Abstract Volume

INTERNATIONAL SEMINAR ON RECENT DEVELOPMENTAL TRENDS IN BIOLOGICAL RESEARCH

Date: 15th July, 2023
Venue: Acharya Prafulla Chandra College

EDITORS

Dr. Nithar Ranjan Madhu, Bhanumati Sarkar, Dr. Sutapa Biswas,
Dr. Mouli Saha, Dr. Ram Prasad Mukhopadhyay,
Sri Goutam Biswas & Dr. Soumosish Paul

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on
Recent Developmental Trends in Biological Research

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Organized by
Department of Zoology & Botany, Acharya Prafulla Chandra College
in Collaboration with
IQAC of Acharya Prafulla Chandra College

International Seminar on Recent Developmental Trends in Biological Research

Editors: Dr. NitharRanjanMadhu, BhanumatiSarkar, Dr. SutapaBiswas, Dr. MouliSaha, Dr. Ram Prasad Mukhopadhyay, Sri Goutam Biswas & Dr. Soumosish Paul

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Acharya Prafulla Chandra College

Acharya Prafulla Chandra College

About the College:

Acharya Prafulla Chandra College began its journey in 1960 under the leadership of Late Sri HaripadaBiswas, a social activist. It was indeed a very humble, struggling and hasty beginning. The primary aim was to provide opportunities for higher education to students of refugee families settled in New Barrackpore colony. At that juncture, education was altogether a different challenge for migrant children. In the last several decades, the college has elevated itself to a premier institution with an ambition of touching the level of excellence. The college successfully runs degree courses in more than 25 subjects at both Honours and General levels, eight Post Graduate courses and two distant learning centres such as Netaji Subhas Open University and Rabindra Bharati University.

Location:

The college is situated on Sodepur Road. The close proximity of the college to New Barrackpore and Madhyamgram railway stations has helped it draw students from far-flung areas of North 24 Parganas. Bus routes also conveniently connect the college with both Jessore Road and B. T. Road. Mission Today's Higher Education has witnessed a paradigm shift from elitist esotericism to common man's right to knowledge. This college is trying to adapt itself to this new way of thinking. The semi-urban location of the college caters to the needs of students who come from the grass-root level; some of them are even first-generation learners. The college is trying hard to set a pedagogic goal that is less hectoring and instructional and more learner-facilitating.

Towards This Mission:

With this aim in mind, the college is successfully running Degree Courses on 25 Honors and General subjects, eight Post Graduate Courses in Microbiology, Electronic Science, Chemistry, Physics, Mathematics, Bengali, History and Computer Science and two Distant Learning centres. The growing demands of the job market have prompted this college to introduce the study of comparatively modern subjects. However, the college is equally keen on simultaneously teaching traditional subjects. Moreover, a professional course like BBA is also operational. The mode of Distance Education has received a great impetus in this area through

the Netaji Subhas Open University Study Centre. There is scope to study computer science at three levels in the college. For students wanting to master the subject, the college offers post-graduate in Computer Science, Computer Science Honours for those who would learn computer Science as an auxiliary, vocational discipline. Over and above, the Institute of Computer Engineers (India) runs a computer centre named 'A.P.C. College Computer Centre' for all categories of students from inside and outside the institution. The courses here are tailor-made to meet the requirements of enterprising boys and girls. So, the college intends to harmonize the traditional and experimental outlook.

ABOUT THE BOTANY DEPARTMENT

The under graduate department of Bioscience was established in the year 1981. It started imparting B.Sc. honours course from 2001 onwards. At present, there are two permanent Assistant Professors, one Associate Professor, three qualified SACT Teachers and onepermanent laboratory attendant. The department has been conducting remedial classes for weaker students, arrangement of special theory and practical classes, interactive discussion, internal assessment, students' seminars, cultural programme, quiz competitions, plantation programme, health consciousness programme etcfor the students. The department has been conducting annual field trips to different phyto-geographical places to give the students better field exposure. Besides these, the department arranged Guardian meetings and reunions with ex-students and Alumni members. The students of this subject observe 'Teachers Day' every year with due respect.

ABOUT THE ZOOLOGY DEPARTMENT

The Zoology Department started in 1981 as the Department of Bio-Science. The college was favoured with the extension of affiliation up to honours level in the year 1994. There are one Associate permanent Professor, three Assistant permanent Professors, three qualified SACT teachers and two non-teaching Staff (laboratory attendants). Four teachers have Ph.D. as their highest qualification & one teacher secured her M.Phil. degree. The students of this subject observe 'Teachers Day' every year with due respect. The department has been conducting remedial classes for weaker students, arrangement of special classes, interactive discussion, internal assessment, students' seminars, exhibitions, cultural programmes, quiz competitions, plantation programmes, health consciousness programmesetc for the students. The department has been conducting annual field trips to different places to give the students better field exposure. Besides these, the department arranged Guardian meetings and reunions with ex-students and Alumni. Department of Zoology organized every year *'INTERACTION'*, which is a seminar cum get-together with existing staff, students, ex-students & retired teachers. The principal or most senior teachers distributed prizes to our ex-students who secured first-class marks in the final examination to encourage the present students. All Alumni members are members of 'NATURE CLUB' to try to save Mother Nature. Students also published a wall magazine *'CANOPY'*.

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Acharya PrafullaChandra College

(NAAC ACCREDITED 'A' GRADE COLLEGE) (Govt. Sponsored)

P.O. New Barrackpore, North 24 Parganas, Kolkata-700131, West Bengal

Message from President

It's my great pleasure to address all of you today at this esteemed International seminar on "Recent Developmental Trends in Biological Research". As an academician, I'm ecstatic to see the confluence of brilliant minds from all over the world who are motivated to further our grasp of how complex life is. Our quest for knowledge and innovation has always placed a specific emphasis on biological research. It is a field that consistently challenges our understanding while helping us understand the workings of life itself and solving the mysteries of existence. We experience amazing discoveries every day that alter our perception of biology and create new opportunities for the advancement of humanity.

The subject of the seminar is highly significant in today's world. Recent trends in biological research progress are nothing short of amazing. These developments have increased our understanding and given us previously unheard-of opportunities to tackle some of the most urgent problems of our day.

The rapid growth of genome sequencing technologies is one of the major trends in biological research. High-throughput sequencing has revolutionized our understanding of the DNA code containing life's instructions. This has paved the way for personalized medicine, allowing us to modify a patient's course of therapy in accordance with their genetic profile. Furthermore, genomics has expanded our knowledge of complicated diseases by revealing the genetic variables contributing to them and creating new opportunities for targeted treatments.

Synthetic biology, a new subject, is another important area of development. Researchers are developing unique biological systems and tools by fusing engineering and biology, which has the potential to revolutionize sectors like healthcare, energy, and agriculture. Synthetic biology holds great promise for addressing major global issues and enhancing human welfare, from altered microbes for sustainable biofuel production to artificial organs for transplantation.

Additionally, bioinformatics and computational biology improvements have allowed researchers to manage enormous amounts of biological data and draw valuable conclusions from challenging datasets. Data analysis and biological research have produced ground-breaking findings that have advanced our understanding of biological processes and made finding novel medication targets and treatments possible.

Yet another area that has made great progress is regenerative medicine. Thanks to scientists' pioneering efforts to restore damaged tissues and organs, numerous people suffering from degenerative diseases and traumas have hope. Regenerative medicine has the potential to transform healthcare and improve quality of life through techniques like tissue engineering, stem cell therapies, and 3D bio-printing.

These are only a few instances of the current developments in biological research that are changing how things are done globally. The incredible progress we have accomplished is a result of the worldwide effort, inventiveness, and cooperation of researchers, scientists, and institutions. Through such worldwide seminars, we stimulate discussion, exchange knowledge, and create relationships that fuel scientific advancement and societal advancement.

Let's celebrate the spirit of exploration and creativity that characterizes the area of biological research as we assemble here today. Let's discuss potential solutions, question presumptions, and imagine a time when biology is key to resolving some of humanity's most serious problems. We can discover the mysteries of life and open the door to a better, happier, and more sustainable future for everyone when we work together.

I am sure scholars from various parts of the country will assemble in Acharya Prafulla Chandra College & contribute significantly to expansion of knowledge and research in the relevant area of scientific specialization. I convey my hearty greetings & best wishes for the grant success of the seminar. Thank you so much again for organizing this seminar, Department of Zoology, Botany and IQAC, and may it be a grant success.

Dr. Nikhil Chandra Halder
President, Governing Body,
Acharya Prafulla Chandra College

To
Dr. Nithar Ranjan Madhu & Mrs. BhanumatiSarkar,
Organizing Secretaries of the International Seminar,
Acharya Prafulla Chandra College

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Message from Organizing Chairman & Teacher in Charge

I am extremely pleased to learn that my institution's Department of Zoology, Botany, and IQAC will host an international seminar on July 15, 2023, with the theme "Recent Developmental Trends in Biological Research." I would like to send my best greetings to everyone attending the International Seminar on Recent Developmental Trends in Biological Research. It gives me great pleasure and honour to do so. I am honoured to welcome eminent scientists, researchers, professors, students, and business people from all over the world as the chairman of this distinguished event.

In recent years, the field of biological research has made remarkable advancements that fostering our understanding of the intricate mechanisms of life. We will share and discuss the most recent innovations, discoveries, and trends that are influencing the direction of biological research during these lectures.

We will explore a wide range of subjects and areas of biological study during this session. Sessions on genomics, proteomics, synthetic biology, molecular biology, biotechnology, bioinformatics, and a host of other intriguing fields are on our itinerary. As we consider the potential applications of biological findings in diverse fields, these conversations will cover both basic research and applied research.

We have put up a line-up of eminent speakers who are leaders in their respective fields. Their perceptive presentations and thought-provoking discussions will definitely encourage academic conversation and suggest fresh lines of inquiry. Additionally, the seminar offers a fantastic setting for participant networking and collaboration, which will progress the area even further.

It is essential to acknowledge the enormous influence that biological research has had on society as we come together to share knowledge. Healthcare, agriculture, environmental sustainability, and numerous other sectors could be completely changed by our discoveries. Because biological research is interdisciplinary, it requires cooperation and synergy between researchers with various specialties. We can advance knowledge and tackle some of the most important issues confronting humanity by working together.

In order to make this seminar a reality, the organising committee, sponsors, and partners deserve nothing less than my sincere gratitude. Your devotion and commitment to creating a forum for scientific conversation and encouraging innovation are vital.

Last but not least, I urge everyone to actively participate in the seminar sessions, present your research findings, and offer your viewpoints. As we set out on this

fascinating journey to investigate current developmental trends in biological research, let's embrace the spirit of cooperation, intellectual curiosity, and scientific rigour.
We hope your seminar experience is both interesting and worthwhile. We hope that this seminar will motivate us to advance biological research's frontiers and pave the road for a better future.

Thank you,

Dr. Syed Rafi Ahmed
Teacher-in-Charge &
Organizing Chairman of the International Seminar
Acharya Prafulla Chandra College

Message from IQAC Coordinator

Biology is intimately entangled with every sphere of life. Changes in global ecology demand intensive research in the realm of biology to combat with the newly emergent threats of the domain of microorganisms. Leading a hassle-free, smooth and healthy life mostly depends on the innovations in the field of biological science. Previously research works in the field of biological sciences used to be carried out segment wise i.e., Zoology, Botany, Physiology etc. However after the knowledge explosion in the past few decades, interdisciplinary and collaborative research has become an integral part of modern-day research.

Recently this planet has gone through a viciously difficult situation caused by the outbreak of COVID 19. Prolonged pandemic situation has brought radical change in the physiological aspects of human beings. Biological research has become even more important in respect of the mutations that occurred in microorganisms during the pandemic period.

It gives me immense pleasure to announce that departments of Zoology and Botany of our institution are going to organise an international seminar on Recent Developmental Trends in Biological Research. I firmly expect that issues related to various aspects of human life will be thoroughly spotlighted in this seminar. Abstracts submitted in the seminar will be published in the form of an abstract book which will provide a glimpse of the topics covered in the seminar.

I wish a grand success of this international seminar and expect that lecture sessions in the seminar will be followed by fruitful interactive sessions to enlighten the listeners about the thrust areas of modern day Biological Research.

Dr. SubhojitGhosh
IQAC Coordinator
Acharya Prafulla Chandra College

Message from Organizing Secretaries

We are pleased to welcome you all to this important event on behalf of the Organizing Secretaries for the International Seminar on "Recent Developmental Trends in Biological Research". It is essential for scientists and researchers from all around the world to come together to exchange their knowledge, thoughts, and findings as the area of biological research has been developing quickly. This seminar seeks to serve as a thought-exchange forum and promote teamwork among specialists in various biological research subfields.

This year's lecture will focus on "Recent Developmental Trends in Biological Research," which reflects the field's dynamic nature. A varied and thought-provoking programme that will cover a wide range of themes has been assembled by us.

We have distinguished keynote speakers who are well-known authorities in their professions on our invitation list. Their seminars will offer insightful information and stimulate creative thinking. Participants will be able to submit their research findings through oral presentations and poster sessions in addition to the keynote addresses and Scientific Sessions (I & II).

We have established a scientific committee with renowned researchers to ensure the highest standards of scientific rigour and quality. For oral and poster presentations, they will evaluate and choose the best abstracts. All attendees are encouraged to submit their abstracts and participate in the seminar's scientific discussion.

We are aware of the difficulties the on-going worldwide pandemic presents. You may be confident that we will adhere to all mandatory health and safety precautions as recommended by regional and international health authorities. On our official website, you can find information about the seminar, including how to register and the rules for submitting abstracts.

I sincerely appreciate your interest in and participation in this International Seminar on "Recent Developmental Trends in Biological Research" on behalf of the organising committee. Let's push the boundaries of knowledge, encourage partnerships, and reshape the direction of biological research together. Additionally, we want to put this seminar to use in the hopes that it will adequately address this important biological research, offer a venue for the sharing of thoughts and information, and heighten awareness of the importance of conserving the environment.

Dr. Nithar Ranjan Madhu & Mrs. BhanumatiSarkar,
Organizing Secretaries of the International Seminar,
Acharya Prafulla Chandra College

Message from the Desk of Convenors

On behalf of the organizing committee, it is with great pleasure to welcome all the participants of the International seminar "Recent Developmental Trends in Biological Research". We are really excited to have such a prestigious gathering of great minds and accomplished scholars from different domains. We are looking forward to hearing from each and every one of you.

As we know, Biological Science is a rapidly developing field, and seminars provide a forum for experts in the field to get together to exchange information, spark new lines of inquiry, and forge productive working relationships with one another. The abstracts submitted in the seminar will play remarkable role in advancement of Biological Research which is reflected in our focus on contemporary trends in the discipline. Our minds have been fascinated by the amazing developments in quantum information and computing as well as the ground-breaking discoveries that have been made in a wide variety of scientific fields. These discoveries have pushed the boundaries of human understanding.

We believe this seminar will serve as a platform for the formation of new relationships and interdisciplinary collaborations that will inspire the next generation of Biological Researcher. We hope you all have an interesting and fulfilling seminar experience. Your contributions, comments and discussions may enrich our goal.

We are grateful for continuous support received from each and every section of the college.
With warm regards,

Dr. SutapaBiswas& Dr.MouliSaha
Jt. Convenors

Message from the Desk of Co-Convenors

We are highly indebted to the Internal quality assessment cell, Department of Botany and Department of Zoology of Acharya Prafulla Chandra College, New Barrackpore to organize International seminar on " Recent Developmental Trend in Biological Research''.

This Seminar will be able to explore different corners of recent trends of biological research development. We strongly believe that this International seminar will usher solemn thoughts in mankind and will immensely help young budding researchers innovate ways to bring unbeaten lives for human beings on this planet.

We wish this conference a grand success in all aspects and shall be able to enrich the treasure of knowledge of our department.

Dr. Ram Prasad Mukhopadhyay, Sri Goutam Biswas, Dr. Soumosish Paul
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CONTENTS

Electronic nicotine delivery systems (ENDs) initiate reprogramming of lung stem cells

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Abstract

Several scientific publications showed that the electronic nicotine delivery systems (ENDS) aerosols consist of various carcinogens such as diacetyl, propylene glycol, acetaldehyde, acetyl propionyl (2,3-pentane dione), acetyl propionyl (2,3-pentane dione), formaldehyde, crotonaldehyde (2-butenal), acrolein, acetone, arsenic, cadmium, nicotine, Polonium-210 as well as lead-210. There was a lack of research studies illustrating the mechanism of epigenetic reprogramming of human lung stem cells caused by above mentioned carcinogenic aerosols of ENDs. Here, we report the carcinogenic effects of ENDS aerosols, as well as the mechanism of epigenetic reprogramming analyzing the bioinformatics databases namely, AACR Genomics Evidence Neoplasia Information Exchange (GENIE) database, NIH Toxicology Data Network (TOXNET), Comparative Toxico-genomics Database (CTD), and the database of the National Institute of Environmental Health Sciences (NIEHS). We observed from CTD analysis that the chemical gene interactions indicated roughly 3% of genes highly affected by diacetyl and propylene glycol. The CTD analysis revealed that the chemical gene interactions of affected 9 genes with miR140 by formaldehyde and propylene glycol among a total of 3983 genes; 5 genes by acetaldehyde, acetaldehyde, and propylene glycol, among a total of 275 genes; 1 common gene by crotonaldehyde (2-butenal) and propylene glycol, among 227 genes; 7 common genes by acrolein and propylene glycol among 2185 genes; 18 common genes by nicotine and propylene glycol, among1244 genes; 11 common genes by arsenic and propylene glycol, among 4983 genes. The lead-210 and Polonium-210 of ENDs have been informed as Group 1 human carcinogens as well as release alpha particles. The alpha particles-initiated DNA lesions, as well as gene mutations in human lung stem cells. The alpha particles reported having long-term chromosomal variability in primary human T lymphocytes. Epigenetic mechanisms of histone modifications of above-mentioned potential carcinogens have been revealed by the analysis of the database of NIH Roadmap Epigenomics Mapping Consortium. Our current analysis showed that the Mitogen-activated protein kinase 1(MAPK1) is epigenetically reprogrammed by the interaction of 10 different highly expressed genes.

Key Word:

Electronic nicotine delivery systems (ENDs), lung stem cells, Cancer, carcinogens.

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Cancer health, students learning and application of Artificial Intelligence (AI) techniques

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Abstract

Recently scientific studies reported that the application of artificial intelligence (AI) in cancer healthcare can be a game changer for medical professionals to create a more cognizant decision built on more truthful information that is helpful for reducing time, cutting costs as well as enlightening medical data management as a whole. Therefore, AI is redesigning the field of cancer health by giving new instruments to detect cancer, personalized treatments, and achieve patient cares. However, as emerging applications of AI techniques, we focused on knowing how our student population can acquire and have some, knowledge and, awareness to become as future healthcare professionals. Here, we report how students can learn about different types of cancer biomarkers, predictive models, causes of vulnerable age groups, and data management, by a computer algorithm recognized by humans or well-read by the computer to provide decisions and perform different jobs. We used Jupiter Lab and bio python for image analysis of different cancer stem biomarkers levels in different stages of cancer tissue microarrays. We also observed the application of machine learning techniques where we are providing the computer to discern benign pathology, benign pathology from malignant pathology, and so we train the computer with annotated regression (R) datasets to evaluate the differences of histology, immunofluorescence RGB images of benign vs malignant tissue arrays. Our current studies showed how students with different backgrounds and health professionals can learn AI applications to improve cancer health.

Key Words:

Cancer, Artificial Intelligence (AI) techniques, healthcare.

