

Conference Proceedings

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2ND | INTERNATIONAL CONFERENCE

HODIERNAL ASPECT OF SCIENCE AND TECHNOLOGY

24th-25th Feb 2023

(Blended Mode)

Sponsored by Chhattisgarh Council of Science and Technology

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Organized by

FACULTY OF SCIENCE

DEPARTMENT OF CHEMISTRY



KALINGA UNIVERSITY



NAAC
GRADE B+

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2022

Ranked in
Top 101-150
Universities

75
Azadi Ka
Amrit Mahotsav

International Conference on HODIERNAL ASPECT OF SCIENCE AND TECHNOLOGY

Organises
FACULTY OF SCIENCE
DEPARTMENT OF CHEMISTRY



About Kalinga University

Kalinga University, Raipur is a NAAC accredited University with Grade B+ and the Only Private University in Chhattisgarh ranked in Top 101-150 Universities in NIRF Ranking 2022 and has emerged as a centre of excellence of higher education in Central India. Strategically located in the Smart City of New Raipur, this University has started carving a niche for itself in the education domain and is rising as a shining star on the horizon of quality education.

Infrastructure – Kalinga offers World Class Infrastructure and student facilities with student centric approach. Highest attention is paid to hands on learning approach and students are encouraged to come up with innovative ideas for projects and practicals. The University has more than 90 laboratories and workshops, all well equipped with the latest, state of the art apparatus and tools. Special emphasis is given to the development of communication skills through the language lab. More than 1000 computers are available for the use of the students.



Establishment – Established in 2013, this University has been able to win the confidence of over 8000 students. Meritorious students from all over the country and various foreign countries like Afghanistan, Angola, Bangladesh, Cameroon, Gambia, Ivory Coast, Kenya, Lesotho, Liberia, Malawi, Namibia, Nepal, Nigeria, Papua New Guinea, South Sudan, Swaziland, Tanzania, Uganda, Zambia, Zimbabwe, etc have chosen this University for their education and career.

Schools of Excellence – Currently the University is serving the student community through various UG and PG programs namely Engineering, Law, Pharmacy, Arts & Humanities, Science, Commerce & Management, Biotechnology, Information Technology, Library Science, Fashion Design & Interior Design, Education.



Dr. Rajeev Kumar

Chairman, Kalinga University.



I am ecstatic to have learned that the International Conference on "Hodiernal Aspect of Science and Technology 2023" will be organised by the Department of Chemistry, Faculty of Science, and I commend them for their initiative. By planning such events, we are furthering our goals of creating a culture that fosters innovation and the sharing of ideas for advancements in science and technology.

The purpose of this conference is to provide a global forum for the exchange of cutting-edge research findings in the areas of innovation and technology. The Conference will also honor the chosen participants for their exceptional work.

Our main aim has been that this conference will serve as an opportunity for brainstorming potential future partnerships.

I send my best wishes for the International Conference.

Dr. Sandeep Arora

Chancellor, Kalinga University.



The International Conference on "Hodiernal Aspect of Science and Technology 2023" was organized with great effort, and I applaud that. The purpose of this conference is to bring together researchers to exchange knowledge and discuss the newest developments in science and technology that will advance humankind.

The purpose of the conference is to disseminate and discuss the most recent information and advancements in science and technology. The Kalinga University, Raipur, has taken a revolutionary step by organizing this conference as another landmark in its continuous agenda to take huge leaps to nurture industry relevant academic research. The goal of this conference is to create much needed perspective and expertise in constantly evolving trends & practices in the field of science and technology.

As industry and academia share their expertise and practices in the field of engineering, this distinguished event also sincerely hopes to offer a forum for useful discussions. The conference's discussion of recent "Science & Technology" advancements will give attendees a great chance to discover new areas for engineering research. I'm grateful for the enthusiastic reception this conference has received overall, and I hope that it will help everyone learn more about the best practices and many modern concepts.

A successful conference is wished for.

Dr. R. Shridhar

Vice Chancellor, Kalinga University.



The Department of Chemistry, Faculty of Science, Kalinga University New Raipur is hosting the "2nd International Conference on Human Aspects of Science and Technology" on February 24 and 25, 2023. As a Vice Chancellor of Kalinga University, I have the honor and pleasure of welcoming you to this event. The Conference is topical given the enormous significance of engineering and science the innovations it has contributed to, particularly in the fields of science and technology.

As we move forward with our work towards Science Innovations playing a significant role in the field of science and technology, which are expanding with time to face more and more complicated changes, I hope that the Conference will be of professional and personal benefit to all of us.

Best wishes for an efficient conference.

Dr. Byju John

Director General, Kalinga University.



Dear all,

I am glad to extend a warm greeting to all of the professionals and academics from around the world on behalf of the organizing committee for the "2nd International Conference on Human Aspect of Science and Technology," which will take place on February 24 and 25, 2023.

