Psoralea corylifolia (Linn.) belongs to the family Fabaceae and is widely distributed tropical and sub-tropical areas. The seeds of *P.corylifolia* have found in rich amount of secondary metabolites. There is an increasing recognition that Pharmacoinformatics and molecular docking technologies can be effectively used for drug discovery and drug development from *P.corylifolia* Phytocompounds. In this study, there are different extracted biological compounds from *P.corylifolia* were selected for Pharmacoinformatics and molecular docking analyses to find out active compounds against tumor induced cancer disease. The identified biological compounds of *P.corylifolia* species were investigated. Seven major biological compounds were selected for virtual screening analysis to find out the drug - likeness activity. Out of these seven compounds five compounds are drug - likeness in nature. Based on the ADMET analysis, Isopsoralen showed a low toxicity level and it represents the Lipinski rule of five. The molecular docking results of Isopsoralen interact with target protein used in the study showed the docking energy was obtained against tumor induced cancer protein -10.9505kcal/mol. The result was concluded that, *P.corylifolia* seeds derived compound Isopsoralen was showed significant tumor induced anti-cancer activity. Pharmacoinformatics and molecular docking study was providing valuable inputs to developing the active component Isopsoralen into potential drug in future.

Keywords: Pharmacoinformatics; ADMET; Docking; Phytocompounds; *P.corylifolia*.

OP-11

ADVANTAGES AND DISADVANTAGES OF BIOMASS ENERGY

V. Sivasankar

Department of Energy Science and Technology, Periyar University,

Salem -11, Tamil Nadu, India

ABSTRACT

Biofuels are renewable energy sources derived from organic materials such as plants, algae, and waste products. As an alternative to fossil fuels, biofuels have gained significant attention due to their potential to reduce greenhouse gas emissions, mitigate climate change, and promote energy security. The two primary types of biofuels are bioethanol and biodiesel, which are produced through fermentation and transesterification processes, respectively. This paper explores the different types of biofuels, their production technologies, and their advantages and challenges. It also highlights the environmental impacts, economic feasibility, and policy considerations associated with biofuel adoption. The future of biofuels relies on continued advancements in sustainable production methods, feedstock diversification, and integration with existing energy systems to meet global energy demands while minimizing environmental degradation.

Keywords: Biofuels, bioethanol, energy, environmental degradation

OP-12

IMPORTANCE OF GREEN BUILDING

Kamalakannan

Department of Energy Science and Technology, Periyar University,

Salem -11, Tamil Nadu, India

ABSTRACT

Green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by: Efficiently using energy, water, and other resources. Protecting occupant health and improving employee productivity. Green buildings are needed on a global scale to help drastically reduce greenhouse gas emissions; conserve increasingly stretched energy resources, and contribute to improved human health. Reducing waste, pollution and environmental degradation. Green buildings help reduce negative impacts on the natural environment by using less water, energy, and other natural resources; employing renewable energy sources and eco-friendly materials; and reducing emissions and other waste.

Keywords: Renewable energy, eco-friendly, Green Building, Emissions

OP-13

INDUCED MUTAGENESIS FOR TRAIT IMPROVEMENT IN *SETARIA ITALICA* (L.) BEAUV. VAR. CO (TE)7

I. Anittha

Department of Botany, Thiru. VI. KA Government Arts College,

Thiruvarur- 610 003

***Corresponding Author:** anitthamoorthy@gmail.com

ABSTRACT

This study investigated the effects of chemical mutagens, Ethyl Methanesulfonate (EMS) and Diethyl Sulfate (DES), on *Setaria italica* (L.) Beauv. Var. Co $(Te)_7$ in the M_4 generation to enhance genetic variability and agronomic traits. Seeds were treated with EMS (20, 30, 40 and 50 mM) and DES (20, 30, 40 and 50 mM) and their impact was evaluated on plant height, number of leaves, leaf length, days to first bloom, yield per plant and 1000-grain weight. The treatments produced significant differences in all parameters, with EMS proving more effective than DES in inducing genetic variability and enhancing quantitative traits. EMS treatments led to substantial improvements in yield, plant vigor and early flowering, making it a powerful tool for crop improvement. These findings demonstrate the potential of induced mutagenesis as a revolutionary approach for breeding better varieties of *Setaria italica*, addressing the global demand for nutritionally enriched and high-yielding crops in sustainable agriculture. This work underscores the critical role of mutagens in accelerating breeding programs and developing food crops with enhanced commercial value.

Keywords: *Setaria italica,* Induced mutation, EMS, DES, sustainable agriculture

OP-14

DISTRIBUTION OF NESTS AND NESTING PATTERN OF ASIAN WEAVER ANTS *OECOPHYLLA SMARAGDINA* (FABRICIUS, 1775) IN MAYILADUTHURAI DISTRICT, TAMIL NADU.

Malini, S[1]., Paramanandham J[1]., Ronald Ross, P[2] and Nagarajan, R[1]

[1] PG and Research Department of Zoology & Wildlife Biology, A.V.C. College (Autonomous), Mannampandal- 609 305.

[2] PG and Research Department of Zoology, Govt. Arts College, Ariyalur

Corresponding Author : maliniammu2000@gmail.com

ABSTRACT

Eusocial ants that build elaborate nests in the canopy in tropical areas. Asian weaver ants (*Oecophylla smaragdina*) are arboreal ants that are known to form mutualistic complexes with their host trees. A colony comprises of multiple nests, usually on multiple trees, and the boundaries of the colony may be difficult to identify. However, they provide the ideal model for studying group living in invertebrates since there are a definite number of nests for a given substrate, the tree. Here, we briefly examine the structure of the nests and the processes involved in the construction and maintenance of these nests. In this present investigation, deals with the 297 nests of the Weaver ant collected from 33 different trees and climbers' species which belong to 19 families. Among the 33 plant species, Annonceae, Fabaceae and Combretaceae families contribute three species each. Number of leaves used by the weaver ant for construction of nest that, Indian laural tree and Arjuna tree showed 14 leaves per nest. The least number of leaves used by the ant for construction nest was Heart leaved moonseed climber has only three leaves per nest. Length of the nest showed that, significantly differed the leaves length and width between the used and unused leaves for nest construction. Number of nests was also counted in each tree species, among the trees *Manjifera indica* shows 22.3±9.29 and least number of nests was in *Jasminum officinale*. The above study indicates that, micro creatures are also having ability to determine the nest site characteristic features as they like as.

Keywords: Nest, *Oecophylla smaragdina*, Eusocial insects, Nest Site

OP-15

EFFECTS OF CLIMATE AND PLANT BIODIVERSITY CHANGE ON POLLUTION DYNAMICS

V. Shalini and S. Ansar Ali*

Department of Botany, Sri Vidya Mandir Arts and Science College (Autonomous), Katteri, Uthangarai, Krishnagiri (Dt) - 636902.

Corresponding Author: shalinivediyappan16@gmail.com

ABSTRACT

Climate change, driven by natural factors and intensified by human activities, is profoundly impacting biodiversity, agricultural production, and food security. Narrowly adapted plants and endemic species face the threat of extinction, as rising temperatures disrupt ecosystems. Plants, which have evolved over millennia to suit specific environments, are now blooming earlier due to warming, leading to mismatches with their pollinators. Water availability, a critical factor for plant survival, is increasingly strained, while elevated global temperatures are reducing crop yields. In 2024, global warming has reached a critical threshold, with temperatures temporarily rising by 1.5°C, marking the year as potentially the hottest on record. Glaciers in the Hindu Kush-Himalayan region are melting 65% faster, resulting in rising sea levels and more frequent heat waves. Population growth further exacerbates waste production, pollution, biodiversity loss, and greenhouse gas emissions. Alarmingly, atmospheric carbon dioxide levels reached a record 419.3 ppm in 2023, contributing to ozone layer depletion due to industrial activities. Urgent action is required to mitigate these impacts. Sustainable practices, such as composting, water conservation, forest preservation, and reducing industrial product usage, are essential to restore ecological balance and ensure a healthy, natural world for future generations.

Keywords: Climate Change, Biodiversity Loss, Agricultural production, Food Security and Sustainable Practices.

OP-16

EVALUATION OF ANTIOXIDANT AND ANTIDIABETIC ACTIVITY OF GREEN SYNTHESIZED SILVER OXIDE NANOPARTICLES FROM ETHANOLIC WHOLE PLANT EXTRACT OF *TRAPA BISPINOSA* ROXB.

A. Venkatesan

Associate Professor, Department of Botany, Annamalai University, Annamalai Nagar, Chidambaram

***Corresponding Author:** drvenkatesans@gmail.com

ABSTRACT

The tiny plant *Trapa bispinosa* Roxb., a member of the Trapaceae family, is utilised extensively across the world for its therapeutic qualities. An essential plant in the Indian Ayurvedic medical system, *Trapa bispinosa*, also known as *Trapa natans*, is used to treat issues with the stomach, genitourinary system, liver, kidney, and spleen. It has diuretic, febrifuge, stomachic, astringent, bitter, and antiseptic properties. Menorrhagia, gonorrhoea, and other genital ailments are treated using the whole plant. It helps with wounds, ulcers, ophthalmopathy, diarrhoea, and dysentery. The antioxidant and antidiabetic qualities of green synthesised silver oxide nanoparticles were evaluated in this work using an ethanolic whole plant extract of *Trapa bispinosa*. Silver nanoparticles produced in a green manner and identified using FTIR, XRD and SEM EDX. Three techniques were used to assess antioxidant activity: the FRAP, ABTS, and H_2O_2 assays. The α-amylase and α-glucosidase assays were also used to test for antidiabetic activity. AgO nanoparticles made from *Trapa bispinosa* have a strong antioxidant effect. In contrast to H_2O_2 and ABTS at 500 g/mL, FRAP exhibits the greatest %RAC (123.12) with an IC50 value of 40.55. At 500 g/mL, the AgO NPs also exhibit 89.23% and 86.54% inhibition in alpha amylase and alpha glucosidase, respectively, with IC50 values of 60.23±0.44 and 70.54±0.34.

Keywords: *Trapa bispinosa*, AgO NPs, Antioxidant assay, Antidiabetic assay, IC50

OP-17

EVALUATION OF IN-*VITRO* ANTICANCER ACTIVITY OF HEPATOBLASTOMA CELL LINE (HEPG2) AND HUMAN COLORECTAL ADENOCARCINOMA (CACO2) FROM SILVER OXIDE NANOPARTICLES OF ETHANOLIC LEAVE EXTRACTS OF *MUSSAENDA ERYTHROPHYLLA* L.

Debasish Dikshit[1*] and A Venkatesan[2]

[1*] Ph.D Research Scholar, Department of Botany, Annamalai University

[2] Associate Professor, Department of Botany, Annamalai University

***Corresponding Author:** debasishdikshit586@gmail.com

ABSTRACT

Uncontrolled cell proliferation, invasion, and metastasis are hallmarks of cancer, a diverse illness with several genotoxic and oncogenic abnormalities. More than 36 major cancer kinds exist, and 9.6 million people die from them each year. In the twenty-first century, it is predicted to be the top cause of mortality worldwide, posing a serious health burden. Biosynthesis of silver oxide nanoparticles (AgO NPs) was achieved by utilizing the reducing and capping potential of leaf ethanolic extracts of *Mussaenda erythrophylla*. Nanoparticles were subjected to FT-IR, XRD analysis and SEM EDX.Lower doses enhanced the viability of the cultured cells, MTT assay higher doses decreased viability of the cells by 50% or more. MTT assay was used to measure cell proliferation and survival. Apoptosis was done by using fluorescence microscopy (Ao/EtBr Staining) and flow cytometry by double staining method (Annexin V PI) shows the maximum Cell death in 100 µg/ml of MEE-AgO NPs. Where early apoptosis was shown in 25 µg/ml and late apoptosis showed in 100 µg/ml of MEE-AgO NPs.

Keywords: *Mussaenda erythrophylla,* In-vitro anticancer activity, MEE-AgO NPs, Apoptosis

OP-18

EVALUATION OF IN *VITRO* ANTIOXIDANT AND IN *VITRO* HYPOGLYCEMIC ACTIVITY OF DIFFERENT SOLVENT LEAVES EXTRACT OF *POUZOLZIA HIRTA* ROXB.

[1]Koba Doke and [2*]A.Venkatesan

[1]Ph.D Research Scholar, Department of Botany, Annamalai University

[2*]Associate professor, Department of Botany, Annamalai University

***Corresponding Author:** drvenkatesans@gmail.com

ABSTRACT

Plants have been used as medicine and in making food in many cuisines since ancient times. Plants were the primary therapeutic agents utilized by humans until the mid-nineteenth century. Many rural communities in underdeveloped countries view traditional medicinal plant-based therapy as a substantial healthcare contribution due to their strong belief in allopathic drug and restricted access to them. This study was carried out to evaluate *in-vitro* antioxidant and hypoglycemic activity of *Pouzolzia hirta* from three solvent extracts *viz.,* methanol, chloroform and aqueous. The *in-vitro* study was done using DPPH, FRAP and ABTS assay and *in-vitro* antidiabetic activity was also carried out using α-Amylase inhibition assay and α-Glucosidase inhibition assay. Results showed that the methanolic leaves extract of *Pouzolzia hirta* exhibited the highest antioxidant and hypoglycemic assay when compare to chloroform and aqueous extracts. Highest antioxidant was shown in DPPH than FRAP and ABTS. α-Amylase inhibition assay showed highest hypoglycemic activity at 1000µg/ml i.e., 70.25% with IC50 value of 137.5µg/ml where α-Glucosidase showed highest at 1000µg/ml i.e., 81.35% with IC50 value of 101.5µg/ml IC50 value.

Keywords: *Pouzolzia hirta*, DPPH, Antioxidant assay, Antihypoglycemic activity.

OP-19

QUALITATIVE AND QUANTITATIVE PHYTOCHEMICAL ANALYSIS AND *IN VITRO* ANTIOXIDANT ACTIVITY OF *ACORUS CALAMUS* LINN

[1]Cecilia Mossang and [2*]A.Venkatesan

[1]Ph.D Research Scholar, Department of Botany, Annamalai University

[2*]Associate professor, Department of Botany, Annamalai University

***Corresponding Author:** drvenkatesans@gmail.com

ABSTRACT

Acorus calamus Linn (sweet flag) is a well-known traditional herb used in Indian system of medicine for many ailments including epilepsy, mental illness and rheumatism. The present study was designed to explore the phytochemical contents and antioxidant activities of *A.calamus* rhizome in ethanol extracts. The powdered rhizome of *A.calamus*, was subjected to Soxhlet extraction for crude extract to elucidate phytochemical studies and antioxidant potential of plant using in vitro assays. The preliminary phytochemical analysis showed significant indication about the presence of various bioactive secondary metabolites *viz*., Saponins, alkaloids, phenols, steroids, and flavonoids. Quantitative analysis was performed to determine the Total phenolic content (TPC) and total flavonoid content (TFC) with standard Gallic Acid Equivalent (GAE) through spectrophotometric method. 2,2-diphenyl-1-picrylhydrazyl free radical scavenging assay (DPPH) and Ferric reducing power assay (FRAP) were used to analyze antioxidant activity using ascorbic acid as standard. The study clearly demonstrates a potent anti-oxidant activity of *A.calamus* as shown by different antioxidant assays. Flavonoids and phenols extracted from sweet flag could be a good potent source of antioxidants for nutraceuticals application or food additives as those compounds are correlated to the antioxidant activity.

