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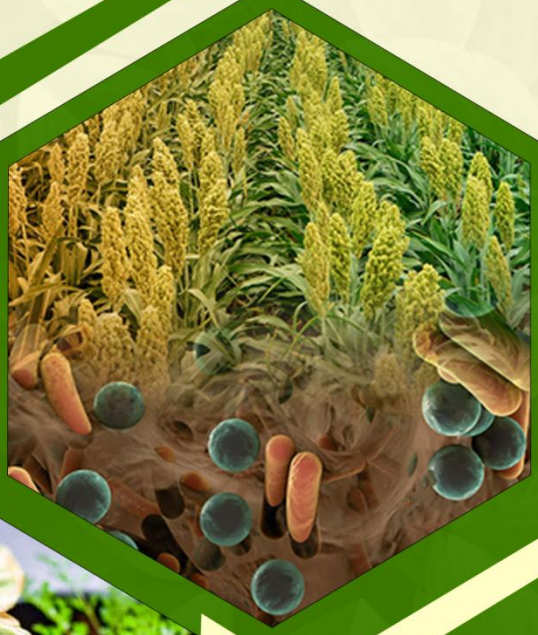

NATIONAL CONFERENCE

ON

PLANTS AND MICROBES: PROGRESS, POTENTIAL AND FUTURE

[PMPPF-2023]

SEPTEMBER 30, 2023

Organised By

Department of Botany, D. D. U. Gorakhpur University, Gorakhpur (UP)

In Association with

Microbiologist's Society, India (MBSI) And Avishka Council of Industrial and Allied Biosciences (ACIAB)

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गोरखपुर-273009 (उ0प्र0)
Deen Dayal Upadhyaya
Gorakhpur University,
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Message

I am pleased to know that the Department of Botany, Deen Dayal Upadhyaya, Gorakhpur University, Gorakhpur is organizing a **"NATIONAL CONFERENCE ON PLANTS AND MICROBES: PROGRESS, POTENTIAL AND FUTURE [PMPPF-2023]** in association with **Microbiologist's Society, India (MBSI) and Avishka Council of Industrial and Allied Biosciences (ACIAB) on September 30, 2023.**

The themes covered in the seminar are diverse and may certainly attract the scientists and experts involved in various disciplines of fungal biology, plant-microbes interaction, and plant protection research.

It is my firm belief that this seminar will provide excellent opportunities for the experts and the budding young minds to exchange their ideas and strategies for better exploitation of the microbial world for human welfare.

I extend my warm welcome to the experts from various disciplines and participants in Gorakhpur, the land of ancient glory and medieval mysticism, and in the campus of Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur. I compliment the Organizers, Convener, Organizing Secretary, Joint Secretaries, and those who are involved in organizing this event.

I wish all the participants a great learning experience and wish the seminar a grand success.

(PROF. POONAM TANDON)

भा.क.अनु.प.–भारतीय सब्जी अनुसंधान संस्थान
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डॉ. तुषार कान्ति बेहेरा
निदेशक
Dr. Tusar Kanti Behera
Director

दिनांक : **20/09/2023**

Message

Microbes and plants coevolved over the evolutionary process and continue to enjoy coexistence in parallel even today. Prokaryotic cyanobacteria and eukaryotic algae coexisted in the earliest oceanic life forms. Later, +interactions between the early communities of bacteria, fungi, algae, lichens and bryophytes led to the emergence of terrestrial life forms, which largely supported the development of plant evolution on the soil. The role of microbial communities inhabiting fully evolved plants either as beneficial or parasitic/pathogenic bacteria having non-dependent interactions or dependent endosymbionts has become more pervasive and a driving force. The intricate and intertwined relationships that exist between plants and their phytomicrobiome which represents the microbial communities that live in the rhizosphere, phyllosphere, and endophytic region, have the power to influence how well both plants and microbes perform under biotic and abiotic pressure. Amazingly diverse microbiomes that exist within plants play a fundamental role in plant immunity, metabolite formation, nutrient uptake and acquisition, carbon sequestration, nitrogen fixation, phosphate solubilization, disease and insect-pest management, xenobiotic degradation, waste bioconversion and decomposition, and many other critical processes. In essence, the microbiome associated with plants not only supports plant growth, soil health, food and nutrition but also curbs the negative impacts of climate change on sustainable agricultural productivity.

Looking into the prospects and pertinence of the present era agriculture, the National Conference on Plants and Microbes: Progress, Potential and Future (PMPPF-2023) is a very pertinent and rightly planned platform to discuss the role of microbial communities in shaping the future of agriculture and environment.

I wish every success for this very positive endeavour.

(T.K. Behera)

AVISHKA COUNCIL OF INDUSTRIAL AND ALLIED BIOSCIENCES

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Date:15-09-2023

Dear Distinguished Colleagues and Participants,

It is my distinct honour and privilege to extend my warmest greetings as the President of the Avishka Council of Industrial and Allied Biosciences on the occasion of the National Conference on Plants and Microbes: Progress, Potential, and Future, organised by the Department of Botany, DDU Gorakhpur University, Gorakhpur. The partnership between ACIAB and DDU Gorakhpur University for this conference underscores the importance of collaborative efforts in advancing the frontiers of science. Our shared commitment to the study of plants and microbes is a testament to the significance of these organisms in our ever-evolving world. Plants and microbes have long fascinated scientists, and their profound impact on ecosystems, agriculture, and biotechnology is undeniable. This conference provides a platform for us to come together, exchange knowledge, and explore the remarkable progress made in this field, as well as the immense potential that lies ahead. I would like to express my deepest gratitude to the Department of Botany at DDU Gorakhpur University for their dedication and hard work in organizing this conference. Their commitment to promoting scientific inquiry and fostering a collaborative spirit is truly commendable. To all the speakers, researchers, and participants, your presence and contributions are invaluable. Your diverse perspectives and expertise will undoubtedly enrich the discussions and lead to innovative solutions for the challenges we face in the world of plants and microbes. As we gather here, let us seize this opportunity to engage in meaningful dialogues, share our findings, and lay the groundwork for a future where plants and microbes continue to play a pivotal role in shaping a sustainable and thriving world. I encourage you all to make the most of this conference, forging new connections, and nurturing existing ones. Together, we can propel the field of biosciences to new heights and make a lasting impact on the future. Once again, I extend my heartfelt welcome to all of you, and I look forward to the insightful deliberations and discoveries that will undoubtedly emerge from this gathering.

Warm regards,

Nishant 15.9.23

Dr. Nishant Srivastava
President, Avishka Council of Industrial and Allied Biosciences (ACIAB)

T-11, 401, Nirala Estate GH 04, Techzone 04, GreaterNoidaWest,Gautam Buddha Nagar, Uttar Pradesh-201306

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MESSAGE

I am pleased to know that the Department of Botany, Deen Dayal Upadhyaya, Gorakhpur University, Gorakhpur is organizing the National Seminar on **"NATIONAL CONFERENCE ON PLANTS AND MICROBES: PROGRESS, POTENTIAL AND FUTURE [PMPPF-2023]"** in Association with Microbiologist's Society, India (MBSI) and Avishka Council of Industrial and Allied Biosciences (ACIAB) on September 30, 2023.

The themes covered in the seminar are diverse and may certainly attract the scientists involved in various disciplines of fungal biology, plant-microbes interaction, and plant protection research. It is my firm belief that this seminar will provide excellent opportunities for the experts and the budding young minds to exchange their ideas and strategies for better exploitation of the microbial world for human welfare.

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(Ajay Singh)

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Prof.Anil Kumar Dwivedi
Head
Department of Botany
DDU Gorakhpur University, Gorakhpur29/09/23
Email:profanilkdwivedi@gmail.com
Mob: 9453695331,6393524365

MESSAGE

It is a matter of great pride for the Department, particularly for me that the Department of Botany, Deen Dayal Upadhyaya, Gorakhpur University, Gorakhpur is organizing the National Conference on 'PLANTS AND MICROBES: PROGRESS, POTENTIAL AND FUTURE' [PMPPF-2023] in Association with Microbiologist's Society, India (MBSI) and Avishka Council of Industrial and Allied Biosciences (ACIAB) on September 30, 2023.

The theme of the Seminar reflects the understanding of plant-microbe interaction, recent advances in therapeutics, and cutting-edge research in different fields. I am sure that this gathering of diverse learned scientists of this field from different parts of the country would be fruitful towards the emergence of new scientific vistas. Further, this would provide a common platform for all researchers to share their ideas to motivate young botanists. May this Seminar be fruitful and contribute to a more successful science-based solution to the problems we are facing today. I wish the Seminar a grand success.

20/9/23

(Anil Kumar Dwivedi)

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- Dr. Ashok Kumar
- Dr. K.Sunita

Plants of Family – Myrtaceae as potent fungitoxicant against *Cladosporium cladosporioides*, a destructive cellulolytic fungus.

Neeraj Srivastava* and Kavita Srivastava

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Abstract:

A group of fungi causing biodeterioration of Cellulose is called "Cellulolytic Fungi". These fungi heavily degrade and destroy objects of historical importance like library books, archives, paintings and historical monuments etc. During present investigation, a survey was done to study dynamics of cellulolytic fungi in unglazed and glazed papers in Gorakhpur and predominance of *Cladosporium cladosporioides*(Fres.) de Vries was recorded, which was selected as Test Fungus.

The chemical fungicides used to control these cellulolytic fungi including *Cladosporium cladosporioides* deface and destroy the objects and are non-biodegradable, toxic, non-ecofriendly, pollutive and have a carcinogenic risk too. The volatile constituents of higher plants*, i.e.,* essential oils and their constituent terpenoids have shown potent fungitoxic activities in their vapours.Plants of Family – Myrtaceae have been proved to contain volatile essential oils having antifungal properties.

In the present investigation, four plants of Family - Myrtaceae*viz. Eucalyptus camaldulensis*Dehnh., *Melaleuca leucadendron* L., *Psidium guajava* L. and *Syzygiumaromaticum*Merr. & Perry. have been selected to determine antifungal properties of the vapours of their essential oils against the test fungus*Cladosporium cladosporioides*causing biodeterioration of paper manuscripts in Gorakhpur. The fungitoxicity was determined *in vitro* as minimum inhibitory concentration (MIC), minimum lethal concentration (MLC) and inoculum density sustained at MIC and hyper MIC doses (fungicidal or fungistatic nature). It is concluded that the oil of *Syzygiumaromaticum* dried flower bud (Clove or Laung) is the most effective oil against this test fungus and can be recommended for further *in vivo* investigations. The other three oils show moderate to low fungitoxicity. The oil of *Psidium guajava* leaf shows the lowest fungitoxicity.

Keywords: Cellulolytic fungus, *Cladosporium cladosporioides,* Fungitoxicant, Myrtaceae.

Aeromycoflora of indoor air of Neta ji Subhash Chandra Bose district hospital, Gorakhpur

Alok Krishan Tripathi and Prof. Awanish*

Department of Botany, Mahatma Gandhi P.G. College, Gorakhpur, Uttar Pradesh

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Abstract:

Air microflora has significant role in human health. Indoor air has a higher risk of infection, particularly in large gatherings such as hospitals, schools, and theaters. The current investigation was conducted to determine the mycoflora of the interior air of the District Hospital in Gorakhpur.

This study looked into the types, number, and frequency of airborne aeromycoflora in the general ward, emergency ward, dispensary, and dressing room of Neta Ji Subhash Chandra Bose District Hospital in Gorakhpur. Every month from January to March 2022-2023, sterilized culture plates with PDA media were used for sampling. Each plate was exposed to air for 5-10 minutes at a height of 1 m - 4.5m from the floor. For 3-4 days, the fungal culture plates were incubated at room temperature and number of colonies were counted after incubation. For identification, the fungal colonies were extracted and cultivated on suitable media. Based on colony morphology and microscopic analysis of the spore and hyphae, the fungal colonies were identified.From several research, 9 fungal colonies were isolated and described. There are three species of *Aspergillus* sp., *Cladosporium* sp., *Mucor* sp., *Alternaria* sp., *Fusarium* sp., and two species of *Penicillium* sp. among the fungal colonies discovered. We differentiated aeromycoflora colonies based on their color, which included yellow, white, red, black, green, and brownish colonies. Most colonies were irregular and round, with diameters ranging from 1-2 mm. Monitoring of the fungi mentioned above in the air can aid in the prevention of fungal allergy illness.

Keywords: Microflora, Aeromycoflora, District Hospital, Indoor air, PDA, Fungal colonies.

Scope and Studies of Bioremediation of Ground water near dumping site

Kavita Tripathi and *AnilKumar Dwivedi

Pollution and Environmental Assay Research Laboratory (PEARL)

Department of Botany, Deen Dayal Upadhyay Gorakhpur University, Gorakhpur, Uttar Pradesh

Abstract:

Ground water is a source of livelihood of huge populations of the world. Due to tremendous growth in Population, Industrialisation, use of hazardous chemicals, pesticide and unscientific management of solid waste produces large number of toxic chemicals, which percolate the ground and contaminate the ground water. Contamination in groundwater affects their physio-chemical property which can causes very serious disease to living beings. For extraction of these contamination there are lots of techniques available in which billions of moneyinvesting in the world but Bioremediation is one of the cost efficient and effective technology in which we can easily and feasibly extract or treat contaminants of ground water by using natural microbes. Some aerobic microbes like *Pseudomonas, Sphingomonas, Rhodococcas, Mycobacterium* remediate the hydrocarbon and pesticides. Some anaerobic are used to bio remediate the PCBs. Ground water remediation is removal of pollutants from water by physical, biological or chemical processes in which In-situ and Ex-situ technology can be used. Biosparging and Bio-augmentation is some In- situ technology. Like Microbes some plant species like *Brassica juncia* etc also play a key role in remediation of ground water known as Phytoremediation.

Keywords: Bioremediation, Biosparging, Bio-augmentation, Groundwater, Phytoremediation.

Algae as Water Remediation

Nikita Gupta M.Sc. 3rd Semester

Department of Botany, Deen Dayal Upadhyaya Gorakhpur University Gorakhpur, Uttar Pradesh

Abstract:

Water pollution is a pressing global issue, with adverse implications for ecosystems and human health. Algae, a diverse group of photosynthetic microorganisms, have emerged as a promising tool for water remediation. This review aims to explore the multifaceted role of algae in addressing water pollution challenges highlighting their capacity to remove contaminants and contribute to ecosystem restoration.

Algae possess unique attribute that make them well-suited for water remediation. They have a natural affinity for nutrients such as nitrogen and phosphorus, which are major contributors to water pollution in the form of agricultural runoff and wastewater discharge. Algae efficiently assimilate and store these nutrients, curbing their excessive presence in aquatic environments and mitigating harmful phenomenon like eutrophication.

Moreover, certain algae species exhibit a remarkable ability to sequester heavy metals from water. Their bioaccumulation mechanisms can significantly reduce toxic metal concentrations in contaminated water bodies, safeguarding aquatic life and human interests. Algae based water remediation offers a sustainable and eco-friendly alternative to conventional treatment methods. By harnessing sunlight and atmospheric carbon dioxide, algae not only cleans water but also contribute to carbon fixation and oxygen production, benefiting the environment.

In Conclusion, algae's potential as water remediator I undeniable. However, successful implementation requires careful consideration of species cultivation, selection and integration with existing water management strategies. Algae-based water remediation presents a promising avenue for safeguarding water resources for future generations.

Keywords: Bioaccumulation, Eutophication, Waste water, Water remediation, Photosynthetic microorganism

Comparision of extract prepared from dry and fresh leaf of *Ipomoea cairica* by testing on microbes of selected strains and its effect on them.

Shivangi Sahgal*, Deepa Srivastava

*Department of Industrial Microbiology, Research Scholar, Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur

Department of Botany, Assistance Professor, Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur

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Abstract:

Ipomoea cairica (Convolvulaceae) are naturally found in waste areas, rainforest margins, open forests, gardens, fences, coastal sand dunes, and vegetation growing next to streams (i.e. riparian zones). It is used by people because it contains many therapeutic, psychotropic substances, primarily alkaloids and manifest antimicrobial properties. In this study we have compared the effectiveness of extract prepared from its fresh and previously dried leaf on a selected microbe. Further investigations helped to find out that ZOI (zone of inhibition) of fresh leaves of *Ipomoea cairica* were clearer and prominent as compared to dried samples. Therefore, the study suggests that the extract preparation by fresh and dry leaves can affect its properties which may have different effect on the same strain of microbes.