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Scope of Polar Biological research through Indian Antarctic program

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Abstract

Antarctica, the remotest, coldest, windiest, driest, loneliest continent of the world is famous for its extreme environment. It contains almost 80% of the world's freshwater, yet it is the largestcold desert on the Earth. The continent is the coldest place on Earth because of the long polar night and the low inclination of solar rays during the summer. Here no human habitation exists except few scientific research stations, field research is very difficult and expensive, thus it became a continent for scientific research. Antarctica known as climate engine of the earth due to its immense role in global climate change issue. Scientific research on Antarctica is very much necessary for the sustenance of global environment. This lecture will basically focused on the scope of biological research for the young researchers through Indian Antarctica Program organized by National Centre for Polar and Ocean Research (NCPOR), Ministry of Earth Science, Government of India. India is having two very well equipped research stations namely *Maitre* and *Bharti* in Antarctica for conducting various interdisciplinary studies specially focusing the extreme cold environment. Antarctica can give necessary information for better understanding the extreme environmental processes and the response of ecosystems to climatic and environmental change. Greenhouse effect and climate change are having intense impact on the polar ice caps. These increases of temperature are responsible for melting of the Antarctic ice sheets, which would increase global sea levels, is one of the major concerns of twenty first century. The other scopes of research are effect of increased ozone and cosmic radiations on Antarctic biota, unique biodiversity along with extreme cold tolerance mechanisms etc. Endemic plant and animal species of Antarctica are another concern for scientific research interest. The major floral composition found in these regions represents mainly different psychrophilic bacteria, algae, lichen and moss, angiosperm species are very scarcely found in Antarctic region. A skua, petrels, different types of penguins, seals, whales represents the major faunal compositions which cater immense research attention. Thus Indian Antarctic Program is an excellent opportunity for the young enthusiastic researchers to explore the new dimension of scientific research in Antarctica.

Key Words:

Antarctic program, cold environment, Polar, Maitre and Bharti, Ocean Research.

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A Comprehensive Analysis of Wastewater Treatment

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Abstract

The process of wastewater treatment is crucial for preserving environmental sustainability and public health. Through a multifaceted approach, this study seeks to give a thorough examination of wastewater treatment, taking into account a variety of factors such as technology, effectiveness, environmental impact, and cost-effectiveness. The study starts out by going over the prior research on wastewater treatment methods and noting both their benefits and drawbacks. The most recent developments in treatment technologies are then examined, including biological treatment, physio-chemical procedures, and cutting-edge developments like membrane filtration and high-tech oxidation techniques. The study also compares the effectiveness of various treatment techniques by evaluating important factors like the effectiveness of pollutant removal including organic matter, nutrients, and heavy metals, energy consumption, and sludge production. It looks at the operational circumstances, hydraulic retention time, reactor design, and other aspects that affect treatment performance. The analysis of the environmental effects of wastewater treatment operation also considers as the production of bio-solids, the release of greenhouse gases, and potential effects on aquatic ecosystems. Anaerobic digestion and resource recovery are two options that are evaluated in the study for their potential to lessen the environmental costs associated with wastewater treatment. In addition, cost-benefit analysis, life cycle evaluation, and capital and operating costs related to the economics of wastewater treatment are taken into account. The study looks at the trade-offs between various treatment methods considering financial viability in the long-term.In conclusion, this multifaceted study offers insightful comprehension of the technological, efficacy, environmental, and economic aspects of wastewater treatment. The findings are intended to assist practitioners, researchers, and policymakers in creating cost-effective and resource-efficient wastewater treatment strategies that can successfully manage environmental pollution.

Key Word:

Water pollution, anaerobic digestion, environmental sustainability, resource efficiency.

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Effect of point sources of pollution and heavy metal contamination in riverine ecosystem

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Abstract

The present study aims to analyze the bioaccumulation of heavy metals in the fish population as well as the effects of various sources of pollutants on the water quality of a river ecosystem. Water quality degradation from pollution from point sources, such as industrial discharges and municipal wastewater treatment, has been acknowledged as a significant factor and a possible hazard to aquatic life. Water samples were taken upstream and downstream of point sources as well as at various points along the river in order to accomplish these goals. Physical and chemical characteristics of these samples, such as pH, dissolved oxygen, turbidity, conductivity, and nutrient concentrations, were examined. In addition, accumulation of heavy metals,including lead, mercury, cadmium, and chromium were assessed in fish tissues and water samples.Significant differences in water quality metrics were found between the upstream and downstream sampling sites. In comparison to the upstream, the downstream that were affected by the point sources showed higher accumulation of contaminants and lower water quality metrics. The quantities of heavy metals in the water samples were higher than the permissive limit, indicating pollution from specific point sources. Fish samples were taken from various places along the river and examined for the presence of heavy metals to determine the bioaccumulation. The results showed a greater build-up of heavy metals, especially in fish living in downstream areas impacted by point sources. These findings imply that fish population in the river ecosystem is exposed to high concentrations of heavy metals, which can be harmful to both their health and ecological balance as a whole. This study highlights the requirement for efficient management approaches to curb and lessen pollution from point sources. To stop future deterioration of water quality and safeguard the fish habitat, it is crucial to implement strict restrictions and cutting-edge treatment technology for industrial and municipal wastewater discharge. To evaluate the effectiveness of pollution control measures and assure adherence to environmental requirements, regular monitoring programmes should be implemented. Overall, our study underlines the dangers associated with heavy metal bioaccumulation in the fish ecosystem and offers insightful information about how point sources of pollution affect river water quality. The results highlight how urgent it is to take proactive steps to protect the wellbeing of aquatic ecosystems and advance sustainable water resource management.

Key Word: River, pollutant, heavy metal, bioaccumulation, fish

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Effect of Agrochemicals on the Environmental and Human Health

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Abstract

To increase crop output and control pests, modern agricultural practices now frequently use agrochemicals, such as insecticides, herbicides, and fertilizers. However, there are concerns regarding these agrochemicals' possible effects on the environment and human health due to their excessive and indiscriminate application. Main ramifications of the investigation into the effects of agrochemicals on the environment and human health are summarized here. Effects of agrochemicals on the environment are complex. Herbicides and pesticides have the potential to linger in the environment and contaminate soil, water, and air. These chemicals can be carried by runoff from agricultural fields to surrounding aquatic bodies, resulting in water pollution, and having an impact on aquatic life. Additionally, pesticides may unintentionally affect species that are not their intended targets, such as beneficial insects, birds, and mammals, altering ecosystems and biodiversity. Overuse of fertilizers can cause nutrient runoff, which contributes to eutrophication in water bodies and can cause severe algal blooms and oxygen depletion. A major issue is the effect of agrochemicals on human health. Pesticide exposure through work-related handling, eating contaminated food, or living in treated regions has been linked to a number of health problems. Adverse effects on the neurological system, reproductive health, endocrine disruption, and an elevated risk of several cancers have been associated to acute poisoning occurrences and chronic exposure. The build-up of pesticide residues in food poses significant dangers to consumers, particularly at-risk groups including young children, pregnant women, and babies. A multifaceted strategy is needed to reduce the negative impacts of agrochemicals on the environment and human health. The usage of agrochemicals can be minimized through the use of Integrated Pest Management (IPM) techniques, which place an emphasis on using alternative pest control strategies and reducing chemical inputs. Pesticide and fertilizer applications that are targeted can help to reduce the toxic load in the environment. Agrochemicals can also be handled and disposed safely by adhering to tougher legislations, better labelling, and education programmes. Despite their critical contribution to increasing agricultural output, agrochemicals pose serious dangers to the environment and public health when used carelessly. Adoption of sustainable agricultural practicesand utilization of alternative pest management techniques can reduce these hazards and promote a healthier and more environmentally sound agroecosystem.

Key Words:

Fertilizer, pesticide, integrated pest management, sustainable agriculture.

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Past, Present, and Future of Edible Insects: Potential for Future Application

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Abstract

Insects have been consumed for ages and are becoming more popular as an alternative and sustainable food source. This study covers edible insect history, traits, benefits, hazards, and future prospects. Ancient archaeological sites show that humans ate insects. Due to their availability, nutritional worth, and cultural significance, many societies have used insects in their diets and cooking. Industrialization and Western diet patternhave reduced insect eating in many regions. However, edible insects have been gaining popularity due to a number of benefits. Edible insects provide high-quality protein, necessary amino acids, healthy fats, vitamins, and minerals. They need less land, water, and feed than livestock, making them environmentally friendly. Insects can also be raised from organic waste, helping the circular economy. Edible insects have risks despite their benefits. On the other hand, allergic and toxic species are a major cause for concern. Food safety requires proper processing, preparation, and regulation. Some cultures view insects as food, which requires understanding and societal acceptance. Edible insects have a bright future as alternative foods are in high demand due to a growing population, environmental concerns, and the search for sustainable protein sources. Hence, edible insects can improve food security and sustainable development. Research on edible insect rearing, processing, and product formulation is ongoing to improve acceptance and integration into mainstream diets. Finally, edible insects are a sustainable food source with a long history of usage. Despite concerns, their use in food, feed, and other areas seems promising. To maximize edible insect potential and assure food system sustainability, further research, regulatory assistance, and cultural acceptance are needed.

Key Words:

Entomophagy, insect, alternative food, nutrition.

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A Global Perspective on the Prevalence of Overweight and Obesity

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Abstract

The prevalence of overweight and obesity has been rising at an alarming rate over the past few decades, and they have now emerged as major global public health concerns. Using significant findings from recent studies, this study seeks to provide a brief overview of the current global situation regarding the incidence of overweight and obesity. Overweight and obesity are both classified by the World Health Organization as abnormal or excessive fat build up that poses a health concern. An energy imbalance between calorie intake and calorie expended is the main cause of these disorders. The effects of being overweight or obese are extensive, with a variety of socio-economic, psychological, and medical repercussions. According to recent research, the prevalence of overweight and obesity has reached pandemic levels throughout the world. People of all ages are now being affected by these conditions, which have become more prevalent in both developed and developing nations. Changes in eating habits, sedentary lives, urbanization, and globalization of the food industry are all factors that have contributed to this rise. Number of research have offered insightful information on the incidence of overweight and obesity. For instance, according to the Global Burden of Disease Study, over 650 million individuals worldwide have been classed as obese in 2019, out of an estimated 1.9 billion adults who were overweight. In addition, the study predicted that by 2030, there will be over 1.1 billion obese people and over 3 billion overweight people worldwide if current trends continue. Children and adolescents are also affected by the burden of overweight and obesity, in addition to adults. According to the Global Burden of Disease Study, more than 340 million kids and teenagers aged 5 to 19 were overweight or obese in the year 2019. This incidence has alarmingly increased by three times since 1975, signalling a concerning trend of early-onset obesity and its potential long-term health effects. A variety of chronic problems, such as endocrine disorders, type 2 diabetes, cardiovascular diseases, malignancies, and musculoskeletal issues, are among the many associated effects of being overweight or obese. Additionally, these illnesses have a significant financial cost due to rising healthcare expenditures and loss of productivity. In conclusion, the incidence of overweight and obesity has reached epidemic levels worldwide, affecting people of all ages and creating serious health and financial difficulties. To solve this worldwide public health catastrophe, urgent and comprehensive initiatives are needed that concentrate on preventative measures, promote healthy lifestyles, and build environments that are conducive to long-lasting behavioural change. To reduce the consequences of overweight and obesity and stop their rising prevalence, actions must be taken at the individual, local, national, and international levels.

Key Word:

Obese, body mass index, public health, diseases

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Environmental Stressors and Male Reproductive Function

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Abstract

Due to the potential effects that environmental stressors may have on human health and reproductive systems, they are a growing source of worry. The effects of environmental stress on male reproductive organs were the focus of this evidence-based study. Male reproductive failure has been linked to a number of stressors, such as heat, radiation, chemical contaminants, and lifestyle choices. Chemical contaminants that disrupt the normal hormonal balance and harm spermatogenesis include heavy metals, herbicides, and industrial chemicals. These contaminants can build up in the environment and then infiltrate the food chain, posing a serious threat to the health of male reproduction.Male fertility may be significantly impacted by high temperature exposure, whether it results from work-related or lifestyle reasons. Reduced sperm quality and quantity can result from disrupted spermatogenesis caused by elevated scrotal temperature. Further affecting reproductive function is testicular injury brought on by protracted exposure to high temperatures. Male reproductive organ damage has been linked to radiation exposure, both ionizing and non-ionizing. Ionizing radiation can damage the DNA in sperm cells, leading to genetic abnormalities and decreased fertility. Examples of this type of radiation include those released by X-rays and radioactive materials. Sperm motility and viability have been linked to non-ionizing radiation produced by computers, mobile phones, and other electronic gadgets. Male reproductive health might suffer from lifestyle variables such as stress, poor diet, alcohol use, smoking, and poor dietary choices. There is evidence that drinking too much alcohol and smoking both affect sperm function and production. The male reproductive system can be further harmed by oxidative stress, inflammation, and vitamin shortages. Chronic stress, which is frequently felt in today's fast-paced environment, can throw off hormonal balance and impair the quality of sperm.

It is essential to comprehend how environmental stress affects male reproductive organs in order to put appropriate procedures in place to lessen its negative consequences. This area of study seeks to define the precise mechanisms by which stressors cause harmful effects, establish safe exposure standards, and investigate novel therapeutic approaches to preserve male fertility.

Key Word:

Environmental pollutant, male reproductive organ, fertility, sperm quality

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Comparative physiological and biochemical performance studies of the six different strains of the family Scytonemataceae (*Cyanobacteria*) under nitrogen-deficient cultural condition

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Abstract

Cyanobacteria (BGA) are photosynthetic bacteria using them as biofertilizers due to their ability to convert atmospheric nitrogen into ammonia that is the fixation of nitrogen in plants. It will not only enrich the nitrogen status of the soil by its fixation process but also provide organic matter and biologically potent substances for plant growth. These are living constituents of the soil biotype and continue their activity. In the present study 3 strains of *Scytonema* i.e., *Scytonema chiastum*, *S. tolypothricoides*, *S. bewsii*& 2 strains of Tolypothrix i.e., *Tolypothrix distorta*, *T. bysoidea* and one strain of *Camptylonemopsislahorensis compare* among these six experimental strains of the family Scytonemataceae through the assessment of their dry-weight in nitrogen-deficient medium, Chlorophyll-a, cellular protein and nitrogenase activity (as per chlorophyll-a and per vial) on 15th day. The present results indicate that both the two species of *Tolypothrix* have higher values of dry-weight, Chlorophyll-a and nitrogenase activity in terms of per µgchl-a/ml than the other three selected fast-growing strains of *Scytonema* and *Camptylonemopsis*.

Keywords

Cyanobacteria (BGA), biofertilizer, dry weight, chlorophyll-a, nitrogen fixation.

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Use of ClustVis: a web tool for visualizing clustering of multivariate data for validating the Evolution of traditional rice (*Oryza sativa* L.) varieties by artificial selection

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Abstract

Rice (*Oryza sativa* L.) is said to be responsible for feeding half of humanity. Thee are hundreds of different traditional rice or farmers variety that were suitable to the myriad niches. For these cultivar evolution seems to be entirely distinct from the evolution of the rice genus *Oryza sp*. complex. While domestication is an artificial process, speciation is a natural one. Early farmers specifically chose some traits during domestication while discarding others. Most of these characters were either high-quality or commercial. *Oryza sp*. ecotypes have evolved in response to environmental demands. In the investigation 30 rice lines comprising of commercial "Aromatic" rice' & "Non Aromatic" rice varieties, and some "breeding lines" were selected. Ten (10) agro-morphological traits that appeared to be crucial for "Ecological selection" and "Yield" were taken into account. Additional 10 (Ten) high-calibre characters that are "Economically Important" were selected. All Cluster analysis was done by using ClustVis: a web tool for visualizing clustering of multivariate data. The status of real selection and the origin of alleles are revealed through multivariate analysis of morphological features. Four groupings are formed by the Heat Map of Character Expression. Analysis of these findings throws light on the evolution of different varieties of rice suited for different eco-geographical areas. It seems that most traditional varieties evolved by artificial selection by the farmers according to the farmer's choice at that time and space.

Keywords

Rice (*Oryza sativa* L.), ClustVis, Heat Map, farmer's selection, traditional rice

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Diseases of Guava: Status & Management Under Gangetic Alluvial Zone 0f West Bengal

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Abstract

Guava (*Psidium guajava* Linn) is an important tropical fruit native to Southern America and the West Indies, but now it cultivated in many tropical and subtropical regions including India. Guava is a quite hardy, prolific and highly remunerative fruit in West Bengal and is cultivated over an area of around 276 thousand ha, with an average annual production of 4236 thousand tons (NHB Ann Rep. 2018-19) 2008). It is commercially grown in the gangetic alluvial zones of North and South 24 Parganas, Nadia, and Murshidabad district. The fruit is commonly eaten fresh or made into beverages, jams, jelly and other foods; it is a good source folic acid, high in dietary fiber, vitamin C andmany essential minerals. People use guava leaf for stomach and intestinal conditions, pain, diabetes, and wound healing. The fruit is used for high blood pressure.As the commercial cultivation of the crop is increasing alarmingly using different new varieties including many exotic collections; different maladies especially diseases become the major constraint causing yield loss of the crop. The current research focuses to identify the diseases of guava, to detect the causal agents, nature of damage and ultimately to find out efficient management strategies to reduce the yield loss and to improve the economy of the farmers community. Different pathogens infect on leaves, roots and fruitsleading to reduction of quantity and quality of fruit production and may cause damage of whole plant.Findings of the investigation reveals that major diseases of guava are: wilt (*Fusarim oxysporium* f.sp *psidii*), anthracnose (*Gloeosporium psidii*) fruit rot (*Phytophthora nicotianae*), fruit canker of guava (*Pestalotiopsis psidii)*, Cercospora (*Cercospora sawadae*) leaf spot and Algal leaf (*Cephaleuros virescens*) diseases are considered as major diseases of guava leading to economic loss of the crop. The comprehensive approach including cultural, mechanical, chemical and biological weapons are to be used including suitable disease resistance/ tolerance varieties for effective management of different lethal diseases and to improve yield quality of the product.

Key Word:

Guava, Guava Diseases, Disease Management

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Biological control of mosquito using Bot-koi, *Badis badis* (Hamilton, 1822) in ground water (domestic well): Initial discovery of a laboratory experiment

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Abstract

In order to eliminate the mosquito breeding ground in the domestic well in the Jalpaiguri District of West Bengal, food preference and predation potentiality experiments with Bot-koi, *Badis badis* (Hamilton) were conducted in a laboratory setting. The fish were collected from the water bodies of the Moraghat forest and were kept in two glass tanks with chemically untreated well water that was sieved through a phytoplankton net to remove larvae and planktons. Selected fish were maintained overnight before the experiment for acclimatization and fasting in order to establish their preference for feeding on mosquito larvae. Multiple wells were used to capture mosquito larvae, which were then added to the first aquarium. Remaining larvae were counted every 3 hour interval from 6 am to 6 pm and to maintain a constant prey density, the same number of larvae was then replaced within the glass beaker. A similar experiment was conducted to determine the feeding preference on commercially available fish pellets. In this experiment, formulated fish pellets were initially given in a second aquarium, and the residual pellets were counted every three hours from 6 am to 6 pm. The experiment showed greater feeding preference for mosquito larvae than formulated fish diet. The predation potentiality or feeding capability result showed a 3.6 cm length fish could consume 29 larvae per day with predatory index 37.66. The present study concludes that introduction of indigenous Bot-koi can effectively reduce mosquito larvae in domestic well (ground water) and also suggests that this species may help to prevent the mosquito borne diseases biologically.