While there is a lot of encouragement and advancement in the field of science and technology today, it is crucial to comprehend the conference's theme, which is the new technology and its essential elements, such as adverse event case management and aggregate reporting, which can help businesses gain a competitive edge by creating a more robust benefit-risk profile and improving their ability to spot emerging trends. Future Engineering Innovations must reach worldwide coverage and conform to a variety of regulatory systems tailored to various markets.

As the Director General of Kalinga University, it is my delight and pride to welcome you to the University's great and active campus.

My heartfelt gratitude to the organizing committee for hosting this incredible event.

Dr. Sandeep Gandhi

Registrar, Kalinga University.



Greetings!

As Registrar of Kalinga University, New Raipur, it gives me great pleasure to extend an invitation to you to the "2nd International Conference on Hodiernal Aspects of Science and Technology" on the 24th and 25th of February 2023, which will be held by the department of Chemistry, faculty of science, Kalinga University. I'd also like to thank everyone who contributed to the success of this conference.

The theme of the conference will be the importance of science in current innovation and development. The major goal of this conference is to discuss innovative ideas in the field of Science and Technology in order to better monitor and improve existing hazards to the environment in addition to take advantage of and manage the risk of emerging technologies.

The Conference expects to be filled with informative interactive sessions on the issue by bringing together famous speakers and experts from across the country, making it a memorable event.

I am incredibly grateful to the organizing group for this fantastic enlightening experience. Best wishes for the conference's success.

Dr. Rahul Mishra

Dean Academic Affairs



Dear participants,

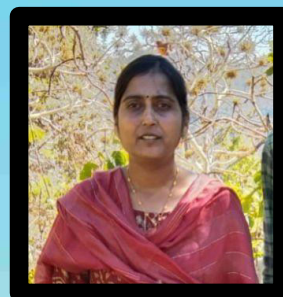
On behalf of Kalinga University, I cordially invite all Science and Technology professionals to the "2nd International Conference on Hodiernal Aspects of Science and Technology" on the 24th and 25th of February 2023. The theme of the international Conference is a breakthrough in the area of science and technology, reflecting genuine concern about the detrimental consequences of the environment.

We hope that the Conference will lead to a bright future for young professional scientists in the fields of science and technology, with good perspectives offered from an international platform. My warmest wishes for a good and fruitful meeting, and my heartfelt gratitude to the organizers.

Good luck to all.

Dr. Vijayalaxmi Biradar

IQAC Director



I want to express my heartfelt gratitude to all the speakers, organizers, sponsors, and attendees who have made this event possible. I hope this conference will provide you with an opportunity to engage in fruitful discussions, gain new perspectives, and establish new connections with like-minded individuals. I believe that your participation will not only enrich your own knowledge and expertise but also contribute to the advancement of your respective fields. So, I wish you all the best for the conference. May you have a productive and enjoyable time here, and I look forward to hearing about your successes and achievements in the future.

Dr. Shilpi Shrivastava

HoD Chemistry



It is well known that workshops, conference and seminar are very important to keep one aware of the latest happenings in the concerned research field globally.

The "2nd International Conference on Hodiernal Aspect of Science and Technology" aims to provide common platform to young researchers to interact and share their valuable view with famous names in their respective field. We are confident that the scientific and technical deliberation made in this mega event will be through provoking, stimulating and inspiring to our young generation, scientists and researchers. It would have a long impact in strengthening the research in the field of sciences. I hope this conference will provide an opportunity for all participants to interact with each other and discuss the issues related to the future of Science. The deliberation at this conference will enable the participants to play an important role in strengthening the department of science.

Dr. Sanyogita Shahi

Convenor



It is increasingly acknowledged that congresses, symposia, and workshops are of the utmost importance for keeping one up to date regarding the most significant innovations in the relevant study fields across the globe. The "2nd International Conference on Human Aspect of Science and Technology" is aimed at providing young researchers a common means of interacting and exchange useful perspectives with established figures in their respective areas. Our young generation and scientists and researchers will be provoked, stimulated, and inspired by the scientific and technical constraints made throughout this massive event, we are confident. It would have a long-lasting effect on advancing scientific research. I'm expecting that somehow this event will provide to everyone chance to interact and start a conversation about implications about the potential future of science. Discussions at this conference will give attendees a hugely important chance to nurture their idea and innovation in field of science and technology.