Keywords: Zone of inhibition, alkaloids, psychotropic, antimicrobial

Elucidating the role of fungal pectinases for retting of fibres: An eco-friendly approach

Shruti Dwivedi, Ruhina Naz, Ankur Singh, Rishika Yadav, Shashwat Cristy, Km.Arati and Dinesh Yadav*

Department of Biotechnology, Deen Dayal Upadhyaya Gorakhpur University,
Gorakhpur-273009 (Uttar Pradesh)
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Abstract:

Nature has bestowed human civilisation with natural fibres.Plants based fibres like *Crotolaria, Corchorous, Cannabis*, Bamboo, *Gossipiyum* and animal-basedfibres like wool, silk. These fibres have been used extensively. Bast fibres areextracted from the phloem which is located at the stem of fibrous plant. These bast fibres are used for making ropes, bags, furnishing materials, and can even form composite materials.The limitations in using them is their bulk fibre extraction. Fibres are extracted by process called retting. The retting process uses natural agents like water and dew. This has been industrialised with the help of chemicals agents. These chemically retted fibres increase the yield, produces lustrous fibres but still lack the quality to fight against the synthetic or composite fibres. Additionally, these pollute the environment with release of toxic effluents. Naturally retted fibres (water and dew) are brittle, dull and have comparatively lesser tensile strength. Pectinases are biocatalyst that feed on pectin. Pectin is the middle cementing agent between cellulosic and hemi-cellulosic layers of plant cell wall. Degradation of pectin releases the bond between the phloem fibres and eases the fibres releases. The filamentous fungi are the prominent producers of extracellular pectinases. Fungal pectinases of *Aspergillus*, *Fusarium*, *Trichoderma*, *Penicillium* have been reported for efficient retting of bast fibres. Additionally, fibres from agro-wastes like banana leaf sheaths and pineapple leaves have been extracted using pectinolytic retting. This step can add to waste valorisation of the agro-wastes for sustainable fibre production. Our lab is currently working on mining of fungal diversity as novel sources for pectinolytic activities. We have reported several indigenously isolated strains of *Aspergillus* and *Fusarium*, with immense potential for retting of natural fibres. These fungal pectinases have been extensively applied for retting of bast fibres of *Cannabis sativa*, *Crotolaria juncea*, banana leaf sheath and leaf fibres from pineapple crown.

Keywords: Fungal Pectinases Microbes, Microbial retting, Natural fibres, Sustainable environment.

Fungal Applications in Plastic Biodegradation: A Promising Sustainable Solution

Suchitra Vishwakarma*

Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur, Uttar Padesh

Abstract:

Plastic pollution has emerged as a global environmental crisis, necessitating innovative strategies for plastic waste management and reduction of its detrimental impacts. Fungi have gained attention as potential agents in the biodegradation of plastics due to their ability to secrete enzymes like lipases, cutinases and esterases which act on plastic materials like polyethylene (PE),polypropylene(PP), and polyethylene terephthalate (PET) by cleaving chemical bonds, thereby breaking them down into smaller fragments. Some fungal species, including *Aspergillus*, *Trichoderma*, *Pleurotus* and*Penicillium*, have shown the remarkable ability to utilize these plastic fragments as a carbon source for growth and metabolism.Additionally, the physical colonization of plastic surfaces by fungal mycelium facilitates the degradation process. The biodegradation includes biodeterioration, fragmentation, assimilation, and mineralization. As a result, fungi offer a potentially sustainable means of addressing plastic pollution. However, challenges remain, including the variability in fungal species' effectiveness, the speed of the biodegradationprocess, and the dependence on environmental conditions. The utilization of fungi in plastic biodegradation holds promise as a sustainable and eco-friendly approach to mitigate the environmental impact of plastic materials. This review provides an overview of the utilization of fungi in plastic biodegradation, emphasizing their unique enzymatic mechanisms and their potential for eco-friendly plastic waste management.

Keywords: Environmental crisis, Biodeterioration, Fragmentation, Assimilation, and Mineralization

Agricultural wastes as a sustainable approach for Paper-making

Supriya Gupta, Nikki Kumari, Ruby Chaudhary, Abhishek Mishra, Dikshanshikha Gupta, Nayanika Yadav, Aiman Tanveer and Dinesh Yadav*

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Abstract

Paper is a fundamental part of our regular life because it is the medium to express feeling, knowledge, data information, conservation, etc. through its writing, lithography, and packaging abilities. Approximately 300 million tonnes of paper/ day were produced and used globally. Mature wood is the primary source for the production of 80% paper. An increasein paper and paper-based product demand is expected to be five hundred million tonnes in 2025. Papers are the materials of cellulose which are formed the moist fibres from primary sources as wood. The main problem of primary fibers is excessive deforestation due to a lack of raw materials.Industrial papermaking preparation creates problems in the environment as its enhanced consumption of natural resources (water, forest as a virgin source for wood pulp and land) produces dangerous pollution due to the emancipation of harsh chemicals. Machine-based paper-making technology reduced the employment.Paper making process involvesraw material preparation, pulping and bleaching, screening of pulp, washing, refining, and finally undergoes for papermaking.Agro waste is waste collected after the harvest of seasonal crops namely annual plants obtained during autumn or summer. Paper production from wood is approx. 92% whereas 9% of production of paper and paper products is based on agro waste globally. India is a seasonal country, that producesagricultural products, so its waste is used in different sectors like making composites, textile and paper and pulp industries, etc. Many scientists and researchers focus on the use of agricultural waste. Some agricultural wastes such as Sugarcane bagasse, cereal straws, banana plants, cotton stalks, etc. are used in the paper industry.

Keywords: Agro-waste, cellulose, Papermaking, Primary fibers, sustainable paper.

Bacteriocin-Producing Bacteria: Natural Agents of Antimicrobial Warfare

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Abstract

Bacteriocins, small antimicrobial peptides produced by certain bacteria, have emerged as promising alternatives to traditional antibiotics due to their specificity, ecological advantages, and potential in combating multidrug-resistant pathogens. This abstract provides an overview of bacteriocin-producing bacteria, shedding light on their ecological roles, mechanisms of action, and applications in various fields.Bacteriocin-producing bacteria are found in diverse environments, ranging from soil and aquatic ecosystems to the human microbiome. Their ability to synthesize bacteriocins represents a form of microbial warfare, wherein these peptides selectively inhibit the growth of closely related bacterial species, providing a competitive advantage.Further research is needed to unravel the diversity of bacteriocins, optimize their production, and develop innovative strategies for their application in biotechnology, agriculture, and medicine.

Keywords: Bacteriocin, bacteriocin-producing bacteria, microbial warfare etc.

Therapeutic benefits of mushroom-specific bioactive compounds

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Abstract

Fungi are the most distinct and economically important creation on earth, playing a vital role in the production of therapeutics. Humans for their high food and medicinal value have used mushrooms. They possess diverse therapeutic activities, which treat a number of diseases. The presence of bioactive molecules is the key reason for their immense nutraceutical activities. Molecules such as glucans, terpenoids, peptides, antioxidants, unsaturated fatty acids, mineral elements, and dietary fibers are therapeutically important. These combine in mushroom to make it a major functional food thatsupplies protein and cure ailments. The bioactive compounds are responsible for anti-inflammatory, antibacterial, antiviral, antidiabetic, hepatoprotective, and antitumor acts. Owing to these properties, they are not only popular for cultivation but also in labs. Recent advances highlight mushrooms as feasible cancer fighters, immunity boosters, and anti-aging agents. A few edible mushroom species have migrated beyond land and are gaining recognition in the pharmaceuticals sector. This paper compiles the nutraceutical potential of their bioactive molecules alongside their culinary aspects. The therapeutic benefits of mushroom intake and their immense nutritional power may prove to be of great value to humankind.

Keywords: Bioactive molecules, Functional food, Fungi, Mushrooms.

Identification and analysis of glutathione s-transferase gene family in quinoa (*Chenopodium quinoa* Willd.)

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Abstract:

Glutathione S-transferases (GSTs) are one of the major detoxifying enzymes that play a key role in stress modulation, secondary metabolism, signaling, defense mechanism, plant growth and development. Although the GST gene family has been studied in several plants, large scale in silico genome wide identification and characterization of GSTs in Chenopodium quinoa are lacking. In this study, a total of 120 GST genes were identified that were majorly localized in cytoplasm. The multiple sequence alignment revealed highly conserved N-terminus with active site serine or cysteine residue for the activation of GSH binding and GST catalytic activity. The evolutionary relationship of proteinswascarried out using maximum likelihood method that showed all the tau and phi class GSTs were closely associated with those of *G. max*, *O. sativa* and *A. thaliana*.Molecular docking of GST molecules showed that the phi class genes had the lowest binding energy. The comprehensive study of CqGST gene family in quinoa provides groundwork for further functional analysis of CqGST genes in the species at molecular level and has potential applications in plant breeding.

Keywords: Characterization, GST, phylogenetic analysis, Quinoa, subcellular localization

Understanding *Fusarium* [Panama] Wilt of Banana

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Abstract:

Panama wilt of banana, caused by the *Fusarium Oxysporum* f. sp. *Cubense.*The fungus that causes the disease is soil-borne, and it enters the roots through the small laterals. Infected rhizomes or suckers, farm equipment or vehicles, and irrigation water are all effective means of spreading the disease. The symptoms of Panama diseases consist of yellowing of the oldest leaves or lengthwise splitting of the lower leaf sheath, the leaf may wilt and buckle at its petiole base and, later younger leaves collapse and die. Internally brown streaks develop or end within older leaves sheath, which are yellowed by a large portion of the xylem brick red to brown. Panama diseases now occur in most areas where bananas are grown. In India the famous states where bananas are grown in abundant form like Tamil Nadu, Andra Pradesh, Maharashtra, and Karnataka. Recently, in 2020 Panama disease was found in Bihar.There are no easy or good control of Panama disease. The most effective control is achieved by planting banana variants resistant to the existing race of the pathogen. The use of tissue culture proceeds propagative material free of the pathogen is helpful. Among the novel chemical Tebuconazole, 50% + Trifloxystrobin 25% are most effective against *Fusarium oxysporum f.*

Keywords: Control, Pathogens, Splitting, Symptoms, Variants

Impact of salt stress on growth, productivity and physiochemical properties of *Clitoriaternatea*

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Abstract:

Salt stress is a significant abiotic stress factor that affects the growth and development of plants, including *Clitoriaternatea*. This study aimed to investigate the effects of salt stress on the physiological and biochemical responses of *Clitoriaternatea*. Seedlings of *Clitoriaternatea* were subjected to different salt concentrations (0 mM, 50 mM, 100 mM, and 150 mM NaCl) and evaluated for several parameters. Under salt stress conditions, *Clitoriaternatea* exhibited reduced growth parameters, including decreased plantheight, leaf area, and biomass accumulation. The chlorophyll content was also significantly reduced, indicating impaired photosynthetic efficiency. Furthermore, salt stress induced oxidative stress in the plants, as evidenced by increased reactive oxygen species (ROS) production and lipid peroxidation levels.However, *Clitoriaternatea* demonstrated adaptive mechanisms to cope with salt stress. The accumulation of osmolytes, such as proline and soluble sugars, increased significantly under salt stress, suggesting their role in osmotic adjustment and cellular protection. Antioxidant defense systems, including superoxide dismutase (SOD), catalase (CAT), and peroxidase (POD), were upregulated to scavenge excess ROS and maintain cellular redox homeostasis.

Keywords: Environmental stress, Growth, Physiochemical changes, Productivity, Salinewater, Salt stress

Influence of drought stress on secondary metabolites in medicinal plants *Desmodium gangeticum* (L.) DC.

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Abstract:

In nature plants are continuously facing various biotic and abiotic stresses. Drought stress is one of the main environmental stresses, which affects growth, physiology and phytochemicals of plants. Drought or soil water deficit relates to low water availability. In the present investigation impact of drought on biologically active secondary metabolites viz; alkaloids, flavonoids and phenolic content were studied in *Desmodium gangeticum*. Plants were exposed to varying water regimes (200 ml water in control daily and in stress plants 200 ml water was given at 3 days intervals, 4 days intervals and 6 days intervals termed as stress1, stress2 and stress 3 respectively). Plant samples were collected and analysed from 15 to 45 days after drought stress at 15 days interval. Results indicated that *Desmodium gangeticum* plant expressed differential response to water deficit on the basis of severity of stress and age or plant growth. At 15 to 30 days after drought stress significant changes were observed in flavonoids and alkaloids content. At 45 days after drought stress significant changes was seen in alkaloids content.

Keywords: Drought stress, *Desmodium gangeticum*, secondary metabolites, phytochemical.

Understanding Rust Disease: A Comprehensive Overview of a Pervasive Plant Pathogen

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Abstract:

Rust diseases, caused by a diverse group of fungal pathogens belonging to the **Pucciniales** order, basically ***Puccinia*** genus pose a significant threat to global agriculture, natural ecosystems, and horticultural industries. This abstract provides an overview of rust diseases, their impact, and the critical factors contributing to their emergence and spread.Rust pathogens are characterized by their distinct rust-colored spore masses, and they exhibit a complex life cycle involving multiple host plants and various spore stages. These pathogens primarily infect leaves, stems, and other above-ground plant structures, leading to chlorosis, necrosis, and reduced photosynthetic capacity. The resultant economic losses in agriculture are substantial, with billions of dollars at stake annually.This abstract delves into the factors that influence rust disease dynamics, including environmental conditions, host-pathogen interactions, and genetic diversity among rust strains. Climate change, globalization, and increased monoculture farming practices have exacerbated the prevalence and distribution of rust diseases, making them a pressing concern in the 21stcentury. Efforts to manage rust diseases involve a multifaceted approach encompassing cultural, biological, chemical, and genetic strategies. Recent advancements in genomic research and molecular techniques have enhanced our understanding of rust pathogens and facilitated the development of resistant crop varieties, offering hope for sustainable disease management. RustDiseases remain a formidable challenge for agriculture and ecosystems worldwide. This abstract underscore the urgency of continued research and collaboration in the field of plant pathology to mitigate the impact of rust diseases, ensure global food security, and promote sustainable agriculture practices.

Keywords: Agriculture, Disease, Fungus, Host, Life Cycle, Pathogen, Rust.

Diseases of Rice (Oryza *sativa*) plant and it's control in Gorakhpur District (Uttar Pradesh), India.

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Abstract:

In Gorakhpur, Uttar Pradesh, India, rice farming is of utmost importance since it provides millions of people with their primary source of food. The prevalence of several rice diseases, which have a negative impact on agricultural production and food security, however, presents the area with significant difficulties. The main rice illnesses in Uttar Pradesh are summarized in this abstract, with an emphasis on their effects and prevention measures. There are several noteworthy diseases that affect rice crops in this area, including bacterial leaf blight, blast disease, sheath disease, brown spot, tungro disease, and rice yellow mottle virus. Each illness has its own unique symptoms and, if left untreated, might result in considerable yield losses. In Uttar Pradesh, managing rice illnesses effectively requires a variety of cultural practices, including the use of disease-resistant rice cultivars, smart planting methods, and effective nutrient management. Furthermore, timely pesticide or fungicide treatment when necessary is essential for disease management. Considering how crucial rice is to the regional food and economy, continuous research and extension services keep collaborating with farmers to create long-term disease management plans. These initiatives include the creation of rice cultivars resistant to disease, enhanced disease surveillance, and the sharing of information and best practices among farmers. In order to lessen the effects of diseases, assure food security, and support sustainable agricultural practices, this abstract highlights the importance of ongoing research and collaboration in the field of plant pathology.

Keywords: Diseases, Disease management, Food security, Rice cultivars

Understanding Leaf Curl in ChillyPlants: Causes, Effects, and Management

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Abstract:

Leaf curl in *Capsicum* genus, chilly plants is a pervasive physiological disorder that affects their growth, yield, and overall health. This phenomenon, often triggered by various environmental and biological factors, has garnered significant attention from researchers and growers alike. This abstract provides a concise overview of the causes, effects, and management strategies associated with leaf curl in chilly plants.Leaf curl in chilly plants primarily stems from environmental stressors such as temperature fluctuations, humidity levels, and nutrient imbalances. Viral infections, notably the Tomato Leaf Curl Virus, can also induce severe leaf curl symptoms. The effects of leaf curl include reduced photosynthesis, stunted growth, and diminished fruit production, resulting in economic losses for farmers. Managing leaf curl in chilly plants necessitates a multifaceted approach. Cultivar selection plays a crucial role in resistance to specific pathogens, while maintaining optimal growing conditions, such as temperature and humidity control, aids in prevention. Employing integrated pest management (IPM) techniques to control vector insects can mitigate viral infections. Additionally, providing a balanced nutrient regime, especially with regard to micronutrients, can enhance plant resilience.The abstract underscores the significance of understanding the complex factors contributing to leaf curl in chilly plants, emphasizing the importance of proactive management strategies. As global climate variability and emerging viral threats persist, ongoing research and knowledge dissemination are crucial to sustaining chilly production and food security.

Keywords: Chilly, Curl, Disorder, Symptoms, Viral.

Taxonomy, geographical distribution and diversity of aster yellows phytoplasma associated with medicinal plants

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Abstract:

Throughout history, plants have played a significant role in providing natural, safe, and locally accessible remedies for various health concerns, thanks to their rich reservoirs of bioactive compounds. Nevertheless, the escalating prevalence of 16SrI group phytoplasma infections presents a serious challenge.Phytoplasmas are closely associated with approximately 200 medicinal plants worldwide. Among the different phytoplasma groups, the 16SrI group, often referred to as 'aster yellows,' stands out as the most diverse and predominant. This group exerts a significant impact on medicinally important plants, with its highest occurrence noted in European and South-Asian regions.In particular, the aster yellows group has been responsible for disease incidence rates as high as 70% in *Withania* and *Waltheria*, 8-35% in *Plantago*, 3-30% in *Tagetes* and *Echinacea*, 8-10% in *Plumbago*, and 5% in *Ocimum.* These alarming rates underscore the detrimental effects of 16SrI group phytoplasmas on medicinal plants. Infections by the aster yellows group significantly reduce valuable phytochemical concentrations and also alter secondary metabolites. The primary vector responsible for transmitting phytoplasma 16SrI aster yellows group can differ based on the particular plant species, location, and environmental factors. Nonetheless, leafhoppers(Cicadellidae family), particularly those within the genus*Macrosteles*, followed by *Euscelidius*and *Agallia* are commonly recognized as the predominant vectors of 16SrI aster yellows group in medicinal plants.Within the *Macrosteles* genus, *Macrosteles quadrilineatus* is frequently linked to transmissionwithin the 16SrI group.Additionally, numerous subgroups within the aster yellows group present opportunities for large-scale infections. Phylogenetic analysis revealed that 19 out of 24 sequences of 16SrI phytoplasma associated with medicinal plants were associated with the 16SrI-B subgroup. The present work provides an extensive data-set on aster yellows group infections in medicinal plants worldwide, including their geographical distribution, induced symptoms, the subgroups involved and highlights the 'B' sub-group of 16SrI group as the most prevalent one among medicinal plants.