Keywords: *Acorus calamus*, Phytochemicals, Rhizome, Gallic Acid, TPC, FRAP.

OP-20

LIFE SCIENCES PAYLOADS FOR SPACE AT MICROGRAVITY ENVIRONMENT IN PSLV-C60

H.Muthurajan

Tinkerblox Technology India Private Limited, Coimbatore, India

ABSTRACT

Indian Space Research Organisation (ISRO) has come up with the idea of using the spent terminal stage of PSLV to perform experiments under the name of PSLV Orbital Experiment Module (POEM). We can utilize this POEM platform to carry out space related experiments including Life Sciences experiments under microgravity conditions. The development of an entire satellite is resource intensive & may not be cost effective. When we design a payload alone with specific missions such as life sciences experiments, no need to concern about requirements like electrical power, Navigation, attitude control, data management & specific requirements including telecommand. Along with POEM platform, life sciences payloads will also orbitsour Earth every 90 minutes, resulting in 16 sunrises and sunsets per day at about 28,800 kilometers per hour speed. Out of 24 Payloads, recently launched by PSLV-C60 from Sriharkota, 3 payloads are life sciences related and discussed in this paper. This paper also highlights the various ground testing, which life sciences payload needs to undergo such as vibration test, thermos-vacuum test, RS485 communication test, daisy chain test, EMI / ESD test etc. At the end, this article provides insight on how to design your own life sicences microgravity experiments for the next PSLV Mission under POEM platform.

Keywords: Life Sciences Payload, Space Experiments, Microgravity, PSLV Orbital Experiment Module (POEM)

OP-21

SEUJI PAM GARDENING INITIATIVE: FOSTERING ORGANIC FARMING SKILLS AMONG STUDENTS AT SILAPATHAR SCIENCE COLLEGE, SILAPATHAR

Jitu Gogoi and Zakir Hussain Malik

Assistant professor, Department of Botany, Silapathar Science College, Assam

***Corresponding Author:** gogoijitu@gmail.com

ABSTRACT

Seuji Pam Gardening at Silapathar Science College is an innovative initiative aimed at teaching organic farming to students in the campus, thus spreading the sustainable agriculture. The project mainly focuses on cultivating nearly twenty varieties of seasonal vegetables locally, such as cauliflower, cabbage, radish, broccoli, spinach, and mustard leaves. By establishing dedicated gardening blocks, the initiative provides students with hands-on training in essential organic farming techniques such as soil preparation, crop rotation, composting, and natural pest control. This program allows theoretical concepts from the botany curriculum to be integrated easily with practical applications towards helping students understand biodiversity conservation and eco-friendly practices. Through this program, theoretical concepts from the botany curriculum are seamlessly integrated with practical applications, fostering a deeper understanding of biodiversity conservation and eco-friendly practices. The initiative serves to open up the students to be close to nature, practical knowledge gathering, and ecological responsibility awareness. This research paper assesses the effectiveness of the *Seuji Pam* gardening initiative in enhancing students' practical knowledge and ecological consciousness. The study demonstrates the program's potential as a replicable model for educational institutions to blend environmental education with experiential learning, creating a new generation of sustainable agriculture advocates.

Keywords*:* Seuji-Pam Gardening, Organic Farming, Sustainability, Biodiversity Conservation, Experiential Learning

OP-22

BALANCING INNOVATION AND ETHICS: THE ROLE OF ARTIFICIAL INTELLIGENCE IN TRANSFORMING HIGHER EDUCATION

Nur Rafi Abdurohman

Yauka Child Development & Psychotherapy**,** Universitas Persada Indonesia YAI, Indonesia

ABSTARCT

Artificial Intelligence (AI) is revolutionizing higher education by introducing advanced tools and methods that enhance both teaching and learning experiences. This paper examines the opportunities AI offers, including personalized learning experiences, intelligent tutoring systems, automated evaluation processes, and data-informed decision-making. These advancements allow educators to prioritize creative and strategic responsibilities while increasing the accessibility and efficiency of education. However, integrating AI into higher education also brings significant challenges, such as ethical considerations, data privacy issues, and the widening digital divide. Additionally, the successful adoption of AI technologies by faculty and students demands extensive training and a cultural shift within academic institutions. This study explores how higher education institutions can navigate these opportunities and challenges to integrate AI effectively into their frameworks. It underscores the importance of collaboration among technology developers, educators, and policymakers to ensure that AI is implemented ethically and equitably. The study also offers recommendations for using AI to drive innovation, enhance educational outcomes, and mitigate potential risks.

Key words*:* Artificial Intelligence, Higher Education, Ethical Concerns and Digital Divide

OP-23

FUTURE TRENDS IN NANOMEDICINE: POTENTIAL APPLICATIONS OF *HEXASEPALUM TERES*-DERIVED NANOPARTICLES

V. Porkodi, M. Shalini and S. Ansar Ali

PG Department of Botany, Sri Vidya Mandir Arts and Science College (Autonomous), Katteri - 636 902, Uthangarai, Krishnagiri (Dist), India.

***Corresponding Author:** dransar1993@gmail.com

ABSTRACT

The field of nanomedicine has revolutionized healthcare by offering new solutions for the diagnosis, treatment, and prevention of diseases. Among the most promising approaches is the use of plant-derived nanoparticles, which are synthesized through environmentally friendly methods and exhibit high biocompatibility and therapeutic potential. *Hexasepalum teres*, a plant with a rich array of bioactive compounds, which offer diverse applications in nanomedicine. *Hexasepalum teres* contains compounds which play an integral role in the synthesis of nanoparticles with enhanced therapeutic properties. These nanoparticles exhibit a wide range of biological activities, making them suitable for various medical applications. Furthermore, their potential in drug delivery, gene therapy, wound healing, and diagnostic imaging is gaining attention, showcasing the versatility of these plant-derived nanoparticles in advancing medical treatments. This review also highlights emerging trends in nanomedicine, and precision therapies. These advancements offer exciting prospects for further research and application of *Hexasepalum teres* - derived nanoparticles. Future research should focus on optimizing synthesis techniques, investigating the synergistic effects of nanoparticles with other bioactive agents, and conducting clinical trials to evaluate their safety and effectiveness. In conclusion, nanoparticles derived from *Hexasepalum teres* represent a promising frontier in nanomedicine, providing a sustainable and innovative solution for future medical applications with broad therapeutic potential.

Keywords: *Hexasepalum teres*, Nanomedicine, Drug delivery and Future trends.

OP-24

MICROPROPAGATION ON SHOOT TIP EXPLANTS OF *ACHYRANTHES ASPERA* L.

K. Logasathyanathan and V. Tamilselvan

PG Department of Botany, Sri Vidya Mandir Arts & Science College, Katteri, Uthangarai, Krishnagiri – 636 902

***Corresponding Author:** tamilselvanvt@gmail.com

ABSTRACT

Achyranthes aspera, L. (Amaranthaceae) is traditionally used to treat a number of diseases including diabetes mellitus, renal and cardiac dropsy. A number of valuable secondary metabolites such as betaine, achranthine and quinolizidine alkaloids have been isolated from *A.aspera*. *Achyranthes aspera* L. Leaves are reported to have antimicrobial properties. An innovative approach was made to utilize this eco-friendly and renewable source for the production of microbial resistant fabric. Due to its medicinal and antimicrobial properties *A. aspera* L. is most wanted economically. Because of its need, the present study aims to multiplate this herb by *in vitro* propagation method. Shoot tips of healthy plants of field grown *A. aspera* L. were inoculated in MS (Murashige and Skoog) medium supplemented with various concentrations (5µm, 10µm, 15µM, 20µm, and 25µm) of KIN and BAP. Of these various concentrations, 15µM KIN Supplemented medium was found to be more effective in producing higher number of microshoots (36.6 ± 1.11) with longer length (11.82 ± 0.22 cm). The efficiency of KIN in inducing multiple shoots of *A. aspera* L. has been found to be more when compared with BAP. It's because the variability in cell cultures are brought about by genetic factors. The responses of plant hormones vary depending on the plant species or even varieties. The *in vitro* regenerated microshoots were then transferred to half-length MS medium supplemented with various concentrations (2, 4, 6, 8, and 10µm) of IBA for rooting. The maximum number of roots (24.6 ± 2.24) per microshoots with maximum length of roots (7.22 ± 0.22 cm) was obtained in the medium supplemented with 6µm IBA. The complete rooted plantlets thus regenerated in *in vitro* were successfully transfered to the field after 2 to 3 weeks of cultural conditions. The protocol so far achieved will be useful for the multiplication of *Achyranthes aspera* L., one of the important medicinal herb.

Keywords: *Achyranthes,* diseases, hormones, medicinal

OP-25

IN VITRO PROPAGATION OF *OLDENLANDIA CORYMBOSA* L. AN IMPORTANT MEDICINAL PLANT

E. Ranjitham and V. Tamilselvan

PG Department of Botany, Sri Vidya Mandir Arts & Science College, Katteri, Uthangarai, Krishnagiri – 636 902

***Corresponding Author:** tamilselvanvt@gmail.com

ABSTRACT

Oldenlandia corymbosa L. (Rubiaceae) is a weedy annual herb, found specifically during rainy season in fields throughout India, Sri Lanka, tropical East Asia to Java and the Phillipines. In the present study, an effective micropropagation protocol of *Oldenlandia corymbosa* L. was carried out from the nodal explant. Shoot multiplication was successfully carried out using BAP and KIN. Two cytokinins (BAP and KIN) were tested but, BAP was found to produce more number of shoots compared with KIN. MS basal medium fortified with different concentrations of BAP. The 10 µM BAP was actively to produce maximum number of shoots 20.6 ± 2.23 with 100 % response for shoot induction and 10.16 ± 0.33 cm shoot length. Of the different concentrations of KIN were tested for shoot multiplication. The 15 µM KIN shows better result for 100% shoot induction frequency and maximum number of shoots 19.6 ± 1.11 with 8.82 ± 0.25 cm shoot length. Roots were induced from the isolated shoots using auxins (IBA and NAA).In the present study two auxins are tested, IBA was found to induce more number of roots. In 6 µM IBA induce the maximum number of 17.6 ± 1.24 roots per shoot and 4.42 ± 0.22 cm shoots length respectively. In the MS basal medium supplemented with 8 µM NAA was induce 15.4 ± 1.12 roots per shoot. The rooted plants were successfully transferred to the field through hardening and acclimatization.

Keywords: *Oldenlandia corymbosa,* herb, medicinal plant, root

OP-26

A STUDY ON THE BIODIVERSITY AND STATUS OF HABITAT CONSERVATION IN BORDOIBAM BEELMUKH BIRD SANCTUARY OF ASSAM, NORTHEAST INDIA.

Dr. Chandana Shyam
Assistant Professor, Department of Zoology, Silapathar Science College, Silapathar, Dhemaji, Assam, India.
***Corresponding Author:** shyamc19380@rediffmail.com

ABSTRACT

Bordoibam Bilmukh Bird Sanctuary, Dhemaji, Assam is a wetland which was created in great earthquake that occurred in 1950. Due to its high diversity of flora and fauna and promising scope to develop as ecotourism site Government of Assam has declared as a Bird Sanctuary in the month of July, 1996. It is about 65 kms away from Silapathar town and lies between Dhemaji and Lakhimpur district of Assam. The Bird Sanctuary harbours diversified flora and fauna. The Sanctuary has been recorded with 133 species of macrophytes, 7 species of aquatic ferns, 68 species of fish, 58 potential aquarium fishes, 40 species of insects and more than 250 numbers of rare and migratory bird species. But at present, the Bordoibaam Bilmukh Bird Sanctuary is under big trouble from anthropogenic activities. Owing to lack of proper safety of the Sanctuary, the resources are exploited un - judicially by local people. As the Sanctuary is surrounded by villages and tea gardens, household wastes and industrial chemical effluent may be contaminated in the water. Some parts of the Sanctuary are used for agricultural purposes in different seasons for different crops by the local people. Sanctuary is explicitly chosen for cattle grazing and fishing in dry seasons when migratory birds come for breeding. Therefore it is crucial to assess the issues and look for immediate strategies to stop such activities in the Sanctuary.

Keywords: Bordoibaam Bilmukh Bird Sanctuary, macrophytes, aquatic ferns, bird species, anthropogenic.

OP-27

BIOCHEMICAL CHARACTERIZATION AND NUTRITIONAL POTENTIAL OF MARINE CYANOBACTERIAL SPECIES

J.Sasikala[1]., G. Subramanian[1]* and M. Ramachandran[2]

Department of Botany, Arignar Anna Government Arts College, Namakkal- 637 002, Tamil Nadu, India

***Corresponding Author:** raj599931@gmail.com.

ABSTRACT

This work focuses on the marine cyanobacterial species Microcystis sp., Lyngbya limnetica, Oscillatoria roai, Oscillatoria acuminata, and Oscillatoria princes, emphasizing their biochemical potential for nutritional applications. The preliminary investigation analyzed pigments, proteins, amino acids, and carbohydrates, providing insights into their qualitative and quantitative composition. Among the pigments, chlorophyll-a was most abundant in Oscillatoria princes (6.02%), while Oscillatoria acuminata and Oscillatoria princes exhibited notable phycocyanin levels (0.89% and 0.95%, respectively). Carotenoid content peaked at 1.9% in Lyngbya limnetica and Microcystis sp., with Microcystis sp. also containing the highest β-carotene content (2.06%). Nutritional macromolecules, including proteins, amino acids, and carbohydrates, were also significant, with Oscillatoria princes demonstrating the highest levels of protein (7.72%), amino acids (7.12%), and carbohydrates (8.22%). These findings highlight the immense potential of these cyanobacteria as nutritional resources for both human food and animal feed, owing to their rich biomolecular composition.