ORGANIZING COMMITTEE MEMBERS:

S. No.	Faculty Name	Designation	Department of
1	Dr. Shilpi Shrivastava	HOD	Department of Chemistry
2	Dr. Manoj Singh	HOD	Department of Zoology
3	Dr. Aloke Verma	HOD	Department of Physics
4	Dr. Smita Premanand	HOD	Department of Fashion Design
5	Mr. Naimeesh Joshi	HOD	Department of Interior Design
6	Dr. Preeti Pandey	Assistant Professor	Department of Chemistry
7	Dr. Moumita Sinha	Assistant Professor	Department of Forensic Science
8	Dr. Paromita Banerjee	Assistant Professor	Department of Microbiology
9	Dr. Ajay Kumar Harit	Assistant Professor	Department of Zoology
10	Dr. Amit Joshi	Assistant Professor	Department of Biochemistry
11	Dr. Dhananjay Jain	Assistant Professor	Department of Yoga
12	Ms. Priyanka Gupta	Assistant Professor	Department of Chemistry
13	Ms. Sarvaree Bano	Assistant Professor	Department of Chemistry
14	Ms. Neelam Ahirwar	Assistant Professor	Department of Forensic Science

"2nd International Conference on Hodiernal Aspect of Science and Technology"

on

24th and 25th Feb
2023.

PROGRAMME SCHEDULE

(Due to COVID Programme may be Changed depends on Future prospects)

Conference Venue - Auditorium

24 FEBRUARY 2023: DAY 1st SCHEDULE

08:45 AM Onwards	Registration
09:15 AM- 10:15AM	Inauguration: Dr. Shailendra Saraf, Director National Institute of Pharmaceutical Education and Research, Ahmedabad, Gujrat.
10:15AM-11:00AM	Scientific Sessions 1: Dr Sanjib Banerjee (10:15AM-11:00AM)
11:00AM-11:20AM Tea Break	
11:20AM- 01:45PM	Scientific Sessions 2: Prof. (Dr.) Rahul Jain (11:20AM-12:10PM) Scientific Sessions 3: Dr. R. S. Thakur (12:10PM-12:55PM) Scientific Sessions 4: Dr. Ashish Singh (01:00 PM-01:45PM)
01:45PM- 02:45PM Lunch Break	
02:45PM- 04:20PM	Scientific Sessions 5: Dr. Tabarak Malik (02:45PM-03:30PM) Scientific Sessions 6: Dr. Vinod Dumblekar (03:30PM-4:20PM)
04:20PM- 04:40PM Tea Break	

25 FEBRUARY 2023: DAY 2nd SCHEDULE

09:35AM-10:45AM	Scientific Sessions1: Prof. (Dr.) Manisha Shukla (09:35AM- 10:00AM) Scientific Sessions 2: Prof. (Dr.) Robert Doerksen (10:00AM-10:45AM)
10:45AM-11:00AM Tea Break	
11:00AM- 1:30PM	Scientific Sessions 3: Prof. (Dr.) Desh Deepak (11:00AM-11:50AM) Scientific Sessions 4: Prof. (Dr.) R. A. Thakur (11:50AM-12:45PM) Scientific Sessions 5: Prof. (Dr.) Anil Mishra (12:45PM-01:30PM)
01:30PM- 02:30PM Lunch Break	

02:30PM- 04:00PM	Scientific Sessions 6: Dr. R. Sabari Banu (02:30 PM-03:15PM) Scientific Sessions 7: Dr. Kingshuk Dutta (03:15PM-04:00PM)
04:00PM-04:20 PM Tea Break	
04:20PM- 05:30PM	Valedictory Session and Certificate distribution

Poster/Paper Presentation Venue - Seminar Hall

24 FEBRUARY 2023: DAY 1st SCHEDULE	
11:45AM- 2:00PM	Poster/Paper Presentation
01:45PM- 02:45PM Lunch Break	
02:45PM- 04:00PM	Poster/Paper Presentation
04:20PM- 04:40PM Tea Break	

25 FEBRUARY 2023: DAY 2nd SCHEDULE	
10:00AM-11:00AM	Paper Presentation
10:45AM-11:00AM Tea Break	
11:00AM-01:30PM	Paper Presentation
01:30PM- 02:30PM Lunch Break	
02:30PM- 03:30PM	Paper Presentation
04:00PM-04:20 PM Tea Break	
04:20PM- 05:30PM	Valedictory Session and Certificate distribution