Keywords: "Aster yellows", group, symptoms, phytochemicals, vector, disease incidence, medicinal plants

Ecology and management of Invasive weed *Parthenium hysterophorus* L. in North- Eastern Uttar Pradesh

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Abstract:

*Parthenium hysterophorus*L. (Family- Asteraceae, local name-Chatakchandni), an invader weed, assumes importance and poses a problem because of its nuisance value. The present study accounts for its population structure, community relation and its probable association with neighbour species within the major grassland vegetation types of the north- eastern Uttar Pradesh. For the study of population status, phytosociological characters, neighbour relations of *Parthenium* and its contribution to the two major grasslands' the natural (I) and managed (II) were calculated by the standard sampling methods. Highly disturbed or completely cleaned sites may be fast colonized and aggregated by *Parthenium,* as evident from the values of its phytosociological attributes. In natural grassland, however, the number of species as the nearest neighbour of *Parthenium* was quite high. *Parthenium* was found to occur at all different stages of growth and at every stage of its life cycle throughout the year. The degree of association was significant ($p < 0.05$) with *Oxalis, Sonchus* and *Evolvulas*at both sites, but for *Rungia*, it was significant only at site II. In the months of July, November and March, a much greater number of individuals were in the seedling stage. Since there is no lapse period between seed dispersal and germination, effective management may be exercised only before they enter the reproductive phase. Since there is no mode of asexual regeneration in this species, manual elimination must be held at juvenile stage to get an area rid of this noxious weed.

Keywords: *Parthenium*, Population, Grassland, Nearest neighbour, Association.

Theme: Plant latex and their toxic potential
Effect of *Ficus benghalensis* latex based combinatorial formulations on various enzymatic parameters in Indian white termite *Odonto termesobesus*

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Abstract:

In presentstudy various bioassays were conducted to determineeffect of *Ficus benghalensis* latex based combinatorial formulations oncertainmetabolic enzymes i.e alkaline phosphatase, acid phosphatase, glutamate oxaloacetate transaminase, glutamate pyruvate transaminase and acetylcholinesterasein Indian white termite *Odontotermesobesus*. For this purpose worker termites were treated with sub-lethal dose 40% and 80% of 24 hrs LD50 values and observations were taken at 4 hrs interval up to 24 hrs.Reduction or increase in enzymes was calculated by using corresponding control. Maximum decrease in acid phosphatase level was observed at 16 h when termites were treated with 80% of $LD_{50}$of B-MLT-B and P-MLT i.e. 82.84% at 16 h of treatment. A similar dose caused a very slight decrease in glutamate pyruvate transaminase at 4 h of treatment but it was significantly ($p > 0.05$) decreased in other successive treatments. 40% and 80% of LD_{50} of C-MLT-B mixture caused significant ($p > 0.05$) decrease in alkaline phosphatase and acid phosphatase level at 16 h treatment i.e. 93.42%, 89.46% and 95.89% , 88.17% respectively. Similarly acetylcholinesteraselevel was also found to be decreased with 40% and 80% of LD_{50} of C-MLT-B mixture i.e. 92.72% and 97.27% respectively. All these alterations found in levels of various enzymes display the action of latex ingredients on worker termites. Most of these latex based formulations were foundstrong antifeedant to termite workers. These ingredients can be used for sustainable control of not only termites but also other phytophagous insects.

Keywords: *Ficus benghalensis*, enzymatic alterations, *Odontotermesobesus*; plant latexes; termiticidal activity

Rhizobial interaction of legumes with pesticides.

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Abstract:

Rhizobium a type of soil bacteria that fixes N_2, can co-exist symbiotically with legumes. Thissymbiosis causes nodules to grow on the plant roots, where the bacteria may transform atmosphericN_2 into plant- usable NH_3. In order to protect legume plants against a variety of Phyto-pathogenic pestsand thus increase crop yields, Various chemical pesticides are applied in agricultural practices. Someapplied pesticides may have an impact on rhizobial growth &nodulation. These agricultural chemicalsnot only have an impact on growth but they also have potential inhibitory effect on plant beneficialphysiology activities of *Rhizobium,* as well as they interfere with the molecular signalling between*Rhizobium*&the host legume plants, which is crucial for the establishment of symbiosis. therefore, thenegative effects of pesticides treatment have been evaluating for rhizobial Inoculants in vitro, on treatedseed, and in the field.This review highlights the mechanism basis of pesticide medicated inhibition of rhizobia and legumes.*Rhizobium* symbiosis in detail with current perspectives. It does so with the general description ofpesticides, their environmental fate, and the extensive listing of their noxious impact on both the*Rhizobium* and the symbiotic parameters of legumes.

Keyword: Rhizobium, interaction, pesticides, legumes.

Study on growth parameters of cabbage by using biocontrol agent *Trichoderma harzianum* with FYM.

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Abstract:

An attempt was made to study the bio-control efficacy of *Trichoderma*harzianum on growth parameter of cabbage crop. Three types of treatment soil treatment, seed treatment and foliar treatment on combination with farm yard manure were given. The result was recorded at 50 days after sowing, 60 days after sowing and 70 days after sowing. The best result was recorded in soil treatment followed by foliar treatment and seed treatment in comparison with control. Therefore from present investigation it is concluded that an eco-friendly biopesticide *Trichoderma harzianum* is very easy to use and having no adverse effect on crops, people or animals and they can be applied to prevent and control several pathogenic fungi and grow healty crop. The *Trichoderma harzianum* can be used as a bio-control agent as it is low cost and profitable dependent system and it also help in conserving the natural resource.

Keywords: *Trichoderma harzianum*, soil treatment, foliar treatment, seed treatment, pathogenic fungi, bio-control, growth parameter.

Gemini-virus: A growing threat to crops.

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Abstract:

Geminiviruses provide a fresh risk to the sustainability and security of the world's food supply since they severely damage food, feed, and cash crops. Geminivirus epidemics have affected crop output over the past 20 years, especially in the tropics and subtropics, and have resulted in significant crop losses. A wide family of plant viruses known as "geminiviruses" (family Geminiviridae) have tiny circular single-stranded(ss) DNA genomes that are encapsidated in twinned virions. The second-largest family of plant viruses is called Geminiviridae. Begomoviruses have become significant issues in crops like vegetables, cotton, cereal legumes, and cassava. Globally, these geminiviruses are responsible for economically significant illnesses of food, feed, and fiber crops, and they can result in yield losses of up to 100%. Even in areas that were previously free from these viruses, geminivirus epidemics that are both remerging and newly emerging are becoming more common. The development of viral variants, the introduction of the whitefly 'B' biotype, and the rise in vector population are major drivers of the creation and spread of new geminivirus illnesses. Due to the widespread dissemination of diseases that are significant to the global economy, managing geminiviruses is a challenge. Although it is the most popular strategy, applying insecticides to manage vectors may have unfavorable effects on the environment and public health. IPM, or integrated pest management, is the best method of control.

Pseudomonas aeruginosa: An Emergence in agriculture as a Plant Growth Promoting Rhizobacteria (PGPR)

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Abstract:

Pseudomonas aeruginosa a Gram negative, motile, rod-shaped bacteria is a potent candidate for PGPR. Its optimum growth temperature is 37° C but it thrives well at 46° C. It is resistant to high salt concentration as well. It has pearlescent appearance and tortilla or grapes-like odour. *Pseudomonas aeruginosa* is a fluorescent bacterium producing pyocyanin (blue-green pigment), and pyoverdin (yellow-green). It shows vivid of PGPR attributes and enhances growth in various crops. It produces Indole-3-acetic acid, Siderophores, Hydrogen cyanine (biocontrol aspect), proteases and lipases. *Pseudomonas aeruginosa* BA5 showed highest antagonistic activity (58.33 % mycelial growth inhibition) against *Fusarium oxysporum*f. sp. *cucumeninum* .*Pseudomonas aeruginosa* also had direct plant growth mechanisms viz. solubilizes phosphate and zinc and produces organic acids and ammonia. It showed very high soluble phosphate production (219.64 ±0.330 µg /ml) in Pikovskaya's liquid medium as reported. It can be concluded that different PGPR aspects of *Pseudomonas aeruginosa* need to be explored more in vitro and in vivo both. It could be an effective and futuristic bioinoculants (biofertilizers and biopesticides) which would work under adverse condition of temperature and salinity.

Keywords: Biocontrol agent, Biofertilizer, *Pseudomonas aeruginosa*, Plant Growth Promoting Rhizobacteria.

Molecular characterisation and analysis of 16SrII group phytoplasma related strain associated with Spinach and Hemp witches' broom in India

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Abstract:

Phytoplasmas are prokaryotes which are obligate parasites that belong to class Mollicutes. It causes numerous diseases in weeds which may act as an alternative natural host facilitating its spread to other economically important plants and thus increasing economic losses. Early detection of these phytoplasmas associated with diseases of weeds is necessary to check the possibility of further spread of phytoplasma diseases to other cultivated crops.

The symptoms of witches' broom and little leaf were observed in *Spinacia oleracea* (Spinach) and *Cannabis sativa* (Hemp) plants during a field inspection in Narendra Dev University of Agriculture & Technology campus at Ayodhya, Uttar Pradesh, India. The nucleotide sequence analysis and the phylogenetic studyof 16S rDNA sequences indicated the presence of a '*Candidatus* Phytoplasma australasia'-related strain. The in silico RFLP allowed the classification of the phytoplasmas associated with the infected samples to the 16SrII-D subgroup which is a new report. *Cannabis* reported as host of 16SrII-D subgroup unveiled its impact as potential natural reservoir of phytoplasma in nature.

The genetic resemblance of phytoplasma strains present in *C. sativa* and *S. oleracea* shows the presence of a common insect vector(s) involved in phytoplasma transmission.*Orosiusalbicinctus*has been earlier reported as a vector transmitting Peanut witches' broom phytoplasma therefore, screening of phytoplasma strains in insect vectors is essential in development of effective management strategies.

Keywords: *Cannabis sativa*, insect vectors, PCR, peanut witches' broom group, phytoplasma disease, RFLP analysis, *Spinacia oleracea*, weed plants

Effect of *Trichoderma harzianum* on size and weight of cauliflower curd with farm yard manure

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Abstract:

This experiment was conducted in research field of St. Andrew's College Gorakhpur, during winter season of 2021-2022 with an aim to study the different treatment of *Trichoderma harzianum* with FYM on size and weight of Cauliflower.Three types of Treatment – soil, seed and foliar in combination with farm yard manure. The result was recorded at fifty and sixty days after sowing and at the time of harvest. The best result was recorded in foliar treatment followed by soil and seed treatment in comparison with control. Therefore from present investigation, it is concluded that, an eco-friendly biopesticide (*Trichoderma harzianum)* is very easy to use and having no adverse effect on crops, animals or people. They can be applied to prevent and control several pathogenic fungi and grow healthy crop. *Trichoderma harzianum* can be used as a biocontrol agent as it is low cost and profitable dependent system to all people and animals. *Trichoderma harzianum* play important role in conserving natural resource and ecologically sustainable approach.

Keywords: Biopesticide, Foliar Treatment, FYM, *Trichoderma harzianum*, soil treatment, seed Treatment

Mechanism of Copper Metal Stress in *MurrayKoenigi* Plants: Morphological and Biochemical Aspects

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Abstract:

Copper (Cu) is an essential micronutrient for plants, but excess Cu in the soil can lead to toxicity and adversely affect plant growth and development. *Murraya koenigi* plants, a unique and relatively understudied species, provide an intriguing model to investigate the mechanisms underlying Cu stress responses. This abstract summarizes the key findings regarding the morphological and biochemical aspects of Cu stress in *Murray koenigi* plants. Morphologically, *Murray koenigi* plants exposed to elevated Cu levels exhibited distinct responses. They displayed visible symptoms of stress, including chlorosis, reduced leaf size, and inhibited root growth. Additionally, microscopic analyses revealed alterations in root architecture and cell wall structures, suggesting a dynamic response to Cu-induced stress.Biochemically, Cu stress triggered intricate molecular processes within *Murray koenigi* plants. Notably, elevated Cu levels led to an increase in reactive oxygen species (ROS) production, activating antioxidant defense mechanisms to counteract oxidative damage. Furthermore, Cu stress altered the expression of genes associated with metal homeostasis, particularly those involved in Cu uptake and transport.This research sheds light on the intricate mechanisms employed by *Murray koenigi* plants to cope with Cu stress, emphasizing the importance of understanding the interplay between morphological and biochemical adaptations. These findings contribute to our broader knowledge of metal stress responses in plants and offer insights into potential strategies for mitigating Cu toxicity in agriculture and environmental management.

Keywords: Biochemical responses, copper stress, Cu transport, Cu uptake, Metal homeostasis, Morphological response, *Murray koenigi* plant, Reactive oxygen species.

Anitifungalpotential of plant extract of angiospermicplants against *Fusarium sp.*

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Abstract:

Fusarium oxysporum is highly versatile and host-specific and soilborne pathogen. It infects plants through the roots and spreads within the plant's vascular system. This results in wilting, yellowing of leaves, stunted growth, and, in severe cases, plant death. The pathogen interferes with the plant's ability to transport water and nutrients due to the blockage and damage to the xylem vessels.

Many plant extracts have been explored for their potential as natural and eco-friendly alternatives to synthetic chemical pesticides in the control of *Fusarium*.Aqueous extracts of 52 angiospermic plants belonging to different families were tested against *Fusarium oxysporumf.sp. lini,* causing wilt disease in *Linum usitatissimum* L., by poisoned food technique given by Grover and moore, 1962. The efficacy of plant extract was neither affected by increased inoculum density nor by storage. In vivo trialsof leaves in powdered form were non phytotoxic and also checked the wilting in flax caused by *Fusarium oxysporum*f. sp. *Lini.*

Keywords: *Fusarium oxysporum,* host-specific, plant extract

Traditional Uses and NutraceuticalPotential of Medicinal PlantKaronda (*Carissa carandas*L.)

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Abstract:

Carissa carandas L. is a useful food and medicinal plant of the India, which is commonly known as Karonda, belongs to the family Apocynaceae. The plant has been used as a traditional food and medicine over thousands of years in the various system of medicine.The fruit is widely used for edible purposes in India in the form of pickles condiments,spices,curries,beverages, jams, jelly,squash,syrup and drink. It is rich in vitamin-C, Calcium, Iron, and vitamin A and some other bioactive ingredientsas flavonoids used in curing of various diseases such as indigestion, diarrhea and anemia. It is analgesic, anti-diabetic, anti-inflammatory, hepatoprotective, antioxidant, cardiovascular, anticancer, anti-malarial, anti-microbial activity and natural immunity booster. The plant is rich in flavonoids and vitamin-C also possess mild anti-inflammatory action and it also help build up the body's natural immunity. The fresh juice of leaves and unripe fruits are used in treatment of cough,cold and asthma, as an expectorant. The plant avenue providesa new dimension in food, nutrition,health, wealth and all-round ecodevelopment of the society which need conservation and propagation.

Keywords: *Carissa carandas,* Traditional Uses, Nutraceuticals, Flavonoids, Medicine, Immunity Booster

Induction of defense related molecules against early blight disease of tomato

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Abstract:

To describe and develop a plant protection strategy, which effectively combines systemic induced resistance, plant restoratives, and if necessary, minimum quantities of chemical to control the early blight disease of tomato. It includes the use of alternative chemical(s)/ biological inducer(s), andinduction of defense related metabolites. Plant treated with plant growth promoting rhizobacteria (PGPR) alone or in combination with chemical inducer(s) in an eco-friendly manner. Present study deals Screening of PGPR, siderophore production againstearlyblightdisease of tomato, Role of PGPR & chemical inducers in induction of resistance against blight of tomato and accumulation and activities of PR-proteins induced by PGPR and their role in induced resistance.

The Plant Growth Promoting Rhizobacteria (PGPR), *Pseudomonas fluorescens* (*Pf*) were practical for growth promotion and the Induction of Systemic Resistance (ISR) against "Early Blight Disease of Tomato''. An apparent increase was observed in plants in reference to shoot and root length treated with *P. fluorescens*. However, the root development was reduced by a combination of *P. fluorescens* and *Alternaria alternata* (*A. alternata*). *Pseudomonas fluorescens* isolates systemically induced resistance against early blight of tomato caused by *A. alternata* and reduced the disease significantly. All the isolates of *P. fluorescens* produced salicylic acid (SA) in King's B (KB) broth and induced its accumulation in tomato leaf within 24 h of bacterial inoculation. SA levels were significantly increased in plants treated with bacteria compared to the split control from one to five days following inoculation. Endogenous SA accumulation in plant tissue is considered to be involved in induced systemic resistance to early blight disease of tomato caused by *A. alternata*. PR- Proteins and defense enzymes bioassay showed the relevant of study.