Keywords: Biomolecular, Marine, Cyanobacterial species, Amino acids

OP-28

A REVIEW – CHALLENGES AND FUTURE PERSPECTIVES ON MEDICINAL PLANT ANTIMICROBIAL ACTIVITY

R. Rajeswari

Assistant professor and Head, Department of Botany, Gandhi College of arts and science for Women, N. Kandampalayam, Namakkal District - 637 203

***Corresponding Author:** rajeswarimsc1988@gmail.com

ABSTRACT

The increasing emergence of drug-resistant pathogens makes it urgent to identify and isolate new bioactive compounds from medicinal plants using standardized modern analytical methods. Medicinal compounds derived from plants could offer novel, straightforward approaches against pathogenic bacteria. This review examines the antimicrobial activity of plant components, their possible mechanisms of action and their chemical potential. The focus is on the current challenges and future prospects surrounding the antimicrobial effects of medicinal plants. There are some inherent challenges with medicinal plant extracts and their antimicrobial effectiveness. Furthermore, in the development of new antimicrobial agents from plant extracts, several difficulties and problems must be overcome while making efforts to improve the antimicrobial activity of chemical compounds. The most pertinent studies pertaining to the validation of medicinal plant antimicrobial activity, the underlying mechanisms of action, the mechanisms of bacterial resistance, the plant-derived chemical compounds that may be responsible for such activity, the challenges and future perspectives of medicinal plant antimicrobial activity were thoroughly examined in this review in order to gain a more thorough understanding of the potential use of medicinal plant extracts as alternative solutions to combat drug resistance.

Keywords: antimicrobial activity, bioactive compounds, challenges; future perspectives

OP-29

GAMMA IRRADIATION EFFECTS ON MORPHOGENETIC AND PHOTOSYNTHETIC PIGMENTS OF BLACK GRAM (*VIGNA MUNGO* (L.) HEPPER)

K. Yasmin[1] and D. Arulbalachandran[2]

1. Assistant Professor, PG and Research Department of Botany, Kandaswami Kandars College, Velur.

2. Division of Crop Mutation and Molecular Breeding, Department of Botany, School of Life Sciences, Periyar University, Salem-636011, Tamil Nadu, India.

***Corresponding Author:** yasbot14@gmail.com

ABSTRACT

The present investigation was carried out to determine the gamma irradiation effect on growth characteristics and photosynthetic pigments in black gram (*Vigna mungo* L. Hepper) variety VBN-4. Various doses of gamma rays were tested to induce mutation in black gram seeds at 200, 400, 600, 800, 1000 and 1200Gy. Gamma radiation (γ) induced the morphological changes such as plant height, stem and root length, fresh and dry weight was decreased with increased doses compared to control. While studying the photosynthetic pigments, the chlorophyll a and b were decreased however, carotenoid contents were increased at increasing dose of gamma ray treatment compared to control. The present results confirm that the inhibitory effects of plant growth and photosynthetic pigment damage depend on exposure of gamma radiation.

Keywords: Black gram, Gamma rays, Morphogenetic and Photosynthetic pigments.

OP-30

PHYTOCHEMICAL SCREENING OF AQUILARIA MALACCENSIS (AGAR WOOD) LEAVES ON DIFFERENT REGIONS OF ASSAM, INDIA.

M.Mathiyazhagan[1], NibeditaBaruah Dutta[2], Marjana Anjum[3] and [4]Ranjit Saikia

[1]Associate Professor of PG Department of Botany, Silapathar Science College, Silapathar, Dhemaji, Assam, India.

[2]Cheif Technical Officer, Chemistry and Bio-Prospecting Division, Rain Forest Research Institute, Jorhat, Assam, India.

[3]Nazir Ajmal Memorial College of Education, Hojai, Assam, India.

[4]Principal,Silapthar Science College, Silapathar, Dhemaji, Assam, India.

***Corresponding Author:** mathibdu@gmail.com

ABSTRACT

Aquilaria malaccensis belongs to the family Thymelaeaceae and it has 15 species and is predominantly found in Indo-Malaysian region. The plants are adapted to a variety of environments that include sandy, rocky, marshes, hills, and slopes with good drainage. In India the plants are prefer to grow mostly on northern states which includes Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. These trees are growing in this region because of its economic value involved in the production of perfume, incense sticks and traditional medicinal use. The economic value of the tree is mainly depending on its fungal infection of tree either natural as well as artificial and phytochemical constituents too. However the growth of the tree is not common to all the regions i.e. the growth of the tree is differ on different environmental conditions. So for this work leaf samples were collected from two different locations of Assam such as Rain Forest Research Institute (RFRI), Jorhat, Barjoha Village, Nagaon. Preliminary investigation of leaf extracts confirmed the presence of phenols, flavonoids, and saponins for both the locations but alkaloids, tannins, and terpenoids are not present in the leaves taken from the Barjoha Village. The antioxidant assay was determined by using free radicals scavenging activity against 1,1-diphenyl-2-picrylhydrazyl (DPPH) and anti-inflammatory activity using egg albumin denaturation assay. So the present study states that the methanolic extract of the leaves from RFRI, Jorhat have the potential antioxidant and anti-inflammatory property.

***Keywords*:** Phytochemical screening**,** Antioxidant activity, Anti-inflammatory activity.

OP-31

THOTTEA SILIQUOSA (LAM.) DING HOU (ARISTOLOCHIACEAE), AN UNDERUTILIZED MEDICINAL PLANT SPECIES OF WESTERN GHATS, INDIA

Murugesan K*, Balakrishnan B and Shakthimalar V

PG & Research Department of Botany, Thiagarajar College, Madurai,

Tamil Nadu - 9.

***Corresponding Author:** murugesan_botsf@tcarts.in

ABSTRACT

Thottea siliquosa is a shrub belongs to the family Aristolochiaceae, commonly known as Birthwort family. The species is native to India and Sri Lanka. In India, it is distributed in evergreen forest regions of Karnataka, Kerala and Tamil Nadu mainly on rock cervices of stream sides of Western Ghats. Morphological characters of the species showed leaves elliptic-oblong, flowers purple or dark brown in color, perianth lobed, stamens 12 united in three whorls, fruit capsule, seeds trigonous. The root of the species is used against snake bite and chronic disorders traditionally. *T. siliquosa* showed antioxidant, anticancer, anti-inflammatory, antibacterial and antifungal activity. The species is used for various medicinal purposes. However, still now it is underutilized and unexploited medicinal plant species of Western Ghats. The main aim of this study is to know about the medicinally important species *T. siliquosa* and explore the species for future utilization. This study reported the underutilized species of *T. siliquosa* and their medicinal importance for exploration.

Keywords: *Elliptic, Tamil Nadu, Thottea siliquosa, Western Ghats.*

OP-32

GENERAL INSECT PESTS IN HOMES AND CULTURAL HERITAGE SITES

P. Vimala[1]., P. Premalatha[1]., P. Karupannan[2]., C. Makeshkumar[1*]. and M. Ramachandran[3]

[1]PG Department of Zoology, Sri Vidya Mandir Arts & Science College (A), Katteri, Uthangarai - 636 902, Tamil Nadu, India

[2]Vivekanandha College of Arts and Science for Women, Elaiyampalayam, Tiruchengode, Namakkal - 637 205, Tamil Nadu, India

[3]PG Department of Botany, Sri Vidya Mandir Arts & Science College (A), Katteri, Uthangarai - 636 902, Tamil Nadu, India

***Corresponding Author:** premalatha@nmc.ac.in

ABSTRACT

Insect pests pose a significant threat to the integrity of historic buildings and homes, causing severe and irreversible damage. These pests extensively damage organic materials, including wood, textiles, and paper. The most common insect pests found in historic buildings and homes include beetles, termites, booklice, moths, and cockroaches. Several beetle species, particularly the furniture beetle and powder post beetle, are renowned for their ability to infest and consume wood. Termite infestations often remain undetected while causing substantial damage, potentially leading to complete structural failure. Similarly, cloth moth larvae cause significant damage to textiles, including carpets, furniture, clothes, and tapestries. Some species of wood-destroying cockroaches can severely damage historic buildings. This article reviews the literature and provides an overview of major insect pests from five taxonomic orders. These pests threaten households, museums, depositories, libraries, and cultural heritage buildings. Additionally, we discuss their biology, impact on human health, and various methods for their identification.

Key words: Insect, Home, Human health, Heritage and Pest

OP-33

GREEN SYNTHESIS AND BIOLOGICAL EVALUATION OF SILVER NANOPARTICLES (AG NPs) FROM THE EXTRACT OF CROSS AND RA INFUNDIBULI FORM IS FOR ANTIMICROBIAL, ANTIOXIDANT, ANDCYTOTOXIC ACTIVITIES

M. Manikandan*, S. Chellappan[1], T. Elumalai

*Assistant Professor, PG Department of Zoology, Sri Vidya Mandir Arts and Science College, Katteri - 636 902, Tamil Nadu, India.

***Corresponding Author:** drmanikandanshanthi@gmail.com

ABSTRACT

The biological activity of silver nanoparticles (AgNPs) synthesized using Crossandra infundibuli formis flower extracts (both dry and fresh) was investigated to evaluate their potential antimicrobial, antioxidant, and cytotoxic properties. In this study, AgNPs were biosynthesized by reducing silver ions in an aqueous solution using extracts obtained from both dry and fresh flowers of C. infundibuli formis. The synthesized nanoparticles were characterized using techniques such as UV-Visible spectroscopy, X-ray diffraction (XRD), transmission electron microscopy (TEM), and dynamic light scattering (DLS) to confirm their size, morphology, and surface charge. The biological activities of the AgNPs were assessed by examining their antibacterial and antifungal efficacy against a range of pathogens, including Escherichia coli, Staphylococcus aureus, and Candida albicans, as well as their antioxidant potential using DPPH and ABTS assays. Additionally, the cytotoxicity of the nanoparticles was evaluated in vitro using human cancer cell lines (HeLa and MCF-7), and their safety was assessed in normal human fibroblast cells. The results indicated that the AgNPs exhibited significant antimicrobial activity, with the fresh flower extract yielding nanoparticles of smaller size and higher antibacterial activity compared to the dry flower extract. Furthermore, both AgNPs demonstrated potent antioxidant activity, with a dose-dependent cytotoxic effect on cancer cells, suggesting their potential as an alternative therapeutic agent for the treatment of infections and cancer. These findings underscore the promising applications of plant-mediated AgNPs, particularly from C. infundibuliformis, in biomedical and pharmaceutical fields.

Keywords: Silver nanoparticles, Crossandra infundibuliformis,

OP-34

IN VITRO REGENERATION OF *SOLANUM NIGRUM* L. USING CYTOKININS AND AUXINS

M. Mahalakshmi, R. Murugan and V. Tamilselvan*

PG Department of Botany, Sri Vidya Mandir Arts & Science College (Autonomous), Katteri - 636 902, Uthangarai, Krishnagiri (Dist), India.

***Corresponding Author:** tamilselvanvt@gmail.com

ABSTRACT

Solanum nigrum L. (Black nightshade), a medicinal plant belonging to the Solanaceae family, has been traditionally used to treat pain, inflammation, and fever. This study aimed to establish an efficient in vitro regeneration protocol using nodal explants. Shoot multiplication was successfully induced using cytokinins (BAP and KIN), with 6 µM BAP producing the highest number of shoots (41.2) per explant, followed by 8 µM KIN (34.8 shoots). MS basal medium supplemented with 2–10 µM of these cytokinins, either individually or in combination, enhanced shoot induction and proliferation. Rooting was achieved using auxins (NAA and IBA), with 6 µM NAA inducing the highest number of roots (11.6 per shoot), while 8 µM IBA produced 10.4 roots per shoot. Well-rooted plantlets were successfully acclimatized in paper cups. This protocol provides an effective method for the large-scale propagation of S. nigrum for medicinal applications.

Keywords: *Solanum nigrum*, in vitro regeneration, BAP, KIN, NAA, IBA, micropropagation, medicinal plant.

OP- 35

MICROPROPAGATION OF *PHYSALIS MINIMA* L. USING CYTOKININS AND AUXINS

R. Murugan, M. Mahalakshmi and V. Tamilselvan

PG Department of Botany, Sri Vidya Mandir Arts & Science College (Autonomous), Katteri - 636 902, Uthangarai, Krishnagiri (Dist), India.

***Corresponding Author:** tamilselvanvt@gmail.com

ABSTRACT

Plants have been a vital source of medicine for centuries, with medicinal plants playing a crucial role in providing life-saving drugs worldwide. *Physalis minima* L., a perennial herb from the Solanaceae family, is known for its bitter, appetizing, tonic, diuretic and laxative properties and is traditionally used to treat inflammations, spleen enlargement, and abdominal disorders. This study aimed to develop an efficient micropropagation protocol using nodal explants. Shoot multiplication was successfully induced using cytokinins (BAP and KIN), with 6 µM BAP producing the highest number of shoots (28.2 ± 3.45) and a shoot length of 13.24 ± 0.32 cm. Similarly, 8 µM KIN resulted in 100% shoot induction, yielding 24.8 ± 1.82 shoots with a shoot length of 10.84 ± 0.23 cm. Rooting was achieved using auxins (IBA and NAA), with 4 µM IBA inducing the highest number of roots (12.4 ± 2.66) per shoot and a root length of 7.22 ± 0.22 cm. MS medium supplemented with 5 µM NAA resulted in 10.4 ± 1.08 roots per shoot with a root length of 7.26 ± 0.14 cm. The rooted plantlets were successfully hardened and acclimatized to field conditions. This protocol provides an effective method for the large-scale propagation of *P. minima* for medicinal applications.

Keywords*: Physalis minima*, Micropropagation, BAP, KIN, IBA, NAA, in vitro regeneration, medicinal plant.

OP-36

ASSESSING THE BIOACTIVITY AND MOLECULAR MECHANISMS OF *LEUCAS ASPERA (WILLD.)* AGAINST *SPODOPTERA LITURA*: A POTENTIAL BIOCONTROL AGENT

Perumal Vivekanandhan*and Kannan Swathy

Department of Entomology and Plant Pathology, Faculty of Agriculture, Chiang Mai University, Chiang Mai- 50200, Thailand

***Corresponding Author:** vivekanandhan.p@cmu.ac.th

ABSTRACT

The essential oils of *Leucas aspera* (Willd.) leaves were examined for toxicity against *Spodoptera litura* in this study, and GC-MS analysis was used to identify the chemical components of the leaves. Additionally, the connections between important chemicals and their target proteins were confirmed using molecular docking techniques. According to the findings, 48 hours after treatment, *L. aspera* essential oils caused 85%, 76%, and 70.33% of *S. litura* larvae, pupae, and adults, respectively. At 48 hours after treatment, the essential oils reduced the LC_{50} and LC_{90} values in the larvae (23.465 and 57.328 ppm/ml), pupae (32.946 and 75.361 ppm/ml), and adults (51.562 and 114.486 ppm/ml). Significant differences in the amounts of antioxidant and detoxifying enzymes as well as insect-specific enzymes were found in the study. In particular, compared to the control group, there was an increase in glutathione S-transferase levels and a decrease in catalase enzymes. When *Artemia nauplii* were exposed to essential oils derived from *L. aspera* leaves, the mortality rate was 20.33% 48 hours after treatment. Five main chemical elements were found by GC-MS analysis of essential oils extracted from *L. aspera* leaves: β-Caryophyllene, Apigenin, Stigmasterol, Lupeol, and Spathulenol. The most important chemical component among these elements is β-Caryophyllene, which shows a great deal of promise for insecticidal effects.