Key Words:

mosquito breeding ground, feeding preference, predation potentiality, predatory index, larvivorous fish

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Phagocytic Cells Collected From Teleost Swim-Bladder May be Important Indicators of Fish Health Status

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Abstract

In teleosts, the best characterized macrophage phenotype is that comparable to classically activated cells (M1) which act to induce inflammatory responses. The swim bladder is a cavitary organ, with facilities for exudates collection for assessment of inflammatory cells. Teleost swim-bladder (SB) possesses mucosa-associated lymphoid tissue (MALT) similar to lungs.Inflammatory cells were collected from the swim bladder (SB) after 30 min of injection with activated charcoal particles within SB from alive fish samples of rohu (*Labeo rohita*) and tilapia (*Oreochromis* sp.). Giemsa stained compact and poorly organized loose aggregates of macrophages and inflammatory cells, NBT positive cells (indicated presence of ROS) and neutral red positive macrophages (indicated presence of lysosomal enzyme) were noticed. The presence of a great number of phagocytic cells suggested that fishes injected with charcoal particles showed increased acute inflammation which is important for fish immunity. These assessments may be important indicators of fish health status.

Key Words:

Swim Bladders, Macrophages, Inflammatory Cells

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Importance of Cancer Stem Cell in Development of Pancreatic Cancer

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Abstract

Pancreatic cancer (PC) is a highly fatal disease that is caused by the uncontrolled proliferation of pancreatic exocrine or neuroendocrine glands. It remains the seventh and third leading cause of cancer death worldwide. This disease has an overall poor 5-year survival rate (10%). On other hand Pancreatic ductal adenocarcinoma (PDAC) is a highly lethal malignancy with a majority of patients presenting with unresectable or metastatic disease, resulting in a poor 5-year survival rate.According to clonal evolution theory, the random driver mutations take place in tumor cells, which are selectively and clonally chosen to provide a growth advantage compared to other cells in the tumor and adjacent normal cells. The second theory, postulates the presence of cancer stem cells (PCSC). Pancreatic cancer stem cells, defined by expression of the cell surface markers CD44+ CD24+ ESA+ (0.2-0.8% of all pancreatic cancer cells), were highly tumorigenic and possessed the ability to both self-renew and produce differentiated progeny that reflected the heterogeneity of the patient's primary tumor. We also observed the upregulation of the developmental signaling molecules sonic hedgehog and Bmi-1in pancreatic cancer stem cells. This, in turn, is Due to the presence of highly complex tumor microenvironment and the presence of cancer stem cells, PC patients shows increased therapy resistance and tumor relapse. Therefore, understanding and targeting the tumor microenvironment and global gene profiling of cancer stem cells may be key strategies for designing effective PDAC therapies.

Key Words:

Cell surface marker, CSC (cancer stem cell), microenvironment, PC (pancreatic cancer), PDAC, tumor

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Impact of integrated use of sowing method and weed management practices on performance of summer sesame (*Sesamum indicum* L.)

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Abstract

A field experiment was conducted during the pre-kharif season of 2020 at the Agricultural Farm of the Institute of Agriculture, Visva-Bharati, Sriniketan, West Bengal with sesame variety 'Rama' to study the effect of integrated use of sowing method and herbicide on growth, yield and economics of summer sesame. Two methods of sowing comprising of sowing after pre-sowing irrigation (soil mulching) and sowing followed by irrigation were allocated in the main plot and six weed management practices viz. pre-emergence(PE) application of pendimethalin at 1.0 kgha^{-1}, early post emergence (PoE) application of fenoxaprop-p-ethyl at 60 gha^{-1} at 18 DAS, pre-emergence (PE) application of pretilachlor at 450 gha^{-1}, early post emergence (PoE) application of propaquizafop at 60 gha^{-1} at 18 DAS, untreated control and weed free check in sub-plot in a split-plot design replicated thrice. Data revealed that Soil mulching sowing method (M_1) registered higher values of growth parameters such as plant height, leaf area index, dry matter accumulation, crop growth rate at all growth stages. Seed yield of sesame under soil mulch sowing was about 12.99% higher than under the sowing followed by irrigation. Seed yield was the highest with early post emergence application of fenoxaprop-ethyl at 60g ha^{-1} which was statistically at par with pre-emergence application of pendimethalin at 1.0 kg ha^{-1} and early post-emergence application of propaquizafop at 60 gha^{-1}. Sowing with soil mulching method along with early post emergence application of fenoxaprop-ethyl at 60 gha^{-1} fetched the highest net return and return per rupee invested. Thus, sowing of sesame after pre-sowing irrigation (soil mulching) along with early post emergence (PoE) application of either fenoxaprop-p-ethyl at 60 gha^{-1} or propaquizafop at 60 gha^{-1} appeared as effective in terms of yield, net return and return per rupee invested of sesame in lateritic soil of West Bengal.

Key Words:

Pre-emergence, post-emergence, soil mulching, fenoxaprop-p-ethyl, weed management.

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Bibenzyl core compound detected in Sundarbans mangrove species: A plant secondary metabolite known to be of high therapeutic value

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Abstract

Bibenzyl derivatives are reported to be secondary plant metabolites with significant therapeutic value, known majorly from Orchids and Bryophytes. A wide range of bibenzyl derivatives with different biological activity was reported till date with varying substituent groups being present in core bibenzyl structure. In our endeavour to validate the traditional medicinal applicability of different mangrove species, largely used by the medicine men (Kaviraj) in the settlement villages of 19 blocks of Indian Sundarbans, we subjected different parts of ~18 mangrove species to phytochemical screening via Gas Chromatography Mass Spectrometry (GC-MS) analyses. We confirmed the presence of at least the core bibenzyl compound in all the mangrove species with detection of peaks having match factor and reverse match factors ranging ~800-900 with 80-90% probability and with identical mass as pure bibenzyl compound. Again, presence of bibenzyl cores was re-validated with repeated Gas Chromatography Flame Ionisation Detection (GC-FID) analyses in comparison to standard pure Bibenzyl compound purchased from Sigma. We presume the common presence of this secondary metabolite in almost all mangrove species might be a product of a common biosynthetic pathway that is induced in mangrove species under stressful environment. The differential clinical use of mangrove plant parts for different diseases could be related to different derivatives of bibenzyls present, which is not known to us and could not be validated yet under the scope of this study. To the best of our knowledge, this is the first report of bibenzyl compound from mangrove plants of Indian Sundarbans as a bio-resource.

Key Words:

bibenzyl, GC-MS, GC-FID, Indian Sundarbans,traditional medicine

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A Preliminary Study on Ant Diversity in an Urban College Campus

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Abstract

Ants are one of the earthbound insects that are commonly adopted as bio omens. Ants disport an important role in ecosystem operation. They rotate and ventilate the soil and there by acquiesce water and oxygen passage to plant roots. They also help in dissemination of seeds and disintegration of organic wastes. The present study deals with distribution and diversity of ant species in a small locus of an urban college which will emulate the condition of terrestrial ecosystem in an urban area. Total 10 species of ants which belongs to 3 subfamilies viz. Myrmicinae, Formicinae and Ponerinae were found. The highest number of species was found in Subfamily Myrmicinae(50%) followed by Formicinae and Ponerinae. Most abundant ant genera were *Solenopsisgeminata* followed by *Camponotuscompressus*, *Paratrechinalongicornis*, *Meranoplusbicolor*, *Monomorium* sp1, *Tetramorium* sp., *Lepisiota* sp., *Pheidole* sp., *Diacammarugosum* and *Brachyponera* sp. The study divulges that ant has the competence to repel the human intervention. Moreover, the high abundance of *Solenopsis germinata* raises an alarm over the presence of pollutants in the atmosphere.

Key Word:

Ant, Bio omen, urban area, human intervention

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Inherited Female Elimination: A promising technology for prevention of the deadly malaria

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Abstract

Malaria,oneofthedeadliestdiseases,affectingmainlytropicalcountriesoftheworldhasgonetoanoptimumlevel.Existingcontrolsystemofthisdiseasessuchasquininedrugs,bednet, repellantetc. is failing day by day resulting in innumerable casualties. The main factor contributing to thesuccess of malaria proliferation is the increased number of drug resistant parasites. Recentlygeneticpopulationsuppressivetechnologyhasbeendevelopedtocounteractthisproblem.Female*Anopheles gambie* as well as other anophelines spread the protozoa *Plasmodium sp.* Controllingthis vector would be a great initiative to limit the spread of it. A genetic population suppressivetechnology has been developed. Ifegnia.(Inherited Female Elimination by Genetically EncodedNucleases to Interrupt alleles), a CRISPR based approach has been used to disrupt the femaleessentialgene(fle).IthasbeenseenthatIfegniamalesremainreproductivelyactive andcarrythefle mutation with CRISPR machinery to induce the mutation generation after generation and thussuppress the population. In this protocol an RNA silencing mechanismis used to knock out thefemalemosquito.Thus,the Ifegniamalescouldbe used forasafepopulationsuppressionsystem.

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NTP-217 triggers ROS by mitochondrial leakage in liver cancer cells

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Abstract

In 2020, liver cancer was the third leading cause of worldwide death resulting more than 91530 deaths. Three main therapies of cancer are chemotherapy, surgical removal of infected part and radiotherapy but most of these have noticeable adverse effects. But hybrid peptide therapy is highly effective and have least side effects. Efficacy of NTP-217, a hybrid peptide formed by DIC/Oxyma based accelerated solid phase peptide synthesis is described here. Human liver cancer cell lines HepG2, Hep3B, Hep3B-Luc2-tdT, PLC/PRF/5 maintained in 10% FBS and HuH7, HCCLM3 and Hepa1-6 maintained in DMEM with 10% FBS used for the experiment. In mice cells having Hepa1-6 were injected with either 50µL LTX-315 or 50µL NTP-217 into tumors and fluorescence imaging is done. Also, mitochondrial membrane potential (MMP) is measured and Propidium Iodide (PI) staining as well as Western Blotting, Cell Apoptosis Assay, ATP level assay followed by Statistical Analysis (ANOVA) were performed. Comparative analysis of NTP-217, LTX-315 and Sorafenib revealed that except sorafenib, both LTX-315 and NTP-217 showed ceased contact inhibition and NTP-217 showed 8.7 folds more inhibition compared to LTX-215. Administration of NTP-217 have also selective huge scale accumulation in tumor cells. Intralesional NTP-217 reduced tumor growth by 92.7% whereas in LTX-315 it is only 65.6%. Also, Caspase based assay showed that cells died after 4hrs of NTP-217 is not due to apoptosis, and apoptosis started after 24hrs which can be confirmed after huge scale accumulation of poly (ADP Ribose) polymerase 1 (PARP1), obtained from cleavage of Caspase. Labelling with GFP in revealed that NTX-217 showed uniform distribution in nucleus and then gradually disappeared in cytoplasm and then induces mitochondrial leakage, whereas in LTX-315 plus Rhodamine B treatment is confined in mitochondria. Fluorophore JC10 stained imaging showed NTP-217 reduced MMP as red to green fluorescence reduced from 4hr to 16hr and corresponding increase in Reactive Oxygen Species (ROS) value. The advantage of using NTP-217 over others is that if ROS generated is not enough for apoptosis then it induces double stranded break (DSB) in nucleus over time. Also, different time scale shows different death of cells which needs further research development and toxicity, accumulation and degradation of hybrid peptides in the body is not clearly known. But hybrid peptide can be added as a new feather in anticancer therapy in hepatoma.

Key Words:

Hepatoma, NTP-217, LTX-315, ROS, MMP

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Effects of Mangifera indica L. extract and Mangiferin on renal function of hypertensive rats

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Abstract

An antihypertensive effect is attributed to the ethanolic extract of *Mangifera indica* Linn., which is known to have a history of use in traditional medicine. Mangiferin is the most active biological component of *Mangifera indica* plantsand has the highest biological activity, followed by benzophenones, phenolic acids, and other antioxidants such as carotenoids, flavonoids, isoquercetin, quercetin, tocopherols, and ascorbic acid. We projected that *Mangifera indica* might prevent the development of salt-induced hypertension because of the presence of alkaloids and the antioxidant qualities it has. Wistar rats (n=6 each) were treated for 21 days as follows: control (Tc) (normal diet + water), salt-loaded (Ts) (2% salt water + normal diet), salt-extract-loaded (Tse) (2% salt water + normal diet + 200mg/kg b.w. extract), and salt-mangiferin-loaded (Tsm) (2% salt water + normal diet + 200mg/kg b.w. mangiferin). The electrolyte profiles of their serum and urine, as well as the urine volume and levels of serum aldosterone hormone, were assessed. The investigation focused on the examination of the urinary space within the Bowman capsule and the overall anatomical structure of the kidney. Mango peel extract and mangiferin were shown to be effective in reducing the hypertensive effects seen in rats with salt-induced hypertension, functioning similarly to diuretics.

Key Word:

Mangifera indica, Mango peel, Mangiferin, Hypertension, Electrolyte, Aldosterone

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Liver function test: a promising tool to assess Pesticide toxicity in fish

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Abstract

Pesticides are a prevalent pollutant in freshwater ecosystems because they are widely used in agriculture to control crop insect pests and then discharged into various freshwater habitats. Fish, like other non-target aquatic organisms, are susceptible to pesticide attacks. The liver has become the focus of toxicological investigations since it is the primary organ for detoxification of xenobiotics. Pesticides, in general, are highly toxic to fish (96-h LC_{50}< 1 mg/L). Liver function testing can help to better understand how normal metabolic pathways are altered by chronic pesticide exposure at sub-lethal concentrations in fish. Analyses of several hepatic biomarkers like liver glycogen level, activities of hepatic acid phosphatase, alkaline phosphatase, aspartate aminotransferase, alanine aminotransferase, acetylcholinesterase, oxidative stress enzymes, hepato-somatic index, and hepatic histopathology have long been used as reliable tools to understand the extent and mode of pesticide toxicity in fish. This article summarises the relevance of liver function tests in assessing pesticide toxicity in fish.

Key Words:

Pesticide, Toxicity, Fish, liver, biomarkers

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Isolation of colistin resistance bacteria from different deltas of west Bengal and investigate the effect of curcumin to rejuvenate colistin against multi drug resistance bacteria

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Abstract

Colistin is an old antibiotic that was banned for its toxicity, but is now reconsidered due to the rise of multi-drug resistant bacteria. However, colistin resistance is also increasing, mainly through lipopolysaccharide changes and the plasmid-mediated Mcr gene. Environmental colistin resistance is a serious public health issue, especially in India where sewer water from hospitals and industries contaminates the environment. Bacterial culture from clinical and environmental samples is important to monitor colistin resistance. Novel non-antibiotic therapies and targets have been proposed to fight resistant infections, such as iron chelation, phage therapy, biofilm remediation, nanoparticles, antimicrobial peptides, and phyto-compounds. In this study, bacteria were isolated from soil samples collected from three major deltas in West Bengal, India. The multi-drug resistance pattern and MAR index of the isolated gram-negative bacterial population, with a particular focus on colistin resistance, were evaluated. The growth curve and bactericidal effect of high colistin resistance bacteria were also examined. The study further investigated the effect of curcumin on the growth pattern of these highly resistant bacteria and plans to explore the combined effect of colistin and curcumin in future research. The aim is to assess the potential of combinatorial therapy using different biomolecules on opportunistic pathogens, which could contribute to the development of alternative therapeutic approaches for colistin and multi-drug resistant infections.

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Toxic effects of Lead on human health

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Abstract

Lead is one of the earliest heavy metals discovered by human beings. The important properties of lead like softness, malleability, ductility, poor conductibility and resistance to corrosion seem to make difficult to give up its use but its non-biodegradability and continuous use in different industrieshelp to accumulate it in the environment with increasing hazards. It pollutes the environment and accumulates in the human body via various methods like absorption, bioavailability and bioconcentration etc. In the recent past lead toxicity hasemerged as an important global problemwith public health consequences, particularlyin children, due to its serious impacton brain function.Actually, every function in the human body is affected by lead toxicity. The symptoms of acute Lead toxicity are like rapid onset of nausea, headaches, cognitive changes, and emotional disruptions. Chronic Lead toxicity is more common and much more dangerous if it is kept untreated for long time. Persistent vomiting, encephalopathy, lethargy, delirium, convulsions and coma are the common symptoms of the chronic form of Lead toxicity. Lead mainly affects the nervous system of the living organism. Longer exposure to lead causes severe effects on brain and kidney also.Ithas an adverse effect on the reproductive systems of both males and females.This article includes various physiological and biochemical effects of Lead toxicity in humans.

Key Words:

Heavy Metals, Lead Toxicity, Health hazards, Lead contamination

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Calcium Gluconate Production from Glucose: Process Suitability for Future Scaling-Up

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Abstract

The conversion of glucose to calcium gluconate is highlighted in this abstract, which also evaluates the process's viability for future scaling-up. For its many uses, including as a nutritional fortifier and an intravenous calcium supplement, calcium gluconate is a vital medicinal and food ingredient. The investigation of different, more environmentally friendly approaches is necessary because the current processes for producing calcium gluconate frequently entail complicated and expensive operations. In this paper, we describe a unique enzymatic method to convert glucose to calcium gluconate. The enzymatic method has a number of benefits, including low reaction temperatures, excellent specificity, and potential for scaling. Glucose oxidase is used in the procedure to convert glucose into gluconic acid, which is then reacted with calcium hydroxide to create calcium gluconate. Several factors are taken into account, such as reaction kinetics, enzyme stability, reactant concentrations, and process optimisation, to establish the process's viability for further scaling-up. The effect of reaction temperature, pH, substrate concentration, and enzyme loading on conversion efficiency is examined in the study. In order to determine the scalability of the process, additional variables such reaction time, enzyme reusability, and the capability for continuous operation are assessed. Initial findings show that using the enzymatic method, glucose can be converted into calcium gluconate with promising conversion yields. The efficiency and yield of a reaction are increased through reaction condition optimisation, which also maintains excellent enzyme stability and reusability. The process has the ability to run continuously, which might increase productivity and cost-effectiveness even more. To determine whether scaling up the process is feasible, economic and sustainability factors are also taken into account. The effectiveness of the enzymatic approach in terms of cost and the influence it has on the environment are assessed through comparison with currently used manufacturing techniques. Overall, there is a lot of room for further scaling up the enzymatic conversion of glucose into calcium gluconate. The limitations associated with present methods are addressed, and this research opens up possibilities for broader applications in the pharmaceutical and food industries. It also lays the way for the development of a more environmentally friendly and economically viable method for the synthesis of calcium gluconate.