INDEX

Sr. No.	Paper Title
1	ANTICANCER ACTIVITY STUDY OF SOME SELECTED INDIAN MEDICINAL PLANTS USED TRADITIONALLY
2	Alkaloid and capsaicinoids in combination impede neurodegenerative effect in Experimental Rat model of Huntington's disease induced by quinolinic acid and investigating upregulation and downregulation of ubiquitin protease pathway.
3	Analysing Metallic Nanoparticles in Plant Extract
4	A Review: Modern Generation with Permanent Hair Loss (Androgenic Alopecia) From the Scalp, Causing and Related Treatment-
5	A Review: Characteristics of Nanomaterial with it application
6	A Review on CED-based analysis of a double-pass packed-bed solar air heater
7	A REVIEW: Modern Generation with Permanent Hair Loss (Androgenic Alopecia) From the Scalp, Causing and Related Treatment
8	Role of Coumarin Based Dyes For Sustainable Development
9	Alkaloid and capsaicinoids in combination impede neurodegenerative effect in Experimental Rat model of Huntington's disease induced by quinolinic acid and investigating up regulation and down regulation of ubiquitin protease pathway.
10	Alternative Source of Protein for Vegans
11	A Comprehensive Review of Toxic Heavy Metals in Polluted Soil to Evaluate Pollution Levels
12	Analysis of Heavy Metal Levels in Growth Environments
13	Boron Carbon Nitride Coated Conducting Carbon Cloth for High Performance Flexible Super capacitor
14	Bioactive Component of Cinnamon: A Review
15	Bio active properties of Papaver somniferum : A Review
16	Bio active properties of Star anise : A Review
17	Bio active properties of Piper cubeba : A Review
18	Biogenesis of silver nanoparticles and its antibacterial studies
19	Bioactive Component of Chirayata: A Review
20	Biodiesel production using Soybeans: A green approach
21	Bioactive Component of Clove: A Review

22	Bioinspired Nanomaterial in Drug Delivery
23	Catalytic Application of Modified Biochar for the efficient production of Cyclic Carbonates from Carbon Dioxide and Epoxides: Synthesis, performance & mechanism
24	Cyclotrimetaphosphate-Assisted Ruthenium Catalyst for the Hydration of Nitriles and Oxidation of Primary Amines to Amides Under Aerobic Conditions in Water
25	Designing Of Nano-Co-Crystal Of An Anti-Hyperlipidemic Drug For The Management Of Hyperlipidemia.
26	Designing Nanoemulsion Of An Antiretroviral Drug For The Management Of Neuroaids
27	Development of Printed Electrode Using Graphene Nanomaterial
28	Development of Polyacrylate Films with Polymer Nanocomposite
29	Distribution of fluoride and arsenic in groundwater and human health risk evaluation from lower Gangetic plain of West Bengal, India
30	Design, Synthesis and Biological Activity of Methoxycyclohexyl Nicotinamide compounds
31	Efficacy of the Column method Adsorption and desorption via Gold nanoparticles encapsulated alginate microspheres for Safranin Orange dye and the metallic Chromium ions
32	Effective traditional medication for snakebite and skin diseases <i>Achyranthes aspera</i>
33	Economical model of organic waste management for sustainable development
34	EFFECTS OF SOIL POLLUTION IN PATHALGAON AREA OF JASHPUR DISTRICT (C.G.)
35	Environmental Remediation and Analysis of metalloids in Water by Novel Techniques
36	Groundwater Fluoride Removal Techniques by Using Bio – Adsorbent Method
37	Green synthesis of ZnO nanoparticle: A critical review
38	Impact of Nanotechnology on Material Development
39	Lemon juice-assisted hydrothermal synthesis of hydroxyapatite nanoplates for orthopedic applications
40	Microfluidics in the in-situ drug delivery of cancer medications
41	Mitigation of nitrous oxide (N ₂ O) emissions from wheat crop through fertilizer management with increased nitrogen use efficiency and crop yield.

42	Medicinal value of <i>Calotropis procera</i> : A Review
43	Naturally Occurring Glycosides and Oligosaccharides as Future Drugs
44	“Nanotechnology” Current Status in Pharmaceutical Science
45	Preparation of Nanoparticle through Terpenoid: An Overview
46	Physicochemical Studies on Assessment of Ground Water Quality of Raipur District
47	Production of Nano ZnO Thin Films by Sol-Gel Spin Coating for Use in Transparent Solar Cell Layers
48	Physico-chemical parameters of the ground water in the Navapara in the Raipur district, Chhattisgarh, India.
49	Production and characterization of Polyhydroxy butyrate using <i>Achromobacter kerstersii</i> KUMBNGBT-36 isolated from dump yard soil sample
50	PHISICO-CHEMICAL STUDIES OF WATER SUPPLIED BY AREA OF RAJIM MUNICIPALITY DISTRICT –RAIPUR
51	Polythiophene-based metal oxide nanocomposites and their effect on supercapacitor applications
52	Review paper on difference in chemical composition of cancer cells and normal cells
53	Quinoline and its Derivatives: A Complete Survey of its Biological Significance
54	Role Of Polyamines In Pathogenesis Of <i>Streptococcus Pyogenes</i>
55	Ring-Modified Histidine-Containing Short Peptides as Antifungals
56	Rapid Detection of Designer Drugs- Presents Challenges for Forensic Chemists
57	Response surface methodology: A tool for modelling and optimization in microbial technology
58	Recyclable Zerovalent Iron Mediated photoRDRP for synthesis of Stimuli-Responsive polymers
59	RECENT REVIEW ON SYNTHESIS, SPECTRAL STUDIES, VERSATILE APPLICATIONS OF AZO DYES AND ITS METAL COMPLEXES
60	Structure elucidation of a novel hexasaccharides Urose from <i>Shyamadhenu</i> milk
61	Synthesis And Characterization of Biodegradable Plant Based Bioplastic
62	Study of growth performance and biochemical responses of <i>Chrysopogon zizanioides</i> cultivated in abandoned bauxite mine soil