Keywords: *Spodoptera litura*, botanical insecticide, *Leucas aspera* (Willd.), essential oil, non-target species, molecular docking studies, ecofriendly.

OP-37

NEEM LEAF ESSENTIAL OIL: AN ECO-FRIENDLY ALTERNATIVE TO ARTIFICIAL PESTICIDES FOR SUSTAINABLE *TUTA ABSOLUTA* MANAGEMENT

Swathy Kannan, Patcharin Krutmuang*
Department of Entomology and Plant Pathology, Faculty of Agriculture, Chiang Mai University, Chiang Mai- 50200, Thailand
***Corresponding Author:** patcharin.k@cmu.ac.th

ABSTRACT

The tomato leaf miner (Tuta absoluta) is a significant threat to global tomato production, causing severe crop damage. Conventional pesticide use has led to environmental harm, non-target organism damage, and resistance, highlighting the need for sustainable pest control solutions. Neem (Azadirachta indica) leaf essential oil, known for its insecticidal, antifeedant, and repellent properties, has proven effective as a natural biopesticide. This study evaluates the efficacy of neem leaf essential oil against T. absoluta. The chemical composition, analyzed using gas chromatography-mass spectrometry (GC-MS), revealed key bioactive compounds such as Azadirachtin, Nimbin, Salannin, Nimbidin, and Nimbinol. Concentrations of 50, 100, 150, 200, and 250 ppm were tested for their impact on mortality of T. absoluta. At 250 ppm, larvae showed 94% mortality within 48 hours, and at 200 ppm, pupae exhibited 76% mortality within 48 hours. LC50 and LC90 values for larvae (37.693 and 85.743 ppm/ml), and pupae (58.864 and 142.956 ppm/ml) indicated significant toxicity. Lower concentrations also showed feeding inhibition and oviposition deterrence, enhancing its pest control potential. Neem oil's use in integrated pest management (IPM) is beneficial for organic farming and areas with pesticide resistance. Future research should focus on field testing, formulation stability, and compatibility with other biocontrol agents.

Keywords: Tuta absoluta, Pest Control, Integrated Pest Management (IPM), Neem Essential Oil, Mortality, GC-MS analysis.

OP- 38

EXPLORING THE ANTIMICROBIAL POTENTIAL OF *MAPPIAFOETIDA*: A MEDICINAL PLANT FOR COMBATTING DRUG-RESISTANT PATHOGENS

A. Selvaraju

Assistant Professor, Department of Plant Biology and Plant Biotechnology, Guru Nanak College (Autonomous), Guru Nanak Salai, Velachery, Chennai – 600 042.

Corresponding Author: selvaraju.a@gurunanakcollege.edu.in

ABSTRACT

Antimicrobial resistance (AMR) is one of the biggest threats to global health since bacterial and fungal diseases are no longer easily treatable as they used to be. This study aimed to determine the efficacy of Mappiafoetida extract against important bacterial isolates (Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa, Klebsiella pneumoniae, and Enterococcus faecalis) and fungal species (Candida albicans, Aspergillus niger, Cryptococcus neoformans, Fusarium oxysporum, and Penicillium chrysogenum). Qualitative and quantitative phytochemical analyses revealed that the plant extracts contained phenolics, flavonoids, alkaloids, and terpenoids. The TPC and flavonoid content expressed using quantitative analysis were found to be 35.4 mg/g and 28.7 mg/g respectively. Antimicrobial testing showed that all the extracts possessed appreciable activity against bacteria and yeasts, of which gram-positive bacteria exhibited higher susceptibility, followed by opportunistic fungi such as Candida albicans and Cryptococcus neoformans. The antimicrobial compounds identified by GC-MS included hexadecanoic acid, camptothecin, and quercetin, indicating the therapeutic value of the plant. These findings suggest that M. foetida is a potential source of natural antimicrobial compounds for future use. The development of plant-bearing therapeutic compounds is expected owing to their effectiveness against MDR pathogens. Additional studies, such as active compound extraction and in vivo corroboration, are required for the potential practical application of such findings. This study also supports the plausibility of continued reliance on medicinal plants for sustainable drug discovery.

Keywords: Mappiafoetida, Antimicrobial resistance (AMR), Antibacterial, Antifungal Phytochemicals, therapeutics

OP-39

APPLE ORCHARD CULTIVATION IN ANANTNAG DISTRICT, KASHMIR UNDER CHANGING CLIMATE: A STUDY ON PRODUCTIVITY, PHENOLOGY AND ADAPTIVE MEASURES

Zakir Hussain Malik

Assistant Professor, PG Department of Botany, Silapathar Science College
Amritpur, Silapathar, Dhemaji, Assam, India - 787059.
***Corresponding Author:** malikzakir112233@gmail.com

ABSTRACT

Apple orchards in Anantnag district, Kashmir, form a vital part of the region's economy and livelihood. However, climate change has significantly altered the environmental conditions essential for apple cultivation, affecting productivity, phenology, and overall orchard health. This study examines the impact of rising temperatures, erratic precipitation patterns, shifting snowfall regimes, and extreme weather events on apple cultivation in the region. Through field surveys, farmer interviews, and climate data analysis, we assess key phenological changes such as altered flowering and fruiting cycles, increased pest and disease incidences, and declining yield trends. Additionally, we explore various adaptive strategies adopted by local farmers, including modified orchard management practices, the use of climate-resilient apple varieties, and water conservation techniques. The study highlights the urgent need for sustainable adaptation measures and policy interventions to mitigate climate change effects and ensure long-term resilience in apple farming. The findings provide critical insights for researchers, policymakers, and farmers to develop region-specific solutions for sustaining apple production in Anantnag amid changing climatic conditions.

Keywords: Climate change, Apple orchards, Anantnag district, Phenology, Productivity, Adaptive strategies

OP-40

CLIMATE-DRIVEN CHANGES IN NECTAR AVAILABILITY AND POLLINATOR FORAGING PATTERNS

S. Ansar Ali, M. Ramachandran and V. Chinnadurai

PG Department of Botany, Sri Vidya Mandir Arts and Science College (Autonomous), Katteri - 636 902, Uthangarai, Krishnagiri (Dist), India.

Corresponding Author: dransar1993@gmail.com

ABSTRACT

Climate change is reshaping plant-pollinator interactions by altering nectar production, composition and availability. Rising temperatures, erratic precipitation patterns and elevated atmospheric CO_2 levels disrupt floral physiology, affecting nectar secretion rates, sugar concentration and volatile emissions that attract pollinators. These changes can lead to phenological mismatches, where flowering times and pollinator activity become unsynchronized, reducing pollination efficiency. Additionally, reduced nectar availability forces pollinators to modify their foraging behaviour, including increased foraging distances, shifts to suboptimal floral resources, and changes in pollination networks. Such behavioural adaptations may lead to nutritional stress, declining pollinator populations and biodiversity loss. This study explores the extent of climate-induced disruptions in nectar dynamics and their cascading effects on pollinator species, emphasizing the need for conservation strategies, such as habitat restoration and climate-resilient plant species, to sustain pollination services. Understanding these changes is crucial for maintaining ecosystem stability and global food security in a rapidly changing climate.

Keywords*:* Climate change, nectar secretion, pollinator foraging behaviour, floral phenology

OP-41

EVALUATION OF PHYTOCHEMICAL, AND *IN VITRO* ANTIOXIDANT ACTIVITY IN DIFFERENT PARTS AND EXTRACTS OF TRADITIONAL MEDICINAL PLANT - *FICUS CALLOSA* WILLD.

Narayanan Narasimman*, Viswanathan Periannan
PG and Research Department of Botany, Government Arts College,(Autonomous), Coimbatore – 641018.
***Corresponding Author:** narayanan4240@gmail.com

ABSTRACT

Introduction: Indian Ficus (Fam. - Moraceae) plants are traditionally used in Ayurvedic medicine to treat various ailments. The purpose of the study was to investigate the phytochemicals, investigate the quantification of secondary metabolites, and investigate the *in vitro* antioxidant and anti-inflammatory properties of *F. callosa* leaf, bark, and fruit extracts. **Methods:** The Soxhlet technique was used to extract dried *F. callosa* components fruit, bark, and leaves which were then first tested for the presence of several phytochemicals using petroleum ether, chloroform, ethyl acetate, ethanol, and aqueous solvent based on low to high polarity. **Results:** According to the results, the presence of phenolics, tannin, and flavonoids was higher in ethyl acetate bark extracts (263.38 ± 0.50 GAE/g,220.46 ± 0.74 GAE/g, and 250.80 ± 0.31RE/g), *in vitro* antioxidant activity in DPPH (IC_{50}) (39.46 µg/mL)the bark ethyl acetate extracts showed higher IC_{50} values. In phosphomolybdenum assay (219.6 mg AAE/g),ABTS+ scavenging activity (40138.9 ± 1048.5 µg TE/g), superoxide radical scavenging (44.75 ± 0.62%) Percentage of inhibition was found, Overall, the best result is seen in bark ethyl acetate extract. *In vitro,* anti-inflammatory membrane stabilization (74.39 %) bark ethyl acetate, and heat-induced hemolysis (64.34 mg/mL) fruit ethanol extracts showed higher IC_{50} values. **Conclusion:** When tested with two distinct *in vitro* models, the results confirmed that ethyl acetate *F. callosa* bark extract showed superior anti-inflammatory activity than leaf and fruit extracts, and the dosage dependence activity was seen.

Keywords*: Ficus callosa*, DPPH, anti-inflammatory activity.

OP-42

INTERACTION OF MOLECULAR MECHANISMS OF PLANT-DERIVED METABOLITES IN TYPE 2 DIABETES MELLITUS: A NETWORK PHARMACOLOGY, DOCKING AND MOLECULAR DYNAMICS APPROACH ON AKT1 KINASE

Ekambaram Gayathiri

Assistant Professor, Department of Plant Biology and Plant Biotechnology

Guru Nanak College (Autonomous), Velachery, Chennai 600042, Tamil Nadu,

***Corresponding Author:** gay3purush@gmail.com

ABSTRACT

T2DM is a common metabolic disease with enormous effects on health worldwide; moreover, the use of phytochemicals as therapeutic compounds has drawn increasing attention. Therefore, the objective of this study was to assess the effectiveness of these phytochemicals in combating diabetes through a comprehensive evaluation of their interactions with biological networks through network pharmacology, molecular docking, and molecular dynamics simulations. The first goal of this study was to search and screen potential phytochemicals for binding with key proteins involved in T2DM, with special emphasis on AKT1 kinase, an integral component of the insulin signaling pathway. Network pharmacology analysis was carried out, and the interaction network of targets associated with T2DM was generated using KEGG, STRING and Cytoscape 3.9.1 software's. To determine the specific metabolic processes, cellular compartments, and molecular functions involved in T2DM, we performed Gene Ontology and KEGG analyses. An initial and short molecular docking study was conducted to analyze the binding modes, while the molecular dynamics simulations provided insights into the binding energy and stability of phytochemicals at target sites, with emphasis on rutin engaged with AKT1.In total, 10 hub genes were proposed to be involved in T2DM and can be considered candidate therapeutic targets, namely MTOR, CASP3, CCND1, TNF, MMP9, ALB, MDM2, AKT1, and HSP90AA1. Rutin was found to have the highest binding score for AKT1 in docking studies, while MD simulations identified the structural stability and persistence of the compound's activity at the target enzyme loci. This study identified rutin and flavonoids as potential anti-diabetes phytochemicals. Based on these observations, an opportunity for other in vitro experiments and additional in vivo studies to confirm these buildings as multi-target drugs in T2DM patients is provided.

OP-43

ETHNOPHARMACOLOGY AND THERAPEUTIC POTENTIALS OF OXALIS CORNICULATA L.

R. Gopikrishnan and S. Murugesh*

***Corresponding Author:** murugeshs1957@gmail.com

ABSTRACT

The plant Oxalis corniculata Linn. This herbaceous plant, which is found in tropical and subtropical regions of the world, has long been used as a medicinal remedy. It is a member of the Oxalidaceae family and is commonly referred to as creeping wood sorrel. In various traditional medical systems, the plant has been used to treat human illnesses and ailments. Many different types of phytomolecules, including flavonoids, alkaloids, tannins, steroids, polyphenols, glycosidic compounds, lipids, and volatile oil, are revealed in this review. Flavonoids, isovitexine, and vitexine-2-O-beta-D-glucopyrunoside are among the herbal compounds found in the plant's leaves. Palmitic acid, oleic, linolenic, and stearic acids are among the many essential fatty acids that are abundant in it. Numerous significant pharmacological activities, including astringent, diuretic, febrifuge, cardio-relaxant, antimicrobial, anthelmintic, anti-inflammatory, anti-cancer, and stomachic qualities, are present in it. According to these very positive reports, further research on the herb is necessary to determine its potential therapeutic uses. The current review article provides a brief overview of this medicinal herb's pharmacological characteristics, phytochemical composition, ethnomedicinal applications, and botanical characteristics. The current study serves as an attempt to compile and record the relevant data on various facets of *Oxalis corniculata* and emphasizes the need for further investigation.

***Keywords*:** phytochemical composition, ethnomedicinal, *Oxalis corniculata*

OP-44

SEAWEED BIOPLASTICS AS BETTER ALTERNATIVE TO PLASTIC

M. Meera and M. Ramachandran*

Sri Vidya Mandir Arts & Science College (A), Katteri, Uthangarai - 636 902.

[2]Department of Botany, Periyar University, Salem - 636 011.

***Corresponding Author:** ramtojob@gmail.com

ABSTRACT

Plastics are simply polymers based on carbon. The most common use for it is to make petroleum. The invention of plastic, which produces a vast array of useful materials, greatly eased humankind's burden. But because of their durability, plastics do not break down readily, and some of them never do. Wasted plastics are causing pollution, which has made our environment much less appealing. Getting rid of plastic is a very challenging process. One of the main contributors to global warming is the release of toxic substances like dioxins. Due to the variety of plastics that require distinct recycling procedures, the process of recycling plastics is also challenging. Seaweeds are natural polysaccharides that are used in the manufacturing of pharmaceutical tablets, stabilizers, cosmetics, and packaging materials for bioplastics. Green plastics are made from raw materials with poor mechanical qualities, such as corn, sago, and food crops. Researchers have produced biofuels from red algae to create substitute plastics. It has the prospects by novel techniques to produce sustainable bioplastics for the next future generations. A plastic can be altered into sustainable bioplastic can be discussed furthermore.