Keywords: ISR, SA, Tomato, PGPR, *Pseudomonas fluorescence*

Xylanaseenzyme from fungal strain employed as greener tool indifferent industries

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Abstract:

Xylanases (EC 3.2.1), belongs to the group hemicellulose which are a group of enzymes that are define and classified according to their substrate hemicellulose. Xylan is one the major hemicellulosic constituent, having a linear backbone of α-1,4 linked xylose(polysaccharides).Xylanases are hydrolytic enzymes, which catalyse the endo-hydrolysis of α-1, 4-xylosidic linkages in xylan backbone. The xylan hydrolysis end product has considerable industrial application like Xylanases play an important role in the conversion of agricultural and other lignocellulose residues into value-added productother application likeXylooligosaccharides (XOs) are produced by the hydrolysis of xylan containing lignocellulosic biomass (LCM). These XOs are used in pharmaceutical, agriculture and feed products. XOs are prebiotic by nature and help by stimulating the growth or activity of one or a number of bacteria in the colon other application include in biofuel, artificial sweetener, animal feed production, baking, textile, clarification of fruit juices,In the present study, production of xylanase by solid state fermentation using fungal strain *Fusarium moniliform esubglutinans* MTCC2015 and *Fusarium subglutinans MTCC9916*in media containing wheat bran, tea extract and salt solution was attempted. Maximum production was optimized on7th and crude enzyme was harvested and assayed for xylanase. The crude enzyme xylanase was characterized for optimum pH, optimum temperature, pH stability and temperature stability. The optimum pH and temperature of xylanase produced *by Fusarium subglutinans MTCC9916 and moniliforme subglutinans MTCC2015* was found to be 6.0 and 50^{o} C respectively. The pH stability was found to be in the range of 3 to 9 while temperature stability ranged from to 20^{o}C to 50^{o}C for 30 minutes.

Keyword: α-1, 4-xylosidic linkages,bio-bleaching, chlorine, xylan, Xylooligosaccharides (XOs) etc.

Lectin protein from *Canavalia gladiata* (Jacq.)D.C.: A tool in basic and medical sciences

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Abstract

Canavalia gladiata(sword bean) is a potential source of lectin proteins in legumes. It is a cultivated climber food plant. Lectins are universal biomolecules present in plants, animal and microorganisms. Association of these bio functional lectin protein (LP) with carbohydrate and lipids give immense biological functions in an organism. Glycoprotein is the best example of glycogen and protein association. Sword bean seeds and pods are rich in lectins, mainly present in form of concanavalin A (Con A) in their tissue. The concanavalin A lectin protein (LP) is regarded as potential biofunctional molecule in food and medicine biology. The common application of plant lectins as tool in basic and medical sciences with special reference to food, medicine and nutraceuticals.

Keywords: *Canavalia gladiata*, Food, Lectin protein, Medicine, Nutraceuticals.

Cuminum cyminum oil as a botanical preservative against fungal deterioration of stored pigeonpea seeds

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Abstract:

Stored seed samples of pigeonpea collected from 18 places of Eastern Uttar Pradesh, India were examined for associated fungi. Seventeen fungal species were associated with the seed samples. Out of these, Aspergillus flavus and A. niger were predominant and caused heavy deterioration in fresh seeds. Volatile constituents extracted in the form of essential oils from 50 higher plants were evaluated against these two fungi. The oil from cumin (Cuminum cyminum) caused cent percent inhibition. The oil of cumin protected seeds of pigeonpea for six months stored in 250g plastic- gunny bags. It was found superior over the synthetic fumigants. The oil did not exhibit any adverse effect on seed germination (showed 86.6 to 93.3 % germination), seedling growth, general health and morphology of host plants. Thus, the cumin oil can be judiciously used as botanical preservative for pigeonpea seeds against spoilage by fungal during storage.

Key words: Storage deterioration, pigeonpea seeds, cumin oil, fungicides

Use of next-generation sequencing for the identification and characterization of Viruses in Chilly*(Capsicum annum)*.

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Abstract:

The identification of novel, unidentified viral diseases in Chiili plant can be challenging because standard techniques like real-time PCR or ELISA may be excessively specific to a particular virus species or even a single strain, while alternatives like electron microscopy (EM) or sap inoculation of indicator species typically do not provide species-level diagnosis.Recently, techniques based on next-generation sequencing (NGS) technology have been described; these techniques offer an effective and all-purpose front-line screen that is particularly suited to viruses. By effectively utilizing the method's massively parallelism and de novo nature, the viral genome can be sequenced against a background of host nucleic acid, and bioinformatics methods can be used to identify the pathogen sequences by comparison to known viruses or motif-like sequences found in viruses.The study underlines the potential of non-targeted molecular diagnostics, particularly next-generation sequencing, to make quick progress in understanding disease causative agents and delivering sequences for rapid diagnostics. The method is especially beneficial when there are new or developing variants that have not been found using standard procedures.Next-generation sequencing (NGS) provides an alternate option in which the sequence is generated randomly and identification is based on similarity searches against GenBank. The conventional and NGS techniques were used to study a potentially harmful and new plant disease. NGS has been found to be a valuable tool for virus identification, discovery, and diversification studies, and its popularity continues to rise while its cost has decreased.

Keywords: Next-generation Sequencing (NGS), Chilly, PCR, ELISA, GenBank, Plant Viruses.

Microbial pollution of water and its nexus with human health

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Abstract:

Microbial pollution is undoubtedly a significant environmental problem on a global scale, and it has historically had a negative impact on health of human. India, like many other countries throughout the world, is experiencing majorproblems with water scarcity and pollution on a worldwide level as a result of its population increase (238 million people in 1901 to 1210 million by the end of 2011), booming industries, and quickly developing cities. Without any treatment, more than 80% of the sewage produced by human activity is dumped into rivers and oceans, causing environmental damage and more than 50 diseases. Polluted water is a factor in 80% of diseases and 50% of child mortality worldwide. The habitat and nutrients provided by water pollution are ideal for the growth of bacteria and other microorganisms.*Escherichia coli, Salmonella typhi, Vibrio cholerae, Klebsiella spp.,*and *Enterobacter spp.* are some examples of bacteria discovered in tainted water that cause a number of water-borne illnesses, such as diarrhoea, dysentery, typhoid and cholera. *E.coli* contamination of water implies faecal pollution, and it may also suggest the presence of other microbes.

This article goal is to draw attention to presence of bacteria (*E.coli*)in water sources and how it affects human health.

Keywords: Diversity of bacteria, Human Health, Water Pollution, Water borne diseases.

Diversity of cellulolytic fungus genus *Aspergillus* in Government Library, Gorakhpur

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Abstract:

District Gorakhpur is located in the North-Eastern Uttar Pradesh with humid and sub-tropical climatic conditions suitable for microbial growth including fungi. **"Rajkiya Jila Pustakalaya"** (Govt. Library), Gorakhpur was established in 1925 during British rule by the executive members of "Aman-O-Aman Sabha" for the intellectuals of Gorakhpur city. It was initially named "Homes Clane Aman-O-Aman Library", which was later renamed as "Rahul Sanskrityayan Library" by Municipal Corporation, Gorakhpur and is located in front of Govt. Jubilee Inter College, Buxipur, Gorakhpur. This library contains valuable books, many of which are out of print in thepresent time. Because of favourable climatic and nutritional conditions, these books are greatly infested by various types of cellulolytic fungi, which cause biodeterioration of these valuable and rare books by producing various types of enzymes, chiefly cellulase enzyme. In the present investigation, a survey of this library was made to isolate and identify these cellulolytic fungi, especially species of ***Aspergillus*** Micheli, a destructive cellulolytic fungus, causing biodegradation of these library books. These fungi were isolated on Potato Dextrose Agar (PDA) Medium, purified and identified. A predominance of five species of *Aspergillus viz.*, *A. flavus* Link*, A. fumigatus* Fresenius*, A. nidulans*(Eidam) Wint.*, A. niger*van Tieghemand *A. terreus*Thom.

Keywords: *Aspergillus*, Cellulase Enzyme, Cellulolytic Fungus, Government Library.

Botanicals as sustainable bio-preservative of millets

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Abstract:

A group of small-seeded, incredibly diverse plant species, native to many regions of the world have been collectively referred to as millets. They can survive in poor soil fertility,harsh temperature and under little precipitation.Due to their short growing season and better productivity in hot and dry conditions, they are beneficial in semi-arid regions. But during their post-harvest storage, they have been found to undergo varied levels of physical, bio-chemical and microbial spoilage. Microbes, mainly xerophiles like species of *Aspergillus, Penicillium, Chrysosporium* etc., deteriorate them. Mycotoxins like aflatoxins, ochratoxins,fumonisin and ergot alkaloids are produced by the infecting fungi and have negative effects on human health when consumed. Thus, commercial value of the millets decrease . Chemical preservatives are utilized in rescue, although it has been discovered that most of them have some levels of cytotoxicity. Several plants with low mammalian toxicity are currently being suggested for use as biopreservatives in an effort to manage them. Therefore, the food industry can depend on plant based preservatives as a sustainable mitigant to stop the degradation of the millets and their products.

Keywords: Millets, post-harvest deterioration, fungal- pathogens, mycotoxins, chemical preservatives

Nutritional evaluation of *Ganoderma lucidum* Karst collected from Gorakhpur

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Abstract

Ganoderma lucidum is a wood decaying macrofungi and has been recognized as medicinal mushroom for over 2000 years. Day by day its demand for use as medicinal purpose has been increasing very rapidly. *G. lucidum* is rich source of various natural bioactive compounds which imparts its therapeutic properties, viz., antibacterial, antiviral, antifungal, anticancer, anti-inflammatory, antitumor, anti-hypotensive, and antioxidative agents. The present study aims to determine the nutrient content of *Ganoderma lucidum.* It is clear from the finding that this mushroom is rich in protein (14.28±1.02%) and fibre (49.62±1.21%) while lipid was found in low concentration (1.28±0.31%). Other nutrient was also found in considerable amount viz., carbohydrate: 30.50±1.22%, moisture: 7.50±1.20%, Dry matter: 92.50±1.82%, and ash: 1.98±0.07%. The result clearly shows that *Ganoderma lucidum* is rich source of nutrient and can be used as food supplements.

Keywords: Ash, Carbohydrate, Lipid, Mushroom, Protein

Exploring medicinal plants for the treatment of diabetes: A comprehensive review

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Abstract:

Botanical sources throughout history have yielded a rich repository of remedies for various human ailments. Diabetes, a subtle yet pervasive epidemic, exerts a steadfast impact on lives worldwide, characterized by elevated blood glucose levels. According to a WHO report, the diabetic patient population is projected to soar to 300 million by 2025. India is the capital of diabetic patients and there is urgent need for assistance in this matter. Current diabetes therapies encompass insulin and oral anti-diabetic agents like sulfonylureas, biguanides, and glinides, albeit with adverse effects on the human body. A diverse array of plant-derived active compounds, including alkaloids, glycosides, galactomannan, polysaccharides, peptidoglycans, hypoglycans, guanidine, steroids, carbohydrates, glycopeptides, terpenoids, amino acids, and inorganic ions, have exhibited various biological activities, including the potential for diabetes treatment. Among these, *Gymnema sylvestre, Trigonella foenum graecum, Momordica charantia, Citrullus colocynthis*, and *Ficus bengalensis* emerge as the most active plants, showcasing hypoglycemic effects and antioxidant activity and also providing protection against insulin resistance. Additionally, *Agrimony eupatoria, Aloe barbadensis*, *Bixa orella* stand out as the most active plants with insulin mimetic properties and insulin secretagogue activity. The review demonstrates some bioactive drugs and isolated compounds from plants such as strictinin, isostrictinin, epicatechin, christinin, pedunculagin, glycyrrhetinic acid, dehydrotrametenolic acid and roseoside showing significant hypoglycemic activity. In the near future to help our nation and world at large from this deadly ailment we should not only depend on chemicals or synthetic drugs, but we should rely on plants which promise to heal us, protect us and also cure our ailing pancreases to maintain our blood glucose level. Plants are only the sustainable answer to help us live a healthy life in longer run.

Keywords: Bioactive drugs, Anti-diabetic, Hypoglycemic, Insulin mimetic, pancreatic cell.

The antioxidant potential of ripe fruits of *Flacourtia jungomas* (Lour.) Raeus.

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Abstract:

The antioxidant potential of the ripe fruits of *Flacourtia jungomas* (Lour.) Raeus. has been investigated. The free radical scavenging activity of the ethanol-aqueous extract has been assayed using DPPH method. The results have indicated that the free radical scavenging activity has ranged between 45.2 to 98.6 and these were concentration dependent. A comparison with earlier observations indicated that the ripe fruits of *Flacourtia jungomas* have better free radical scavenging activity than the unripe fruits.

Keywords: Antioxidant potential, *Flacourtia jungomas*, ripe fruits, DPPH

Nutraceutical potential and pharmacological activities of *Grewia asiatica* L.: A food plant

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Abstract:

Grewia asiatica L. (Phalsa) is a promising underutilized berry fruit of tropical regions of South Asia containing a rich source of various bioactive compounds. The whole plant of phalsa is known for its medicinal values but fruit is reputed for its antioxidant, anti-fertility, antibiotic, spasmolytic, anti-diabetic, hypotensive and cardio-protective properties. *In vitro* and *in-vivo* studies as well as some clinical trials provide some evidences mostly for phytochemically characterized fruit extracts showed antibacterial, antimalarial, antidiabetic, antipyretic, analgesic, antifungal, antiviral, antiplatelete, hepatoprotective, anti-hypersensitive and immune-modulatory effects among others. This might be linked to strong antioxidant activities, inhibition of alpha-glucosidase, alpha-amylase, cyaniding-3-glucoside, vitamin C and minerals. Many Organic acids, asiatic acid, anthocyanins (Delphinidin-3-sambubioside and Cyanidin-3-sambubioside), beta-amyrin, beta-sitosterol, quercetin, betulin, lupeol, lupenone, grewinol, 7-dihydroxy-hentriacontanoic acid, stigmasterol, campesterol are likely to contribute to these effects. More well designed controlled clinical trials are needed which use phytochemically characterized preparations. For standardization besides new product development, there is a need to develop new and improved varieties that can give better fruit yield, and improved quality for sustainable management.

Keywords- Anti-fertility, Anti-hypersensitive, Grewinol, Phalsa, Spasmolytic

Pharmacological and Nutraceutical Potential of *Abelmoschus moschatus* Medik

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Abstract:

Herbal medicine is playing an essential role in health care, where about 75–80% of the world's population relying mainly on the use of traditional or alternative systems of medicines for their primary health care. *Abelmoschus moschatus* Medik., commonly known as musk okra belonging to the family Malvaceae, is used traditionally in the treatment of various health ailments throughout the world. Musk mallow is cultivated in the tropical regions of Asia, Africa, and South America for its seeds which are used mostly for the isolation of fragrance components. In India it is generally cultivated in hilly region of Karnataka, Deccan, North Eastern Terai region of U.P. and at Himalayan foothills for jute like fibre, cleaning agent in jaggery and heavy fragrance like musk.*A. moschatus* has been extensively studied by various researchers for its biological activities and therapeutic potentials such as diuretic, antioxidant activity and free-radical scavenging, antiproliferative, antimicrobial, antilithiatic, hepatoprotective, memory strengthening, antidiabetic, hemagglutinating, antiageing, antidepressant, anxlytic, anticonvulsant, hypnotic, and muscle relaxant activity. Traditionally, the roots, leaves, and seeds of musk mallow are considered as conventional medicine, while the pods/capsules and leaves are used in meals. Generally, it has great importance in pharmaceutical and food industries.

Keywords: Herbal Medicine, *Abelmoschus moschatus,*Nutraceutical, Pharmacological, Bioactives.

Enzymatic alterations induced by *Citrus maxima* essential oil based combinatorial formulations inIndian WhiteTermite *Odontotermesobesus*

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Abstract:

Plant essential oils are better alternative to synthetic termiticides with the inherentresistance by insects, environmental and health effects on humans. In this investigation, *Citrus maxima* essential crude oil extract was used to prepare combinatorial formulations and workers of Indian white termite *Odontotermesobesus* were treated topically with 40% and 80% of 24 hr LD_{50} values of these formulations. In subsequent bioassays levels of various enzymes i.e., alkaline phosphatase, acid phosphatase, glutamate oxaloacetate transaminase, glutamate pyruvate transaminase and acetylcholinesterase were evaluated to determine the anti-termite efficacy of formulations. A significant ($p > 0.05$) alteration was observed in all the test enzymes except acetylcholinesterase levels after 16 h in comparison to control. Both dose response and time period was found important in physiological alteration in levels of various enzymes. Combinatorial mixtures of *Citrus* essential oils have shown synergistic action on termite behavior and physiology.The research findings of this study will be helpfulin control termite infestation in crop field, gardens and houses in a sustainable way.

Keywords: *Citrus maxima*, Essential Oils, *Odontotermesobesus*, Enzyme inhibition, Termiticidal action.

Evaluation of Essential Oils from Aromatic Plants for Inhibition of *Botrytis cinerea* and Prolonging Shelf Life of Strawberries.

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Abstract:

Gray mold rot, caused by *Botrytis cinerea*, is a major pathogen causing strawberry fruit losses in the fields and during storage. Essential oils (EOs) from aromatic plants have been found to have high potential in controlling various fungal pathogens and food contaminants. During screening of 25 Essential oils against *Botrytis cinerea,* the essential oil of six plants namely,*Dysphania ambrosioides, Ocimumcanum, Eucalyptus citriodora, Cymbopogon citratus,Ocimum sanctum*and *Hyptissuaveolens*, were most potent against*B. cinerea.Dysphaniaambrosioides* oil exhibited the highest potency, showing 100% growth inhibition of *B. cinerea*. The oil showed higher anti-fungal activity compared to synthetic fungicides and further work regarding *in vivo* useof potent essential oil for field as well as postharvest preservation of strawberries is being carried out.The EO is naturally safe and do not exhibit any phytotoxic effects on the strawberries. Given these findings, *Dysphaniaambrosioides* oil has the potential to be used as a bio-fungicide on large scale due to its less hazardous, sustainability, and eco-friendly properties. This study highlights the importance of sustainable management in controlling fungal strawberry pathogens during cultivation and in storage, also presents a promising alternative to synthetic fungicides.