Key Words:

Calcium Gluconate Production, Glucose, pharmaceutical and food industries

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Hypolipidemic effect of hydro-ethanolic extract of Amorphophallus campanulatus in ethanol induced Dyslipidemia in Male Wistar Rat

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Abstract

Chronic alcohol consumption causes alcoholic liver disease, which is associated, or initiated, with dysregulated lipid metabolism. Hyperlipidemia is a lipid metabolism disorder and the major risk factor for the development of CVDs. Although most of the current hypolipidemic drugs are expensive and have potential side effects, the research focusing on natural alternative medicines is relevant. The current study is designed to emphasize the hypolipidemic effect of hydro-ethanolic extract of *Amorphophallus campanulatus* (*AC*) in ethanol administered male Wistar rat model. Male Wistar rats weighing 150-200gm were used in the study and were divided into control, ethanol treated, extract treated (250 and 500mg/kg body weight) and atorvastatin (10mg/kg body weight) treated groups. The ethanol treated groups were administered 40% ethanol 2gm/kg body weight while the extract and standard drug treated groups were simultaneously treated with the similar dose of ethanol prior to extract and drug treatment. The normal controls received equivalent amount of normal saline. Long-term excessive alcohol feeding to rats caused fatty liver and liver injury, which was associated with disrupted cholesterol homeostasis, characterized by increased hepatic cholesterol levels and hypercholesterolemia. Ethanol administration elevates total cholesterol by 54.96%, triglyceride and VLDL by 46.67% and LDL by 79.53% as compared to control group. However, in contrast to these the HDL cholesterol is significantly lowered ($P<0.001$) in the ethanol treated group as compared to control by 46.82%. Administration of hydro-ethanolic extract of *AC* (250 mg/kg and 500 mg/kg) together with continuous ethanol administration for four weeks showed significant reduction in serum cholesterol level by 25.5% and 37.1%, respectively ($p < 0.05$); serum triglyceride level by 22.6% and 33.6%, respectively ($p < 0.05$); serum LDL level by 24.1% and 35.4%, respectively ($p < 0.05$), and serum VLDL level by 15.5% and 20.5%, respectively ($p < 0.05$), as compared to ethanol group. However there was also significant change ($p < 0.05$) in HDL level was observed. AC 500 mg/kg was more effective than AC 250 mg/kg. AC 500mg/kg dose was as effective as the standard drug, atorvastatin. Histological study also showed that ethanol group had fatty infiltration in liver sections which was arrested in the extract treated groups. Thus the results of the study indicate that *Amorphophallus campanulatus* extract show considerable hypolipidemic action that make it encouraging as future therapeutic agent to treat dyslipidemia.

Key Words:

Alcohol, dyslipidemia, ethanolic extract, hypercholesterolemia

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Perspectives on Melatonin's Oxidative Damage Protection

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Abstract

Oxidative stress, characterised by an imbalance between the generation of reactive oxygen species (ROS) and cellular antioxidant defence mechanisms, has been linked to the development of several human diseases, such as cancer, cardiovascular diseases, and neurological disorders. A powerful antioxidant and free radical scavenger, melatonin, a hormone predominantly produced and secreted by the pineal gland, can regulate the redox status of cells and tissues. This abstract aims to give a general understanding of the complex interaction between melatonin and oxidative stress. Multiple mechanisms, including direct ROS scavenging, activation of antioxidant enzymes, and maintenance of mitochondrial function, allow melatonin to perform its antioxidative effects. The nuclear factor erythroid 2-related factor 2 (Nrf2) pathways, a crucial transcription factor involved in the cellular defense against oxidative stress, are also regulated by melatonin. Experimental research has shown that melatonin administration can reduce oxidative stress-related harm to various organ systems, such as the kidneys, liver, heart, and brain. The preventive properties of melatonin also include the reduction of oxidative DNA deterioration and preserving genomic stability. Promising findings from clinical studies also point to the potential therapeutic benefits of melatonin in treating oxidative stress-related diseases like Alzheimer's, Parkinson's, cardiovascular issues, and age-related macular degeneration. However, many elements, such as dosage, timing of administration, and the particular clinical environment, may affect the effectiveness of melatonin as an antioxidant. More study is required to clarify the mechanisms underlying the link between melatonin and oxidative stress and improve melatonin-based therapies. To sum up, melatonin is an essential endogenous antioxidant that helps to prevent oxidative stress and shields cells and tissues from oxidative damage. Novel therapeutic approaches to disorders linked to oxidative stress may be made possible by better understanding the intricate relationships between melatonin and oxidative stress.

Key Words:

Melatonin, Pineal gland, oxidative stress, antioxidants, reactive oxygen species

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Trans Kingdom Host switching from plants to Anurans - Are we witnessing Evolution of *Alternaria alternate*

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Abstract

Since the last few decades amphibians and especially anurans are facing a survival crisis across the globe due to over trading, disease, and various other factors. The case scenario is quite different in the south of Bengal, an enigmatic pathogen has been killing the frogs rapidly. The genus *Hoplobatrachustigerinus* and *Euphlyctishexadactylus* are quite dominant in this part of the country, thus we studied the effects on them. The rural agricultural land and habitations has been surveyed thoroughly for 3 years; the infected animals were recovered from the site. Upon further investigation carried in laboratory, the infection was found to be caused by a fungus. Upon isolation, characterization and confirmation of the infection, it came up to a result which was quite shocking. The skin (both dorsal and ventral), lungs and liver were the main organs that were found to be affected the most. The pathogen isolation, identification and characterization were done and to our surprise we found that the causal pathogen is an established plant pathogen, *Alternaria alternata.*Reportedly anuran have strong innate immune response in general, however such defensive measures were found unsuccessful to defend the studied frogs from Alternariosis.

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Diptera: A boon or bane amongst insects

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Abstarct

Diptera (commonly known as true flies) is an order of single pair winged insects that occupy nearly 14% of the global entomofauna with more than 160 described families. They are one of the most successful organisms on earth both in terms of species number and abundance and found in every ecosystem from temperate tropics to cool Antarctics, from extremely hot deserts to extremely cold polar region. They are found in most land-biomes, including caves, deserts, tundra, mountain passes, forests, deserts, seashores, sandy beaches, coastal lagoons, lakesand even found in areas that are polluted by industrial emissions, rotting waste, urban areas, cattle and poultry farms.Diptera have a considerable impact on the ecosystem services ranging from pollination (Bee flies: Bombyliidae and Hover flies: Syrphidae)to predation (Robber flies: Asilidae and Tachinidae) to disease spreading (Mosquitoes: Culicidae, blackflies: Simuliidae,drain-flies: Psychodidae). *Anopheles* mosquitoes transmit malaria, filariasis, *Aedes* carry dengue-fever, yellow fever and Zika-virus, *Culex* carry lymphatic filariasis, japanese encephalitis and other viral diseases. Blackflies carry river blindness and sandflies carry leishmaniasis. House flies are mechanical vectors and transmit diseases like typhoid, dysentery, cholera, fever, poliomyelitis, anthrax, leprosy etc. Fruit flies (Tephritidae), Leaf-miner flies (Agromyzidae) and gall midges (Cecidomyiidae) are pests of agricultural crops and cause significant economic loss. Some flies (Calliphoridae, Sepsidae, Phoridae, Sarcophagidae)are major detectors of cadavers and carcasses and can provide useful information regarding the nature and time of death, thus playing an important role in criminology and forensics, and hence called as forensic flies. Diptera larvae (maggots) can be used as safe and effective biomedical tool for chronic woundcare, as they eradicate dead tissues to promote cell growth and healthy wound healing. Blowfly larvae and bluebottle larvae are produced commercially and used as bait for fish and also food for farmed chickens, pigs and fish. Fruit-fly (*Drosophila melanogaster)* has long been used as a model organism in researches of genetics, developmental biology, physiology, microbial pathogenesis and biomedical research.Besides the huge economic importance, Diptera has ecological significance too. Some qualify as “ecosystem engineers”,that significantly alter their abiotic habitat and thereby affect the ecology of other organisms and related processes in the ecosystem. Few diptera (example: Chironomid larvae) act as “bioturbators” as they can mobilize various compounds and nutrients, making them available to other organisms and thus add significant aeration and nitrogen to the habitat. Aquatic Diptera, mostly the larval forms, are a significant food resource for myriad invertebrates, vertebrates and also serve as diets of birds, particularly those living in wetlands. Considering the ecological and economic significances of various families of Diptera, a holistic study is extremely important.

Key Words:

True flies, ecosystem service, economic importance, ecological significance

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Comparative study on foraging activity of two wild honey bee *Apis dorsata* F. and *Apis florea* F. on flowers of Mustard plant *(Brassica juncea*, family brassicaceae), at North 24 Parganas district of West Bengal, India

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Abstract

Wild honey bees (specially *Apis dorsata* F., 1793 and *Apis florea* F., 1787) are effective pollinator and have their enormous role in ecosystem service. Mustard production mainly depends on insect visitors are common and honey bee in particular. Foraging behaviour of these two wild bees on bloom of *Brassica juncea* was studied in different agricultural zones of North 24 Parganas during November 2022 to January 2023. Foraging activity of these two wild bees on mustard flowers were recorded separately in different day time and in different weather conditions. Abundance of *A. dorsata* was significantly higher than *A. florea*. Peak foraging activity of *A. dorsata andA. florea* was noticed at 11am (5.38±0.86) and 12 noon (2.30±0.63) respectively. Night forging ability of *A. dorsata* on mustard blooms was observed but in *A. florea* it is not noted. Foraging span (time spent /flower) of *A. florea* was much higher than *A. dorsata* . The foraging rate (number of flower visited per unit time) is much higher in *A. dorsata* than *A. florea*. The present study also observed that the foraging ability of these wild bees were maximum on sunny days and least on cloudy day.

Key Words:

Foraging activity, Wild honey bee, *Brassica juncea*, North 24 Parganas

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Effects of some Hypolipidemic agents on sperm parameters of Wistar rat

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Abstract

The risk of cardiovascular diseases (CVD) is increasing globally. Lipid-lowering agents, have been found to reduce CVD. They act by either reducing LDL or increasing HDL cholesterol which plays a pivotal role in male reproduction as it is a precursor for steroid hormone biosynthesis. During spermatogenesis these hormones are necessary for normal sperm development and differentiation of spermatogonia. Use of statins, fibrates, and plant products like piperine by men of reproductive age, gives rise to concerns regarding the effect on the male reproductive potential. A total number of 24 male Wistar rats, weighing between 150 and 220g and 80 days of age were used for this study. They were randomly assigned to 4 groups each group contains 6 animals. Group 1 was control and received normal saline daily for 28 days, group II gavaged piperine (10 mg/kg/ day, oral) for 28 consecutive days; and group III received atorvastatin (8mg/kg/day, oral) for 28 consecutive days. Group IV received fenofibrate (20mg/kg/day, oral) for 28 consecutive days. One caudal epididymis of each animal was rinsed and gently minced in 2 ml of phosphate buffer saline (PH 7.4). Epididymal sperm motility and sperm concentration was determined. Sperm viability was determined using eosin-nigrosin staining. Sperm morphology was studied from a total count of 100 spermatozoa in a smear prepared from sperm suspension stained by eosin-nigrosin mixture. Atorvastatin and piperine caused a significant reduction in sperm motility, sperm concentration and viability in cauda epididymis at dose of 8 mg and 10 mg per kg body weight /day in respect to control group. The sperm morphological abnormalities in atorvastatin group widely increased than control and other groups.

Key Word:

Cholesterol, Atorvastatin, Fenofibrate, Piperine, Sperm count

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Antibacterial potential of Phytochemicals from *Cassia sophera*

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Abstract

Growing incidents of antibiotic resistance has become a threat in management of infectious diseases. Search for alternative agents having antibacterial potential is need of the day. In ethno botanical literature Cassia sophera, Linn (called kolkasunda in Bengali) is mentioned to be effective in the treatment of pityriasis, psoriasis, asthma, acute bronchitis, cough, etc. C*assia sophera* Linn (Leguminosae) plants are widely distributed worldwide, and find immense applications in traditional systems of medicine in many countries. In our present study, two oils (OL-1 & OL-2) from aerial parts and roots of *Cassia sophera* have been evaluated by GC/MS and comparison of spectral data with the existing in National Institute of Standards and Technology (NIST) library. GC/MS analysis of the two oils revealed the presence of a number of chemical constituents. Again, the isolated oils exhibited considerable antibacterial activity against two Gram positive bacteria viz. *Bacillus megaterium* & *Staphylococcus aureus* and two Gram negative bacteria viz. *Escherichia coli* & *Enterobacter aerogenes*. Therefore, the present study should be useful in progressing in this field for searching new lead molecules.

Key Word:

Phytochemical, Gram positive, Gram negative, Antimicrobial Spectrum

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Amelioration of Cyclophosphamide induced pulmonary toxicity in Swiss albino mice by Naphthalimide based organoselenium compound 2-(5-selenocyanatopentyl)-benzo[de]isoquinoline 1,3-dione

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Abstract

Introduction: Cyclophosphamide is a well known anti-cancer drug, used to treat broad spectrum of malignancies. But its use is often restricted due wide range of toxicities. Among various toxicities imparted by cyclophosphamide, pulmonary toxicity is a very important one. Because of such toxicities, patient's quality of life is greatly reduced which in turn decreases the effectiveness of drug. Selenium, a dietary micronutrient, has been found to protect various organs from cyclophosphamide induced injuries.

Objective: This study was developed to explore the protective efficacy of an organoselenium compound 2-(5-selenocyanato-pentyl)-benzo[de]isoquinoline 1,3-dione against cyclophosphamide- induced hematotoxicity in Swiss albino mice.

Materials and methods: Cyclophosphamide (25 mg/kg b.w.) was administered intraperitoneally for 10 days and the organoselenium compound (3 mg/kg b.w.) was given by oral gavage in concomitant and pretreatment schedules. Various biochemical parameters related to oxidative stress and antioxidant enzymes from lungs were evaluated to assess the effect of the test compound.

Results: The oral LD50 of the test compound was more than 1000 mg/kg b.w. in Swiss albino mice. The test compound substantially prevented Cyclophosphamide induced pulmonary injury by reducing the levels of lipid peroxidation, as well as by restoring the level of reduced glutathione and activities of glutathione-S-transferase, superoxide dismutase, catalase, and glutathione peroxidase in both of the treatment schedules.

Discussion and conclusion: The test compound emerged as an efficient antioxidant protecting lung tissues from cyclophosphamide-induced injury.

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Recent trend on Co-association of physico-chemical parameters with the microorganism's diversity and bloom formation in fresh water waterbodies: a study from Bankura, West Bengal, India

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Abstract

Waterbodies are playing a major impact in the society in different aspects. In aquatic ecosystem planktons are regulating the productivity of the waterbodies. The distribution of the plankton is also co-associated with the different physico-chemical parameters of the waterbodies. In the present study we try to find out the relation of physico-chemical parameters with the plankton distribution among the different waterbodies situated surroundings of the Bankura district. For the present study we have collect the water samples as well as plankton samples and measured the physico-chemical parameters and plankton diversity as per established methods. To study the correlation, we have used several statistical tools. The result shows thatProtozoa has significant positive correlation with Nitrite-N ($r=0.66$; $p\leq0.01$) and negative correlation with Free Carbon dioxide ($r= -0.64$; $p\leq0.05$). It is also found that Protozoa has a positive correlation with pH ($r=0.66$; $p\leq0.01$) of the waterbodies.Sometimes waterbodies are enriched with nutrients which lead to an excessive growth of plants that initially cause of eutrophication and ultimately end up with toxic red algal bloom formation. The causative agent of this red bloom may be *Euglena sp*. The present study clearly indicates, thatphysico-chemical parameters are significantly correlated with the plankton diversity among the said waterbodies.

Key Word:

Waterbodies, Red bloom, *Euglena sp.*, Physico-chemical parameters, Bankura

Fig 1. NormalWaterbody

Fig 2. BloomformingWaterbody

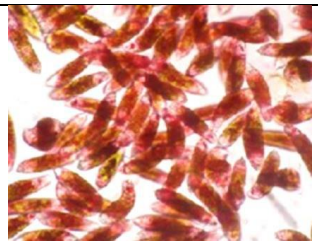

Fig 3. *Euglena sp*. at 400X

Fig 4. *Euglena sp*. at 1000X

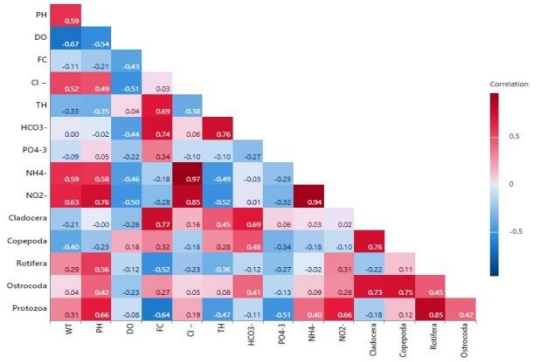

Fig5. Correlogramofdifferentphysico-chemicalparameterswith planktondiversity

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Natural flavonoid Naringin attenuates insulin resistance and oxidative stress in high fat diet induced obese rat model

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Abstract

The consumption of a diet high in fat and carbohydrates is responsible for causing obesity, which in turn leads to insulin resistance, oxidative stress, and other related issues. Naringin is a natural flavonoid that is mainly found in grapefruit. It has significant potentiality for various health benefits, including maintaining lipid levels, acting as an antioxidant, improving insulin sensitivity, and providing cardiovascular protection. The objective of this study is to investigate the impact of naringin on insulin resistance and oxidative stress in obese Wistar rats induced by high-fat diet. The male rats were divided into four groups: Control, High Fat Diet (HFD), Naringin (NAR), and Atorvastatin (ATR). The HFD, NAR, and ATR groups were fed a diet consisting of 40% high fat for a duration of 16 weeks where the control group was fed with normal rat pellets *ad libitum*. However, in the NAR and ATR groups, the treatment was only administered during the final 4 weeks. For the last four weeks, Naringin was administered orally at a dosage of 100mg/kg in NAR group along with ATR at a dosage of 8mg/kg in ATR group. After the study was completed, we determined the levels of serum glucose, lipid profile, insulin, and then insulin resistance index (HOMA-IR) was calculated for further analysis. In addition, the activities of hepatic Malondialdehyde (MDA), Superoxide dismutase (SOD), and Catalase (CAT) were also measured. The results indicated that rats fed a high-fat diet experienced a significant ($p<0.05$) increase in serum insulin, blood glucose, and insulin resistance index levels. The level of hepatic MDA increases significantly ($p<0.05$), while the levels of SOD and CAT decrease significantly ($p<0.05$). The alterations can be reversed through treatment with Naringin. According to the aforementioned study, it has been suggested that administering Naringin for a duration of 4 weeks could improve insulin resistance condition and reduce oxidative stress in rats that have been subjected to a high fat diet.

Key Word:

Natural flavonoid, Naringin, Antidiabetic, Antioxidant enzyme, antioxidant marker

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Mating strategies of a hermaphrodite land snail, *Macrochlamys indica* (Godwin-Austen, 1883) (Eupulmonata, Stylommatophora, Ariophantidae)

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Abstract

Macrochlamys indica is a terrestrial, hermaphrodite snail and one of the most speciose genera in the Ariophantidae family. Mating strategies of the snail include mate choice, mating position, gender choice, dart shooting, penis intromission, and sperm transfer within the mate partners are described here. The body size has a great influence in mate choice of a sexually mature *M. indica*. The individuals of different body size are usually selected as a mate partner in a mating event. The initial gender choice is selected by the relative body size of the mate partners; the individual of smaller body size performs as sperm donor (male) and relatively larger body size performs as sperm recipient (female). The face-to-face mating position and reciprocal mating are commonly observed in most of the mating events. The penis intromission into the atrium and/or female reproductive tract of the opposite mate partner is mostly depended on a successful dart-shooting of an individual between the mate partners. The sperms of the male acting snail are ultimately transported as a spermatophore (or sperm ampulla) into the bursa copulatrix of the female performing individual only. Histological analysis of the bursa copulatrix of both the male and female acting individuals confirms that both the mate partners do not receive the spermatophore in a single mating event. The bursa copulatrix of the female snail is filled with the spermatophore, whereas in male snail, it is devoid of spermatophore and is densely packed with mucus.