Keywords: Seaweed, Plastics, Renewable Energy, bioplastics and Marine source

OP-45

ROLE OF MELATONIN IN PLANT STRESS TOLERANCE MECHANISM

S. Ramya[1] and D. Arulblachndaran[2]

Department of Environmental Science, Periyar University, Salem – 11

Department of Botany, Periyar University, Salem – 11

***Corresponding Author:** ramyabot55@gmail.com

ABSTRACT

Melatonin, an endogenously synthesized indoleamine, exerts pleiotropic effects in plant physiology by interacting with other phytohormones, thereby synergistically regulating plant growth, development, and stress responses. melatonin was implicated in the regulation of pivotal growth and developmental processes, such as seed germination, root development, flowering, and fruiting. Furthermore, it acts as a stress mitigant, endowing plants with the capacity to endure a spectrum of biotic and abiotic stresses, including extreme temperatures, drought, salinity, and the invasion of pathogens and pests. The enhancement of plant tolerance to abiotic stresses by melatonin is facilitated through diverse mechanisms including the activation of antioxidant enzymes, the promotion of osmoregulatory substance accumulation, the maintenance of ionic homeostasis, the regulation of heat-expressed protein expression, and the modulation of stress-responsive gene expression. Recent research has also indicated that melatonin derivatives could be further developed as promising antifungal candidates. Given the significant roles of melatonin, considerable efforts have been devoted to studying its potent functions and underlying mechanisms. This review outlines recent advancements in understanding the roles of melatonin in regulating plant growth and its potential synergistic interactions with biotic and abiotic stress condition

Keywords: Melatonin, Abiotic stress, biotic stress, stress tolerance

OP-46

POLLINATION BIOLOGY OF SOME NORTH-EAST INDIAN ORCHIDS BY DECEPTION

Bhaskar Buragohain* and Koustuv Buragohain

Mariani College, Mariani, Assam, India, 785 634
Jagannath Barooah College (Autonomous), Jorhat, Assam, India, 785001
***Corresponding Author:** bhaskar.mariani@gmail.com

ABSTRACT

Orchids are the fascinating group of plants having peculiar morphological and reproductive characters to attract pollinators for successful pollination. Amalgamation of male and female reproductive structure i.e. androecium and gynoecium to form a specialised organ called column where the male and female parts is separated by a fibrous rostellum, modification of the central petal into labellum, resupination of floral buds before opening, presence of nectar in the spur are some of the special characters. Orchids who provide resources like nectar, wax etc to their pollinators are called rewarded orchids and others who exploit the foraging behaviour of pollinators by providing no rewards are called as deceitful orchids. Pollination biology of some deceptive orchids found in the North-east Indian States were studied from 2016-2021; the orchid species are *Calanthe musaca, Cymbidium aloifolium, Dendrobium muschatum, D. fimbriatum, Phaius tankervilleae, Papilionanthe teres, Vanda coerulea* and *Vanda tessellate*. The terrestrial orchid *Calanthe musaca* is pollinated by a group of butterflies, the *Lasioglossum* sp. is the legitimate pollinator of *Cymbidium aloifolium* and *Dendrobium fimbriatum, Adrena parvula is* the pollinator of *Dendrobium muschatum*. Three species of *Xylocopa* are the legitimate pollinators of *Phaius tankervilleae, Papilionanthe teres, Vanda coerulea and Vanda tessellate*. All these orchids follow the deceptive pollination system and the pollination success of these orchids are negligible.

Key Words: Deception, rewards, nectar, column, labellum, pollinator.

OP-47

PHYTOCHEMICAL INVESTIGATION OF ETHANOL EXTRACT *HYBANTHUS ENNEASPERMUS* EXTRACT AND ANALYSIS OF ANTI-CANCER ACTIVITY IN HELA CANCER CELL LINE

S. Tamilselvi[1], V. Arulmozhivarman[1] and V. Chinnadurai[1,*]

[1]PG Department of Botany Sri Vidya Mandir Arts and Science College (Autonomous), Katteri - 636 902, Uthangarai, Krishnagiri (Dist), India.

***Corresponding author:** chinnaa.v1987@gmail.com

ABSTRACT

Hybanthus enneaspermus popularly known as spade flower which powder Rathanapururushar is used for aphrodisiac hypocholesterolemic, anti-inflammatory, hepatoprotective, antiarthritic, antioxidant, Cardioprotective, antiepileptic and other therapeutic activities. Hypbanthus also conserved in natural repositories is under serve intimidation because of its intensive use in local market for medicinal purpose. In this view, the present work was aimed to analysis of phtochemical screening and anticancer activities of ethanol extract of *Hybanthus enneaspermus*. The dried plant powder was extract by soxhelt extractor with ethanol solvent than it subjected to phytochemical analysis such as preliminary phytochemical qualitative screening, FTIR spectroscopy and GCMS analysis for identify the biochemical constitutes. Further the sample was evaluated anticancer activity in human cancer carcinoma of HeLa cell line. Based on the result various phytochemicals were identified by this study such as alkaloids, flavonoids, terpenoids, saponins, etc. Similarly these secondary metabolites were also confirmed by IR and GCMS spectroscopy analysis. In IR spectroscopy, various peaks are noticed which indicate aliphatic amines, aldehyde and saturated aliphatic groups, etc. The GCMS result revealed the presence of 57 different phytochemicals. Anticancer activity of this extract showed a potential result in HeLa cancer cell line.

Keywords: Enneaspermus, soxhelt, phytochemicals, cell culture and HeLa.

OP-48

MEDICINAL PLANTS AND THEIR TRADITIONAL USES IN AND AROUND THE GASC COLLEGE CAMPUS HERBAL GARDEN

Dr. D. Sheeba Gnanadeebam

Assistant Professor of Botany, Gobi Arts & Science College, Gobichettipalayam.

***Corresponding Author:** amailtosheeba@gmail.com

ABSTRACT

Human societies have been in close contact with their environments since the beginning of their formation and used the ingredients of the environment to obtain food and medicine. Awareness and application of plants to prepare food and medicine have been realized through trial and error, and gradually human became able to meet his needs from his surroundings. Information about medicinal plants has long been transmitted gradually and from generation to generation, a human knowledge has gradually become complete with the formation of civilizations and the provision of more facilities. Medicinal plants are used as a medical resource in almost all cultures. Ensuring the safety, quality and effectiveness of medicinal plants and herbal drugs very recently became a key issue in industrialized and developing countries. By standardizing and evaluating the health of active plant-derived compounds, herbal drugs can help the emergence of a new era of the healthcare system to treat human diseases in the future. Awareness of traditional knowledge and medicinal plants can play a key role in the exploitation and discovery of natural plant resources. In order to maintain this knowledge, comprehensive approach and collaboration are needed to maintain historical records on medicinal plants and use these resources in favour of human beings, before they are destroyed forever. Medicinal plants are vital sources of easily accessible remedy used in the countryside healthcare system. This study aimed to find and make record of plants that are used for medicinal therapy. So far no single study has documented medicinal plants as a whole in the area. Ethnobotanical data were obtained through interviewing informants using semi-structured questionnaires and extracting information from journals and books. Descriptive statistical analysis was applied to describe the data. At Gobi Arts & Science College, the Department of Botany and Environmental Gardening Club (EGC) established and maintains a herbal garden with the support of management and seed money projects. The survey revealed 230 genera belonging to 40 families, with Fabaceae being the most dominant family. The study also identified invasive species and documented the medicinal values of various plants. The garden surveyed medicinal plants are used to remediate variety of diseases and ailments like diarrhea, diabetes, asthma, fever, jaundice, rheumatism, wounds, cuts, stomach pain, cough, cold, body pain, bronchitis, dysentery, leprosy, piles, ulcer, tooth-ache, urinary troubles, vomit, skin diseases, nausea etc., The collection and identification work is heavy. The native inhabitants were well-versed with the utilization of plants of their surrounding by their long trial and error method of using the herbal plants.

Keywords: GASC College, Herbal Garden, Ehnobotanical, Medicinal plants, Uses.

OP-49

PHYTO-MEDIATED SYNTHESIS OF SILVER NANOPARTICLE BY *HYBANTHUS ENNEASPERMUS* AND ANALYSIS OF ITS PHOTOCATALYTIC CAPACITY AND ANTIBACTERIAL ACTIVITIES

V. Arulmozhivarman[1], S. Tamilselvi[1] and V. Chinnadurai[1,*]

[1] Department of Botany, Sri Vidya Mandir Arts and Science College (Autonomous), Katteri, Uthangarai, Krishnagiri - 636 902. Tamil Nadu and India.

***Corresponding Author:** chinnaa.v1987@gmail.com

ABSTRACT

The present work was aimed to synthesis silver nanoparticle using *Hybanthus enneaspermus* aqueous extract and to check its photocatalytic ability, antibacterial and cytotoxicity activities. 1 mM silver nitrate was synthesised with aqueous extract at 9:1 ratio and various pH used for high amount nanoparticle synthesis for 24 h incubation. The synthesised silver nanoparticle was confirmed by ultra violet spectrum visible, Fourier Transform Infra-Red (FTIR) spectroscopy, X-ray diffraction (XRD), scanning electron microscope (SEM) and dynamic light scattering. The silver nanoparticle synthesis was confirmed by dark brown colour change and sharp peak appear in 430 nm of UV visible at pH 9. Further, silver nanoparticle molecular crystalline formation was confirmed by XRD with four major peaks 38˚, 45˚, 64˚, 78˚ at 2θ and seven various function group compounds identified in FTIR. The spherical and rod shapes of silver nanoparticle was observed in SEM and nanoparticle average was observed in 3303. Zeta Potential charge of silver nanoparticle was negative. Silver nanoparticle was subjected to different organic dyes of Congo red, coomassie blue and crystal violet for analysis of photocatalytic capacity by various time interval under sunlight irritation. The result of photocatalytic showed time based reaction and all the dyes were gradually reduced by sunlight irritation, in particular the photocatalytic capacity of this silver nanoparticles was observed maximum reduction at 24 h. Further, silver nanoparticle sample was analysed antibacterial activity by disc diffusion method and the maximum zone of inhibition 3 mm was observed four bacterial organisms of tested five bacterial.

Keywords: Silver, *Hybanthus enneaspermus*, nanoparticle, photocatalytic and zone of inhibition.

OP-50

IN VITRO CONSERVATION AND ACCLIMATIZATION OF AN ENDANGERED *PAPHIOPEDILUM SPICERIANUM* USING ORGANIC SUPPLEMENTS

M. Tamilarasu[1] S. Kokila[1] and V. Chinnadurai[1,*]

[1]PG Department of Botany, Sri Vidya Mandir Arts and Science College (Autonomous), Katteri, Uthangarai and Krishnagiri – 636 902, Tamil Nadu

***Corresponding Author:** chinna.v1987@gmail.com

ABSTRACT

In-vitro propagation is a technique that provides a vital solution for the conservation of endangered orchid species. The media used in tissue culture can be modified through the addition of inexpensive organic materials as an alternative to expensive synthetic additives. Some organic sources, such as coconut water and fruit juice, contain significant amounts of vitamins, amino acids, and organic compounds which can act as growth regulators, making these organic sources excellent additives for in-vitro cultivation. The aim of this study was to develop a protocol for in-vitro micropropagation and acclimatization of *Paphiopedilum spicerianum* using organic supplements in the growth media and various substrates at the acclimatization stage. Banana powder, coconut water, and potato dextrose were added to a basal seed sowing media and evaluated for seed germination percentage and plantlet growth. In addition, various substrates such as coconut coir, horticultural charcoal, sphagnum moss, and wood bark were evaluated for height, number of leaves, and number of shoots in the acclimatization portion of this study. The culture medium with coconut water showed a greater germination percentage (75.20% and 77.65%) compared with the control (38.25% and 46.35%) at 65 and 85 days after seed sowing, respectively. Media with organic supplements showed greater values of plant length and number of roots compared with the control. The combination of coconut coir and horticultural charcoal was shown to be more efficient than the combination of sphagnum moss, horticultural charcoal, and wood bark, as results showed greater values of plant height and number of leaves at 40, 80, and 130 days after transplantation in acclimatization of *Paphiopedilum spicerianum*.

Keywords: Conservation, Plant growth regulators, acclimatization, *Paphiopedilum spicerianum*

OP-51

CLINICAL TRIALS OF MEDICINAL PLANTS: CURRENT STATUS AND FUTURE DIRECTIONS

T. Hema Deepa[1] and S. Ansar Ali[2]

[1]Department of Botany, Bharathidasan University, Tiruchirappalli - 620024 , Tamilnadu, India

[2]PG Department of Botany, Sri Vidya Mandir Arts and Science College (Autonomous), Katteri, Uthangarai and Krishnagiri – 636 902, Tamil Nadu

Corresponding Author: ansarsha468@gmail.com

ABSTRACT

Medicinal plants have been a cornerstone of traditional medicine and are increasingly recognized for their potential in modern therapeutics. Despite their widespread use, the translation of medicinal plants into clinically approved drugs faces challenges, including variability in bioactive compounds, lack of standardization, and limited robust clinical evidence. This review evaluates the current status of clinical trials involving medicinal plants, focusing on their design, outcomes, and regulatory challenges. Key trends indicate a growing interest in using medicinal plants for treating chronic diseases such as cancer, diabetes, and neurodegenerative disorders. However, issues like insufficient sample sizes, inconsistent methodologies, and inadequate characterization of plant extracts hinder their acceptance in mainstream medicine. Future directions call for multidisciplinary approaches to standardize extract preparation, identify biomarkers for efficacy, and ensure quality control. Incorporating advanced technologies like omics, bioinformatics, and machine learning can improve trial design and data analysis. By addressing these challenges, clinical trials of medicinal plants can unlock their full therapeutic potential, bridging the gap between traditional knowledge and evidence-based medicine.

Keywords: Medicinal plants, Clinical trials, Bioactive compounds, and Chronic diseases

OP-52

EX-SITU CONSERVATION OF WILD ORCHIDS IN ASSAM, NE- INDIA: A NOVEL APPROACH BY SILAPATHAR SCIENCE COLLEGE

Dr. Jitu Gogoi

Assistant professor, Department of Botany, Silapathar Science College, Silapathar, Assam

Affiliate to Dibrugarh University, Dibrugarh, Assam

Corresponding Author: gogoijitu@gmail.com

ABSTRACT

Orchids belong to the family Orchidaceae which is the largest and most diverse family of angiosperms which holds a significant ecological, cultural and economic value. Approximately 28,000 species with 880 genera have been recorded from various habitat of the world. India is home to approximately 1,350 orchid species representing 155 genera which contribute significantly to the country's natural ecosystem. The North Eastern states is a harbor of diverse orchid species of 900. Orchids exhibit unparalleled diversity, fascinating scientists with their intricate life histories, exquisite floral morphology and specialized pollination syndromes. As a keystone group, orchids play a vital role in biodiversity conservation. However, these valuable resources face threats from natural and anthropogenic factors, underscoring the necessity for conservation efforts to prevent extinction. In response to these challenges, Silapathar Science College in collaboration with Orchid Society of Assam has initiated an ex-situ conservation program aimed at protecting the wild orchid flora in the region. The present paper reports documentation of wild orchid species which are under threat and conservation in Ex-situ by establishing orchidarium and creating social awareness strategies.