Keywords: Botrytis cinerea, Dysphania ambrosioides, Essential oils, Strawberry, Sustainable management.

Biofunctional properties of *Dysphaniaambrosioides*(L.) Essential Oil

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Abstract:

Dysphania ambrosioides (L.) Mosyakin & Clemants belongs toAmaranthaceae, commonly known as Mexican tea. *Dysphania ambrosioides* Essential oil (DAEO) was assessed forantibacterial, antibacterial mode of action, phytochemical profiling, and its antioxidant activity. DAEO exhibited antibacterial activity against *Salmonella enterica* serovar Typhimurium. For in vitro synergistic effect checkerboard assay was done with other essential oils. DAEO showssynergistic effect with *Cymbopogon citratus* (DC) Stapf with Fractional Inhibitory Concentration Index (FICI). In vitro antioxidant activities were determined by DPPH, ABTS shows percent inhibition of 67% and 100% at 1000 µg/mL. Membrane integrity through Propidium iodide uptake assayrevealed that the mean fluorescent intensity of DAEO treated bacterial cell increased in comparison to control. DAEO treated bacterial cells also shows higher membrane potential. GC-MS analysis showed major constituents as Ascaridole,Isoascaridol and Cyclohexanone, 2-Ethyl. DAEO can be used as an alternative antimicrobial agent against foodborne bacteria.

Keyword – *Dysphania,* Essential oil, *Salmonella*, Antibacterial, GC-MS

Certain Enzymatic alteration Caused by *Tagetes erecta* essential oil based combinatorial formulations in Indian white termite *Odonto termesobesus*

Susheel Kumar and Ravi Kant Upadhyay*

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Abstract:

Plant essential oils and its constituents have proven to be very effective against insects, especially termites. They are the best alternative to synthetic pesticides that are harm less to the environment and human health. In the present study, different enzymes, namely alkaline phosphatase, acidphosphatase, glutamate-oxaloacetate transaminase, glutamate-pyruvate transaminase and acetylcholinesterase, were evaluated in Indian termite *Odonto termesobesus* in a combination preparation based on *Tagetes erecta* essential oil. For study of anti-termite effects against worker termites were treated topically with 40% and 80% of the 24-hour LD_{50} valuesof various combination formulations. A significant ($p > 0.05$) alteration was observed in all the test enzymes except acetyl cholinesterase levels after 16 h all tested treatments in comparison to control. Both dose response and time period was found important in physiological alteration in levels of various enzymes. The combined mixture of *Tagetes erecta* essential oils has significantly better anti-termite ability compared to inorganic insecticides. Findings from this study will help support termite control in fields, gardens and homesina sustainable way, without thedownsidesof insecticide resistance and pollution. These could potentially be used to produce commercial formulations for use against pests.

Keywords: *Tagetes erecta*, Essential Oils, *Odonto termesobesus*, Enzymes, inhibition, termiticidal action.

Mutants from Gamma- irradiation show height reduction and increased yield in Kalanamak rice(*Oryza sativa L.)*

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Abstract:

Among scented rice, Kalanamak is a non-basmati aromatic, small and medium sized grain rice with strong and pleasant and improvement of grain yield and yield stability has always been the primary goal in the breeding of kalanamak rice. This Cultivar is famous for its taste and aroma. Present study deals with selection of the promising mutants of Kalanamak cultivar of rice (*Oryza sativa L.*) from the developed mutant population by Mishra et. al (2023) on the basis of their morpho-agronomic traits. The studied mutants are screened out on the basis of their performance in the M2, and M3 generations. In M4 generation biochemical analysis of seed grains is done with morph-agronomic traits.

Keywords- Aromatic, Gamma-radiation, Kalanamak, Rice, Yield

Distribution pattern and population status of Clonal woody plants within Gorakhpur Forest Division, Uttar Pradesh.

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Abstract:

The present paper deals with the distribution pattern and population status of clonal woody plants in different forests of Gorakhpur Division, India. The regional Sal forest is one of the biodiversity rich forests of India because of its high species diversity, diverse physiognomy and favourable climatic conditions.Based on extensive field visit and literature survey, A total of 208 plant species representing 165 genera and 72 families, out of these 13 clonal plants species were recorded. Clonal woody plants have genetically identical individuals, reproduced through vegetative propagation. The species like *Clerodendron infortunatum*, *Croton oblongifolius*,*Mallotusphilippensis* and *Flacourtia indica*increased their ramet production with increase in disturbances level, but recurrent disturbance of high intensity affected ramet proliferation quite adversely.*Brideliaretusa*,*Casearia tomentosa* and *Holarrhenaantidysenterica* produced comparatively much lesser number of ramets per genet. The inter ramet distances on root-stock as well as the number of ramets per genet showedsignificant differenceswith respect to the level of disturbance. In a forest environment which is too harsh to allow regeneration through seed, a non-seed regeneration of a group of woody perennials may help maintain the minimal vegetation cover and considerable plant diversity.The non-seed regeneration strategy shows a promise to the quick recovery of forest ecosystems ravaged by anthropogenic perturbations.

Keywords: Clonal Plants, Disturbance, Diversity, Forest, Regeneration

Colchicine as a therapeutic agent

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Abstract:

Colchicine is a phytochemical extracted commercially from two plants of the Colchicaceae family, *Gloriosa superba* (flame lily) and *Colchicum autumnale* (autumn crocus). One of the seven upavishas (semi-poisonous drugs) in Indian medicine, colchicine is claimed to treat a number of illnesses but can be lethal if administered improperly. Colchicine dosages greater than 10 mg in humans are always fatal within three days. Due to colchicine's potent anti-inflammatory properties, it can cure many cardiovascular conditions, including coronary artery disease, atherosclerosis, recurring pericarditis, vascular restenosis, heart failure and myocardial infarction. Colchicine has lately demonstrated therapeutic effectiveness in reducing COVID-19 cardiovascular complications. The research on colchicine's anti-inflammatory mechanisms is gaining popularity. The ability of colchicine to inhibit microtubule formation is mainly responsible for its anti-inflammatory effects. Colchicine blocks the following cellular processes: platelet stimulation, macrophage chemotaxis, migration and adhesion, smooth muscle cell growth and migration, and endothelial dysfunction and inflammation. Colchicine suppresses NF-κB signaling, the release of proinflammatory cytokines, and the activation of the NLRP3 inflammasome at the molecular level. In the present review, we are covering the reported mechanism of colchicine used as a drug in various diseases.

Keywords: Colchicine, *Gloriosa superba*, Cancer, Gout, Anti-Inflammatory

Phytotoxic assessment of plant products (extracts) on seed germination&seedling growth of *Solanum tuberosum* andFungitoxic Efficacy of Extracts in Soil Condition

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Abstract:

The present studies cover the phytotoxic effect of two plant extracts viz. *Curcuma malabarica,* and *Hedychium spicatum* on *Solanum tuberosum* with respect to seed (tuber) germination and seedling growth(shoot length) and fungitoxic efficacy of extracts in soil condition**.**

The seeds (tubers) of *Solanum tuberosum* exposed to selected plant extracts at 5.0 ml dose and the phytotoxicity of extracts was measured in terms of per cent seed germination and the seedling growth in terms of plumule length. The results showed that the germination of seeds (tubers) and the seedling growth of *Solanum tuberosum* remained unaffected.

The study also revealed that the fungitoxic efficacy of extracts in soil conditionafter re-inoculation of test fungus, remained unchanged.

Keywords -Antifungal activity, Phytotoxic effect, Plant extract, Soil condition.

Antifungal Activity of Essential Oils Extracted from Some Aromatic Plants of Gorakhpur Division on *Aspergillus niger* van Tieghem

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Abstract:

Aromatic herbs are essential to human wellness and have been used in India for both medical and cultural purposes since the beginning of time. *Aspergillus niger* regularly causes food to spoil and may even pose a threat to human health in some cases. The collection of aromatic plants was picked throughout the region of Gorakhpur. Using Clevenger's apparatus, each unique drop of essential oil was extracted. To assess the oil's toxicity to *Aspergillus niger*, Bocher's inverted Petri plate method from 1938 was applied. The aim of this study is to evaluate the antifungal activity of an essential oil extracted from an aromatic plant against *Aspergillus niger*. By determining the efficacy of the essential oil, we can assess its potential as a natural antifungal agent and explore its possible applications in agriculture, food preservation, and the pharmaceutical industries. This article aims to provide an overview of the research conducted on the antifungal activity of essential oils on *Aspergillus niger* and their potential applications.

Keywords: *Aspergillus niger*, Antifungal activity, Aromatic plants, Essential oils, Gorakhpur division.

Bioefficacy of protease inhibitorsfrom plant seed against *Helicoverpaarmigera*

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Abstract:

Proteases are simple destructive enzymes that are required for the catabolism of proteins and the synthesis of amino acids in primitive organisms. Protease inhibitors (PIs) generated from plants are a potential defensing agent for crop enhancement and insect pest control. *Helicover paarmigera is* one of the key pests causing severe yield losses, infesting several crops such as cereals, pulses, cotton, vegetables and fruit crops as well as wild hosts.The plant protease inhibitors are playing important role because it targets to the midgut proteases enzyme of the larvae of *Helicover paarmigera*. Protease inhibitors (PIs), which are plant defense proteins, are one class of insect pest defense protein. The assumption that plant-derived protease inhibitors are crucial for plant pest and pathogen defense is backed up by the fact that they rarely inhibit endogenous enzymes while inactivating animal and microbial proteases.

Keywords: Endogenous enzymes, Helicover paarmigera, Insect pest control, Protease inhibitors

Exploring the inhibitory potential of Bergenia ciliata (Haw.) Sternb. against dengue viral infection: a host directed approach

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Abstract:

Dengue, a viral diseaselacks specific treatment and its multi-strain infection escalates the severity of disease. Inhibition of host proteins impedes dengue viral replication irrespective of strains (pan-strain). Therefore, in the present study inhibition of host protein ER α-glucosidase II by important Indian medicinal plants were evaluated through *in-vitro* assay, followed by *in-silico* molecular docking and molecular dynamics simulation. *In-vitro* screening on sixty-five plants reveals that *Bergenia ciliata* Wall. has maximum inhibition i.e., 76% at very low concentration of 0.02 µg/mL. Gallic acid and bergenin, the major bioactive metabolites were quantified using RP-HPLC (PDA) in *B. ciliata* and showed efficient binding *in-silico* against ER α-glucosidase II with docking score -7.3 and -6.9 kcal/mol. The protein–ligand (binding complex) stability at various time intervals was validated by molecular dynamics and simulation study, where both ligands formed stable complexes. Thus, *B. ciliata*is a promising candidate as host-directed therapeutics and can be extensively studied for development of pan-strain formulation against dengue virus.

Keywords: *Bergenia ciliata,* Dengue virus (DENV), ER α-glucosidase, Host proteins, Molecular Docking, RP-HPLC.

Phytopathogenic foliicolous fungi parasitising plants of medicinal importance of Family – Asteraceae.

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Abstract:

Phytopathogenic fungi invading leaf surface are called**"Foliicolous Fungi"**and symptoms produced by them are called **"Leaf Spots"**. These fungi cause discolouration to necrosis of leaves. Due to these leaf spots, considerable reduction in the photosynthetic areas of leaves occurs resulting into reduced productivity of the host plants. Many of these fungi have been reported to produce **"Fungal Toxins"** of various kinds. In the present investigation, forests of Gorakhpur division have been surveyed to study the incidence of and to collect and report these foliicolous fungi parasitizing plants of medicinal importance of Family – Asteraceae. A total of four species of thesefoliicolous fungi belonging to three genera have been reported –*Cercospora* Fresenius(*C. calendulaecola*on *Calendula officinalis* and *C. gorakhpurensis*on *Eupatorium adenophorum*); *Cercosporella* Sacc*. (C.achilleae*on *Achillea sp.)* and *Corynespora* Gussow (*C. elephantopi*on *Elephantopusscaber*). Phytopathology and host-parasite relationships of these collected fungi have been examined with reference to per cent reduction in the photosynthetic areas of the leaves.

Keywords: Asteraceae, Foliicolous fungi, Leaf spots, Medicinal plants, Phytopathogenic.

Angiospermic Flora of Jaunpur District, Uttar Pradesh, India

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Abstract:

The Jaunpur district is eastern part of the Varanasi Division. The Varanasi Division's North-West region contains this district. Its land area covers the latitude range of 24.240N to 26.120N and the longitude range of 82.70E to 83.50E. Its attitude fluctuates between 261 and 290 feet above mean sea level (MSL). The district's terrain consists primarily of a flat plain with shallow river-valleys. Its principal parental rivers are Sai and Gomti. The lesser rivers in this area are Varuna, Basuhi, Pili, Mamur, and Gangi. The district is divided into almost four equal landmasses by the rivers Gomti and Basuhi. The majority of the soils are clay, loamy, and sandy. The calamity of floods frequently affects the Jaunpur district. The district of Jaunpur experiences temperatures ranging from 4.30°C to 44.60°C. 987 mm of rain falls annually on average. The district spans 4038 square km of land. The current study of the flora growing in the district having total no. of 602 species under 398 genera over 123 families including 446 dicots and 156 monocots of angiosperms. Out of 602 species, the dicotyledons represents 74.08% and monocotyledons represents 25.91 %.

Keywords: AngiospermsFlora, Jaunpur district, Uttar Pradesh.

Socio-economic and ecological perspectives of forest resources of Gorakhpur Forest Division, India

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Abstract:

Gorakhpur Forest Division is one of the unique ecological sites of India due to its climatic conditions in terms of range of temperature, available moisture and insolation during the year. The forest was observed for the distributional pattern, density and diversity of socio-economic plants. A total of 168 socio-economic plant species representing 136 genera and 63 families were recorded. The species diversity and evenness index were considerable high ($\overline{H}$ =3.16 ± 0.14, J = 0.89). In floristic survey, the selected sites were visited during different sessions of the year and details about collected species were documented. The questioner-based information was also gathered from local communities regarding socio-economic perspective of the species. The common forest associates, which are generally used by local people includes*Clerodendron infortunatum, Desmodium spp., Curculigoorchioides, Elephantopusscaber, Dioscoreabulbifera, Holarrhaenaantidysenterica* etc. The trees species like *Mallotusphilippensis, Schleicheraoleosa, Holarrhenaantidysenterica, Bridelia retusa* and *Terminalia tomentosa* showed quite abundant population. On the other hand, trees like *Casearia tomentosa, AntidesmaghaesembillaFlacourtia indica, Carissa spinarum,* and *Cassia fistula* were quite frequent as sprouts. From these species the commonproduces are timber, fuel woodand a range of Non-Timber Forest Products (NTFPs) such as fruits, seeds, edible fungi and traditional medicines, resins, oil, gums and a range of barks and fibres including bamboo and grasses. Over-exploitation of these plants, lack of awareness about the population structure, habitat fragmentation and niche- specification, seasonal fire are some of the severe threats endangering the existing populations of socially adopted plants. The ecological and socio-economic studyof regional forest may provide some clues to make the sustainable use of NTFPs of the region. There is an urgent need to carry out detailed ecological investigations on the geographical distribution patterns, population status and impact of anthropogenic perturbations on important plant populations.

Keywords: Distribution pattern, Diversity, Resource Management, Sal forest, Socio-economics

Range of distribution and regeneration strategy of woody shrubs in Gorakhpur Forest Division, Uttar Pradesh.

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Abstract:

The present paper deals with Range of distribution and regeneration strategy of woody shrubs in Gorakhpur Sal forest U.P. India.The Salforest vegetation of Gorakhpur is moist and deciduous and evergreen type. A total of 208 plant species representing 165 genera and 72 families were recorded.The sal forest was rich in papilionaceae (23 species),which contributed maximally to the total number of individuals <30 cm girth. After sal, Density was maximal for a leguminous shrub *Moghania chappar.* The individualregeneratingas sprouts from underground stem contributed significantly to the sum total of individuals/ha. As much 45.5% of the total individuals were of ramet origin and shared 10.6% of the total species richness of the forest.In stands facing moderate to low disturbance, thickets of dense entangled mass of vegetation, predominantly composed of thorny lianas, were identified that usually contained less common and rare species like *Rauwolfia serpentinaDesmodium latifolium Crotalaria alata* and *Gloriosa superba* in addition to the frequent ones. As evident from the above observation, the managed or plantation forests may show considerable diversity of wild plants which regenerate naturally in association with planted timber species.since they are the last resortfor the perpetuity of wild plants ,their management as a forest ecosystem is obligatory for the conservation of an array of species occupying different niches within system. In disturbed forest, non-seed regeneration and growth through ramet proliferation and basal sprouting yield sufficient understorey cover, which enables the survival of associated minor flora and fauna.