Key Words:

Copulation,Dart-shooting, Gender choice, Penis intromission, Sperm transmission

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Unlocking the Biotechnological Potential: Exploring Halotolerant Yeast Biofilms

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Abstract

Biofilm formation by microorganisms under nutrient-limited and adverse conditions is a complex phenomenon. These structures consist of cells embedded in an extracellular matrix (ECM) composed of proteins, carbohydrates, lipids, and nucleic acids. While bacterial biofilms have garnered significant attention, research on yeast biofilms, excluding pathological strains, remains limited. However, the exploration of halotolerant biofilm-forming yeasts from saline environments offers intriguing possibilities for biotechnological applications. Halotolerant yeasts have long been utilized in the food and wine industry, but their application in other sectors is relatively unexplored. Drawing inspiration from bacterial biofilms in bioremediation, food production, and biocatalysis, new avenues for halotolerant yeast biofilms can be uncovered. The abundance of halotolerant yeasts in hypersaline environments, including those isolated from food contaminants and solar salterns, presents an opportunity for discovery. Recent studies have unveiled novel halotolerant yeast species in moderate saline environments, expanding our understanding of their unique physiology and molecular biology. Halotolerant yeasts contribute to aroma and taste in food processing, while specific gene clusters have relevance in second-generation biofuel production. The biocatalytic properties of halotolerant yeasts are also beneficial to the pharmaceutical and chemical industries. By delving into the biology and exploring their unique metabolic traits, halotolerant yeasts offer innovative opportunities for genome mining of biotechnologically relevant genes. This poster focuses on halotolerant yeasts, investigating their biofilm formation and potential biotechnological applications. Understanding the untapped potential of halotolerant yeast biofilms unlocks exciting prospects for harnessing their biotechnological prowess.

Key Words:

biocatalysis; bioremediation; food industry; halotolerance; yeast; green chemistry

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PTPRJ- a candidate TSG for Cervical Cancer

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Abstract

PTPRJ on 11p11.2 has several functional roles consistent with tumor suppression including receptor phosphatase, inhibition of cell growth, migration, and angiogenesis and has been identified as a candidate TSG in several carcinomas including colorectum, lung, breast and thyroid. However, its association with CACX has not yet been reported.

Deletion mapping of chromosome 11p11.2 (spanning 2 Mb) was done using three microsatellite markers, D11S1344 (11p11.2), D11S4109 (11p11.2) and D11S1350 (11p11.2). The region harboring the candidate TSG *PTPRJ* showed deletion of 10% in CIN, 31% in stage I + II and 21% in stage III + IV tumors. The methylation frequency of *PTPRJ* increased from CIN to stage I/II and III/IV tumors. SiHa is methylated for *PTPRJ*. Concordance was found between the samples showing deletion/promoter hypermethylation and downregulation of PTPRJ. Reduced mRNA expression of *PTPRJ* was seen in SiHa cell line compared to the normal cervix. Treatment by 5-aza-dC, followed by subsequent increase in expression confirms the inactivation by methylation. However, no significant upregulation of *PTPRJ* in HeLa was seen, thus validating that PTPRJ is unmethylated in HeLa. The clinical outcome of the patients was investigated for a period up to 5 years. The significant increase in overall alteration (deletion/methylation) of *PTPRJ* points to its possible implication in the early invasiveness of CACX.

Multivariate Cox regression model showed relative risks of several prognostic factors (clinical stage, tumor grade, lymph node involvement, parity, age at sexual debut and HPV infection) on overall survival of the patients. The analysis showed *PTPRJ* alterations along-with clinical stage and early sexual debut (<19 years) as significant predictors for poor overall survival, thus indicating the prognostic implication of the gene and pointing that *PTPRJ* is a candidate TSG for CACX.

Key Words:

CACX, PTPRJ, deletion, methylation

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Studies on Population Dynamics and Infestation Rate of Fruit Flies on ash Gourd

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Abstract

Ash gourd is an important cucurbit crop having various health benefits. Ash gourd is attacked by many insects but among them, most destructive insect is fruit fly causing 20-100% damage. The Experiment was conducted during April, 2022 to May, at farmers′ fields of Gangnapur village at Nadia district of West Bengal. The objective was to study the species diversity of fruit flies on ash gourd, the population dynamics of fruit flies, and the rate of infestation along with benefit– cost ratio in both the trapped and non trapped fields. Four farmers were selected who cultivates ash gourd, facing problem of fruit flies. Two farmers were given traps but rest 2 farmers were not provided traps. Each farmer was provided with 2 types of traps (one cue lure + one methyl eugenol). Highest no of fruit flies were trapped during the 2nd interval (10.04.22-14.04.22). Five species of fruit flies were trapped - *Zeugodocus cucurbitae*, *Zeugodocus tau*, *Bactrocera dorsalis*, *Bactrocera zonata*, *Bactrocera correcta*. Among all, *Zeugodocus cucurbitae* was most abundant. Infestation rate was 19.47%and 20.26%in trapped and non trapped fields respectively. The B:C ratio of trapped and non trapped fields were 3.37 and 3.23 respectively. As we can see that B:C Ratio of trap and non trap group are quite similar. So using trap in ash gourd cultivation is not significant for controlling fruit flies.

Key Words:

Population Dynamics, Fruit Flies, Gangnapur village, health benefits.

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Understanding the response of phytoplankton to the cyclonic event Sitrang: A case study in the Hooghly estuary of Sundarban Bay of Bengal region

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Abstract

Tropical cyclones are known to influence estuarine and coastal ecosystems by inducing changes in physicochemical conditions. This study was conducted along the estuarine zone of the Hooghly River near Namkhana zone of Sundarban, offshore of the Bay of Bengal. Water samples were collected before, and after the cyclone, and phytoplankton abundance, chlorophyll-a, and different water quality parameters were analyzed. A noticeable reduction in salinity, dissolved oxygen, and temperature, and an immediate rise in the inorganic macronutrients (nitrate, phosphate, and silicate) were recorded in the post-cyclonic period. Short-term changes in the high abundance of heterotrophic *Noctiluca scintillans* and mixotrophic *Tripos* spp. suggestsfavourable growth conditions for dinoflagellates. The suddenexplosive increase in the number of *Tripos furca* (highest cell density 6.55×104) is a serious concern of harmful algal bloom. PCA analysis was applied to reduce the dimensionality. Several water parameters and numerical abundance of differentphytoplankton species were strongly correlated. This case study provides insights into understanding the response of two different phytoplankton groups dinoflagellates and diatoms, to the cyclone and their potential ecological implications.

Key Words:

Cyclone, abundance, Hooghly, dinoflagellates, PCA

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Tephritidae: The Enemy of Agricultural Crops

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Abstract

Fruit fly (Diptera: Tephritidae) is one of the most destructive insect pests of agricultural and horticultural production in tropical and subtropical conditions. It infests more than 250 plants belonging to 40 families including many commercial fruits. Around 4352 species of 483 genera under six subfamilies are known worldwide, among which nearly 243 species of 79 genera and four subfamilies (Phytalaminae, Dacinae, Trypetinae and Tephritinae) are reported from India. This family can be distinguished from all other families of Diptera by the combination of colour patterned wings, sharply bent subcostal vein and cell bcu with an acute extension. Worldwide production and marketing of fruits as well as vegetables is being affected by these dipteran pests. Their ability to disperse rapidly, high reproductive capability, broad larval host range, wide climatic tolerance, high reproductive potential and extreme polyphagy has helped them to invade new territories and consequently they rank high on quarantine target lists. Among the fruit flies, *Bactrocera* species ranks high on quarantine lists worldwide due to the significant threat these pests place on agricultural resources. Most common species attacking fruits and vegetables are *Bactrocera dorsalis*(Hendel, 1912), *B. cucurbitae* (Coquillett, 1899), *B. corretca*(Bezzi, 1916) and *B.* zonata (Saunders, 1842). Because of their infestations, India has been included in the list of those countries from where fruit import to developed countries is banned. In India, fruit flies cause an estimated total loss of 2,558 and 26,902 million rupees with and without control measures, respectively. Economic effects of pest species include not only direct loss of yield and increased management costs, but also the loss of export market and constructing and maintaining fruit treatment unit having eradication facilities. The damage to these crops is caused either directly by the larvae which eat the fruits or indirectly by pathogenic micro-organisms or decomposers which penetrate the holes made on the surface of the fruit. Female fruit flies puncture eggs by their ovipositor, lay and deposit their eggs on host fruits when they are physiologically ripe. On hatching, maggots bore their way to the interior and feed on the pulp. Area fed by the maggot is discoloured due to rotting of the fruit and the fruit drops prematurely. During July to October, the fruit fly is at its peak and attacks and ruin more than 400 different fruits and vegetables including the fruit crops like mango, guava, citrus, melon, papaya, peach, pumpkin, bitter gourd, bottle gourd, cucumber, sponge gourd, watermelon etc causing heavy damage. Tephritid management is quite difficult due to its polyphagous nature with high reproductive potential, wide host range and adaptability to climate. So, Tephritid is indeed an excellent candidate for extensive studies regarding its distribution, adaptability in changing climate, invasion to new areas and effective control measures.

Key Word:

Tephritid, pest, agriculture, economic loss

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Incidence Of Insect Pests in Different Varieties of Green Gram [Vigna Radiata (L) Wilczek] in Relation to Some Abiotic Factors Vis -A-Vis Their Novel Management

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Abstract

The term 'pulses' is limited to crops harvested solely as dry grains, which differentiates themfrom other vegetable crops that are harvested while still green. Mung bean (*Vigna radiata*)(L.) Wilczek [Synonyms: *Phaseolus radiatus* L. (1753), *Phaseolus aureus* Roxb. (1832)],oftenknownasgreengramormoong,isnativetoIndiaandCentralAsia.Ithasbeengrownin these regions since prehistoric times and as an important legume crop in India throughoutthe year. To study the 'incidence of insect pests in different varieties of green gram in relationto some abiotic factors' an experimentwas laid out in the 'A-B' Block farm of BidhanChandra Krishi Viswavidyalaya during summer 2019. Ten varieties of green gram COGG 13-39, HUM16,PANTM-5,IPM205-7,IPM2-14,IPM610-2,LGG460,LGG630,MH421, IPM 101-102 were considered for the experiment. Whitefly population has been recorded insummer green gram in the vegetative stage only in both the test varieties with peaks on 5WASrespectively.The flowerr thrips population has reacheditsmaximumpopulationin8WAS.Highestgrampodborerpopulationhasbeenrecordedin7 WAS summer seasons, respectively. Whitefly population was significantly and positivelycorrelatedwithbothtemperaturesandbrightsunshinehours. Flower thripspopulationwassignificantlyandpositivelycorrelatedwithmaximumtemperatureand maximumrelativehumidity, and significantlyandnegativelycorrelatedwithminimumtemperature, minimum relative humidity and rainfall. Helicoverpa population is significantlyandnegativelycorrelatedwithmaximumrelativehumidity. Overall findings show that whitefly,population is present in vegetative stage of the crop. Thrips population presentin flowering stage of the crop. Helicovepresentssent mid vegetative stage to pod bearing stageof the crop. To study the efficacy of novel insecticides, one popularvariety of green gram the experiment was laid out in CR-Gayespur farm. The experiment wasdone with the popular variety of green gram "SAMRAT". From that experiment, we see that Bt(BIOSAR) 2.5kg/ha was found best treatment against spotted pod borer and gram pod borerwithmeanpopulationof1.56/plantand1.42/plantrespectively.Againstthrips,Thiomethoxam (CRUX)25%WG25gma.i/hashowed the besttreatmentwiththemeanpopulationof2.46/plant.

AmongyielddatabestyieldgivesBT(BIOSAR)2.5kg/ha(1500kg/ha)andlowestyieldgive Spinosad(TRACER)45%SC185ml/ha(860kg/ha). Lowestpod damagein the case of Maruca was recorded on BT(BIOSAR) 2.5kg/ha (15.94)andhighestpoddamage was recordedincontrol(41.94).Highestcost-benefitratiogivesBT(BIOSAR) 2.5kg/ha (3.7) and lowest cost benefit ratio is Spinosad (TRACER) 45% SC185ml/ha(1.2).

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Key Words:
Pulses, Greengram, Novel pesticides

Morphological variations of the pharyngeal teeth in two Snake-headed fishes: Channa punctata (Bloch, 1793) and Channa orientalis (Bloch & Schneider 1801)

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Abstract

The snake-headed fishes are voracious carnivore and mainly feed on live animals such as zooplankton, insect's larvae, small fishes, and frogs. The fishes possess a series of terminal teeth and a set of pharyngeal teeth in the buccal cavity. The pharyngeal teeth are located on the pharyngeal plate, which is a modified structure of the fifth gill racker and includes a pair of thick, ovate-shaped dorsal pharyngeal plates and a triangular thin ventral pharyngeal plate. The shape, size and arrangement of the pharyngeal teeth on the pharyngeal plate are species-specific and related to the feeding preference of the individuals. The morphostructural characteristics of the dorsal pharyngeal teeth of two snake-headed fishes; *Channa punctata* (Bloch, 1793) and *Channa orientalis* (Bloch & Schneider 1801) are described for the first time for the family Channidae using light microscopy and scanning electron microscopy. However, the feeding habit of the two fish species are almost same and the pharyngeal teeth of these two fishes are mostly similar to some extend with some species-specific uniqueness. Some teeth of the fishes are looks like a bison's horn-shaped with tapering anterior smooth rounded tip and another is cashew-shaped with anteriorly bi-pointed smooth tip. The cashew-shaped teeth type is located at the peripheral region of the pharyngeal plate in the two fish species. In case of *C. punctata* are the cashew-shaped teeth consists of two relatively pointed and sharp edge than that of the *C orientalis.* The surface sculpture of the teeth is longitudinal in case of *C. punctata*, while it is vertical for the *C. orientalis.* The internal cavity of the teeth contains teeth bud and a dense collagen matrix and they are well-developed in the *C. punctata* than those of the *C. orientalis*. Therefore, the pharyngeal teeth can be used as an important predictor to evaluate the species identification and their interrelationship to the respective feeding habits.

Key Words:
Anabantiformes**,** Bucco-pharyngeal cavity,Feeding habit,Taste buds, Ultrastructure

The Eco-friendly Technology for Sustainable Management of Different Industrial Wastes-An Overview

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Abstract

A huge amount of solid, liquid, and gaseous waste is produced by almost every industry, which causes environmental hazards due to inefficient management and recycling techniques. Several industries such as paper mills, palm oil, tannery, food processing unit, pulp & textile industries, dairy, bakery, wine, distilleries, sugar mills all are generally discharged their effluents without adequate treatment on agricultural land or into water bodies.The dumping of industrial wastes/sludges in an environment without proper treatment may contaminate the soil and other fauna, which causes many health hazards.Hence, the key concern is to reduce the potential toxic elements of industrial sludge by proper processing, which is a challenging and complex environmental problem. One possible solution is to ensure that the industrial wastes could be reused on agricultural land, by conditioning and stabilizing the sludge using a pretreatment process. In this context, vermicomposting - a green and clean technology is an alternative for the biological stabilization of organic wastes. In addition, vermicompost considerably reduced the availability of heavy metals by forming organic-bound complexes despite several fold increases in their total content. The toxicity of industrial sludges is mostly detoxified through bioconversion and all the potential toxic elements like Cr, Cu, Ni and Pb were decreased after vermicomposting by earthworm *Eisenia fetida*.Earthworm gut microbes and chloragocyte cells have the capacity to detoxify heavy metals in industrial sludgesThis study highlighted the intense importance of adopting vermicompost technology in bioremediation of various categories of industrial wastes for introduction in the agriculture field. This sustainable approach wisely manages the global problem of waste recycling and its proper application.

Key Word:

Waste recycling - Bioremediation - Vermicomposting - Potential toxic elements

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Detection and in *silico* characterization of banana bunchy top virus (BBTV) in West Bengal

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Abstract

Bunchy top disease of banana caused by Banana bunchy top virus (BBTV, genus Babuvirus family Nanoviridae) is one of the most important constraints in production of banana in the different parts of the world. Based on distinctive viral symptoms and high populations of aphids in the field, the association of begomovirus was suspected from various source comprising the areas of district Nadia, West Bengal (Jaguli, Mohanpur, Mondouri Horticultural Research station, and Farmer's field, Kalyani). The identification of this virus associated with the disease was performed by polymerase chain reaction using gene specific primers. The obtained products were cloned, sequenced, assembled and Genbank accession numbers received as MT670274 (DNA-C) and MT109277 (DNA-U3).The sequences of both the genome (MT670274 and MT109277) run in Blastn to see the homology of the BBTV ancestors and multiple alignments with the related BBTV genomes.The result MT670274 showed thatmaximum identity of 98.92% with Banana bunchy top virus cell cycle link protein gene (Pakistan) with a query coverage of 100% and nucleotide sequence (MT109277) showed a maximum identity of 98.5% with Banana bunchy top virus isolate Malawi 73 segment DNA-U3 (JQ820454.1) with a query coverage of 100% belongs to Pacific Indian Ocean Isolate which proves that our Jaguli isolate belongs to Pacific Indian Ocean Group. In our phylogeneticanalysis with 1000 bootstrap replication showed that the DNA-C sequence of BBTV Jaguli (West Bengal) isolate clearly falls under the cluster Pacific Indian Ocean Group and shares its clade with Kerala (MF540876) and sister clades with Pakistan isolates. The DNA-U3 of BBTV Jaguli (West Bengal) isolate belonged to the first major cluster and was found to be in a separate clade, but was more close to the clade of Tamil Nadu isolate (KU559330.1). Both the DNA genome has conserved stem loop regions. Results of our present investigation on BBTV in Nadia confirmed that the full-length sequence of BBTV DNA-C West Bengal isolates very high homology with the sequence of BBTV isolates from the PIO group (95-99%) and DNA U3 genome of BBTV West Bengal isolate about 91-99% similarity with the PIO group. In future its need to be characterized the other components of BBTV in West Bengal for further detail study.

Key Words:

Banana bunchy Top Virus, Pacific Indian Ocean Group, Polymerase Chain Reaction

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Development of Transgenic Indian Mustard (*Brassica junceae*) for Improved Aluminum stress tolerance

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Abstract

Production of a designer crop having added attributes is the primary goal of all plant biotechnologists. Specifically, development of a crop with a simple biotechnological approach and at rapid pace is most desirable. Apart from the usual stress factors, the acid soil stress is premeditated as the key factor which regulates the plant growth and developmental process. Here, we wish to develop transgenic Indian mustard plant in a favorable manner. Increasing demand forcing cultivation at higher density and changing soil texture necessitated development of Al stress tolerant plants. Cotton plants showed the ability to combat this acid soil stress condition. Thus, in order to develop such mustard plants, we targeted to over express Cotton *GhSTOP1* (Sensitive to Proton rhizotoxicity 1). It is one of the most important aluminum stress tolerance regulatory gene. Our first aim is to clone the *GhSTOP1* gene(s) from Cotton plant. Followed by the development of transformed lines in the mustard plant lines with *GhSTOP1* gene and will be characterized under acid soil toxicity to evaluate their tolerance. Furthermore, the expression pattern of cloned genes will be analyzed under control, proton and acid toxicity. The modified plant would also serve as ready 'genetic pool' for utilization in yield heterosis programme.