Keywords: Wild orchids, Documentation, Ex-situ conservation, Awareness strategies

OP-53

ROLE OF THE ORGANIC FARMING FOR SUSTAINABILITY FOR AGRICULTURE

R.Santhakumari, N.Amudha, S.Jagathes kumar, K.Mageshwari

PG and Research Department of Botany

Sri Vijay Vidyalaya College of Arts and Science

Nallampalli, Dharmapuri, TamilNadu.

Corresponding Author: mounikumari8392@gmail.com

ABSTRACT

Agriculture is the main economic structure for many developed and developing countries. The modern agricultural practise affect the environment namely nutrient cycle, soil erosion, carbon sequestration, and many other ecological patterns. The organic farming may largely exclude the usage of chemical fertilizers, growth hormones and feed additives of livestock actives. Organic farming is influential practice to minimize the environmental and ecological impact of sustainable development. A combination of organic farming and new technologies is of most importance to reduce the limitations and challenges of organic farming. The innovative and sustainable approach of organic farming enhances the agricultural productivity, and quality of life of many farmers in an environmentally friendly way.

Keywords: Environment, Sustainable, Organic, Quality, Productivity

PP-01

TRADITIONAL KNOWLEDGE AND SOCIO-RELIGIOUS IMPORTANCE OF PLANTS IN SILAPATHAR, ASSAM

Kunjalata Konch, Juma Hajuary and Mala Chetry

PG. Department of Botany, Silapathar Science College

***Corresponding Author:** kunjalatakonch48@gmail.com

ABSTRACT:

Traditional knowledge and the socio-religious significance of plants play a vital role in the lives of the indigenous communities in Silapathar, Assam. The region, characterized by its diverse ethnic groups, utilizes plants not only for their medicinal and nutritional value but also for their cultural and spiritual importance. Various plants such as Tulsi (*Osimum sanctum*), Neem (*Azadirachta indica*) and Peepal (*Ficus religiosa*) are integrated into religious rituals, festivals and daily practices. These plants are believed to possess spiritual power and are often used for offerings and prayers. Additionally, local communities rely on plants for traditional healing practices, utilizing them to treat common ailments and for agro-forestry with species that support sustainable agriculture. This study explores the intricate relationship between plants and socio-religious customs in Silapathar, Assam, emphasizing the importance of preserving this traditional knowledge in the phase of modern challenges.

Keywords: Cultural practices, Indigenous community, Silapathar, Socio-religious, Traditional knowledge.

PP-02

EXPLORING PLANT TAXONOMY: A COMPREHENSIVE STUDY OF LOCAL FLORA IN SIVASAGAR, ASSAM.

Swapnali Saikia and Lipi Mohan

Department of Botany, Silapathar Science College, Assam, India

***Corresponding Author:** saikiaswapnali081@gmail.com

ABSTRACT

Plant taxonomy is a critical branch of botany that involves the identification classification and naming of plants. This study focus on the rich and diverse plant flora of Sivasagar district, Assam aiming to provide a comprehensive understanding of local plant speices and their taxonomy characteristics. The region located in the northeastern part of India is known for it is varied climatic condition which support a wide range of plant species including angiosperms ,gymnosperms and pteridophytes .Through exclusive field service and specimen collection this research explores the morphological traits of plants in different ecological zone within the district . The study also includes the identification of none and endengerous plant species and evaluates their conservation status. This work will serve as a valuable resource for students, researshers and conservation in understanding the local flora and its significances to the regions biodiversity.

Keywords: Ecological zones, Morphology Conservation, Plant taxonomy, Sivasagar.

PP -03

ASSESSMENT OF FUNGAL DISEASES IN MAJOR CROP SPECIES OF SILAPATHAR: A STUDY OF SYMPTOMS, SPREAD AND CONTROL

Mala Chetry, Kunjalata Konch and Juma Hajuary

Department of Botany, Silapathar Science College, Assam, India

***Corresponding Author:** chetrymala48@gmail.com

ABSTRACT

Fungal diseases are a major challenged agriculture particularly in crop intensive regions like Silapathar, Assam. This study assesses fungal infections affecting major crop species in Silapathar, identifying prevalent fungi, symptomology, disease spread and effective control measures. Target crops include rice, maize, and mustard, critical for local agriculture and economy. Field surveys and sample collections were conducted across key agricultural areas with laboratory analysis used to confirm fungal pathogens. Observed symptoms include leaf spots, wilting and nacrosis varying by crop and fungal species. Findings reveal that environmental factors like humidity and temperature significantly influence fungal spread. The study evaluated both chemical and biological methods emphasizing integrity disease management practices. This research highlights the need for regular monitoring and tailored control strategies to mitigate croploss into yields and support sustainable agriculture in Silapathar.

Keywords: Silapathar, Crop pathology, Disease symptoms, Fungal spread, Sustainable agriculture.

PP-04

MEDICINAL PLANT DIVERSITY IN SILAPATHAR: DOCUMENTATION, PHYTOCHEMISTRY AND CONSERVATION INSIGHT

Juma Hajuary, Kunjalata Konch and Mala Chetry

Department of Botany, Silapathar Science College, Assam, India

***Corresponding Author:** jumahajuary123@gmail.com

ABSTRACT

Silapathar located in the dhemaji district of Assam, harbors at reach diversity of medicinal plant use traditionally by local communities for healthcare and wellness. This study aims to document the diversity of medicinal plants in silapathar, analysis their phytochemical properties and explore conservation strategies. Extensive field service and ethnobotanical interviews were conducted to identify and catalog medicinal plant species used by indigenous groups. Phytochemical analysis was performed on selected species to identify bioactive compounds revealing the presence of alkaloids, flavonoids, saponins and other secondary metabolites responsible for their therapeutic effects. Conservation measures were assessed to address threats from habital loss and overexploitation. This research highlights the potential of silapathar's medicinal plant in drug discovery and sustainable health care practices, offering valuable insight for researcher, policymaker and conservationist.

Keywords: Medicinal Plants, Silapathar, Phytochemistry, Conservation, Ethnobotany

PP -05

EXPLORING THE COMMERCIAL POTENTIAL OF *CROTALARIA SAGITTALIS* IN PHYTOPHARMACEUTICALS: ISSUES AND FUTURE TRENDS

P. Rindhiya, P. Pavithra, B. Manjula, M. Sowmiya and S. Ansar Ali

PG Department of Botany, Sri Vidya Mandir Arts and Science College (Autonomous), Katteri - 636 902, Uthangarai, Krishnagiri (Dist), India.

***Corresponding Author:** dransar1993@gmail.com

ABSTRACT

Crotalaria sagittalis offers significant potential as a source of bioactive compounds for the phytopharmaceutical industry. However, challenges such as variability in chemical composition, inconsistent cultivation, and lack of standardized extraction methods limit its commercial exploitation. Despite these hurdles, the plant's rich phytochemical profile, including alkaloids, flavonoids, and tannins, holds promise for developing therapeutic agents, particularly for antimicrobial, anti-inflammatory, and anticancer purposes. Key obstacles to commercialization include maintaining consistent product quality and addressing regulatory challenges. Sustainable cultivation practices and efficient extraction methods are crucial to ensure the plant's reliability as a commercial source. Additionally, research gaps in understanding the molecular mechanisms behind its therapeutic effects must be addressed. Future research should focus on biotechnological innovations such as tissue culture and genetic modification to enhance production efficiency and consistency. With proper development, *Crotalaria sagittalis* could become a key player in the global phytopharmaceutical market, offering sustainable alternatives to synthetic drugs.

Keywords: *Crotalaria sagittalis*, Phytopharmaceuticals, Bioactive compounds and Regulatory challenges.

PP-06

ENVIRONMENTAL IMPACT OF LARVICIDAL PRODUCTS DERIVED FROM *ANISOMELES INDICA*

M. Sowmiya, P. Rindhiya, B. Manjula, P. Pavithra and S. Ansar Ali

PG Department of Botany, Sri Vidya Mandir Arts and Science College (Autonomous), Katteri - 636 902, Uthangarai, Krishnagiri (Dist), India.

***Corresponding Author:** dransar1993@gmail.com

ABSTRACT

The use of plant-based larvicides has emerged as a promising alternative to chemical insecticides, offering a more environmentally friendly solution for mosquito control. *Anisomeles indica*, a medicinal plant with potent bioactive compounds, has shown significant larvicidal activity against mosquito species like *Aedes aegypti*. However, before widespread application, it is crucial to assess the environmental impact of *Anisomeles indica* - derived larvicidal products to ensure their safety and sustainability. This study focuses on the environmental effects of larvicides derived from *Anisomeles indica*, evaluating their biodegradability, toxicity to non-target organisms, and potential for ecosystem disruption. Results indicated that *Anisomeles indica* extracts exhibit biodegradability and minimal toxicity to non-target organisms at recommended application doses. The compounds showed low residual effects in the environment, suggesting their potential for use in integrated pest management systems with reduced ecological risks. The findings of this study support the use of *Anisomeles indica* - derived larvicides as an environmentally safe alternative to synthetic chemical insecticides, contributing to more sustainable vector control strategies. Further research is needed to refine application methods and assess long-term environmental impacts, ensuring the continued ecological safety of these natural products.

Keywords: *Anisomeles indica*, Larvicidal products, and Sustainable pest control.

PP-07

ADVANCES IN THE DEVELOPMENT OF *PERGULARIA DAEMIA* - BASED HERBAL FORMULATIONS FOR CLINICAL USE

P. Pavithra, B. Manjula, P. Rindhiya, M. Sowmiya and S. Ansar Ali

PG Department of Botany, Sri Vidya Mandir Arts and Science College (Autonomous), Katteri - 636 902, Uthangarai, Krishnagiri (Dist), India.

***Corresponding Author:** dransar1993@gmail.com

ABSTRACT

Pergularia daemia, a traditionally used medicinal plant, has shown significant pharmacological potential due to its diverse bioactive compounds, including alkaloids, flavonoids, and saponins. Over the years, research has focused on harnessing the therapeutic properties of *Pergularia daemia* for the development of herbal formulations aimed at treating a wide range of health conditions, including inflammatory diseases. This review discusses the latest advances in the formulation of *Pergularia daemia* - based herbal products and their clinical implications. Recent studies have highlighted the optimization of extraction techniques, such as solvent-based and water-based methods, to enhance the bioavailability of key compounds. Furthermore, novel delivery systems, such as nanoparticles, liposomes, and encapsulation techniques, are being explored to improve the stability, targeted delivery, and absorption of active ingredients from *Pergularia daemia*. The review also addresses the progress in clinical trials evaluating the safety, efficacy, and dosage optimization of *Pergularia daemia* extracts and formulations. While promising results have been reported, there is a need for more comprehensive studies to establish standardized dosages, safety profiles. In conclusion, *Pergularia daemia* presents great promise as a source for novel herbal formulations, with ongoing research into innovative delivery systems and clinical testing paving the way for its integration into modern medicine.

***Keywords*:** *Pergularia daemia*, Herbal formulations, Bioactive compounds and Clinical trials

PP-08

EVALUATION OF ANTIPYRETIC ACTIVITY OF METHONOLIC EXTRACT OF *ANDROGRAPHIS LINEATA*IN WISTAR ALBINO RATS

Dr. K. Bhavani

Guest lecturer, Department of Botany, Sri Parasakthi College for Women,

Courtallam- 62710, Tamil Nadu, India

ABSTRACT

The present study has been carried out to evaluate the antipyretic activity of the methanol extract of whole plant of *Andrographis lineata* Wallish ex Nees. in rats using Brewer's yeast induced Pyrexia model as described by Loux *et al* (1972). The plants of *Andrographis lineata* Wallish ex Nees. Were collected from Therkkumalai estate, Courtallam and cut into small pieces and shade dried. The dried powdered plants (100 gm) were extracted in a Soxhlet apparatus by using methanol. Albino rats weighing (150-200g) were taken for the experiment divided into four groups of four animals each. Group 1 was treated as positive control and received 10 ml of normal saline. Group 2 served as negative control which received NSAID (non steroidal anti-inflammatory drugs) paracetamol 10 mg/kg/ml suspended in 1% DMSO which served as standard anti-pyretic agent. Group 3 and 4 were treated with 200 mg/kg/ml (low dose) and 400 mg/kg/ml (high dose) of methanol extract of the whole plant of *Andrographis lineata* suspended in DMSO respectively. The results showed that the *Andrographis lineata* at dose 400 mg/kg at 1,2,3 and 4th h have significant antipyretic activity ($P< 0.01$) and can be used as antipyretic drugs in fever. The percentage of reduction in *A. lineata* were found more effective when compared with control and standard paracetamol.

Keywords: *Andrographis lineata,* DMSO, Antipyretic, Brewer's yeast, Paracetamol

PP-09

SURVEY OF MEDICINAL PLANT SPECIES DIVERSITY IN THEERTHAMALI HILLS, EASTERN GHATS OF DHARMAPURI DISTRICT, TAMIL NADU, INDIA.

Sathiyavani K[1]* and P. Vino

1 PG Department of Botany, Sri Vidya Mandir Arts & Science College (Autonomous), Katteri, Uthangarai - 636 902, Krishnagiri District, Tamil Nadu, India.

***Corresponding Author:** pvino726@gmail.com

ABSTRACT

A survey of medicinal plants was conducted in theerthamali hills of Eastern Ghats, Dharmapuri district, Tamil Nadu. The investigation revealed that a total of 100 plant species belong to 48 families were identified and documented and their usage to treat various ailments were also standard based on the medicinal properties of the parts of the plants. Medicinal plants and their parts used to cure different ailments such as Bronchitis, Jaundice, Diarrhoea, leprosy, fever, skin disease, diabetes, cancer, stomach disorders, tooth ache, antidote, eye disease, vaginal disorders, etc., were documented. When dominant life forms were analyzed, it was found that trees were dominant followed by herbs. Similarly, the family, Fabaceae was identified as the dominant family followed by Apocynaceae and Asclepiadaceae. The leaves of the plants were stood first to treat various ailments and disorders followed by roots and other plant parts. The present study revealed that researchers have been continuously being in search of the traditional knowledge about the uses of folk medicines from the local inhabitants and the medicinal practitioners, as they have no interest on their own safest traditional treatments in spite of attractive side effect causing allopathic medicines.

Key words: Theerthamali hills, Medicinal plants, leprosy.

PP-10

PRIMING OF PLANT RESISTANCE TO BIOTIC AND ABIOTIC STRESSES BY SEAWEED EXTRACT

T. Gokul Sarvesh[1]., D. Arulbalachandran[2]., E. Dilipan[3]., S. Ramya[4] and M. Ramachandran[1*]

[1]Sri Vidya Mandir Arts & Science College (A), Katteri, Uthangarai - 636 902.

[2]Department of Botany, Periyar University, Salem - 636 011.

[3]Department of Physiology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical & Technical Sciences, Saveetha University, Chennai

[4] Department of Environmental Science, Periyar University, Salem - 636 011.