Keywords: Distribution, Diversity, Regeneration, Sal forest

In-silico mining of simple sequence repeats (SSRs) in the chloroplast genome of *Bambusa bambos*

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Abstract:

Bamboos (Subfamily: Bambusoideae) are fast-growing perennials that are used by billions of people for food and fiber, and also contribute significantly to sustainable development. Microsatellites, simple sequence repeats (SSR) or short tandem repeats (STR) are a ubiquitous class of simple repetitive DNA sequences, which are widespread in both eukaryotic and prokaryotic genomes, and demonstrate high level of allele polymorphism. Since, meager reports are available with respect to analysis of SSRs in chloroplast genomes of bamboos and their use in assessing the phylogenetic relationships among different species using the chloroplast genome sequence data, the present study was carried out to analyze the occurrence and distribution of SSRs in the chloroplast genome of *Bambusabambos*. The chloroplast genome sequence was retrieved from NCBI in FASTA format and SSRs were analyzed by using MISA perl script. The minimum motif repeat size was set to 10 for mononucleotide, 6 for dinucleotide, 5 for trinucleotide, and 3 each for tetranucleotide, pentanucleotide and hexanucleotide. A total of 41 SSRs were detected of which 4 were present in compound formation. Mononucleotide repeats were the most frequent (60.97 %), followed by tetranucleotides (39.02 %) and pentanucleotides. No trinucleotide repeat was observed.

Keywords: Bamboo, SSRs, MISA, Mononucleotide repeats

Folkoric Plant *Helminthostachys zeylanica* (L.) Hook.traditionaluses and health benefits

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Abstract:

Helminthostachys zeylanica is king of Potency and famous for its aphrodisiac property in India, in traditional system of medicine. The traditional uses of *H. zeylanica* include Leucorrhea, spermatorrhoea, neurogenic tonic and potency enhancer. Rhizome and trophophore of*H. zeylanica* are the most commonly used part of the plant for medicine while other part like young leaves are used as vegetable sinceancient times. It consists of hundreds of phytochemicals and among them, some of the bioactive compounds have specific potential pharmacological and medicinal value. Its potential pharmacological value in anti-hepatic, anti-diabetic, anti-oxidant, anti-inflammatory and many more. It is prominently used in ethnomedicinal system of medicine. Due to which the plant is under great pressure of exploitation. The plant needs to be explored for its pharmacological validation and in its economic prospective as it needs to be cultivated by farmers. The plant holds potential of medicinal value for which further investigations should be done to the level of breeding, gene and adaptation techniques. There are many varieties of plants growing in nature. Future efforts with many quality and adaptation targets can utilize existing varieties for conservation of landraces already exist.

Keywords: Conservation, Folkoric plant, *Helminthostachys zeylanica,*Pharmacological value Traditionaluses.

Plant diversity of aquatic and marshy wetland of Taal Ratoy of Mau, Uttar Pradesh

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Abstract:

The wetlands are very important of natural water body as well as the water reservoir on the earth. The wetlands area which remains the waterlogged, seasonally, temporary, permanent, throughout the year. Wetlands are provided plants species and numerous and other ecological services such as flood mitigation, nutrient cycling etc. strictly terrestrial area. Taal Ratoy is a relatively large area situated in Fatehpur nearby Madhuban Tehsil and it is about 35 km away from the Mau city. The present study was carried out of the aquatic and marshy wetland plants of Taal Ratoy area. The study area was conducted by Oct 2021 to Feb 2022. The aquatic and marshy plants was belonging to families, 49 genera and 51 species. Out of which 44 plants belonging to dicot, 3 plants belonging to monocot, 4 plants belonging to pteridophytes, and 1 plant belonging to bryophytes.The aquatic and marshy plants are classified into different categories on the basis of natural and depth of water and degree of soil wetness in which they can live. Plants living in flowing and standing water with excessive supply of water do not face the problems of water loss due to transpiration, wilting and drought, they are termed as hydrophytes.

Keyword: Aquatic, marshy wetland of Taal Ratoy.

Seasonal Variationsin Macrophytic Diversity of RiverAmi, Maghar, SantKabirNagar

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Abstract:

The current study investigates seasonal variations in the diversity of aquatic macrophytes in the River Ami, located in Maghar, Sant Kabir Nagar district of Uttar Pradesh. River Ami issituated at global position of 26.76°N 83.13°E. Aquatic macrophytes play a significant role in water ecosystems, and understanding their diversity is essential for comprehending river ecosystem dynamics. The research is focused on the species composition and seasonal distribution of aquatic macrophytes from January 2021 to March 2023. Ami river remain iscovered by water along with its aquatic vegetation almost throughout the year. During the investigation, the study site was visited twice in a month for two years and species found there were recorded. A total of fifteen different species of aquatic macrophytes were identified in the studied river, including one free-floating, eight submerged, and six emergent macrophytes. Notable species such as *Eicchorniacrassipes*, *Hydrillaverticillata*, *Polygonumglabrum*, *Cyperuslongus* and *Ipomoeafistulosa* were found to be present throughout the year, indicating their specificity to environmental quality. The results suggest that the river's surface water quality is productive. Furthermore, the study highlights the need for further research to describe unknown species. The highest diversity of macrophytes was observed during the summer, followed by the rainy season and winter. The luxuriant growth of aquatic macrophytes indicates the high productivity of the river, while the dominance of emergent macrophytes suggests the encroachment of littoral vegetation, indicating a successional trend toward a marsh meadow ecosystem.

Keywords: Diversity, Aquatic macrophytes, Seasonal variation, Ami river.

*Pseudocercospora*causing leaf spot diseases of medicinal plants of Family –Euphorbiaceae in North-Eastern Uttar Pradesh.

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Abstract:

The humid, sub-tropical climatic condition of North-Eastern Uttar Pradesh supports lush green vegetation having various plants of medicinal importance. Also, this climate supports biodiversity of microbes and the vegetation harbours phytopathogenic fungi of various groups. *Pseudocercospora Spegazziniis* a hyphomycetouspathogenic fungus of *Cercospora*– Complex group and many of its species have been recorded parasitizing plants, including plants of medicinal importance and causing leaf spot diseases. During the course of survey of forests of Gorakhpur division for foliicolous hyphomycetes, six species of *Pseudocercospora* have been collected, identified and described causing leaf spot diseases of medicinal plants of Family – Euphorbiaceae. These are *Pseudo cercospora acalyphae* on *Acalypha indica* L., *P. asiatica* on *Glochidion lanceolarium* (Roxburgh) Voigt*, P. Baliospermi* on *Baliospermum montanum*(Willd.) Muell-Arg*, P. Brideligena* on *Bridelia stipularis* (L.) Blume*, P. Putranjivae* on *Putranjiva roxburghii* Wall. and *P. trewiae-nodiflorae* on *Trewianodiflora (*syn*. Mallotusnudiflorus*(L.) Kulju &Welzen*.* Detailed morpho-taxonomic description of these six species has been done with suitable camera lucida drawings and host-parasite relationship has been studied with reference to reduction in photosynthetic areas of leaves resulting into reduced productivity of the host plant.

Medicinal Properties of Pudina(Mentha) Leaves

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Abstract:

Pudina(mint) scientifically known as *Mentha spicata* is a perennial and aromatic herb belonging to the family Lamiaceae. It is called Spearmint in English and is widely used in Indian and Italian cooking. It is one of the best mints used for flavors. The exact distinction between species is not clear. It is estimates that 13 to 24 species of *Mentha* exist. Hybridization occurs naturally where some species ranges overlap. Many hybrids and cultivars are known. The genus has a sub-cosmopolitan distribution across Europe, Africa (Southern Africa). Asia, Australia-Oceania, North America & South America. The species found in many environments, but mostly grow best in wet environments & moist soils. Mint leaves are alkaline. Mint herbs have 8.0 pH level once digested. Mentha leaves have amazing appetizing property. Mint oil has antiseptic and antibacterial properties to relieve indigestion, stomach infection etc. It acts as an anti-spasmodic remedy due to the presence of menthol.Mentha have multiple health benefits such as prevention from cancer development and anti-obesity, antimicrobial, anti-inflammatory, anti-diabetic and cardioprotective effects, as a result of its antioxidant potential combined with low toxicity & high efficacy. Other benefits of Mentha are- boost immune system, better brain function, support pregnancy, reduce cold systems, keep mouth healthy and help to manage stress.

Keywords: Perennial, Flavors, Appetizing, Antioxidant, Immune system.

Studies on chemical characterization of bioactivecompoundswithanolides and withamine through mutagenesis in differentvarieties of*Withania somnifera*(Ashwagandha) collected from CSIR-CIMAP, Lucknow

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Abstract:

*Withaniasomnifera*Dunal (family Solanaceae) is an annual crop having various medicinal properties due to the presence of bioactive compound viz. withanolide A, withanolide B withaferine A, withamine etc. chemical constituents. Mother seed stock of Ashwagandha varieties (Procured from CIMAP, Lucknow) areused as material source for chemical mutagenesis through Ethyl Methane Sulfonatetreatment, four different seeds of varieties Nimtili 118, Pratap, Cimpusti, and Poshita were treated with different dose of EMS 1%, 0.8%, 0.6%, 0.5%, 0.4% and 0.2%.In seeds of M1generation plants, The Data of morphometric trait viz. Plant height (cm), No. of Branches(cm), No. of Leaves, No. of Seed berries/plant, wet berry weight, Dry berry weight, No. of seeds/berry, seeds/ berry weight, Total seeds/plant, Wt. of 1000 seeds, Main Root Length(cm), Root Width upper portion, Root width below 7cm, Fresh Root weight (gm), Dry Root weight(gm) has been recorded. during the investigation LD 50 was observed as 0.8% dose in NIMTILI, 1% and 0.2% in PRATAP, 0.4% in CIMPUSTI and 1% in POSHITA .

Keywords: Indian Ginseng; Withania; Mutagenesis; Withanolides; Withamine; Poshita;Cimpusti

Nigella sativa: As an excellent therapeutic herbal medicine

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Abstract:

Interest in medicinal plants has recently increased due to factors such as cheap cost, easy availability, safety, and efficacy of plant-derived drugs as compared to synthetic medicines. Among the promising medicinal plants,*Nigella sativa*L. (Family: Ranunculaceae) is an annual herbaceous plant that has been used in the Middle East and Mediterranean region since centuries as a culinary spice, food additive and in folk medicine. A wide range of phytochemicals have been reported in black cumin like thymoquinone (TQ), thymohydroquinone, dithymoquinone, *p*-cymene, sabinene, carvacrol, 4-terpineol, kaempferol (glucoside) *t*-anethol, longifolene (sesquiterpene), α-pinene, α-hederin (pentacyclic triterpene) and thymol. TQ, the most abundant constituent of *N. sativa* seeds, is used in the treatment of skin diseases, jaundice, gastrointestinal problems, anorexia, conjunctivitis, dyspepsia, rheumatism, diabetes, hypertension, intrinsic haemorrhage, paralysis, amenorrhea, anorexia, asthma, bronchitis, headache, influenza and eczema.Black cumin extract as well as TQ exhibits strong antimicrobial activity againstviruses, fungi, and both Gram-negative and Gram-positive bacteria. Current research has provided scientific evidence for the traditional usesof black cumin especially antioxidant, anti-inflammatoryantibacterial, antifungal, antiviral, anticancer,antidiabetic, neuroprotective, gastroprotective and antiarthritic effects.

Key words: *Nigella sativa*, Thymoquinone, Medicinal plant, Antimicrobial, Therapeutic agent

An overview of Medicinal and therapeutic properties of *Hordeum vulgare* L.

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Abstract:

Hordeum vulgare L. (tribe: Triticeae, family: Poaceae), commonly known as Barley or Jau, is an annual grass and most conspicuously characterized by their inflorescence i.e. Spike with six rows of fertile spikelets. It is one of the founders as well as first domesticated cereals of the old-world agriculture and ranks fourth in world cereal crop production. In addition to the already known uses, barley also has therapeutic qualities discovered over time. The medicinal and nutritional profile of the plant enhances its usage in pharmaceutical and cosmeceutical formulations as well as dietary supplements. Besides, high starch, protein, lipid and fatty acid content, it also has good quantities of beta-glucan, acetylcholine, lysine, thiamin and riboflavin, substantially accounting for its wide spectrum of medicinal properties. As per the Ayurveda, Barley is an effective mean to avoid as well as to control Diabetes due to presence of beta-glucan. Many studies revealed that eating barley seed or consuming as juice or, powder made from young leaves of plants lead to the protection against atherosclerosis, ischemic, stroke, diabetes, insulin resistance, obesity and cancer. Therefore, the present study is an overview of medicinal and therapeutic potential of *Hordeum vulgare*deciphering its role as a valuable medicinal resource.

Keywords: Barley, inflorescence, medicinal, nutritional, therapeutic

An overview of the genus *Setaria*P. Beauv. (Paniceae: Poaceae) from Western Himalaya, India

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Abstract:

Setaria P. Beauv., a member of the tribe Paniceae (Panicoideae: Poaceae), is a cosmopolitan genus mainly concentrated in tropical, subtropical, and sub-temperate regions. Globally, the genus comprises ca 136 species, of which, ca 13 species are reported from India. However, in Indian Western Himalaya, the genus constitutes a total of nine species, viz., *S. barbata*, *S. homonyma, S. intermedia*, *S. italica*, *S. parviflora*, *S. palmifolia*, *S. pumila*, *S. verticilata*, and *S. viridis*. The genus *Setaria* is characterized by the presence of bristles subtending the spikelet at the base, panicle spicate, or open and transversely rugose upper lemma. The taxonomic delimitation of this genus is quite complex due to overlapping morphological characters. Although characters such as panicle spicate or loose, leaves simple or plicate, number of bristles per spikelet, and length of the upper glume in respect to smooth or transversely rugose upper lemma are important to delimit the genus at species level. Species such as *S. intermedia, S. italica*, S. *parviflora*, *S. pumila*, *S. verticillata*, and *S. viridis* have simple linear-lanceolate leaves, spicate panicle, spikelet subtended by more than six bristles and the upper lemma is usually transversely rugose, whereas, the species *S. barbata*, *S. homonyma*, *S. pamifolia*, and *S. plicata* are characterized by the presence of plicate leaves, panicle open, and spikelet is subtended by a single bristle.

In the context of economic perspective, *Setaria*occupies an important place, like *S. italica* (foxtail millet), which is cultivated for grains in hilly regions. *S. homonyma* and *S. intermedia* are preferred by cattle due to their high fodder value. Moreover, the inflorescence of *S. verticilata* is also being uses as a repellent against rats whereas *S. palmifolia* is grown as an ornamental grass. Furthermore, *S. pumila*, *S.parviflora*, *S. verticillata*, and *S. viridis* are highly invasive weeds of cultivated fields.

Keywords: Fodder, Fox-tail millet, Invasive, Panicle, Panicoideae

Bioconversion of Cellulose-Derived Products: A Sustainable Approach to Value-Added Bioproducts

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Abstract:

Cellulose, a ubiquitous biopolymer abundantly found in plant biomass, has emerged as a promising feedstock for the sustainable production of value-added bioproducts. The bioconversion of cellulose is driven by a diverse array of microorganisms, enzymes, and chemical catalysts. These biotechnological approaches aim to break down the intricate cellulose structure into fermentable sugars, the building blocks for bioethanol, butanol, and other biofuels. Additionally, the utilization of cellulolytic enzymes and genetically engineered microorganisms has opened avenues for cost-effective and eco-friendly bioconversion processes.The ability to modify cellulose-based materials and tailor their properties for various applications showcases their versatility in the bioproduct industry.The presented research and innovations exemplify the growing significance of cellulose bioconversion as a key driver in the pursuit of a more sustainable and environmentally responsible future.

Keywords: Cellulose, bioproducts, cellulosic enzymes etc.

A STUDY ON ADULTERATION OF MILK AND MILK PRODUCTS

A REVIEW

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Abstract:

Any living being cannot live without food.Food is a substance which is composed by **carbohydrates, water, fats** and **proteins.** These foods can be eaten by humans and animals for providing proper nutrition. In another word, food is one of the basic necessities for every living being and it is very important aspects for life.Food is a basic need for a healthy life, rather than a life; but in our day-to-daylives, food becomes adulterated and causes a harmful impact on human health. The adulteration of food is evil for society. For the greed of money and getting more profit, the traders add different types of adulterants into the food products. The process of adulteration is that by which the nutritional quality of food becomes reduced which is done by dishonest retailers and traders for getting more and more profit.Milk is such a type of liquid foodproductthat could be easily adulterated and is a verycompositemixture. It is the normal mammary secretionthat is derived from the complete milking of healthy milch animals either through addition or extraction too. It is unbelievably valuable food that is easily absorbed and digested. It contains many nutrients which are more than 100 which could be present either in solution, suspension, or emulsion in water, the most important is casein, which is the major milk protein, lactose(which is a milk sugar), whey as well as mineral salt which are needed for the proper growth and maintenance for the human health.

Keywords: Milk adulteration, Adulterants, health hazards, Detection Method.

Nutraceutical Potential of *Dioscorea bulbifera* L. from North Eastern Terai Region of Uttar Pradesh

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Abstract:

Plants have huge reservoir of food and healthcare benefits and an ethereal gift of nature. After the cereal grains, tubers are also an important food source for human society. *Dioscorea bulbifera*, commonly known as 'Yams', is a monocotyledonous vine belongs to family Dioscoreaceae. The *D. bulbifera* parts viz. tubers, stem, leaves bulbils have rich number of biomolecules with divine therapeutic potentials e.g.,carotenoid, polyphenols, flavonoids, terpenoids, saponins, sapogenins, steroids, alkaloids, tannins etc. These phytomolecules have demonstrated various pharmacological activities viz., antimicrobial, antitumor, antispasmodic, analgesic, diuretic, anthelmintic, antidiabetic, antiobesity, andantirheumatic. Due to their enormous food as well as nutritional values there is an instant need for exploration of this underutilized plant as an alternative source of future food and medicine.