63	Structural characterization of kankrej cow milk oligosaccharides by 2D NMR techniques
64	Structure Elucidation of a Novel Heptasaccharide Ausose from Black Cow milk by 2D NMR and Mass Spectrometry
65	Syntrophic Consortia: Recent Advances in Understanding Microbial Interspecies Interactions
66	Surface polarization and external electrical stimulation effect on biocompatibility of MgSiO ₃ bioceramics
67	The Production of Goods Using Biological Systems, Processes or Organisms with the Goal of Modernizing Industry or Improving Human Life: A Review
68	Therapeutic applications and Health benefits of Water Lily: A Review
69	Understanding the Anti-nutritional Factors & bioactive compound of Millets and Little Millets varieties grown in different locations in Chhattisgarh (especially Baster Region): A Review
70	Various Approaches for Drug discovery using Natural products
71	Zebrafish as A fascinating animal Model: a robust platform for in vivo screening for Biomedical researches
72	A Review on Nanoparticle as a Catalyst in Dyes



INAUGURAL GUEST

Dr. Shailendra Saraf

Director,
National Institute of Pharmaceutical
Education and Research, Ahmedabad



SPECIAL GUEST

Dr. Manisha Shukla

Associate Professor
Lucknow University

Our speakers



Prof. (Dr.) Anil Mishra

HoD-Chemistry,
Lucknow University



Prof. (Dr.) Rahul Jain

Medicinal Chemistry,
NIPER, Punjab



Prof. (Dr.) R. A. Thakur

Director IITM
Srinagar, J&K, India



Dr. Desh Deepak

Professor,
Lucknow University



Dr. Kingshuk Dutta

Scientist,
CIPET-APDDRL, Bangalore,
Polymer Chemistry and Fertilisers



Dr. Sanjib Banerjee

HOD & Associate Professor
Chemistry, IIT Bhilai



Dr. Tabarak Malik

Professor,
University of Godar, Ethiopia



Dr. R. S. Thakur

Scientist,
CSMRI, Bhavnagar, Gujarat



Dr. Vinod Dumblekar

Motivational Speaker,
New Delhi



Dr. R. Sabari Banu

DST-Women Scientists C
Bangalore Region



Dr. Ashish Singh

Department of Chemistry,
Associate Professor,
CGU



Prof. (Dr.) Robert Doerksen

Professor, Associate Dean,
University of Mississippi, USA

ANTICANCER ACTIVITY STUDY OF SOME SELECTED INDIAN MEDICINAL PLANTS USED TRADITIONALLY

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Abstract: Due to the availability of several secondary metabolites, plants and their derivatives have historically been relied upon as a primary source of therapeutics. Many different plant families have been found to have compounds with possible anticancer effects. The purpose of this research was to use the SRB assay to assess the cancer-fighting effects of an ethanolic extract of three plants from different families, namely *Croton bonplandianum* Baill., *Heliotropium indicum* L., and *Quisqualis indica* L., on four different human cancer cell lines: melanoma (MDA-MB-231), chronic lung disease (A-549) and prostate cancer (PC-3) and hepatoma (HepG2). These three plants were tested for their cytotoxic activity (SRB assay) against these cancer cell lines. Different test material concentrations (10 gram/milligram, 20 gram/milligram, 40 gram/milligram, and 80 gram/milligram) were used to determine the level of activity. At 80 ug/ml, only *H. indicum* showed a promising impact against melanoma (MDA-MB-231) and lung cancer (A549) cell lines, whereas *C. bonplandianum* and *Q. indica* had no effect (A-549).

Keywords: Plant derivatives, Melanoma, Cytotoxic Activity, SRB assay, Secondary Metabolites.

Alkaloid and capsaicinoids in combination impede neurodegenerative effect in Experimental Rat model of Huntington's disease induced by quinolinic acid and investigating upregulation and downregulation of ubiquitin protease pathway.