***Corresponding Author:** ramtojob@gmail.com

ABSTRACT

Seaweeds are a natural marine resource containing many bioactive compounds such as amino acids, lipids, carbohydrates, proteins, phytohormones, antimicrobial compounds and produce secondary metabolites with a varying range of biological functions such as antibacterial antifungal, antiviral, anti-inflammatory, nematocidal, and anticoagulant.. Since ancient times, it's used in various fields, such as medicine, food, and the cosmetic industry. Now seaweeds are a promising alternative to reduce the application of harmful chemicals in agriculture. Seaweed has been utilized for plant growth promotion, immunity enhancement, and the reduction of biotic and abiotic stresses. Agriculture sector is facing a lot of constraints such as climate change, increasing population and the use of chemicals, and fertilizers which have significant influence on sustainability. The excessive usage of chemical fertilizers and pesticides has created a significant risk to humans, animals, plants, and the environment. In contrast, seaweed-based products are emerging as a newer option for stress mitigation and reduction, offering an alternative to synthetic chemicals. In this review, an attempt has been made to explain how seaweed extracts and their bioactive components induce tolerance and promote growth under stress conditions.

Key words: Abiotic stress, Agriculture, bioactive, Seaweed, Tolerance

PP-11

PLANT GROWTH REGULATORS TO MITIGATE DROUGHT STRESS TOLERANCE IN CROPS

R. Rithika[1]., D. Arulbalachandran[2]., S. Ramya[3]., K. Yasmin[4] and M. Ramachandran[1*]

[1]Sri Vidya Mandir Arts & Science College (A), Katteri, Uthangarai - 636 902.

[2]Department of Botany, Periyar University, Salem - 636 011.

[3]Department of Environmental Science, Periyar University, Salem - 636 011.

[4]Department of Botany, Kandaswami Kandar's College, Velur, Namakkal - 638 182

***Corresponding Author:** ramtojob@gmail.com

ABSTRACT

Environmental stress negatively affects plant productivity by up to 70%. Various ecological stresses, including biotic and abiotic stresses, hinder plant development. Drought stress is most important environmental stress, that has a negative impact on crop growth and production is water deficiency. These modifications are mostly linked to changed metabolic processes, such as reduced or absent photosynthetic pigment production, ion uptake and translocation, glucose biosynthesis, food metabolism, and growth promoter synthesis. Phytohormones play vital roles in stress modulation and enhancing the growth of plants. They interact with one another to produce programmed signaling responses by regulating gene expression. In a nutshell, the current review will mainly focus on the role of phytohormones and related mechanisms involved in drought tolerance in various crop plants.

Keywords: Climate change, Crops, Drought stress, Plant Hormones, Tolerance

PP-12

A REVIEW - EFFECTS OF MICROPLASTICS ON HUMAN HEALTH

A. Akshaya[1]., D. Arulbalachandran[2]., S. Ramya[3]., R. Ramkumar[4] and M. Ramachandran[1*]

[1]Sri Vidya Mandir Arts & Science College (A), Katteri, Uthangarai - 636 902.

[2]Department of Botany, Periyar University, Salem - 636 011.

[3]Department of Environmental Science, Periyar University, Salem - 636 011.

[4]Department of Botany, Muthayammal Memorial College Arts and Science College, Kakkaveri, Rasipuram, Namakkal Dt

***Corresponding Author:** ramtojob@gmail.com

ABSTRACT

Nowadays, due to the enormous benefits and practical use of plastics in our lives, the global production and disposal of plastics have increased rapidly. The properties of plastics are lightness, flexibility, water resistance, high strength and ease of manufacture. They are also very resistant to decomposition and can withstand the environment over a longer period of time. The prevalence and abundance of microplastics in the world is such that many scientists use them as key indicators of the recent and current period that defines a new historical era. Microplastics (MP) are considered a global problem due to their toxic effects on humans. Microplastics (MP) occur in the food chain through bioaccumulation in animals and plants as well as in plastic food packaging. MP contamination endangers the lives of animals because living organisms accumulate MPs in cells and tissues and can therefore also pose a threat to the human food chain and public health. Therefore, we need to understand the knowledge of MPs in the food chain and their impact on human health, including issues such as oxidative stress, immune disorders and cancer risk. Then we try to explore the mechanism of toxicity in the human body of MPs. The present study, we conducted a capillary review of the literature on micro plastics and their potential risk to human health

Key words: Human, Food chain, microplastics, plastics, toxicity

PP-13

ROLE OF BIOCHAR ON ABIOTIC STRESS TOLERANCE

S. Kaviyarasan[1]., D. Arulbalachandran[2]., S. Ramya[3]., Dilipan E[4] and M. Ramachandran[1*]

[1]Sri Vidya Mandir Arts & Science College (A), Katteri, Uthangarai - 636 902.

[2]Department of Botany, Periyar University, Salem - 636 011.

[3]Department of Environmental Science, Periyar University, Salem - 636 011.

[4]Department of Physiology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical & Technical Sciences, Saveetha University, Chennai - 7

***Corresponding Author:** ramtojob@gmail.com

ABSTRACT

Abiotic stress is the main obstacle to successful crop production in modern times. Over the past few decades, researchers have developed various techniques to mitigate the effects of abiotic stress on crops. Biochar is an important environmentally friendly biostimulant that primarily increases crop production and alleviates the negative effects of various abiotic stresses. It improves crop yield as a fertilizer and soil quality as a soil conditioner. Improving soil with biochar is becoming increasingly popular these days. This is because it improves the physico-biochemical and biological properties of the soil. Biochar improves abiotic stress tolerance and plant growth and yield by modulating ion homeostasis, photosynthetic apparatus and antioxidant mechanisms, and reducing heavy metal accumulation and oxidative damage. However, the stress-reducing effect of biochar is not yet fully understood. This review summarizes recent reports on biochar application and discusses the potential roles of soil biochar amendment on plant growth and production under stress and non-stress conditions. This review also addresses the possible mechanisms of how the mitigation of abiotic stress in plants is achieved, as well as the limitations and prospects of using biochar in agriculture.

Key words: Agriculture, biochar, abiotic stress, mitigate

PP-14

APPLICATION OF NANOPARTICLES (NPS) TO AMELIORATE ABIOTIC STRESS IN PLANTS: A REVIEW

R. B. Sneha[1]., D. Arulbalachandran[2]., S. Ramya[3]., K. Yasmin[4] and M. Ramachandran[1*]

[1]Sri Vidya Mandir Arts & Science College (A), Katteri, Uthangarai - 636 902.

[2]Department of Botany, Periyar University, Salem - 636 011.

[3]Department of Environmental Science, Periyar University, Salem - 636 011.

[4]Department of Botany, Kandaswami Kandar's College, Velur, Namakkal

***Corresponding Author:** ramtojob@gmail.com

ABSTRACT

Plants are subjected to a wide range of abiotic stresses, such as heat, cold, drought, salinity, flooding, and heavy metals. Generally, abiotic stresses have adverse impacts on plant growth and development which affects agricultural productivity, causing food security problems, and resulting in economic losses. To reduce the negative effects of environmental stress on crop plants, novel technologies, such as nanotechnology, have emerged. Implementing nanotechnology in modern agriculture can also help improve the efficiency of water usage, prevent plant diseases, ensure food security, reduce environmental pollution, and enhance sustainability. In the face of increasing environmental challenges, the use of nanoparticles (NPs) offers a promising approach to alleviating abiotic stress in economically important crop species. This review investigates the mechanisms by which NPs improve plant resistance to stressors such as drought, salinity, oxidative stress, heavy metal toxicity, and cold.

Keywords: Abiotic stress, crops, nanoparticles, oxidative stress, resistance

PP-15

APPLICATIONS OF *CASSIA AURICULATA* IN NATURAL PRODUCT DRUG DISCOVERY AND DEVELOPMENT

M. Shalini, V. Porkodi and S. Ansar Ali

PG Department of Botany, Sri Vidya Mandir Arts and Science College (Autonomous), Katteri - 636 902, Uthangarai, Krishnagiri (Dist), India.

***Corresponding Author:** dransar1993@gmail.com

ABSTRACT

Cassia auriculata, a medicinal plant widely used in traditional medicine, has garnered attention in the field of natural product drug discovery due to its rich array of bioactive compounds. This review explores the therapeutic potential of *Cassia auriculata* in the development of novel pharmaceutical agents, highlighting its diverse pharmacological properties and applications. The plant is known for its antioxidant, anti-inflammatory, antimicrobial, antidiabetic, hepatoprotective, and anticancer activities, attributed to its rich chemical composition, including flavonoids, anthraquinones, alkaloids, and glycosides. In drug discovery, *Cassia auriculata* has shown promise in providing leads for the development of therapeutic agents for various chronic diseases, including diabetes, cardiovascular disorders, and cancer. The bioactive compounds derived from the plant have demonstrated significant efficacy in preclinical studies, making it a valuable candidate for further clinical evaluation. Additionally, *Cassia auriculata* has potential in the formulation of novel drug delivery systems, such as nanoparticle-based carriers, to enhance bioavailability and therapeutic efficacy. The review also addresses challenges in translating the plant's traditional uses into clinical applications, including the need for standardization of extraction methods, identification of active compounds, and clinical trials to establish safety and efficacy. Future research should focus on isolating and characterizing key bioactive constituents, exploring their mechanisms of action, and developing biotechnological approaches for large-scale production. In conclusion, *Cassia auriculata* holds great potential in natural product drug discovery, offering a sustainable source of novel compounds for drug development. Its broad spectrum of pharmacological activities makes it a valuable resource for the pharmaceutical industry, contributing to the development of safe and effective therapeutic agents.

Keywords: *Cassia auriculata*, Bioactive compounds, pharmacological properties and pharmaceutical applications.

PP-16

STUDY ON THE ANTI-CANCER PROPERTY OF COELOMIC FLUIDSUB-FRACTIONS FROM *EUDRILUSEUGENIAE*

Sri CibiChakravarthi A, Lathiha S, Arul Prakash P,Crosswin Saravanan, and Mohamed Jaabir M.S.*

Department of Biotechnology, Microbiology & Bioinformatics,
National College (Autonomous), Tiruchirappalli.

ABSTRACT

The earthworm coelomic fluid (ECF) exhibits anti-proliferative effects against various cancers, including breast, liver, gastrointestinal, and brain cancers; however, its efficacy in treating lung cancer remains largely unexplored. Previous research has primarily focused on specific cancer cell lines, lacking comprehensive comparisons across multiple fractions. This creates a significant research gap regarding the therapeutic potential of ECF from *Eudriluseugeniae*. This study investigates the anticancer activity and therapeutic applications of coelomic fluid sub-fractions derived from *Eudriluseugeniae*. The coelomic fluid was separated using a cold shock method. It was fractionated into three forms: crude form, protein fraction, and non-protein fraction. Each fraction was analyzed for bioactive compounds through LC-MS analysis. The efficacy of these fractions was evaluated using MTT assays on various cancer cell lines, including A549 (lung) and MCF-7 (breast). Additionally, cell cycle assays, apoptosis assays, reactive oxygen species (ROS) generation assays, and DAPI imaging were conducted to elucidate the mechanisms underlying their anticancer effects. The results reveal significant cytotoxic potential across all fractions, highlighting the therapeutic promise of *Eudriluseugeniae* coelomic fluid in cancer treatment. This study enhances our understanding of naturally occurring extracts in cancer therapy and promotes further investigation into the bioactive compounds derived from earthworms for potential therapeutic uses.

Keywords: *Eudriluseugeniae,* coelomic fluid, Anticancer activity, A549 (lung), MCF-7 (breast).

PP-17

THE EFFICACY OF COELOMIC FLUID FROM *EUDRILUS EUGENIAE* AS AN ECO-FRIENDLY ALTERNATIVE TO CONVENTIONAL PLANT GROWTH REGULATORS IN *ORYZA PUNCTATE*

Mohamed Jaabir M. S[*], Crosswin Saravanan[1], Priyadarshini[2], and Lathiha[3]
Department of Biotechnology, Microbiology & Bioinformatics
National College (Autonomous), Tiruchirappalli

ABSTRACT

Plant growth regulators (PGRs) play an important role in manipulating plant growth and it can be costly. This study identified an affordable and eco-friendly source of growth factors in the Coelomic Fluid (CF) from earthworms of the species *Eudrilus eugeniae*. Growing *Oryza punctata* in MS media enriched with CF from *Eudrilus eugeniae* increased germination and morphological development compared to traditional micro-propagation methods. The CF was collected using a cold shock technique, sterilized, and stored at -80°C. MS media was prepared with different CF concentrations: 0.2%, 0.5%, and 0.7%. Control groups included one with plant hormones BAP, IBA, and NAA, and one with basal Media. Various analyzes were conducted, including protein estimation, total chlorophyll content, protein profiling through SDS-PAGE, GC-MS for compound identification, and phytochemical screening for secondary metabolites. Comparative analysis revealed that CF-treated plants outperformed the controls. As the concentration of CF increased by 0.2%, 0.5%, and 0.7%, the best outcomes were obtained at 0.7%. Plants treated with CF exhibited a significant increase in shoot proliferation and elevated chlorophyll levels. Remarkably, these plants demonstrated resilience against various environmental stresses, including high saline conditions, absence of light and nutrient media devoid of vitamins. Biochemical analyzes utilizing Bradford's method and SDS-PAGE revealed that CF-treated plants possessed higher protein content compared to untreated control plants. This research suggests that earthworm CF contains growth factors that can enhance plant growth and protein content. As a novel area, further research is needed to address limitations and gain additional insights into using earthworm CF as a plant growth regulator.

Keywords: *Eudrilus eugeniae*, Coelomic Fluid, Growth Factors, SDS-PAGE, GC-MS, Phytochemical Screening

PP-18

STUDY ON THE ANTI-CANCER PROPERTY OF COELOMIC FLUIDSUB-FRACTIONS FROM *EUDRILUSEUGENIAE*

Snagha Singaravelu, Arul Prakash P, Crosswin Saravanan,

Mohamed Jaabir M.S.*

Department of Biotechnology, Microbiology & Bioinformatics,

National College (Autonomous), Tiruchirappalli.

ABSTRACT

The earthworm coelomic fluid (ECF) exhibits anti-proliferative effects against various cancers, including breast, liver, gastrointestinal, and brain cancers; however, its efficacy in treating lung cancer remains largely unexplored. Previous research has primarily focused on specific cancer cell lines, lacking comprehensive comparisons across multiple fractions. This creates a significant research gap regarding the therapeutic potential of ECF from *Eudriluseugeniae*. This study investigates the anticancer activity and therapeutic applications of coelomic fluid sub-fractions derived from *Eudriluseugeniae*. The coelomic fluid was separated using a cold shock method. It was fractionated into three forms: crude form, protein fraction, and non-protein fraction. Each fraction was analyzed for bioactive compounds through LC-MS analysis. The efficacy of these fractions was evaluated using MTT assays on various cancer cell lines, including A549 (lung) and MCF-7 (breast). Additionally, cell cycle assays, apoptosis assays, reactive oxygen species (ROS) generation assays, and DAPI imaging were conducted to elucidate the mechanisms underlying their anticancer effects. The results reveal significant cytotoxic potential across all fractions, highlighting the therapeutic promise of *Eudriluseugeniae* coelomic fluid in cancer treatment. This study enhances our understanding of naturally occurring extracts in cancer therapy and promotes further investigation into the bioactive compounds derived from earthworms for potential therapeutic uses.