Keywords: Underutilized Plant, *Dioscorea bulbifera,* Nutraceuticals, Biomolecules, Therapeutics, Pharmacological Activities

"Isolation and Screening of Distillery Effluent Decolorizing Yeast from the Industrial site of Ayodhya"

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Abstract:

Distillery is the most polluting industry all over the world. Distilleries generate high amount of distillery effluent. Distillery Effluent is also known as Spent Wash. Distillery Effluent is harmful due to the presence of Melanoidin Pigment. The effluent generated contains high amount of COD, BOD, low pH etc hence it is toxic for environment and cannot be released directly without treatment. The Distillery Effluent is treated with the help of microorganism. In the present study yeast were used for the treatment of Distillery Effluent. Effluent Decolorizing yeast was isolated from the industrial site of Masodha Distillery of Ayodhya. The sample was collected in sterile poly bag. The yeast was isolated using serial dilution method. A total of 20 yeast strains were isolated out of which 3 strains showed best Decolourization of Distillery effluent. Therefore, further studies will be carried out on these 3 potential yeast strains.

Keywords: Distillery Effluent, Decolourization, Pollution, Serial Dilution, Yeast.

Water Quality Parameter: Drinking water

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Abstract:

Water is the second most important need for the life to exist on the after air. As a result, water quality has been described extensively in the scientific literature. Since the industrial revolution in the late eighteenth century the world has discovered new source of the pollution nearly every day. So air and water can potentially become polluted everywhere. Due to human and industrial activities the ground water is contaminated. Thus, the evaluation of water quality in particular to enhance the health of human and ecosystem.

Water quality parameters can be classified into three types; Physical, Chemical and Biological parameters.The Physical parameter includes color, taste,odor, temperature,turbidity,solids,electric conductivity. The Chemical parameters includes pH,acidity, alkalinity, chlorine, hardness, dissolved oxygen. The Biological parameters includes bacteria, algae, viruses.

To establish the quality and safety of water, it undergoes a series of essential assessment of physical, chemical and microbiological analyses. The monitoring of some parameters is important both in terms of quality and in particular that of microbiological safety.

The aim of this study was to analysis drinking water quality and its effect on human and ecosystem.

Biosorption of arsenic contaminated water

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Abstract:

Arsenic is now a perceive hazard of water, particularly in the groundwater. The problem of naturally occurring Arsenic in the groundwater is more or less a global reporting. Direct utilization of Arsenic contaminated water is extremely harmful. Thus, a lobby of scientists is engaged in the search of proper, efficient and an economical remedial measure for Arsenic contaminated water. In light of the above, the problem was taken into consideration to study the efficacy of the biological tools in removing the arsenic. On the ground of the literary reports many biological wastes, particularly the agro-wastes were found to be potential enough; and they can be employed for biosorption of Arsenic.

Keywords: Arsenic; Biosorption; Agro-waste; Phytoremediation; Toxins

Efficacy of cumin oil against fungi isolated from mandarin orange

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Abstract:

Citrus reticulata Blanco (Mandarin orange) fruit, belongs to family Rutaceae is rich in vit c, flavonoids and acid. The fruit is antiemetic, aphrodisiac, astringent, laxative and tonic. It can be eaten raw or cooked in puddings, cake, confectionary etc. In the present study 13 fungi were isolated from *Citrus reticulata* by standard method. Essential oil of *Cuminum cyminum* L. was tested against fungi isolated from *Citrus reticulata* by Poison food technique of Grover and Moore, 1962.

The oil was found to be fungitoxic at 1500 and 1000 ppm.

Keywords: Fruits, essential oil, fungitoxic, poison food technique.

Evaluation of *Trichoderma aggressivum* f. europaeum as a Potential Biological Control Agent against Fungal Phytopathogens

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Abstract:

This study aimed to assess the efficacy of *Trichoderma aggressivum* f. *europaeum* as a biological control agent against fungal phytopathogens. Twelve isolates of *T. aggressivum* f. europaeum were obtained from diverse substrates used in *Agaricus bisporus* cultivation on farms in Castilla-La Mancha, Spain. The growth rates of these isolates were evaluated, and their in vitro antagonistic activity was tested against a range of phytopathogens, including *Botrytis cinerea, Sclerotinia sclerotiorum, Fusarium solani f. cucurbitae, Pythium aphanidermatum, Rhizoctonia solani, and Mycosphaerella melonis.* All isolates exhibited robust growth rates. T. aggressivum f. europaeum demonstrated substantial antagonistic activity against most phytopathogens, exceeding 80% inhibition, with the exception of P. aphanidermatum, which exhibited approximately 65% inhibition. The most effective isolate, T. aggressivum f. europaeum TAET1, completely inhibited the growth of B. cinerea, S. sclerotiorum, and M. melonis in detached leaf assays, and it also hindered the germination of S. sclerotiorum sclerotia. In plant assays, disease incidence and severity varied among pathosystems, ranging from 22% for F. solani to 80% for M. melonis. T. aggressivum f. europaeum TAET1 significantly reduced the incidence of Podosphaera xanthii in zucchini leaves by 66.78%. Notably, this isolate displayed high compatibility with fungicides, suggesting its potential for use in combination with various pest management strategies. Based on these findings, T. aggressivum f. europaeum TAET1 warrants further investigation as a biological control agent in commercial greenhouses.

Keywords: Biological control; Trichoderma; fungal phytopathogens; diseases; fungicides

Sustainable andecofriendly approach for the biodegradation of synthetic plastics

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Abstract:

Synthetic plastics are primarily composed of polymers, which are long chains of repeating molecular units. Synthetic plastics have become an integral part of modern life and are used in countless applications due to their unique properties.these plastics are extremely durable and resistant to degradation. The rate of plastic biodegradation depends on environmental factors, including temperature, moisture, and the presence of oxygen.Biodegradation of plastics may be a potential solution to address plastic pollution and reduce the environmental impact of plastics. Some microorganisms, including bacteria and fungi, produce enzymes that can break down the chemical bonds in plastics. These microorganisms have evolved the ability to utilize these materials as a carbon and energy source. The biodegradation of synthetic plastics by microorganisms is an area of active research and has the potential to address the significant environmental issue of plastic pollution. Synthetic plastics, such as polyethylene (PE), polypropylene (PP), polyethylene terephthalate (PET), and others, are not readily broken down by natural processes, which leads to their persistence in the environment for hundreds of years. Research is ongoing to harness the biodegradation potential of microorganisms for plastic waste management and recycling. Some plastics are intentionally designed to be biodegradable, meaning they can be broken down more easily by microorganisms. These plastics are often used in applications where rapid degradation is desirable, such as single-use items and compostable packaging. Biodegradable plastics, however, require specific environmental conditions to degrade effectively.

Keywords: Synthetic plastics, Biodegradable plastics, polyethylene (PE), polypropylene (PP), polyethylene terephthalate (PET)

The study on knowledge about Millets farming practices in Prayagraj and Bhadohi district of Uttar Pradesh

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Abstract:

Millets are acceptable verities to achieve to food and nutritional security. Millets produced and consumed traditionally in India shown a decline in area and production accept for Millets. In present scenario of millets cultivation in India become very small scale and our purpose of this study are to influence the farmers about Millets values and farming practices. This research study was conducted in Prayagraj and Bhadohi districts of Uttar Pradesh. Three blocks were selected randomly i.e. Uruwa, Manda and Deegh based on higher number of Millets growers and from each block, four villeges were selected randomly, total 120 respondents selected randomly from selected villeges. The data was collected through pre structured interview schedule personally. The data were analyzed using appropriate statistical tools. This study reveals that the majority of farmers have knowledge about Millets farming practices land preparation, seed rate, sowing time, recommended dose of FYM, best time for thinning, intercropping, harvesting, moisture content for storage while less knowledge about improved verities, showing methods. We learnt from this study, old age farmers have knowledge about millets farming practices but young farmers have less knowledge about Millets cultivation as well as millets cultivation areas has been decreases. The conclusion of this study farmers have not much knowledge about many millets practices, he was known an average knowledge about millets farming practices.

Keywords: Cultivation, Farming practice, Improvement, Knowledge, Millets

Ecological Investigation of Bakhira Bird Sanctuary, SantKabir Nagar, Uttar Pradesh

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Abstract:

An attempt has been made for the very first time for ecological investigation of birds at Bakhira bird sanctuary, district SantKabir Nagar, Uttar Pradesh, India. Thirty-two species of birds were observed during the field investigation. The line transect method was employed for population estimates. During the field survey, we recorded a significantly higher number of migratory birds at the end of early winter (December) and at the commencement of middle winter (January). Red crested pochard (Nettarufina), Common coot (Fulicaatra) and Gadwall (Marecastrepera) were the most populated species in the present study. The number of birds was not significantly different among winter months except between October/December and October/January wherein, we found significant variation in the number of birds at the Bakhiratal. Of the five main habitat types viz. lowland vegetation, upland vegetation, emergent vegetation, open water and agricultural fields, the most utilized were lowland vegetation and the emergent vegetation in the early and middle wintering stage. While in late winter, the emergent vegetation was the most utilized habitat. The findings of the present study provide the baseline information about the population of migratory birds and the rate of habitat utilization at the Bakhira bird sanctuary. Grey heron, Common Red shank, Spotted Red shank, Long toed Stint, Little Stint, European White Stork and common Sand Piper were recognized as Wintering waders in Bakhira Tal, were highly susceptible to continuous anthropogenic pressures in the form of washing of cloths, cattle bathing, cattle grazing, and entry of domestic sewage, hunting, fishing, and expansion of crop lands. Since crop lands are being destroyed by waders to some extent, Man &Wild conflict was also observed among the local people of study area and waders. Consequently, villagers started scaring campaigns by exploding crackers near the waders to make them fly from the wetland.

Keywords: ecological, migratory, birds, sanctuary, Bakhira, SantKabir, population, habitat, method

Spectroscopy - Exploring a Novel Panorama

Promise Life sciences Interactions

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Abstract:

Spectroscopy often referred to as fingerprints' of matter. It is a scientific technique used in understanding the properties of matter by examining its interaction with electromagnetic radiations. All life sciences interactions are initiated at the level of the cell. Recently, the spectroscopy has increased in popularity as an investigative tool in cell biology despite certain limitations, in part because of the parallel development of some sophisticated techniques and tools in structural biology genomics, proteomics and metabolomics. The present study introduces a presentation on fundamental principles, technique and remarkable applications of spectroscopy in life sciences. Ultra –violet visible spectroscopy, infrared spectroscopy, nuclear magnetic resonance spectroscopy, raman spectroscopy, Mass spectroscopy, circular dichroism spectroscopy, x-ray crystallography, electron paramagnetic resonance spectroscopy, Mass bauer spectroscopy and an ever increasing array of fluorescent spectroscopy that can be applied to investigating biological molecules, cells, tissues and processes.

This study describes some of these approaches and discuss how they are taking us a step closer to viewing the intricate complexity with which living regulate their own functions down to sub-cellular level.

Keywords: Life Science-interactions, Spectroscopic Technique

Phytogeographic Regions of India

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Abstract:

The study of Phytogeographic regions of India helps in finding out endemism and distributional ranges of species.Phytogeography is derived from Greek words *Phyton*= "Plant" and *Geo*= "Earth" and *Graphia*= "write about". The aim of this study was to know about the diversity in the vegetation and climatic condition of all the phytogeographical regions of India which are 11 in number according to Flora of India, Vol. 1(1996) BSI.

Eco-friendly management of Colletotrichum capsici causing anthracnose of chilli by using different plant extract and essential oils

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Abstract:

An investigation was carried out to determine the efficacy of some organic materials to manage anthracnose (Colletotrichum capsici) of chilli. The plant extracts viz., Neem, Tulsi, Marigold, Parthenium, Drumstick and Lantana (each @ 5 and 10%) and essential oils *viz*., Neem, Lemon grass, Thyme, Winter green, Eucalyptus and Cinnamon oil (each @ 0.1 and 0.05 %) were evaluated against the *C. capsici*. The result revealed that, essential oils viz., Thyme oil, Eucalyptus oil and lemon grass oil (each @ 0.05 and 0.1 %) and Cinnamon oil at 0.1 % concentration was highly effective as cent per cent inhibition was achieved followed by Cinnamon oil (88.51 %), neem oil (55.55 %), Winter green oil (66.66 %) with the maximum percent mycelial growth inhibition over the untreated control. The plant extracts Neem was found to be effective and showed growth inhibition percent at 10 and 5 percent conc. was 40.00 and 32.97 percent respectively, followed by Tulsi with growth inhibition percent 27.41 and 21.48 at 10 and 5 percent conc. respectively. The minimum growth inhibition was recorded in case of the Lantana with 14.08 and 21.11 per cent at 5 and 10 per cent conc. respectively. So, organic management might be a better option to control anthracnose of Chilli and also having environment friendly.

Keywords: Chilli anthracnose, Colletotrichum capsici, Ecofriendly management, Essential oils, Plant extract

Compounds identification, antimicrobial and antioxidant activities of lichens *Parmotrema nilgherrense* (Nyl.) Hale and *Ramalina sinensis* Jatta

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Abstract

In the present study the lichens *Parmotrema nilgherrense* (Nyl.) Hale and *Ramalina sinensis* Jatta were collected from Himalaya and their crude extracts were prepared in organic solvent of different polarity. The antimicrobial activity was tested against multi-drug resistant gram-negative bacteria (*Acinetobacter baumannii, Pseudomonas aeruginosa* and normal pathogens *Agrobacterium tumefaciens, Escherichia coli* and *Klebsiella pneumoniae*) at a concentration of 20µg/disc through disc diffusion assay. The Minimum Inhibitory Concentration (MIC) were tested at two-fold serial dilutions at concentration ranging from 10 to 0.001 mg/ml. The methanol extract yielded the highest Zone of Inhibition (ZOI) against *P. aeruginosa* 15.6±1.1 mm which is higher than the streptomycin (S^{10}) and the MIC values 12.4µg/well. Principal Component Analysis has been used to summarize the most active extracts of lichens. The antioxidant properties of methanol extract have been tested by free radicals scavenging (DPPH) and ferrous reducing assay. The maximum values of free radicals scavenging properties were 62.47±0.7% in *P. nilgherrense* and absorbance values of ferrous reducing were 0.06±0.1 in both the lichens at 0.5 mg concentration. The methanol extracts of both the lichens were subjected to GC-MS for identification of compounds. The compounds Threitol, 4-Mercaptobenzoic acid and Methyl atrarate etc. in *P. nilgherrense* and DL-Glyceraldehyde, Phenylacetic acid in *R. sinensis* probably responsible for biological activities in the lichens as these compounds have exhibited similar activities in previous studies carried out elsewhere. As the information on the pharmaceutical importance of lichens is limited the present study is an important contribution in the area.

Keyword: Antimicrobials, MDR pathogens, DPPH, GC-MS, Lichen secondary compounds.

Argemone indica (Papaveraceae): a new species from the foot hill regions of Himalayas of Uttar Pradesh, India

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Abstract:

Argemone indica, from the foot hills of Himalayas of Mau district in Uttar Pradesh, India is described and illustrated. The proposed new species has a few morphological similarities with Argemone mexicana L. and A. ochroleuca Sweet and it also differs characteristically by having whitish green leaves & stamens, stout and thick stamens, creamy white anthers, fused stigma, ovate fruits and mildly ovate seeds.

Keywords: Argemone, Papaveraceae, Taxonomy, India, Himalayas.

New Six Sub-families of Legumes for Food and Medicine in U.P., India

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Abstract:

Legumes are potential source of protein and natural nitrogen fixing industry of the world, and great resources for food and medicine. One hundred twenty-six legume species were collected and identified from the area under survey with the limitations. Out of 126 species of trees, shrubs, herbs and climbers distributed all most all 75 districts and 18 division of Uttar Pradesh were done with possible efforts and time. In the present work, legume plant diversity assessment and its feasibility with documentation especially with reference to legume of Uttar Pradesh as model phytogeography region of India. It was concluded that

Fabaceae (old Leguminosae) is a good proxy for all over angiosperm diversity of vascular plants in many habitats and regions of the world. Legumes are only 8% of the whole world of vascular Plants. First assessment of the **legume diversity in Uttar Pradesh, India** with many habitats and because they comparatively larger family. They have great diversity of life form and functional traits; many species have a crucial function in ecosystem (mainly N2- fixation) and useful for humans. The Leguminosae were divided into six subfamilies on the basis of morphology, chemistry and chromosome numbers. The six subfamilies are

Cercidoideae, Detarioideae, Duparquetioideae, Dialioideae, Caesalpinioideae and **Papilionoidea**. The Comparative of these six subfamilies were studied. The specimen collected records from study area and data provide key resources for legume diversity at local as well as the global level for distribution, modeling and assessing states and trends of legume diversity. The present study provide indicators of the assessment is compared taxonomic diversity with phylogenetic and functional diversity to obtain an integrated picture of diversity. One of the major difficulties that are facing for the legume assessment is that the majority of plant species have too few specimen records to model their ranges using common approaches of distribution modeling. This difficulty can be overcome by coordinating collaboration of local herbaria and by developing a new modeling approach in which phylogenetic relationships between common and rare species are taken into consideration. Legume diversity is to be assessed by wider geographic collaboration among various scientists and additional financial support at local and global level for food and medicine.