Afsha Khan 1*, Ankit Chaudhary 1, Vipin Kumar Garg 1

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Abstracts: Huntington's disease (HD) is a neurodegenerative disorder that effect brain cell entire over time and lead to physical, mental, and cognitive disabilities. Number of CAG (Cytosine, Adenine and Guanine) nucleotide repeats get extended probably 36-200 repeats. Quinolinic acid (QA) caused excitotoxicity in Wistar rat which is pathophysiological feature of Huntington's disease. capsaicinoids (capsaicin) is an active component of chilli pepper but it found to be neuroprotective in animals as well as in humans whereas alkanoids (piperine)is a bioactive component that extract from black pepper, several reports suggest that piperine act as neuroprotective agent in alzheimer and other neurodegenerative disease. Dysfunction of ubiquitin pathway cause various biochemical degregation in HD. In the present study the combinational effect of both capsaicin and piperine was studied to determine neuroprotection against quinolic acid induced excitotoxicity in experimental model of Huntington's disease. Quinolinic acid was administered intraperitoneally at a dose of (10 mg/kg) for 21days. Capsaicin (20, 50 ,100 mg/kg) and piperine (2.5 mg/kg) perorally in combination was administered for next 21 days 1 hour prior to QA administration. Body weight and behavioral estimation (Rotarod, Actophotometer, Narrow beam and grip strength) were done on 0, 1st, 7th, 14th, 21 days. On last day, animals were sacrificed, and striatum was dissected out for biochemical estimation, neuroinflammatory Markers (IL-1 Beta, IL-6, TNF-a), Oxidative Markers (SOD, Catalase, Nitrite, GSH and LPO), Caspase 3, Mitochondrial Complex estimation respiratory chain enzyme activities (Complex IInd, IIIrd and IVth), Neurochemical Parameters (Dopamine, norepinephrine, serotonin, GABA & Glutamate). Piperine showed positive effect against behavioral, biochemical, memory deficits induced by QA in male wistar rat. Combination of piperine with capsaicin significantly improved neurodegeneration as compared with standard drug (NMDA antagonist) 20 mg/kg IP. This investigation has shown strong antioxidant and neuroprotective effect of piperine and capsaicin against QA induced physical and mental deficit rats and showed upregulation of ubiquitin protease pathway.

Keyword: Piperine, Capsaicin, Huntington's disease, Quinolinic acid

Analysing Metallic Nanoparticles in Plant Extract

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Abstract: Metal nanoparticles (MNPs) medical imaging, bioengineering, photoelectricity, antibacterial, anticancer, and catalysis are just a few of the many areas where their unique physical and chemical properties have been extensively utilized. In the conventional MNP synthesis method, toxic chemicals are typically used as reducing and stabilizing agents. This method is extremely harmful to the environment and takes a long time. Because of this, environmentally friendly MNPs synthesis has recently received a lot of attention. Utilizing plant extracts as reductants and stabilizers enables MNP synthesis to be simple, cost-effective, and long-lasting. In addition, unlike their conventional counterparts, the as-synthesized MNPs are uniform in size, less toxic, and more stable. Green preparation methods are becoming an increasingly important focus in MNPs synthesis research. This systematic review provides a summary of the most recent developments in the utilization of plant extracts as reductants and stabilizers in the green synthesis of MNPs. The potential applications of MNPs made from plant extracts have also been studied in greater detail.

Keywords: Metal NanoParticles (MPs), silver Nanoparticle (AgNP), Gold Nanoparticle (AgNPs).

A Review: Modern Generation with Permanent Hair Loss (Androgenic Alopecia) From the Scalp, Causing and Related Treatment-

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Abstract: Hair loss in women is twice more distressing in women when compared to men. The most common cause of hair loss in women is Female Androgenic Alopecia (FAGA) Androgenic alopecia, or male and female pattern baldness, is a type of hair loss that can occur in people of all sexes. A complex interaction between hormones and genes triggers this type of baldness. The primary culprit is dihydrotestosterone (DHT), which comes from testosterone. DHT attacks your hair follicles, causing your hair to fall out and stop growing. His genetics of androgenic alopecia are often misunderstood by the public and by the medical profession,” Leonard says. “Conventional belief is that male pattern baldness is a sex-linked dominant trait, which means you get it from your mother’s father. In fact, the inheritance pattern is polygenic. That means bits of genetic information from both sides of your family play a role in this condition. Androgenic alopecia is due to the increased activity of 5 α -reductase in the hair follicles which results in the gradual transformation of large, terminal follicles to small, miniaturized follicles. Effectively used in the management of the male pattern androgenic alopecia with a dose of 1mg/day but this article mainly reviews the use of Finasteride in the female androgenic alopecia. Studies so far reported increased scalp hair counts, hair density, and hair regrowth both by the patient assessment and photographs by the blinded expert panel. Relevant literatures were chosen to determine the efficacy of Finasteride in the treatment of female Androgenic Alopecia. Maintaining healthy skin and healthy hair is related to having a healthy, balanced diet and good hydration with water intake.

Keywords: Hair Loss, dihydrotestosterone, (DHT), Androgenic Alopecia, Finasteride Good diet.