Key Words:

Acid soil stress, rhizotoxicity, *Brassica junceae*, Al toxicity, *GhSTOP1*

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Biological studies of changing life cycle of a sporadic defoliator of Darjeeling Tea, *Orgyia Postica* (Lepidoptera: Erebidae) under laboratory conditions in summer and winter

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Abstract

The defoliator Orgyia postica Walker (Lepidoptera: Erebidae), occurs sporadically as a minor pest in various tea plantations of Darjeeling hills. Even though intermittent in occurrence, they still cause considerable damage to the crop during their peak infestation period. A laboratory-based seasonal study was conducted to learn more about the differential life-cycle pattern of the pest in different seasons so that it can aid in developing an environment-friendly pest control strategy. Fecundity found to be 250-300 eggs/female in clusters. Eggs were usually laid on the outer surface of the cocoon or in area close by as the female moths were flightless owing to their vestigial wings. The eggs were oval in shape and yellow in colour. The t larval period went through six instars taking about 30-34 days in summer and 50-53 days in winter. The early larvae were light yellow coloured but eventually turned dark brown with a reddish head. They had t characteristics of four broomsticks like tuft of yellow hairs on the dorsal side of the body spread between the first abdominal segments to usually on the fourth segment. The fully grown 6th instar larvae were measured to have an average length of 31.5±0.26 mm. The egg to adult developmental period was shorter in summer than in winter which was about 61.5±1.76 days and 95±2.51 days respectively. The pupa was light brown in colour. The adult male moth was brownish black with a wing span of 30-32 mm the female moth has silky yellowish-brown colour. Adults lived for 5-10 days. Immediate notice should be given to this defoliator by identifying them before this occasional pest attains a major pest status, especially in organic tea gardens where the natural and non-chemical ways of pest control are favoured over conventional chemical pesticides.

Key Words:

Darjeeling hills. Tea gardens, O. postica, life cycle

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Elicitor mediated enhancement of secondary metabolites: Principle, Mechanism & Applications

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Abstract

Secondary metabolites from plants have a wide range of applications in human health and nutrition. Secondary metabolites that are commercially important in medications, food additives, flavours, and other industrial materials can be produced using plant cell and organ culture methods. In the plant system, stress, including various elicitors or signal molecules, usually stimulates secondary metabolite synthesis. Recent advancement in elicitor-mediated plant tissue culture have opened a new pathway for the generation of secondary metabolite molecules. The addition of elicitors to the culture media can stimulate secondary metabolite production and accumulation in cell cultures.

Elicitors can be classified on the basis of their nature as abiotic and biotic sources or on the basis of their origin as endogenous and exogenous elicitors. The effects on secondary metabolite production are mostly determined by the elicitor type, dosage, and treatment schedule. A variety of variables, including elicitor concentrations, exposure time, cell line, nutrient composition, and culture age or stage, all play a role in the effective generation of biomass and secondary metabolite accumulation. This presentation examines the numerous abiotic and biotic elicitors including nanoparticles used in the culture media, as well as their mode of action and stimulating effects on secondary metabolite accumulation.

Key Words:

Cell culture, Elicitor, Mode of action,Nanoparticles,Secondary metabolite

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Understanding Protein-Ligand interactions with the help of docking studies

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Abstract

Several scientific publications showed that the electronic nicotine delivery systems (ENDS) aerosols consist of various carcinogens such as diacetyl, propylene glycol, acetaldehyde, acetyl propionyl (2,3-pentane dione), acetyl propionyl (2,3-pentane dione), formaldehyde, crotonaldehyde (2-butenal), acrolein, acetone, arsenic, cadmium, nicotine, Polonium-210 as well as lead-210. There was a lack of research studies illustrating the mechanism of epigenetic reprogramming of human lung stem cells caused by above mentioned carcinogenic aerosols of ENDs. Here, we report the carcinogenic effects of ENDS aerosols, as well as the mechanism of epigenetic reprogramming analyzing the bioinformatics databases namely, AACR Genomics Evidence Neoplasia Information Exchange (GENIE) database, NIH Toxicology Data Network (TOXNET), Comparative Toxico-genomics Database (CTD), and the database of the National Institute of Environmental Health Sciences (NIEHS). We observed from CTD analysis that the chemical gene interactions indicated roughly 3% of genes highly affected by diacetyl and propylene glycol. The CTD analysis revealed that the chemical gene interactions of affected 9 genes with miR140 by formaldehyde and propylene glycol among a total of 3983 genes; 5 genes by acetaldehyde, acetaldehyde, and propylene glycol, among a total of 275 genes; 1 common gene by crotonaldehyde (2-butenal) and propylene glycol, among 227 genes; 7 common genes by acrolein and propylene glycol among 2185 genes; 18 common genes by nicotine and propylene glycol, among1244 genes; 11 common genes by arsenic and propylene glycol, among 4983 genes. The lead-210 and Polonium-210 of ENDs have been informed as Group 1 human carcinogens as well as release alpha particles. The alpha particles-initiated DNA lesions, as well as gene mutations in human lung stem cells. The alpha particles reported having long-term chromosomal variability in primary human T lymphocytes. Epigenetic mechanisms of histone modifications of above-mentioned potential carcinogens have been revealed by the analysis of the database of NIH Roadmap Epigenomics Mapping Consortium. Our current analysis showed that the Mitogen-activated protein kinase 1(MAPK1) is epigenetically reprogrammed by the interaction of 10 different highly expressed genes.

Key Words:

3-D Structure, Molecular modelling, Complex, Function

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Water Pollution: A Threat to Livelihood of Cooperative Fishers in Murshidabad District of West Bengal

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Abstract

Water pollution is alarmingly causing destruction of aquatic biodiversity worldwide. The causative agent of the aquatic pollution is mainly due to anthropogenic activities. The district Murshidabad of State West Bengal of India is endowed with rich aquatic resources in terms of rivers, canals, wetlands, ponds etc. The district also has large number of fishermen, many of whom work under the banner of fishermen cooperative societies. In the present study, water quality parameters of three water bodies under the active operation of fishermen cooperative societies were analyzed. The water bodies were Chaltia Beel under Bhakuri Matsyajibi Samabay Samity Ltd., Beel Dumnidaha under Andiron Fishermen Cooperative Societies Ltd. and Paikmari Beel under Daserchak Fishermen Cooperative Societies Ltd. The water quality parameters studied were surface water temperature, depth of water, Secchi disc transparency, electrical conductivity, pH, dissolved oxygen (DO), free carbon di-oxide, total alkalinity, total dissolved solids, hardness, phosphate-phosphorus, nitrate-nitrogen, molecular ammonia, biological oxygen demand (BOD), chemical oxygen demand (COD), and plankton density. The dissolved oxygen content was found in low to moderate range (mean value: 4.59±0.68 to 6.16±0.76 mg/l) and free carbon di-oxide was found above the desirable range (<5 ppm) in all the water bodies. The biological oxygen demand (mean value: 11.47±3.82 to 30.33±5.45 mg/l) and chemical oxygen demand (mean value: 20.49±4.64 to68.85±23.72 mg/l) were found well above the permissible limit for aquaculture. The level of ammonia was found higher than the permissible limit in Beel Dumnidaha and Chaltia Beel. The analysis of water quality parameters of the three water bodies showed water pollution from organic sources as indicated by low DO, high CO_2, and high BOD and COD levels. The visible effects of which were observed by frequent large scale death of fishes and massive weed infestation in those water bodies. Chaltia Beel and Beel Dumnidaha were located in semi-urban areas where the sources of pollution were untreated municipal sewages. Paikmari Beel was located in rural areas where the sources of pollution were massive jute retting. The cooperative fishers were suffering from the decrease in fish production (mean value range: 47.60±28.36 to 2257.07±833.31 kg/ha/yr) due to water pollution and their livelihood were in stake. The socio-economic analysis indicated low socio-economic profile of the fishermen associated with those water bodies. The study recommends possible remedial measures to save those water bodies from organic pollution and protection of livelihood of the cooperative fishers in the study area.

Key Words:

Fishermen Cooperative Societies, Fish, Fishers, Aquaculture, Water Pollution

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Effective interaction between Zooplankton and Heavy Metals in Rasulpur River Ecosystem Of Purbamedinipur District : Seasonal Dynamics

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Abstract

Freshwater environments need river ecosystems because they support a variety of biological species and offer crucial ecosystem services. Zooplanktons are essential for the transport of energy and the cycling of nutrients in these ecosystems. However, they can have significant ecological effects when they combine with heavy metals, which are common river pollutants. In order to highlight the most important findings and their consequences for environmental management, this abstract seeks to give a succinct review of the seasonal dynamics of the connection between zooplankton and heavy metal in river ecosystems. The complicated interaction between zooplankton and heavy metals is regulated by a number of variables, such as seasonal variations in ambient conditions, metal concentrations, and the makeup of the zooplankton community. Some zooplankton species are more sensitive to metal toxicity than others, according to studies on their sensitivity and tolerance to heavy metals. Additionally, there may be temporal oscillations in metal concentrations within river ecosystems due to seasonal variations in metal inputs, such as runoff from industrial or agricultural operations. Zooplankton populations' seasonal patterns can have a big impact on how they interact with heavy metals. Metal intake by these creatures may increase during times of high zooplankton abundance, possibly resulting in bio-magnification within the food web. On the other hand, during periods of low zooplankton abundance, metals may build up in the water column or sediment, which could have effects on the larger ecosystem. For efficient environmental management and the creation of effective mitigation strategies, it is essential to comprehend the seasonal fluctuations in the connection between zooplankton and heavy metals. Monitoring programmes that take into account the temporal fluctuations in metal concentrations and the dynamics of zooplankton communities can offer important insights into the health of ecosystems and any dangers brought on by heavy metal pollution. In this study,we found three heavy metals namely, Copper (Cu),Zinc (Zn) and Led (Pb) in Rasulpur river. This abstract review the present understanding of the seasonal dynamics of the interaction between zooplankton and heavy metals in river ecosystems, emphasising the need for additional study to clarify the underlying mechanisms and long-term effects. We can more accurately assess the hazards presented by heavy metals and apply tailored management strategies to protect the health and integrity of river ecosystems by integrating biological and environmental aspects.

Key Words:

Zooplankton, river ecosystems, seasonal dynamics, heavy metals, pollution

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Climatic factors and malarial incidents in Kolkata

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Abstract

Climatic parameters such as temperature, rainfall, rainy days, relative humidity, sunshine hours and air flow are very much associated with vector borne diseases in tropical and subtropical regions of the world. Ambient temperature plays an important role in the life cycle of vector and development of parasite also. Transmission intensity of malaria depends on mosquito abundance, physical and environmental conditions. Physical environment may modify the local climate. Increased relative humidity (RH) increases vector activity and also transmission rate , but heavy rainfall decreases the vector activity. It has been observed that *Plasmodium vivax* requires 15 to 25 days to complete its lifecycle if the temperature remains in between 15 degrees Celsius to 20 degrees Celsius whereas life cycle may be completed within six to ten days for the temperature greater than 25 degrees Celsius, provided the relative humidity lies between 55% to 80%.The study was conducted in the area under the Kolkata Municipal Corporation (KMC) and secondary data were collected from different reports, books and journals of IMD, ICMR and KMC. The increasing trends of surface temperature, change of rainfall patterns with respect to normal and accuracy of extreme events are the signals of climate change. As a result, there must be growing concerns about the climate sensitive diseases like malaria. The survival of malarial parasites also depends on the time of the year. The average temperature in West Bengal, particularly in Kolkata is around 30 degrees Celsius in summer months and hence experience reducing of transmission window. There is still a growing need to identify the influencing factors, malaria prone zone as well as newly malaria prone zone and early warning system by the uses of artificial intelligence (AI) to take protective measures.

Key Words:

Vector borne diseases, Malaria, Temperature, R/H, *Plasmodium vivax*, AI, Kolkata, West Bengal

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Unmasking the Enigma: Bats, Viruses and the Tenuous Tightrope of Immune Equilibrium

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Abstract

Batshaveemergedascriticalplayersinunderstandingemergingviraldiseases,includingHendra,Nipah,Marburg,Ebola,SARS,MERS,andCOVID-19,allofwhichhavebeenassociatedwithsuspectedzoonotictransmissionofbat-borneviruses.Batsexhibituniquecharacteristicssuchasflying,longlifespansrelativetobodysize,lowtumorigenesisrates,andtheabilitytohostviruseswithoutclinicaldisease. This posterexplores themechanismsunderlyingtheremarkablehostdefensesystemandimmunetoleranceofbats, andtheirimplicationsfor humanhealthand diseaseprevention.Studiessuggestthatbatshaveundergone64millionyearsofadaptiveevolution,shapingtheirdefensesystemtobalancebothdefenseandtolerance.Thisintricateimmuneequilibriumhasbestowedbatswiththeexceptionalabilitytoactasidealreservoirhostsforviruses.Byinvestigatingthehostdefense strategiesemployedby bats,we gaininsights intoviralevolutionandthepotentialforpredicting,preventing,andcontrollingfutureviralspillovers.Ofparticularinterestistheremarkableabilityofbatstotolerateviralinfectionswithoutsuccumbingtoclinicaldisease.Recentresearchhasdemonstratedthecreationofinducedpluripotentstemcells(iPSCs)fromtwobatspecies,revealing uniquecharacteristics.ThesebatiPSCsexhibitgeneexpressionprofilesresemblingcellsunderviralattackand contain ahighnumberofendogenousviralsequences,includingretroviruses.This suggeststhat batshaveevolvedmechanismstotolerateviralsequencesandpointstoacloserrelationshipbetweenbatsandvirusesthanpreviouslyrecognized. Furtherinvestigationofbat iPSCsandtheirdifferentiatedprogenywillprovideinsights intobat biology,virus-host relationships,andthemolecularbasisof bats'specialtraits.Byunravelingthesecretsofbatimmunityandimmunetolerance,wecangainadeeperunderstandingofviralevolutionand improveour abilityto predict,prevent, and controlfuturezoonoticoutbreaks.Studyingthemechanismsofimmunetoleranceinbatsmay pavethewayfornovelapproachesto improvinghuman health. Itis essentialto focusresearch effortsonbatsto benefitboth batconservation andhuman well-being.Joinusinunmaskingthemysteryofbats,viruses,andtheintricatetightropeofimmuneequilibrium.Throughthisexploration,weaimtoadvanceourunderstandingofhost-pathogeninteractionsandinspireinnovativestrategiesfortheprediction,prevention,andmanagementof emerginginfectiousdiseases.

Key Words:

Unmasking the Enigma, Bats, Viruses, Tenuous Tightrope, iPSCs.

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Molecular Identification of Aphid Species Affecting Field PEA (*Pisum Sativum* L.)

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Abstract

Field pea, the third most important winter-season legume crop at a global level, is an important source of digestible proteins (22-23%) as well as carbohydrates, minerals and vitamins. It's tender and immature pods are used as vegetables and the mature dry pods are used as pulse crop. Among the different biotic stresses, aphids are the most threatening constraints which hinder field pea development, growth and production. Nymph and adult aphids both suck the sap from young shoots, tender leaves, inflorescence and even from the stems. Besides, they act as vector of the mosaic viruses which causes significant damage to cultivated field pea even at low population level. Honeydew secretion of aphids leads to fungal growth and sooty mould hinders the photosynthetic activity of the plants and directly decrease the yield up to 10% to 15%. Aphid has a complex life cycle with distinctive morphology, social behavior, ability to generate galls in plants, and has tight obligate associations with bacterial endosymbionts. All these reasons make this group of insects intriguing for future study. The intra-ordinal relationships and identification of strains among aphid species is incomplete and quite difficult only by morphological identification . On the other hand, advancement in molecular data have provided the informations that has resolved such problems. In this study, DNA of aphid samples collected from different location was extracted by using Cetyl Trimethyl Ammonium Bromide method. After that DNA samples were amplified using polymerase chain reaction with Mitochondrial Cytochrome Oxydase I gene specific primers, a fragment sized 658 bp of the Mitochondrial Cytochrome Oxydase I gene was sequenced using Sanger sequencing method for molecular study of Aphid. BLAST results confirmed the species as *Aphis craccivora* . The identified species showing 99.57% similarity with Cowpea Aphid, E value -0, Accession number- AB506718.1, reported from Japan.

Key Words:

Aphid, Field pea, Cytochrome Oxydase I gene, Molecular identification

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Diversity of Butterfly (Lepidoptera) in Acharya Prafulla Chandra College Campus and a Review on Conservation Management

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Abstract

Butterfly diversity at Acharya Prafulla Chandra College, West Bengal, India was studied from December 2022 to July 2023. A total of 36 butterfly species belonging to the families of Hesperiidae, Papilionidae, Pieridae, Nymphalidae, Lycaenidae were identified in the present investigation. Butterflies of Nymphalidae family were to found to be the most dominant (39%) in nature throughout the study period. Summer shows the highest abundance (43%) of butterfly. After reviewing different literature, we found 6 endangered species are present in West Bengal. This study revealed that we need to take appropriate conservation measures to protect this wonderful creature.

Key Words:

Butterfly, seasonal diversity, conservation,APC college

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Role of Salinity in Determination of Diversity of Zooplanktons in Bidyadhari and Datta river of Sundarban, West Bengal - A Comparative Study

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Abstract

The Sundarban Estuarine System is an ideal example of Tropical Estuary where there is a continuous periodic mixture of seawater and fresh water. This unique ecosystem is influenced by several physicochemical parameters like temperature, pH, salinity, turbidity, dissolved oxygen, different nutrient content etc but salinity is considered as one of the most crucial determining factors in determination of water quality and the species inhabiting it. Zooplanktons are very important intermediates in aquatic food chain and are also being considered as major bio-indicator species due to their differential tolerance range to different water parameters. The present study shows the salinity of river Bidyadhari that flows between humanized habitats and river Datta, which flows along the side of the Sundarban National Park. Being part of an estuarine system, the salinity of these two rivers is controlled largely by sea water input. Beside sea water input, anthropogenic intervention is also a major factor for determination of salinity level of these rivers. As zooplankton responds very efficiently to their surrounding ecological condition, they serve as very good indicator of differential ecological parameters. In this study, presence or absence or the density of particular zooplankton under particular salinity range is done in a comparative manner between two rivers. River Bidyadhari was found to have higher salinity value than that of Datta and difference in zooplankton composition is correlated with the variation in salinity level.

Keywords:

Zooplanktons, Bio-indicator, Tolerance, Sundarban, Salinity

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Seasonal Dynamics of Tintinids and Other Ciliates with Relation to Physicochemical Properties of Water - Survey from Estuarine Sundarbans of West Bengal

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Abstract

Estuarine Sundarbans is one of the most unique habitats due to its demographic position, climatic conditions and anthropogenic contributions. Tintinid and other ciliates has remained important to the ecologists as they have been functioning as bioindicators in different parts of the globe. Ciliates play very important ecological role in their ecosystems not only as food web intermediates but also indicators of specific physicochemical conditions. The present survey is being done taking samples from Nadabhanga area of Hooghly River estuary of Bay of Bengal spanning more than a year of time. Ciliate diversity was estimated along with periodical evaluation of physicochemical parameters like pH, temperature, hardness, salinity, TDS, electroconductivity, phosphates, nitrates and other related ones.

Key Words:

Estuarine zones, Ciliates, temperature, seasonal variation, bioindicators

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Comparative analysis of vegetables and fruits availability in urban, suburban and rural market areas vis-à-vis indigenous food systems and their nutraceutical value by survey and documentation: Findings of a student research project

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Abstract

Indigenous foods (Ifs), accessed as part of traditional food systems are derived from natural ecosystems and are more sustainable. These Indigenous Foods systems are reservoirs of unique traditional ecological knowledge, incorporated in both cultivated and wild foods derived from plants and fungi species that are available from local natural resources. Nowadays increase in obesity and diet-related diseases are major public health problems. Limited access to nutritious food and relatively easier access to less nutritious food may be linked to poor diets and, ultimately, to obesity and diet-related diseases. However access to affordable and nutritious food is complex and depends on supply (availability) and consumer demand. Consumer behavior, preferences and other factors related to the demand for some foods may account for differences in the types of foods offered across different areas. In this study, which is a student research project with undergraduate students, survey and documentation were used to gather the primary data. A comparative analysis of vegetables and fruits availability in urban, suburban and rural market areas in and around Kolkata vis-à-vis indigenous food systems and their nutraceutical value was carried out. It was seen that the low crop yields associated with indigenous seeds and increased emphasis over modern farming methods by the local agricultural organizations, have led to changes in the traditional subsistence farming practices which have lead to decrease in Indigenous foods (Ifs) even in rural and suburban areas. More research is needed to understand how access, availability and price affect the shopping and consumption behaviors of consumers.