Keywords: Legumes, New Six Sub-families, Diversity, Ecosystem Function, Food and Medicine

Functional and therapeutics potential of inulin

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Abstract:

In recent years, there has been a growing interest in inulin, a type of fructan carbohydrate, due to its potential for both functional and therapeutic applications. Inulin is extracted from various plant sources such as chicory roots, Jerusalem artichoke, and agave. It possesses unique physiochemical properties that make it versatile for a wide range of uses in the food, pharmaceutical, and nutraceutical industries. Our understanding of the human intestinal commensal microbiota and their metabolic products has deepened, shedding light on their role in maintaining host health. As this knowledge has expanded, new health-associated bacteria have emerged. In the pharmaceutical and nutraceutical sectors, inulin has shown promise as a deliver system for various bioactive compounds, including probiotics, antioxidants, and drugs.

Keywords: Inulin, fructan, prebiotic, functional food, gut health, therapeutics potential, delivery system, bioactive compound, beneficial microbes

Monitoring and Assessment of Endocrine Disrupting Compounds from diverse aquatic matrices

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Abstract:

Presence of Endocrine Disrupting Compounds (EDCs) and their transformation products in the aquatic environment may constitute a major hazard to humans. Since these contaminants were introduced or discovered relatively recently, there are gaps in our knowledge regarding occurrence, sources, fate, behavior, and techniques for their efficient removal. Most of the information about background concentrations, sources and dynamics are available from some of the most developed nations. The developing countries like India have limited information about most of the EDCs. Under this review we have conducted an evaluation of occurrence, sources, fate, ecological risk of the ECs from various matrices. Also, we addressed the rising concerns about these EDCs concentrations in aquatic systems (surface, groundwater, and wastewater). Due to their low concentration in the environmental matrices, these compounds pose a great difficulty in analyzing and quantify them from environmental matrices. We also assessed some of the analytical methods developed for the analysis of these compounds. In addition, we also have reviewed the various available methods for the treatment of these EDCs. Although many of the ECs are anthropogenic xenobiotics, their treatment presents challenges due to their synthetic nature. Despite this difficulty, certain technologies exist for treating these compounds, but their efficiency remains somewhat limited. We conclude with the view that we lack to evaluate the ecological risk of these compound and there should be more studies conducted to know about their ecological risks in the aquatic environment.

Keywords*: Endocrine Disrupting Compounds (EDCs), Occurrence, Aquatic environment*

Plant Alkaloids actas an Anti-diabetic Agent in Diabetic Mellitus

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Abstract:

The secondary metabolites i.e.alkaloids play an important role in the management of diabetic mellitus. Diabetic mellitus is a carbohydrate metabolic disorder which affects severe health problem around the world. Diabetic mellitus is an endocrine disorder characterised by hyperglycaemia caused mainly due to deficiency of insulin.Plant alkaloids show anti -diabetic activity through the inhibition of enzymes like alpha amylase , alpha glucosidase, aldose reductase, dipeptidyl peptidase-IV and protein tyrosine phosphatase 1B, inhibition of advanced glycation end Products, increment of insulin secretion and its sensitivity, enhancement of glucose uptake and their antioxidant ability. Plant alkaloids, a bioactive phytochemicalsare considered to be free from side effects. Many studies have confirmed that the alkaloids play an efficient role in management of hyperglycaemia and numerous alkaloids like other natural products regulate glucose metabolism either by inhibiting or inducing multiple proteins including AMP activated protein kinase , glucose transporters, glycogen synthase kinase -3, sterol regulatory element binding proteins, glucokinase, glucose- 6-phosphate, acetyl Co A carboxylase among the others. This studies have been conducted with the aim to help in exploring the use of alkaloids as an anti-diabetic agents.

Keywords: Phyto-alkaloids, anti- diabetic agent, sugar metabolism, hyperglycaemia, insulin.

Antifungal activity of essential oils in control of Alternaria alternata

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Abstract:

Preventing fungal deterioration in organic post-harvest fruit is a growing challenge and there is a need to develop innovative preservation approaches that comply with organic food standard. Preliminary experiments have shown that essential oils of different plants have some antifungal activities. In current study, essential oil derived from five aromatic plants were evaluated and compared for their antifungal efficacies against *Alternaria alternata*, an invasive post-harvest pathogen of tomato fruit. During screening of these essential oil (thyme, sage, nutmeg, Eucalyptus and cassia) against *A. alternata*, two essential oils viz. cassia and thyme were found to have maximum fungitoxic activity. The growth of A. alternata completely inhibited by cassia oil at 400 ppm. While, thyme oil showed Minimum inhibitory concentration (MIC) at 500 ppm. This study proves that, these essential oils were able to inhibit the Alternaria rot of tomato successfully. Therefore, the thyme and cassia oil can substitute the synthetic fungicides to manage the Alternaria rot of tomato in postharvest condition.

Keywords-: Alternaria alternata, antifungal, Cassia, essential oils, thyme.

Study on knowledge and adoption of improved Aonla production practices in Pratapgarh district of Uttar Pradesh

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Abstract:

Aonla is an important medicinal fruit of the berry group found in abundance of nutrients and vitamin C. India ranks first in the world in Aonla production. Purpose of this study to assess the knowledge and adoption of improved Aonla production practices. This study was conducted in Pratapgarh district of Uttar Pradesh. The research was framed with Ex-post facto design. The study was carried out in 12 villages randomly selected from two blocks of Pratapgarh district where Aonla was the major crop. A sample of 120 Aonla growers was randomly selected from selected villages. A semi structured interview schedule was administrated for data collection through personal interview method. Further, the data was analyzed by using appropriate statistical methods. This study reveals that majority of respondents know the Ploughing, harrowing, leveling, improve Aonla varieties Budding or softwood grafting, irrigation period, intercropping in Aonla practices, and adoption of improved practices in Aonla majority of respondent adopted the Land preparation **,** Transplanting July-August spacing adopted grafted or budded plants are planted 4-5 meter chemical fertilizer and manure management FYM**-** 10kg/per plant N.P.K-100:50:100g/per plant post- harvest Murabba, pickle etc. This study found that medium level of knowledge and adoption level of improved Aonla practices. We learnt from this study we should have complete knowledge for improved Aonla productiuon practices. We conclude this study Aonla growers had medium knowledge and medium adoption of improved Aonla practices.

Key Words : adoption, Aonla, knowledge, practices, respondent

A new tetraploid cytotype of *microlepia speluncae* (l.) T. Moore (dennastaedtiaceae - pteridophyta) from india.

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Abstract:

Microlepia speluncae (L.) T. Moore is a fern species mainly found in tropical humid forests.*M*. *speluncae* belongs to the family Dennastaedtiaceae. It has been presently collected from Kushmi forest, Gorakhpur, Uttar Pradesh. The tetraploid cytotype of n= 86 has been recorded for the first time for this species from India and the present study area becomes the third distributional area universally after Bon Island, Thailand & Sri Lanka. The sporangia and the spores have been found to be normal without any abnormalities.

Keywords: *Microlepiaspeluncae*, Dennastaedtiaceae, Cytotaxonomy, Tetraploid, Cytotype, and Kushmi forest, Gorakhpur, Uttar Pradesh, India.

Neuro-Psycopharmacological aspect of *Rauwolfia serpentine* L. Benth. ex Kurz.: An endangered plant

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Abstract:

The *Rauwolfia serpentina* plant, belongs to the Apocynaceae family; is a well-known medicinal since ancient times, but currently in the need for conservation. It has numerous pharmacological and therapeutic characteristics, which are mentioned in the AtharvaVed. It is known as a 'medullary stimulant' and possess neuro-psycopharmalogical properties. The presence of biofunctional compounds viz: alkaloids, flavonoids, glycosides, phlobatannins, phenols, resins, saponins, sterols, tannins, and terpenes, it shows potential in curing a variety of ailments. The plant parts, root and rhizome, have been utilized for ages in Ayurvedic remedies to treat a wide range of ailments including high blood pressure, hypertension, mental agitation, epilepsy, traumas, anxiety, excitation, schizophrenia, sleeplessness and insanity. Clinical and experimental evidences exhibit that *Rauwolfia serpentina* has potential for curing mental disorders. Reserpine which is clinically found to have analogy with Chloropomazine, has poteintial to cure anxiety disorders and nerve restlessness. The present review aims to evaluate the neuro-psycopharmacological aspect of *Rauwolfia serpentina* is like schizophrenia, anxiety, hyperactivity and other nervous disorders.

Keyword: Neuro-psycopharmacological, Indigenous drug, anxiety, *Rauwolfia,* secondary metabolites.

Estimation of cellulolytic activity and cellulase production by *Curvularia officinalis*, a destructive cellulolytic fungus.

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Abstract:

Curvularia officinalis Boedijin has been reported as a destructive cellulolytic fungus of Fungi Imperfecti group causing biodeterioration of objects of historical importance like library books, archives, paintings, historical monuments etc. This fungal species has been selected as test fungus in the present investigation for estimation of its cellulolytic activity and cellulose digesting ability. *Curvularia officinalis* was isolated from library books and pure culture of this test fungus was maintained on Potato Dextrose Agar (PDA) medium. Fungal disc of 6 mm diameter was now cultured in a solid medium containing water agar, Carboxymethyl Cellulose (CMC) and Kanamycin. This culture was incubated for 7 days at 30 ± 1^0C temperature. It was flooded with Gram's Iodine Stain and washed with water for clear observation. The clear zone around the fungal growth was measured, which showed cellulolytic activity and cellulase enzyme production by *Curvularia officinalis.*

Keywords: Cellulolytic Fungus, Cellulase, *Curvularia officinalis,* PDA Medium.

Desmodium gangeticum (L.) DC.: A Traditional Medicinal and Biofunctional Plant of India

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Abstract:

Desmodium gangeticum (L.) DC. (anshumati, Pivari, Dhruva, Dirghamoola and Shaalparni) is a well-known traditional Indian medicinal plant used to treat many imbalances and diseases. It belongs to family Papilionaceae (Fabaceae) which is an important plant found throughout India especially in Gangetic Plain. This plant is a great wealth of various naturally occurring Ayurvedic medicinal plants which have broadly pharmacological activities. It is main contain of Dashamoola for pitta mitigates. In Ayurveda several action of *Desmodium gangeticum* mention in single form as well as multiple compounds. The plant is used as a tonic, febrifuge, digestive, anticatarrhal, antiemetics, in inflammatory conditions of chest and in various other inflammatory conditions in the Ayurvedic System of Medicine. Phytochemical research revealed the plant is rich in alkaloids, pterocarpans, phospholipids, sterols and flavonoids. In this article the Botany, Chemistry and traditional uses of Desmodium *gangeticum* is presented.

Keywords: *Desmodium gangeticum,* Traditional Medicine, Ayurvedic System of Medicine, Phytochemicals, Bioactives, Pharmacological Activities

Disjunct distribution of *Cyclosorus striatus* (Schum.) Ching (Thelypteridaceae-Pteridophyta): a new record to India

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Abstract:

Cyclosorus striatus has been considered to be limited to tropical Africa. The present collection from Kushmi Forest & Tikonia forest, Gorakhpur, Uttar Pradesh, India is a disjunct distribution and a new record to India. Universally, this species has been reported only from the Central African continent and the present report from the foot hills of Himalayas becomes the second distributional area.

Keywords: *C. striatus*, Gorakhpur, India, Pteridophyte, Thelypteridaceae, Uttar Pradesh

POPULATION STUDY OF *FLACOURTIA JANGOMAS* (LOUR.) RAEUSCH. IN GORAKHPUR DISTRICT

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Abstract:

Flacourtia jangomas (Lour.) Raeusch, a member of family Salicaceae, is commonly known as coffee plum, Indian plum, Indian cherry or Paniala. It is a tropical deciduous tree which is native to India, Bangladesh and Myanmar. It is cultivated for its edible fruits throughout Southeast Asia, Eastern Malaysia and Philippines. In India, it is mainly grown in North-Eastern Terai region of Uttar Pradesh, Bihar, Maharashtra, West Bengal, Assam, Odisha and some parts of South India. It is an important indigenous fruit tree of Gorakhpur district. Most of its population are planted in the outskirt of Gorakhpur and adjoining regions. In the present study, a detailed population survey of *F. jangomas* was done in and around Gorakhpur district. The population survey was conducted between 2020 to 2023 and 93 places were marked along with the GPS data in Gorakhpur and adjoining regions. A total 1,331 trees of *F. jangomas* were observed with 161 male and 1170 female trees. During a recent survey of the same marked locations, only 1042 trees were observed with 144 male and 898 female plants left. Also, there was no new plantations observed during the surveyed years. Local orchard owners and fruit sellers were interviewed through questionnaire for finding the reasons behind the increased price of fruit/kg and declining populations. It was found that due to indiscriminate development, increased urbanization, change in rainfall pattern of Gorakhpur and adjoining regions and infection caused by insects and pest in the leaves, flowers and fruits has affected its flowering pattern which resulted into low fruit set. Also, it was observed that the number of male trees is declining which is also the main cause of low fruit set and increased price/kg. Thus, further studies on the details of key events of the reproductive cycle of *F. jangomas* will prove vital to its sustainable utilization as a fruit crop and its conservation.

Keywords: *Flacourtia jangomas,* Salicaceae, population study.

About University

Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur established in 1957 and the first University to be established in Uttar Pradesh after Independence has constantly striven to live up to its motto, "Let noble thoughts come to me from all directions" assimilating diverse ideas, people and beliefs into its academic and corporate lives. Named after the great political thinker, Pandit Deen Dayal Upadhyaya, the University is located in the city of Gorakhpur and inherits the spiritual, philosophical, patriotic, philanthropic legacy of Buddha, Kabir and Guru Gorakshnath, Bismil, Hanuman Prasad Poddar and the Geeta Press. Spread over 190.96 acres, it houses seven Faculties comprising of thirty departments that have played a significant role in imparting holistic education to the people of the Eastern Uttar Pradesh, Western Bihar, and Nepal since its inception. As a residential-cum-affiliating State University whose academic jurisdiction spreads across three districts of Eastern Uttar Pradesh it can boast of a rich academic legacy, illustrious alumni, experienced, qualified and dedicated faculty members, transparent and effective administrative set up, state-of-the art library, ample career growth opportunities, advanced research facilities and a vibrant and safe campus.

About the Department

The Department of Botany, of this University came into existence with the establishment of the Faculty of Science in 1958. Dr. Rajendra Sahai, was the first Head of the Department. The second head was Prof. K.S. Bhargava, who has initiated research in Mycology and Plant Pathology in the Department. His successor was Prof. S.N. Mathur, and then Prof. S.N. Dixit, Late Prof. R.D. Joshi, Prof. P.C. Mishra, Prof. Rajendra Singh. Prof. Kamal a well known mycologist, Prof. S.K. Singh, a great taxonomist, Prof. (Mrs.) Kalawati Shukla, Prof. S.C. Tripathi, Prof. Nisha Misra, Prof. P.P. Upadhyaya, Prof. R. P. Shukla, and Prof. V N Pandey headed the department in sequence. Recently Prof. Pooja Singh has succeeded the headship and in her leadership every area of the department has been upgraded and University was awarded A++ grade in NAAC. Now the Present head of the Department is Prof. Anil K. Dwivedi, who is a dynamic personality, and has taken initiative for MoU with IIVR and organizing Conferences within a month of his joining, definitely the department will gain new height in his leadership.

About Gorakhpur

Gorakhpur, a city on the banks of the Rapti River in eastern Uttar Pradesh, is a gateway to Hinduism and Buddhism. It is also a gateway to a cleaner, greener future. The city has a long history of religious and cultural diversity. It was once part of Lord Rama's renowned Koshla kingdom, and its history can be traced back through a number of popular dynasties such as the Nandas, Sungas, Sishunagas, and Mauryas. In the 12th century, Baba Gorakhnath, a saint, founded the Gorakhnath Math, a Hindu monastery that has become a major center of learning and spirituality.

In recent years, Gorakhpur has also become a major center for environmentalism. Under the leadership of Yogi Adityanath, the Chief Minister of Uttar Pradesh, the city has made significant progress in cleaning up its rivers and improving its air quality. The government has also planted millions of trees and promoted sustainable development.

One of the most notable institutions in Gorakhpur is Gita Press, the world's largest publisher of Hindu religious texts. Gita Press was founded in 1923. The press has published over 400 million books in 14 languages, including the Bhagavad Gita, the Ramayana, and the Upanishads. Gita Press has also been active in promoting social and cultural reform, and it was awarded the Gandhi Peace Prize in 2021 for its contribution to peace and non-violence.

About the Conference

Plants and microbes play a vital role in providing essential resources for humanity's survival. They offer sustenance, shelter, medicines, and the life-sustaining oxygen we breathe. Moreover, they contribute to a cleaner environment and serve as the foundation for various aspects of our lives. Today, we harness the power of plant and microbial technology in innovative ways to develop therapeutic products for medicine, create resilient crops for agriculture, particularly in the realm of pest control and nutraceuticals, and explore numerous other applications. Another rapidly emerging field within the realm of Biological Sciences is the exploration of microbes for their potential in medicine, agriculture, pest management, nutraceuticals, and more. This approach is revolutionizing its applications in agriculture and food technology. The focus of this conference is to spotlight new inventions, process developments, and the applications of plant and microbial sciences for the betterment of humanity. The event is designed to provide a collaborative platform for researchers and academics to delve into the current state of products and technologies rooted in plants and microbes, as well as their promising future prospects. This conference will feature a series of presentations by distinguished speakers and experts from various disciplines, along with research presented through both oral and poster presentations.

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AND

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