A Review: Characteristics of Nanomaterial with it application

Rizul Mishra 1, Dr. Preeti Pandey 1*

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Abstract: Nanoparticles or superfine and smooth particles are the miniature molecules which ranges in size from 1 nanometer to 100 nanometers. Nanoparticles are categorized into distinct classes depends upon their properties as well as their shapes and sizes. Nanoparticles consists of different groups; some of which are fullerenes, metal nanoparticles, ceramic nanoparticles including polymeric nanoparticles. They exhibits significantly various physical properties and chemical properties because of their two dimensional surface area, which is very high. Optical properties of nanoparticles are appeared to be based upon the size, which results in different colors just because of the absorption in the visible region of light. Reactivity, toughness and other related properties are also sustained by their distinctive shapes as well as size and structure. Just because of these properties, nanoparticles have numerous applications in commercial and domestic field which includes catalysis and imaging as well as medical related applications. Also, they plays an important role in energy-based research methods, and environmental related phenomenon's. Solid and heavy metals like Pb, Hg and Sn are appeared to be very hard and stable such that their decay is not easily attainable. If so, it causes destructive effect in environment.

Keywords: Nano particles, Absorption.

A Review on CED-based analysis of a double-pass packed-bed solar air heater

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Abstract: This article's goal is to provide a thorough analysis of the literature related to the use of CFD in solar air heater design. One of the fundamental pieces of equipment for converting solar energy into thermal energy is the solar air heater. In order to anticipate the movement of heat, mass, and momentum as well as to create the best possible designs for various heat transfer and fluid flow processes, computational fluid dynamics (CFD) is a simulation technique. A standard solar air heater is simulated using the cutting-edge CFD code ANSYS FLUENT 16.0. One presupposes a three-dimensional flow. The calculated findings demonstrate that for three-dimensional flow via standard solar air heaters, the Renormalization-group (RNG) k-model produces the best results. The thermal performance of a typical sun air heater, a double pass solar air heater with its top duct packed with layers of aluminum wire mesh, and a lower duct without packing have all been studied. When the findings of a double pass packed bed collector are compared to those of a traditional collector, the thermal efficiency is significantly improved.

Keywords: CFD, bed collector, thermal energy, solar air heater,

A REVIEW: Modern Generation with Permanent Hair Loss (Androgenic Alopecia) From the Scalp, Causing and Related Treatment

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Abstract: Female pattern baldness is twice as upsetting as male pattern baldness. Female Androgenic Alopecia is the leading prevalent cause of hair loss in women (FAGA) Androgenic alopecia, often known as male or female pattern baldness, affects persons of both sexes. This kind of hair loss is caused by a genetic predisposition and the complicated interplay of hormonal. Specifically, dihydrotestosterone (DHT), a byproduct of testosterone, is to blame. DHT is toxic to hair follicles and causes hair loss and a halt in hair growth. Leonard adds that both the general public and doctors have a misunderstanding of the genes of androgenic alopecia. "Male pattern baldness is thought to be a sex-linked dominant characteristic, passed down from of the father of the mother, according to popular opinion. As a matter of fact, the inheritance pattern is polygenic. That's because this disorder involves a patchwork of genes from both your mother's and father's families. As 5-reductase activity rises in the hair follicles, the terminal hairs gradually shrink and fall out, a process known as androgenic alopecia. Although 1 mg of finasteride daily has been shown to help cure male-pattern baldness, the focus of this article is on the drug's usage to treat female-pattern baldness. So far, medical assessments and images taken by a blinded advisory group have shown higher scalp hair counts, hair density, and hair regeneration. To evaluate Finasteride's effectiveness in the management of female Androgenic Alopecia, we searched the literature that was most directly applicable to our research questions. Having a healthy, balanced diet and sufficient dehydration through water intake are linked to keeping a healthy skin and hair.

Keywords: Hair Loss, dihydrotestosterone, (DHT), Androgenic Alopecia, Finasteride , Disorder.

Role of Coumarin Based Dyes for Sustainable Development

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Abstract: A dye is an organic compound that is colored and provides color to a number of objects, such as fabrics, food, and hair. Dyes are the major source of fabric coloring in the textile industry, but the effluents produced from the industry are a significant source of pollution in the environment. Textile wastewater consists of 95% chemicals used with synthetic dyes used for coloring and 5% chemicals used in its manufacturing process. The synthetic dyes used in the process cause a great deal of pollution to the environment, primarily to the plants and animals that live underwater. Currently, scientists are primarily focusing on natural dyes in order to minimize environmental pollution, such as coumarin-based dyes, which are derived from natural sources, such as Tonka beans. There is no adverse environmental impact associated with it. The purpose of this review is to discuss the current status of natural-based coumarin dyes and to evaluate their potential application.

Keywords: Synthetic dyes, Flora, Fauna, Coumarin.

Alkaloid and capsaicinoids in combination impede neurodegenerative effect in Experimental Rat model of Huntington's disease induced by quinolinic acid and investigating upregulation and downregulation of ubiquitin protease pathway.