Key Words:

Indigenous foods (Ifs), survey, documentation, nutaceutical value

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Assessing availability of millets, cereals and different varieties of rice in retail markets and neighbourhood grocery shops: A student research project case study

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Abstract

Millets are widely marketed as healthier alternatives to white rice (WR). Once they were known as inferior coarse grains, millets are now known as super grains for the huge health, economic and environmental benefits they offer. They are considered as healthier alternatives to refined cereals on account of their presumed higher fibre content and lower glycaemic index (GI) and high glycaemic load (GL). There is growing attention by governments and industry in regard to the role played by millets (including sorghum) to help build resilience for farmers and cope with climate change, malnutrition, diabetes, and some other major issues. The high nutritional content of millets compares well with other foods with similar nutritional value. There is a growing interest in reviving millets in India. The Government of India declared 2018 as a National Year of Millets. The United Nations has declared 2023 the International Year of Millets (IYM2023). However the common Bengali diet is characterized by a high glycaemic load (GL) and glycaemic index (GI), primarily on account of the nature of the staple cereal namely white rice (WR). A market survey was carried out in different areas of North Kolkata in July 2023. The objective of this investigation was assessing availability of millets, cereals and different varieties of rice in retail markets and neighbourhood grocery shops and was a part of a student research project-based case study. In was seen that millets were available more in super chain retail outlets rather than in neighbourhood grocery stores. However more varieties of rice were available in the retail outlets.

Key Words:

White rice (WR), millets, IYM2023, glycaemic index (GI), retail market

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Undergraduate student research initiative: Assessment of urban avenue tree population in selected urban areas of North Kolkata

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Abstract

Urban plantation is considered as the basic prerequisite for improving quality of life in highly dense metropolis and developing suburban areas. It is considered as the basic prerequisite for improving quality of life in highly dense metropolis and developing suburban areas The green canopy coverage which is usually provided by the roadside trees of urban or suburban areas is decreasing gradually and hence these areas become more vulnerable when they face ever rising anthropogenic pressures.. The green canopy coverage which is usually provided by the roadside trees of urban or suburban areas is decreasing gradually and hence these areas become more vulnerable when they face ever rising anthropogenic pressures. Greening of urban cities can support human health, provide socio-economic and environmental benefits, and bring colour to an otherwise gray urban landscape. Understanding and quantifying the structure of the street tree resources within an urban environment is critical to evaluate their environmental benefits and for basic street tree management. Good avenue trees come from a single, uniform batch of the same height and width. A comprehensive inventory of the street tree population which includes location, tree types and characteristics is most important to generate baseline data for street tree management. In this study which is a part of undergraduate student research initiative, different areas of North Kolkata were selected as study site. The avenue trees were photographed and any important character was noted. It was seen that in planned cities as in Salt Lake city the aftercare following the plantation of avenue trees was better. But in other areas following plantation in Beleghata and Phoolbagan the survival of the saplings planted by the government depended on the anthropogenic pressure of that area.

Key Words:

Undergraduate student research initiative, avenue trees, survey and documentation

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Indian Traditional Medicine Plants: Using Nature's Pharmacy

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Abstract

India stands out as a treasure trove of such priceless botanical resources, which play a crucial role in healthcare systems. This summary gives a general review of India's rich history of traditional medicinal herbs while emphasising their relevance, variety of uses, and potential for use in contemporary medicine. Ayurveda, the traditional medicine of India, has been closely linked to the spiritual and cultural practices of the nation for thousands of years. Ayurveda makes considerable use of medicinal herbs, which are said to have healing powers and encourage overall wellness. These plants have been employed for thousands of years to treat a variety of diseases and are now an essential component of India's traditional healthcare system. India's tremendous biodiversity is a result of the country's varied climatic conditions and geographic locations. India is home to an abundance of botanical resources that have been used for their therapeutic capabilities, with over 15,000 medicinal plant species officially recognised. Just a handful of the numerous medicinal plants found in India are Tulsi (Holy Basil), Neem, Ashwagandha, Turmeric, Amla (Indian Gooseberry), and Brahmi. Traditional Indian medicines have a wide range of therapeutic uses that address many different facets of healthcare. Traditional uses for these plants include the treatment of musculoskeletal difficulties, cardiovascular problems, skin diseases, respiratory problems, and digestive problems. Additionally, they have been applied to promoting longevity, boosting vitality, and improving mental wellness. Indian traditional medicines have recently attracted attention from throughout the world for their potential in cutting-edge healthcare systems. These plants' active ingredients have drawn scientific interest and are currently the subject of in-depth research into their pharmacological characteristics. Natural substances extracted from these plants have demonstrated promising outcomes in the development of new drugs, the prevention of disease, and complementary and alternative medicine. The conservation and sustainable use of traditional medicinal plants in India, however, confront difficulties due to habitat loss, overuse, and a lack of scientific validation, despite their enormous potential. Governmental agencies, academic institutions, and regional communities are working to encourage the preservation, cultivation, and ethical use of these plants. In conclusion, India's indigenous medicinal plants constitute a sizable and priceless source of healthcare. Researchers, healthcare professionals, and conservationists are all very interested in them because of their historical value, variety of applications, and potential in modern medicine. India can continue to use nature's pharmacy for the well-being of its people and contribute to the world’s understanding of traditional medicine by recognizing and protecting this rich history.

Key Words:

Traditional Medicine, medicinal plants, healthcare,therapeutic uses

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Utilization of Biocontrol Agent for Plant Disease Management

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Abstract

The world's steadily growing population, food security has recently become a serious concern.In the current situation, it is constantly necessary to provide food for the increasing billions without disrupting the environmental balance. In view of this, sustainable modes of agricultural practices offer better promise and hence are gaining prominence recently.Additionally, these control process currently dominate over chemical-based pest control and pathogen control techniques. Biological control is one such important strategy that is now being used.Overa period of time, various biocontrol methods have been experimented with and some have exhibited great success and promise.This investigation highlights the different methods of plant disease management, types of plant pathogens, their modus operandi and various biocontrol approaches employing a range of microorganisms and their by-products.The study lays emphasis on the use of fungus, bacteria, virus and insect-pest as biocontrol agent in sustainable agriculture practices. Instead of directly interacting with the targeted agent, these organisms interact with host plants which leads toinduced resistance by priming them.This non-chemical, environment friendly method provides significant advantages for effective management of harmful microflora causing different diseases of crops in support of sustainable agriculture. In order to understand and improve insect-pest and pathogen management strategy for reduction of the crop loss leading to benefit of thehuman society as well as environment. It is important toidentify suitable techniques using biological tools without hampering the ecosystem and soil health.The new conceptual framework may contribute to more uniform and appropriate regulatory approaches regarding biological management through efficient authorization and application of biocontrol products.

Key Words:

Biological control, microorganism, plant disease, sustainable agriculture

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Artificial Intelligence: Nobel Technology for the Man Kind

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Abstract

Agriculture plays a vital role in India's economy as 54.6% of the total workforce is engaged in agricultural and allied sector activities (MoAFW 2021) and accounts for 17.8% of the country's Gross Value Added (2019-20). Agriculture is the art of producing plants and fruits from the soil which will be used later to feed humans and all creatures in nature, fulfil their basic requirements. The traditional methods, used by the farmers are not sufficient to fulfil the need of increasing population at the current stage.Artificial Intelligence (AI) has become a revolutionary technology in the agriculture sector, and it is transforming the agri-based industries. *AI saves the agriculture sector from different factors such as climate change, population growth, employment issues in this field, and food safety.* AI technologies in agriculture by utilizing data collection methods like remote sensing, GPS, and yield monitoring. It helps the farmers by yielding healthier crops, control pests and diseases, soil monitoring, and many more ways. Some of the successful applications of artificial intelligence in the agriculture sector are: weather forecasting, health monitoring of crops, agriculture robotics, intelligent spraying, disease diagnosis, precision farming, weather and resource management, supply chain optimization, harvesting and sorting etc. Predictive analytics helps the farmers solve key farming challenges, such as analysing the market demands, price forecasting, and finding optimal times for sowing and harvesting the crops. AI brings cost saving production, smart irrigation, fertilizing systems, smart spraying, vertical farming software,robots and drones for harvesting to solve the labour shortage issue. The growth in Artificial Intelligence technology has strengthened agro-based businesses to run more efficiently.Considering the advantages of AI for sustainable farming, implementing this technology seems like a logical step for every farmer. However, there are still some limitations; it is a bit costly and hard to implement for marginal farmers. AI in agriculture offers the potential to improve productivity, reduce resource wastage, increase sustainability, and enhance food security by providing farmers with valuable insights and decision support tools. Although some large-scale researches are in progress and some applications are already in the market, yet industry in agriculture is underserved. Moreover, creating predictive solutions to solve a real challenge faced by farmers in farming is still in progress at an early stage.

Key Words:

Sustainable agriculture, artificial intelligence, precision farming, remote sensing

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Characterization of Lignin Biosynthesis Proteins in *Tossa Jute*: Bioinformatical Approaches

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Abstract

Jute fibre is known as the "Golden fibre" which is the 2nd most important fibre crop after cotton. Lignin is a complex polymer which makes the plant cell wall rigid. The quality of the jute fibre decreases due to higher lignin content. The aim of the present study was to bioinformatically characterize four proteins, Phenylalanine Ammonia Lyase (PAL), Cinnamyl Alcohol Dehydrogenase (CAD), Coumarate 3-Hydroxylase (C3H), and Ferulate 5-Hydroxylase (F5H) of *Tossa* jute which are involved in lignin biosynthetic pathway. The amino acid sequences of each protein were retrieved from different Gene Ids and the physico-chemical parameters were predicted. For understanding the evolutionary relationships, phylogenetic trees among the different gene IDs of same protein of jute species and some other plants were constructed.This study gives useful information for future functional characterization of PAL, CAD, C3H and F5H genes in *Tossa* jute.

Key Words:

Tossa jute, Lignin, PAL, CAD, C3H, F5H

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Unlocking the Biotechnological Potential: Exploring Halotolerant Yeast Biofilms

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Abstract

Biofilm formation by microorganisms under nutrient-limited and adverse conditions is a complex phenomenon. These structures consist of cells embedded in an extracellular matrix (ECM) composed of proteins, carbohydrates, lipids, and nucleic acids. While bacterial biofilms have garnered significant attention, research on yeast biofilms, excluding pathological strains, remains limited. However, the exploration of halotolerant biofilm-forming yeasts from saline environments offers intriguing possibilities for biotechnological applications. Halotolerant yeasts have long been utilized in the food and wine industry, but their application in other sectors is relatively unexplored. Drawing inspiration from bacterial biofilms in bioremediation, food production, and biocatalysis, new avenues for halotolerant yeast biofilms can be uncovered. The abundance of halotolerant yeasts in hypersaline environments, including those isolated from food contaminants and solar salterns, presents an opportunity for discovery. Recent studies have unveiled novel halotolerant yeast species in moderate saline environments, expanding our understanding of their unique physiology and molecular biology. Halotolerant yeasts contribute to aroma and taste in food processing, while specific gene clusters have relevance in second-generation biofuel production. The biocatalytic properties of halotolerant yeasts are also beneficial to the pharmaceutical and chemical industries. By delving into the biology and exploring their unique metabolic traits, halotolerant yeasts offer innovative opportunities for genome mining of biotechnologically relevant genes. This poster focuses on halotolerant yeasts, investigating their biofilm formation and potential biotechnological applications. Understanding the untapped potential of halotolerant yeast biofilms unlocks exciting prospects for harnessing their biotechnological prowess.

Key Words:

biocatalysis; bioremediation; food industry; halotolerance; yeast; green chemistry

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Microbes used as tool for plant disease management

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Abstract

Crop losses due to pests and diseases in the field, storage, as well as in transit and market estimated up to 25 % of the total production in industrialized countries and in developing countries damage is often higher even exceeding 50 %, because of the lack of adequate storage and marketing facilities (Nunes, 2012). For quick and efficient management, the available synthetic fungicides are primarily used to manage postharvest diseases. However, the use of chemicals/ fungicides is to be limited because of environmental and toxicological risks. Recently global trend appears to be shifting towards restricted use of fungicides on produce and product. Nowadays, there is an increasing public concern about environmental matters and healthier food products, thus, scientific desire to seek safer and eco-friendly alternatives for reducing the damage/loss of the freshly harvested produce. Indiscriminate and continuous use of chemicals has led to the development of fungal resistant strains, transforming fungicides ineffective against such strains (Brent and Hollomon, 2007).Application of natural bio-resource that is use of bio-agents is a safer tool for purposeful utilization of introduced or resident living organisms, other than disease resistant host plants, to suppress the activities and populations of one or more plant pathogens. Biological control using microbial agents including yeasts has been reported among several alternatives to the use of synthetic chemical fungicides for managing postharvest fruit decay (Droby et al., 2009). In this regard, the use of antagonistic yeasts has been especially emphasized since they do not produce antibiotics or other toxic secondary metabolites, which may be harmful for beneficial microflora in the rhizosphere. Yeast species have been isolated over the past two decades from a variety of sources and their potential as postharvest biocontrol agents has been investigated extensively. It is necessary to continue finding new potential microorganisms, understand their mode of action, and improve their shelf life and consistency which was the aim of this investigation.

Key Words:

Biocontrol agents,post-harvest disease, yeast, management

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Using GANs and the LSTM Classification Model, a Novel Approach for Prediction of Real and Synthetic PID Diseases Data

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Abstract

In healthcare, disease prediction modelling is essential for early diagnosis and efficient treatment planning. In this paper, we offer a novel method for predicting actual and simulated data related to primary immunodeficiency diseases (PID) by combining generative adversarial networks (GANs) with a long short-term memory (LSTM) classification model. The difficulty of having little real-world data available for training prediction models in the context of PID disorders is addressed by the suggested method. In order to supplement the genuine data already available and increase the training set, GANs are used to produce synthetic PID data. We create a classification model that can tell the difference between healthy people and PID patients by utilising the discriminative power of LSTM, a kind of recurrent neural network. The data creation and categorization phases make up the framework's two primary sections. A GAN is trained to understand the underlying data distribution during the data production phase using actual PID data. The created synthetic PID data then mimics the traits of the real data using the trained GAN. For the purpose of training the LSTM classification model, this synthetic data is mixed with the real data to create an enhanced dataset. The LSTM model is trained on the supplemented dataset during the classification phase to discover the patterns and features that distinguish between healthy individuals and PID patients. The model makes accurate predictions by taking use of the temporal dependencies included in the data. The effectiveness of the classification model is evaluated using a variety of evaluation criteria, including accuracy, precision, recall, and F1 score. An extensive dataset with both actual and fake PID data is used for experiments. The outcomes show that the suggested method performs effectively in predicting PID illnesses. The model demonstrates better generalisation capabilities and robustness to handle real-world scenarios with restricted data availability by utilising GAN-generated synthetic data. The suggested method may help medical personnel properly diagnose and forecast PID disorders, enabling prompt interventions and better patient outcomes. Additionally, the GANs and LSTM classification model combination can be applied to additional illness prediction jobs when real data is scarce, making it an important tool for enhancing healthcare analytics and decision-making.

Key Words:

GANs and the LSTM Classification, Real and Synthetic PID Diseases,disease prediction modelling

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Diversity of Heterocystous Cyanobacteria from Rice fields of Nadia district, West Bengal

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Abstract

Cyanobacteria are photosynthetic prokaryotes that originated 3.5 billion years ago and are distributed worldwide where moisture and light is available. A systemic survey of cyanobacteria was carried out in different rice fields of Nadia district, West Bengal, from August 2021 to May 2023. Nadia district covers a vast area of approximately 3,927 km^2 and the district is located in southern West Bengal and shares the long international boundary with Bangladesh. The district is situated on the largely alluvial plain, formed by the constant shifting of the various rivers of the Ganges Delta, which gives rise to many freshwater bodies, and the soil type is mostly alluvial, which favors the cultivation of rice and rice is cultivated throughout the district. Different types of freshwater bodies and rice fields are the main reservoirs of different types of cyanobacteria. During this survey samples were collected from different rice fields of four subdivisions of Nadia district. Altogether, 61 heterocystous forms belonging to the 26 genera were morphologically identified and documented from these rice fields of the Nadia district. Among the 61 heterocystous cyanobacteria 12 branched heterocystous were documented. Out of the 12 branched heterocystous cyanobacteria 9 were truly and 3 were false branched were documented. Among the 26 heterocystous cyanobacteria genera *Cylindrospermum* is the dominant one, representing 12 species followed by *Calothrix* with 8 species, *Nostoc* and *Rivularia*eachwith 5 species , *Anabaena, Trichormus* and *Hapalosiphon each with 3 species, Anabaenopsis, Westiellopsisand Scytonema each with 2 species. Richelia, Amorphonostoc ,Gloeotrichia, Dichothrix, Dolichospermum, Brasilonema, Cylindrospermopsis, Raphidiopsis, Camptylonemopsis, Fortiea, Tolypothrix, Nostochopsis, Stigonema, Camptylonema, Mastigocladus* and *Fritschiella* each with one species.

Key Words:

Cyanobacteria, Rice fields, Heterocystous, Diversity, Nadia

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Effects of Balaguluchyadi, Punarnavadi, Guluguluthikthakam in amelioration of Rheumatoid Arthritis - A Review

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Abstract

This comprehensive review aims to present a thorough analysis of the effects of various therapies employed in the management of Rheumatoid Arthritis (RA). RA is a chronic autoimmune disorder characterized by joint inflamation, bone erosion and cartilage deformation. Over the years, several therapic interventions have been developed to ameliorate the symptoms and halt the progression of RA. Pharmalogical interventions, such as disease-modifying anti rheumatic drugs (DMARDs), nonsteroidal anti inflamatory drugs (NSAIDs) and corticosteriods have been widely used in treatment of RA. These drugs help in alleviating the symptoms and slowing down the progression of disease. However they often come with adverse effects and may not provide complete relief to all patients. In recent years, there has been a growing interest in exploring herbal or ayurvedic treatments as complementary or alternative approaches for managing RA. Herbal remedies have shown promising results in the management of RA due to their perceived natural origin and potential immunomodulatory anti inflammatory properties. Balaguluchyadi, Punarnavadi, Guluguluthikthakam these three herbal medicines have shown good results in management of RA. These medicines have no side effects unless overdosed. This review aims to provide an overview of the existing treatments of RA and summarizes their mechanism of action, effectiveness and potential side effects to understand the management of RA and provide patients with the best possible outcomes.