Keywords: *Eudriluseugeniae,* coelomic fluid, Anticancer activity, A549 (lung), MCF-7 (breast).

PP-19

A REVIEW ON MOSQUITO MANAGEMENT

S. Vishnu[1]., C. Makeshkumar[1*]., P. Premalatha[1]

[1]PG Department of Zoology, Sri Vidya Mandir Arts & Science College (A), Katteri, Uthangarai - 636 902.

***Corresponding Author:** cmkumar435@gmail.com

ABSTRACT

Many viral, bacterial and protozoans' diseases mosquitoes act as vector. In term of disease transmission and public health importance mosquito are considered as very important group of insects. Population of mosquito's increases exponentially that is major problem for many countries because mosquito spread the different diseases such as filarial, Japanese encephalitis, Lyme disease, Yellow fever, encephalitis, malaria, chikungunya, dengue, and epidemic poly-arthritis. In tropical and subtropical countries mosquito borne diseases are main problem. Different types of mosquito repellents such as synthetic compounds, aromatic oils and herbs are used against mosquitoes. Chemical mosquito repellents have an extraordinary protection profile, but they are noxious as compare to the plant based repellents. In this review how to find best way of mosquito management, to describe different methods of mosquito control, different plants extracts that are used against mosquito and to compare either chemical or botanical control is best.

Keywords: Biological Control, Chemical methods, mosquitoes, Physical methods,

PP -20

A REVIEW - MOSQUITO CONTROL ON FUTURE STRATEGIES

P. Kowsalya[1]., C. Makeshkumar[1*]., P. Premalatha[1]

[1]PG Department of Zoology, Sri Vidya Mandir Arts & Science College (A), Katteri, Uthangarai - 636 902.

***Corresponding Author:** cmkumar435@gmail.com

ABSTRACT

Nearly half a million deaths occur worldwide annually due to mosquito-borne diseases. Mosquito control has become the major strategy in controlling these diseases, especially in the absence of effective vaccines for disease prevention. At the beginning of the last century, mosquito control was mainly done by personal protection methods and larval control by application of petroleum oil and Paris green powder to water bodies. Environmental pollution caused by synthetic insecticides also became a major concern. Novel personal protection methods, community-level operations on source reduction, insect growth regulators and polystyrene beads for larval control, and biological control were introduced as alternatives. Biological control was mainly by larval predators such as fish, dragonfly nymphs, microcrustaceans and Toxorhynchites larvae; bacterial larvicides such as Bti; plant-based mosquitocides; and green-fabricated nanoparticles. Various strategies and techniques have been used to control mosquitoes aiming to reduce transmission of mosquito borne diseases. Each method has its own merits and demerits. Even though the control programmes still heavily depend on conventional insecticides, an urgent need has been arisen to limit their usage mainly due to resistance development and environmental concerns. We discussed modern technologies in this chapter that provide a wide range of mosquito management on future strategies.

Key words: Biological control, larvicides, mosquitocides, pollution

PP-21

ORGANIC FERTILIZER A KEY COMPONENT OF ORGANIC AGRICULTURE AS BETTER ALTERNATIVE TO CHEMICAL FERTILIZER

S. Priya[1]., K. Gopika[1]., S. Ramya and M. Ramachandran*

[1]Sri Vidya Mandir Arts & Science College (A), Katteri, Uthangarai - 636 902.

[2]Department of Environmental Science, Periyar University, Salem - 636 011.

***Corresponding Author:** ramtojob@gmail.com

ABSTRACT

The acreage of organic farming is steadily growing, and this trend is being fueled by the harmful consequences that chemical fertilizers have on both the soil and human health. However, while expanding organic farming, farmers have consistently faced major obstacles, namely the scarcity and inadequate supply of high-quality organic fertilizers essential for superior crop yields. For centuries, traditional sources like compost have dominated organic farming, but the substantial demand has frequently deterred farmers. In recent years, various organic fertilizers, including liquid organic fertilizers, have gained popularity due to their affordability and ease of application. As a consequence, there has been a push to examine various organic sources, their nutrient content, and their impact on various crop yields and soil health.

Keywords: Chemical Fertilizer, Organic agriculture, Crop, Soil Health

PP-22

IMPROVEMENT OF SOIL HEALTH USING BIOCHAR - A REVIEW

R. Poovizhi., K. Agalya S. Ramya[2] and M. Ramachandran[1]*

[1]Sri Vidya Mandir Arts & Science College (A), Katteri, Uthangarai - 636 902.

[2]Department of Environmental Science, Periyar University, Salem - 636 011.

***Corresponding Author:** ramtojob@gmail.com

ABSTRACT

Biochar is a special substance that, when added to soil, can significantly enhance its physical, chemical, and biological characteristics, thereby resolving many of the soil's drawbacks. When compared to other organic matter types like manure, biochar is persistent in soils and has longer-lasting positive effects. The distinctive feature of biochar is that it is more effective than other organic materials, like compost, manures, or common leaf litter, at retaining the majority of nutrients and making them available to plants. Since biochar can potentially absorb carbon dioxide from the atmosphere, its long-term persistence in soil makes it an ideal material for mitigating climate change. Reductions in net emissions through the sequestration of biochar are necessary for the successful reduction of greenhouse gases. When biochar is applied, soil fertility and crop productivity increase, and crop response varies depending on the physicochemical characteristics. Applying biochar may increase the volume of soil per unit weight, which will lower the bulk density of the soil because its bulk density is significantly lower than that of mineral soils. This review also addresses the possible mechanisms of how the improve the soil fertility prospects of using biochar in agriculture.

Keywords: Biochar, Soil Health, Agriculture, Physio-chemical Properties

PP – 23

PHYTOREMEDIATION USING TECHNOLOGY IN PLANTS

B. Muthzhazhgi., S. Kaviyarasi., C. Aasiak., K. Deepa and

M. Ramachandran*

[1]Sri Vidya Mandir Arts & Science College (A), Katteri, Uthangarai - 636 902.

***Corresponding Author:** ramtojob@gmail.com

ABSTRACT

Phytoremediation is the name given to a set of technologies that use different plants as containment, destruction, or extraction technique. The U.S Environmental Protection Agency (EPA) seeks to protect human health and environment from risks associated with hazardous waste sites. Phytoremediation may be applied wherever soil or static water environment has become polluted or suffering ongoing chronic pollution. Past 20 years, this technology has become increasingly popular and employed at sites with soils contaminated with lead, uranium, cadmium, mercury. Some of the phytoremediation mechanisms are Rhizosphere biodegradation, phyto-stabilization, phyto-extraction, Rhizofiltration, phyto-volatilization, hydraulic control, phytodegradation.

Keywords: Phytoremediation, extraction, Rhizosphere, phytodegradation.

PP - 24

MOBILE APPLICATIONS FOR FARMERS IN INDIA

S. Manimegalai., S. Chennammal., K. Swapna., K. Kaviya. And M. Ramachandran

[1]Sri Vidya Mandir Arts & Science College (A), Katteri, Uthangarai - 636 902.

***Corresponding Author:** ramtojob@gmail.com

ABSTRACT

In the modern era of agriculture**, t**he mobile applications are helpful for agricultural development. There are many authenticated free mobile applications are available for the public use. IFFCO Kisan- This application was launched by Government of India which gives information about Market prices, Weather forecasts, Agricultural advisory, guidance related to agricultural practices. Another app called, Indian Farmer, helps the farmers to sell their goods without depending on the middleman. The app, Farmers E-market helps the farmers to display and sell their goods such as animals, poultry, fishes, diary and other farm products. In India, Farmers Guardian, the agricultural national e-newspaper is also available with the mobile application updating the latest farming news, machinery reviews, comments, analysis and show coverage on agriculture today.

Keywords: IFFCO, Agriculture, Market, farmers

PP-25

A REVIEW - ROLE OF AZOLLA IN RICE PRODUCTION

D. Dharani., R. Sankar., G, Sudhakar., S. Naveenkumar, V. Prabanjan and M. Ramachandran*

[1]Sri Vidya Mandir Arts & Science College (A), Katteri, Uthangarai - 636 902.

***Corresponding Author:** ramtojob@gmail.com

ABSTRACT

Azolla is a free-floating water fern which in symbiotic association with cyanobacterium Anabaena azollae fixes the atmospheric nitrogen. Nitrogen fixing ability of cyanobacterial symbiont varies between 30 and 60 kg N ha−1 which designates Azolla as an important biological nitrogen source for rice ecosystem. Inoculation of Azolla is an alternative and sustainable source of nitrogen to increase the rice productivity and it also can decrease the use of synthetic fertilizer. A number of past researches prove that Azolla has been used as a potential biofertilizer for rice production. Azolla is either incorporated in the soil before rice transplanting or grown as a dual crop along with rice. The objective of this paper is to provide a brief account of importance as well as developments in the utilization of Azolla-Anabaena system in agriculture, mainly rice production.

Keywords *:* Azolla, nitrogen, Anabaena azollae, rice crop

PP-26

IN VITRO ANTIMICROBIAL STUDIES ON *LIPPIA NODIFLORA* (L.) MICHX.

P. Velmurugan, D. Venkadesan and P. Viswanathan

JSA Medical College for Siddha and Research Centre, Pali, Ulundurpet,
Kallakurichi District, Tamilnadu, India.

ABSTRACT

Lippia nodiflora plant is used as traditional medicinal plant as diuretic, maturant, useful in fevers and cold, astringent to bowels, stomachic, used in lack of bowel movements, pain in knee joints and lithiasis. It was found that the plant possesses steroids, alkaloids, carbohydrates, flavonoids, essential oil, tannins and salts of potassium. A study was undertaken to investigate the Indian medicinal plant *Lippia nodiflora* against various bacterial pathogens *Escherichia coli, Klebsiella pneumonia, Salmonella typhi, Bacillus cereus and Staphylococcus aureus.* All the organisms responded to both Chloroformic and Ethyl acetate extracts by using Disc diffusion, Streak plate and Agar well diffusion method. The chloroform and ethyl acetate extracts of the plant stem extracts showed different diameters of inhibition zone ranging between *Staphylococcus aureus, Salmonella typhi* and *Bacillus cereus* greater inhibition zone (1.4 cm) and other two bacterial strains like *Klebsiella pneumonia* and *Escherichia coli* showed lesser inhibition zone (0.3 cm).

Keywords: Antimicrobial activity, Traditional medicinal plant, *Lippia nodiflora.* Ethyl Acetate Extract, *Bacillus cereus, Klebsiella pneumonia*

PP-27

PLANT MEDIATED COPPER NANOPARTICLE SYNTHESIS OF *FICUS VIRENS AITON* EXTRACT AND ANALYSIS OF ANTIMICROBIAL AND PHOTOCATALYTIC ACTIVITIES

S. Kokila[1], M.Tamilarasu[1], V. Chinnadurai[1,*]

[1]PG Department of Botany, Sri Vidya Mandir Arts and Science College (Autonomous), Katteri,
Uthangarai and Krishnagiri – 636 902, Tamil Nadu
***Corresponding Author:** chinna.v1987@gmail.com

ABSTRACT

Ficus virens aiton (Moraceae) is a wild plant and their product have made significant contribution to the human diet in science ancient times. The Ficus virens aiton is also called as white fig. The current study was aimed to synthesize and characterization copper nanoparticle (CuNPs) using aerial region of ficus virens aiton aqueous extract and screen antimicrobial activity and photocatalytic degradation of textile dyes. The synthesized CuNPs were characterized by ultraviolet (UV) visible spectrum, Fourier transform infrared (FT-IR), X-ray diffraction (XRD), Scanning electron microscopic (SEM) and Energy-dispersive X-ray spectroscopy (EDX). Also the CuNPs was examined photocatalytic capacity by three different organic dyes and antibacterial activity on five bacterial organisms by well diffusion method. The CuNPs have absorbance peak at 265 nm for reaction at room temperature. The FTIR results also showed various peak patterns. The XRD pattern of the present study clearly exhibits that the synthesized CuNPs was in crystalline. The obtained SEM image shows the morphology of CuNPs was mainly spherical, ellipsoidal and some irregular shape. The EDX results indicates that CuNPs display an absorption peak at 3keV, shows the presence of Copper element. The CuNP sample showed best antibacterial activity at the concentration of 10 mg/ml against *Bacillus subtilis* (7.5±0.12). The bio reduced CuNPs exhibited notable degradation properties in a reduction of organic dyes crystal violet, coomassie blue and congo red.

Keywords: Copper nanoparticles, dye degradation, congo red, antimicrobial and *Bacillus.*

PP-28

THERAPEUTIC POTENTIAL OF *ARGEMONE MEXICANA* L. ROOT EXTRACT- A RICH SOURCE OF SAPONIN

E. Kathar Basha, Vijaya Dhamodaran*

PG and Research, Department of Botany, Government Arts College, Dharmapuri - 636 705, Tamilnadu, India,

*Correspondences author **Email: vijdhamu@yahoo.co.in**

ABSTRACT

Abstract:

Argemone mexicana L., a traditional medicinal plant is a valuable natural agents for the prevention and treatment of various diseases. *A. mexicana* was found to contain saponin in its root extract. The saponin is useful for the prevention and treatment of various diseases, including infectious diseases, and inflammatory disorders. This study investigates the antimicrobial, antioxidant and anti inflammatory potential of saponin extracted from *A. mexicana* roots. The saponin rich extract showed antimicrobial activity, inhibiting the growth of both gram positive and gram negative bacteria. The extract also exhibited antifungal activity against *Candida species, C. tropicalis and C. albicians*. The antioxidant activity of the extract was evaluated using the DPPH radical scavenging assay. The results showed that the extract had potent antioxidant activity, comparable to that of standard antioxidants antioxidant activity for DPPH, ABTS and hydroxyl radicals Saponin. Thus significant antimicrobial activity against various bacterial and fungal pathogens, alongside strong antioxidant and anti inflammatory effects has been deomonstrated. These findings highlight the therapeutic potential of *A. mexicana* saponins as natural agents for combating infections, and inflammation, paving the way for further research into their pharmacological applications. Further research is needed to fully explore the medicinal properties of this plant and to develop novel therapeutic agents from its saponin.

Key words: *Argemone mexicana,* Saponin, Phytochemicals, antimicrobial, antioxidant, and anti inflammatory

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Contact : 04341 - 296366

Mobile : 96880 55877 / 97880 55831

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