Key Words:

Rheumatoid Arthritis, Amelioration, Pharmalogical treatments, Herbal Treatments, Balaguluchyadi, Punarnavadi, Guluguluthikthakam

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A Brief Review on Bioactivities and Synthesis of Novel Xanthones and Related Compounds from Lichens, Fungal and Bacterial Sources

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Abstract

Xanthones are a significant group of phenolic compounds, commonly known as IUPAC 9H-xanthone-9-one, that have crucial importance in various fields. They have been screened and isolated from both higher and lower group of plants including lichens, Fungi and bacteria. Six-types of major xanthone derivatives are found. Xanthones exhibit significant biological potency i.e., antioxidant, anti-inflammatory, antibacterial, antimalarial, anti-HIV, enzymatic inhibitory and cyto-toxic activities etc. The tricyclic chemical structure and the type and location of its substitutions have a significant impact on demonstrating diverse biological properties. Many xanthones play a role as free radical scavenger in many fungi as exemplified in *Aspergillus*, in lichen such as *Parmelia*, in bacteria like *Streptomyces* etc. The biosynthetic pathways involve in various enzymatic reactions producing secondary metabolites. Those biomolecules that contribute towards bioactivities are primarily antioxidative and cytotoxic in functions. In fungi and lichen, the xanthone core is entirely produced from polyketide, unlike plants. In fungi, the primary molecule is acetyl-CoA and malonyl-CoA forming xanthone derivatives. In lichen, polyacetate pathways are utilised. The novel xanthones derived are phomoxanthones, acremoxanthone A, lichexanthones and its derivatives etc. show range of bioactivities. In bacterial system chrestoxanthone A, actinoplanone have been isolated and screened for antifungal and cytotoxic properties. In this review work the specific xanthone groups and derivatives attributing antioxidant and other bioactive nature have been discussed along with their chemical structure, origin and biosynthesis from natural resources. Xanthones and their derivatives are highly valued, primarily for their free radical scavenging capability that have added into various medicinal and therapeutic importance. This work presents and summarizes information in view towards assisting future research investigations regarding these biomolecules and their improvement through metabolic engineering and plant biotechnological approaches in near future.

Key Words:

Xanthone, Biological potency, Biosynthetic pathways, fungi, lichen, bacteria

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Anthropogenic wastes as Nest Materials of Birds and its effect on Birds' Life

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Abstract

Every day millions of tons of anthropogenic wastes are produced by human which cause many bad impacts on our ecosystem and biodiversity. Birds are an important part of our biodiversity. As a result, they are also affected by anthropogenic waste pollution. They start using anthropogenic wastes as nest building materials as because of un-scientific urbanization and lack of proper disposal of such wastes. That too causes many harmful effects in birds and as well as affect other animal and human populations. In a recent study, we found different anthropogenic waste materials used by different species of birds like nylon threads, hard plastic, plastic bag, fishing line, medical waste, synthetic cotton, pieces of cloth, bottle caps, plastic straw, pen, different type of plastic rope, plastic strips, balloon, and more interestingly face mask which was regularly used during covid pandemic and also other things.

Key Words:

Anthropogenic wastes, nest, bird, pollution, ecosystem

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CBL-interacting protein kinase 6 negatively regulates immune response to Pseudomonas syringae in Arabidopsis

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Abstract

Intracellular calcium ion (Ca^{2+}) is a ubiquitous second messenger in various signal transduction pathways in plant cells. Among the three prominent calcium sensors in plants, both calmodulins (CaMs) and calcineurin B-like (CBL) proteins are 'sensor relays', whereas calcium dependent protein kinases (CDPKs) are 'sensor responders'. But unlike CaMs, which interact with a large variety of target proteins, CBLs specifically target a family of protein kinases referred to as CBL-interacting protein kinases (CIPKs). A database search of the *Arabidopsis thaliana* genome sequence revealed 10 CBLs and 26 CIPKs. Expression patterns of these CBLs and CIPKs suggest their diverse functions in different signaling processes, including light, hormone, sugar, and abiotic and biotic stress responses. Most of the *Arabidopsis* CIPKs, studied so far, were shown to have roles in stress tolerance against abiotic stresses such as high Na^+ and low K^+, cold and drought. Previously, we had reported that Calcineurin B-like protein (CBL)-interacting protein kinase 6 (CIPK6) is involved in growth and development along with abiotic stress tolerance of plants. Here, we report that CIPK6 negatively regulates plant immunity in *Arabidopsis thaliana* against the bacterial pathogen, *Pseudomonas syringae* pv. *tomato* (*Pst*). Reduced susceptibility against bacterial (virulent/ avirulent) growth was observed in all the plant lines compromised in CIPK6 expression, whereas CIPK6 overexpressing plants showed enhanced susceptibility. Complementation with CIPK6 restored normal function in these CIPK6-compromised lines. *CIPK6 knock-out* (*cipk6*) line showed upregulated expression of salicylic acid-mediated defense pathway genes and elevated levels of salicylic acid accumulation upon bacterial infection besides reduced bacterial growth. Moreover, enhanced oxidative burst was observed in *cipk6* plants during PAMP-triggered immunity and effector-triggered immunity, whereas CIPK6 overexpressing plants registered reduced oxidative burst than wild-type plants. CIPK6 negatively regulated the activation of different mitogen-activated protein kinases (MAPKs) as well as the expression of different defense-related MAPK-controlled genes during PAMP-triggered immunity. Hence, we propose CIPK6 is a negative regulator of both PAMP-triggered immunity and effector-triggered immunity in *Arabidopsis thaliana*.

Key Words:

Calcineurin B-like protein, Salicylic acid, PAMP-triggered immunity, Effector-triggered immunity, *Pseudomonas syringae* pv. *tomato* DC 3000, Virulent and avirulent strains

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Screening Of Genetically Modified Cry1Ac & Cry2Aa Expressing Pigeonpea Events for Establishment of Transgene Homozygosity

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Abstract

Pigeonpea (*Cajanas cajan* (L.) Milispaugh) is an important legume crop known for its nutritional and agronomic benefits. Genetic engineering techniques have been employed to enhance its traits, such as increased resistance to diseases, improved yield, and enhanced nutritional value. However, the successful development of transgenic crops requires identifying and stabilising homozygous lines, which possess consistent and stable transgene expression across generations. This study is aimed to identify and establish a homozygous line of pigeonpea plants transformed with *cry* genes (*cry1Ac*&*cry2Aa*) obtained from *Bacillus thuringiensis*. The experimental design involves the generation of transgenic pigeonpea plants through *Agrobacterium*-mediated transformation. The target gene of interest, conferring the desired trait, was introduced into the plant genome. Transgenic plants were subjected to rigorous molecular and phenotypic characterization to identify transgenic events and their transmission of transgene in three generations. Molecular techniques PCR and southern blotting were employed to confirm the presence and stability of the transgene. The expression level of foreign genes (*cry1Ac*&*cry2Aa*) in different generations was monitored through western blotting and enzyme-linked immunosorbent assay, and stable transgenic events with consistent transgene expression were identified. Plants from subsequent generations were analysed to ensure stable inheritance and consistent expression of the desired trait. The process of identifying a homozygous line involved multiple rounds of selection and self-pollination to ensure genetic stability and fixation of the transgene. The development of a homozygous line is crucial for incorporation of transgenic plant in subsequent breeding programs through introgressive hybridization, which is an important step for commercialization.

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Nutritional Composition and Potential Health Benefits of Longan (*Dimocarpus longan* Lour.): An Overview

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Abstract

Longan (*Dimocarpus longan* Lour.) is a lesser known but highly esteemed delicate arilloid fruit of Sapindaceae family and closely resembling with Litchi. Owing to its delicate flavour and sweet taste Longan is gaining popularity all over the world especially in the South-East Asian region. Almost each and every parts of the plant possesses medicinal properties with potential health benefits. The longan fruit supplies high levels of desirable nutrients without adding any extra calories to the diet for which it has received recognition as superfoods. Longan possesses abundant nutritional and phytochemical components both as fresh and processed form. Longan pulp possesses several nutritional and functional components including carbohydrate, protein, fat, vitamins like vitamin A and C, minerals such as Phosphorus, potassium, calcium, iron and magnesium, amino acids, polyphenols and volatile compounds. Both flowers and fruits are essential ingredient of the traditional Chinese medicine and herbal preparations. Over the centuries, longan has been heavily used to promote blood metabolism, soothe nerves, relieve insomnia, prevent amnesia and several other health problems. Seed extracts exhibit anti-gelatinage activity and pulp and pericarp are involved in memory enhancement. Polysaccharides and polyphenols present in longan pulp and pericarp contribute to antiglycation, antioxidant, antityrosinase, potent immunomodulatory and anticancer activities. Though this review summarizes nutrient profile and health benefits of longan, there are still so many medicinal aspects which need to be uncovered. Therefore, further studies are necessary to identify complete nutrient profile and potential health benefits of Longan.

Key Words:

Longan, nutrients, medicinal aspects, pharmacological properties, traditional Chinese medicine

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Response of Plants towards Environment: An Epigenetic Approach

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Abstract

Epigenetics is the study of changes in gene expression of an organism without changing the DNA sequence and in plants epigenetic changes are being reported due to environmental factors such as abiotic and biotic stress. The aim of the review is to find out the response of plants towards environment and role of Epigenetics in those plants. The cause of epigenetics is due to post-translational modification of histone protein, DNA methylation and biogenesis of non-coding RNA. Genomic evidence shows that different abiotic and biotic factors affect chromatin structure and play a role in gene expression regulation at transcriptional and post-transcriptional levels. All organisms exhibit some degree of phenotypic plasticity, it is among higher plants that the capacity of genotype to produce alternative phenotypes in response to environment. Concluded that Epigenetic regulation is considered as another layer of genetic regulation of the complex traits which are influenced by environmental stimulus therefore Epigenetic changes and gene expression variations are correlated and plants may revert back to pre-stress condition when stress is withdrawn some of the changes may carry forward over generation. Epigenetic has become an important research field in post-genomic era and even we can use many model organisms whose epigenomes have been sequenced for many years, we still far from having full knowledge about the regulation of gene expression. To better understand the role of epigenetic factors in stress memory future research needs to be focused on crop plants.

Key Words:

Histones, DNA methylation, non-coding RNA, epimutation, stress

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Study on Rachis Characters of Different Genomic Groups of Banana

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Abstract

Bananasarethemostimportantfruitcropgrownexcessivelyinthetropics.Thisexperimentwasconductedtostudythebunchgrowth,rachisbehavior,malebudandyieldcharacteristicsofABBgenomicgroupandAABgenomicgroupbananacultivars.Here5varietiesunderABBgenomicgroup(Behula,BaraBeglo,Bluggoe,GreenBombay,Pantharaj)and5varietiesofAABgenomicgroup(Dudhsagar,Martaman,Manohar,DesiMalbhog,Kalibhog)werebserved.Inthisstudyitwasfoundthatdaystobunchharvestwasrangedfrom70.50days[Behula(ABB)]to117.70days[Kalibhog(AAB)].Thecropdurationwasrangedfrom259.10days[BaraBeglo(ABB)]to453.50days[Kalibhog(AAB)].Bunchweightwasrangedfrom10.50 kg [BaraBeglo(ABB)]to 22.60kg [Dudhsagar(AAB)].Hands/bunchwererangedfrom6.70[BaraBeglo(ABB)]to10.60[Manohar(AAB)].Fingers/Bunchwererangedfrom66.70[Behula(ABB)]to140.20[Manohar(AAB)].Thefingerweightwasfoundmaximuminbluggoe[235.40g(ABB)]andminimuminBaraBeglo[80.70g(ABB)].Amongthesevarietiesmaximumfruitwidthwereobserved7.00cminBluggoe(ABB)andminimumgirth4.70cmin BaraBeglo(ABB).Fruitlengthwerevariesfrom13.70cm to 6.30cminBluggoe(ABB)andDesiMalbhog(AAB)respectively.Thescaresnumberonrachiswerevariedfrom33in[Manohar(AAB)]to60in[GreenBombay(ABB)].Yieldisminimum21.10t/hain [Bara Beglo(ABB)]and maximum 45.20t/hain [Dudhsagar(AAB)]. All these 10varietiesshowed different characteristicsunderdifferenttraits.

Key Words:

Banana,Varieties, Rachis, Male bud

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Comparative studies of biochemical compositions and antioxidant activities of mycelia and fruiting bodies of *Pleurotus pulmonarius* grown with or without bacterial supplementations

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Abstract

Several *Pleurotus* species (oyster mushrooms) are commercially cultivated in India due to their favorable agro-climatic conditions. Three endophytic bacteria were isolated from the inner tissues of fruiting body of *Pleurotus pulmonarius*. The bacterial isolate PP was identified as *Priestia paraflexa* and both PJ1 & PJ2 were identified as *Rosellomorea marisflavi.*. *P. pulmonarius* was grown in both submerged and solid-state fermentations with and without supplementation of endobacteria to observe their role in proximate compositions and antioxidant activities of both mycelia and fruiting bodies. It was found that the bacterial supplementations increase all the tested parameters in both mycelial and fruiting conditions. The protein, carbohydrate, polyphenol, flavonoid concentrations of mycelia are more or less similar to that of the fruiting body whereas the bacterial supplementations increase more biochemical activities in mycelia. Though the antioxidant activity in mycelia was less than fruiting body but bacterial supplementations increase more antioxidant activity of mycelia than the fruiting body. The present study showed the importance of mushroom vegetative mycelia as a source of bioactive compounds especially in presence of tested endophytic bacteria.

Key Words:

Bioactive compound,Edible fungi, Endobacteria, Oyster mushroom, Solid State fermentation,Submerged fermentation

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TiO_2 nanoparticles with *Vitex negundo* as an effective mosquito repellent

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Abstract

A big threat to global health is the spread of illnesses brought on by mosquitoes. Chemical insecticides, which can harm the environment and people's health, are frequently used in traditional mosquito control techniques. There is consequently a rising demand for research on non-chemical, environmentally acceptable methods of controlling mosquitoes. This research explored the potential of titanium dioxide (TiO_2) nanoparticles combined with *Vitex negundo* extracts, a medicinal plant known for repelling mosquitoes, as a unique approach to mosquito management. The produced nanoparticles were found to have a high surface area and photocatalytic activity, which is known to be efficient against numerous pests, including mosquitoes.Then, using a straightforward extraction approach, we made extracts from *Vitex negundo* leaves and examined their chemical makeup. As demonstrated by bioassays carried out on adult female mosquitoes, the extract exhibited notable mosquito-repellent qualities.We carried out mosquito larvacidal and adulticidal experiments to assess the possible synergistic effects of TiO_2 nanoparticles and *Vitex negundo* extract. The outcomes showed that, when used together, TiO_2nanoparticles and *Vitex negundo* extract had more efficacy in controlling mosquitoes than either compound alone. The nanoparticles' role as transporters increased the plant extract's stability and bioavailability. Overall, our research shows that a viable environmentally benign mosquito control method is combining TiO_2 nanoparticles with *Vitex negundo* extract. With the added benefits of lessening the environmental impact and enhancing public health, this synergistic approach provides a powerful and environmentally friendly substitute for traditional chemical pesticides. Before this strategy is widely used, additional research is required to improve the formulation and assess its long-term effects.

Key Words:

TiO_2, nanoparticles, Mosquito, *Vitex negundo*, larvae

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Impact of Urbanization on Plants, birds & Animal

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Abstract

Urbanization has a profound impact on the natural world, including birds, animals, and plants. Our presentation examines the effects of urbanization on these groups.Despite these challenges, some species have adapted to urban environments, while others have declined or disappeared entirely. By understanding the impacts of urbanization on wildlife, we can better manage and conserve these important species.

Things that would be presented

1. Introduction to Urbanization 2. Impact on plants 3. Impact on birds 4. Impact on animals

Developmental Impact on Aquatic life

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Abstract

Development plays an important role in every country. But there is some diverse effect into this. In some conditions this development also effects our Aquatic life. It also destroy the biodiversity of the sustain area. Sometimes we can see some negative impacts on inland and marine ecosystem. Here we have showed some case studies from different sources so that may aware the today's generation in a sustainable way.

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Unveiling the Healing Traditions: Exploring Self-Medication through Anthropological Lens

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Abstract

Self-medication is a widespread practice wherein individuals treat their ailments without professional medical supervision. This paper explores self-medication from an anthropological perspective, highlighting the importance of anthropology in understanding this behavior. Anthropology's holistic approach helps to unravel the cultural, social, and historical factors influencing self-medication practices. It delves into different anthropological perspectives, including biological anthropology, archaeology, cultural anthropology, and linguistic anthropology, to explore the evolutionary, historical, and cultural aspects of self-medication. It examines the role of cultural beliefs and traditional healing systems in shaping self-medication practices, emphasizing the significance of folk medicine and indigenous knowledge. Furthermore, the paper discusses the influence of social and economic factors on self-medication behaviors and explores the risks and challenges associated with self-medication. It includes case studies from various cultural contexts to illustrate the diversity of self-medication practices. Ethical considerations in anthropological research on self-medication are also addressed, stressing the need for cultural sensitivity and collaboration with local communities and healthcare providers. By shedding light on self-medication through an anthropological lens, this paper aims to deepen our understanding of this complex phenomenon and encourage further cross-cultural research in the field.

Key Words:

Medical Anthropology, Holistic Approach, Medication, Folk Medicine

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Scanning Electron Microscopy (SEM) study on somatic embryo of pseudostem callus culture in *In-vitro* condition of Lemon Grass (*Cymbopogon flexuosus*)

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Abstract

The ability of medicinally significant Lemon grass to regenerate through somatic embryogenesis of pseudostem callus culture has been investigated by SEM study.*Cymbopogon flexuosus* pseudostem explants were employed, and the Murashige and Skoog medium (MS basal media) was added with 2,4-dichlorophenoxyacetic acid (2,4-D). In MS basal medium supplemented with 2,4-D (3 mg/1it.)+ 6-Benzyl Adenine Purine (BAP) (1 mg/1it.), plant regeneration through embryogenesis occurred.The results demonstrate that MS medium enriched with 1 mg/lit. of 2,4-D allowed for the greatest induction of callus and proliferation.In the current investigation, it was discovered that 2,4-D supplementation to MS medium was successful in triggering *Cymbopogon flexuosus*'s callus response. Developing calli, regenerating forms of different stages were subjected to the SEM study.

Key Words:

Basal media, callus, lemon grass, somatic embryogenesis. Nodal segment, SEM study

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Preserving Sonamung Local Germplasm: Conservation Strategies in Malda, West Bengal, India

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Abstract

In Malda, West Bengal, India, the Sonamung germplasm of mungbean (Vigna radiata) is of enormous agricultural and cultural importance. It is a crucial component of the local agricultural systems due to its distinctive qualities like fragrance and taste and capacity to adapt to the agro-climatic conditions of the area and its high market value. The fast adoption of contemporary, high-yielding cultivars and evolving agricultural techniques, however, pose a threat to the survival of the Sonamung.The conservation tactics for the Sonamung native germplasm in Malda, West Bengal, are the main subject of this study. The study's goals were to evaluate the condition of Sonamung germplasm, pinpoint the major variables affecting its conservation, and provide workable solutions to assure its long-term preservation.Together with farmers, agricultural organisations, and specialists in Malda, a thorough survey was carried out to gather Sonamung germplasm samples from various sites and to record them. According to the research, Sonamung germplasm is significant because of its distinctive genetic traits, and environmental adaptation. The introduction of contemporary cultivars, however, has led to a decline in Sonamung's cultivation and consumption, which was also emphasised by the survey.Several ideas are put up to overcome the conservation concerns. Involving farmers to create community seed banks for Sonamung germplasm, encouraging on-farm conservation practises, and educating stakeholders about the value of protecting this regional germplasm are a few of these. In Malda, West Bengal, protecting Sonamung indigenous germplasm is essential for keeping genetic variety, advancing food security, safeguarding long-standing agricultural customs, and acting as a foundation for upcoming breeding initiatives. The results of this study add to our understanding of Sonamung germplasm conservation and shed light on successful conservation tactics in the area.

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