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Abstracts: Huntington's disease (HD) is a neurodegenerative disorder that effect brain cell entire over time and lead to physical, mental, and cognitive disabilities. Number of CAG (Cytosine, Adenine and Guanine) nucleotide repeats get extended probably 36-200 repeats. Quinolinic acid (QA) caused excitotoxicity in Wistar rat which is pathophysiological feature of Huntington's disease. capsaicinoids (capsaicin) is an active component of chilli pepper but it found to be neuroprotective in animals as well as in humans whereas alkanoids (piperine) is a bioactive component that extract from black pepper, several reports suggest that piperine act as neuroprotective agent in alzheimer and other neurodegenerative disease. Dysfunction of ubiquitin pathway cause various biochemical degregation in HD. In the present study the combinational effect of both capsaicin and piperine was studied to determine neuroprotection against quinolic acid induced excitotoxicity in experimental model of Huntington's disease. Quinolinic acid was administered intraperitoneally at a dose of (10 mg/kg) for 21days. Capsaicin (20, 50 ,100 mg/kg) and piperine (2.5 mg/kg) perorally in combination was administered for next 21 days 1 hour prior to QA administration. Body weight and behavioral estimation (Rotarod, Actophotometer, Narrow beam and grip strength) were done on 0, 1st, 7th, 14th, 21 days. On last day, animals were sacrificed, and striatum was dissected out for biochemical estimation, neuroinflammatory Markers (IL-1 Beta, IL-6, TNF-a), Oxidative Markers (SOD, Catalase, Nitrite, GSH and LPO), Caspase 3, Mitochondrial Complex estimation respiratory chain enzyme activities (Complex IInd, IIIrd and IVth), Neurochemical Parameters (Dopamine, norepinephrine, serotonin, GABA & Glutamate). Piperine showed positive effect against behavioral, biochemical, memory deficits induced by QA in male wistar rat. Combination of piperine with capsaicin significantly improved neurodegeneration as compared with standard drug (NMDA antagonist) 20 mg/kg IP. This investigation has shown strong antioxidant and neuroprotective effect of piperine and capsaicin against QA induced physical and mental deficit rats and showed upregulation of ubiquitin protease pathway.

Keyword: Piperine, Capsaicin, Huntington's disease, Quinolinic acid.

Alternative Source of Protein for Vegans

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Abstract: Eating protein-rich foods on a daily basis not only helps in growing and repairing body cells, but also keeps health problems at bay. Protein helps you stay energetic throughout the day. It reduces your craving to eat junk food, which also helps you to control weight. Proteins are made of amino acids. Vegetarians have cheese, soy products, legumes and other dairy products to get the required dose of protein. Everyone knows how important protein is for the body. Protein works to build muscles in the body. Protein makes us feel satiated due to which our weight also remains under control. People who do bodybuilding need more protein. Our body is made of proteins. Protein-rich food is needed in our body to repair the daily wear and tear of muscles, to get rid of diseases quickly and to gain strength. Ideally, we should have a nutrient rich pre and post workout meal so that our body gets fresh and energized as soon as possible. Nutrient-rich diet is required for better development of the body. For this reason, doctors also recommend taking a balanced diet to keep the body healthy and fit. But, do you know that each nutrient has a different importance and among all the nutrients, protein is considered more important for the growth and strength of our body. Protein is present in every cell of our body. It is mainly considered necessary for building bones, muscles, skin and maintaining them healthy. In such a situation, every person is advised to take protein-rich foods. At the same time, according to the age and body weight, the required amount of protein can be different for each person. In this case, adults need 0.8 grams of protein per kg, teenagers need 1.0 grams of protein per kg and children need 1.5 grams of protein per kg according to body weight. On this basis, it can be assumed that high protein is beneficial for the body as well as very essential.

Keywords: Protein, Vegan, Nutrient,

A Comprehensive Review of Toxic Heavy Metals in Polluted Soil to Evaluate Pollution Levels

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Abstract- A significant hazard to human civilization now stems from issues with the soil. Understanding the extent of soil pollution and using scientific evaluation as a guide for future work are both beneficial. Chhattisgarh (INDIA), a typical industrial and agricultural state, was chosen as the case study area in this instance. It analyzed a variety of research that was published between 2015 and 2022 and compiled information on toxic soil substances. Different cities experienced heavy metal accumulation due to a variety of causes, such as mining operations, sewage irrigation, industrial waste, weathering of parent materials, and industrial waste. Chhattisgarh needs to pay attention to the health risks associated with heavy metals as well as the input of heavy metals into the soil, especially Cadmium (Cd), Lead (Pb), Copper (Cu), and Zinc (Zn) because the pollution level of heavy metals there is generally at a high-risk level. This research reviews policy suggestions for pollution reduction and environmental management while providing a thorough assessment of the soil heavy metal pollution in Chhattisgarh.

Keywords: Heavy metals, Accumulation, Soil, Toxicity.

Analysis of Heavy Metal Levels in Growth Environments

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Abstract: The investigation of heavy metal contamination in vegetables provides information about soil metal concentration levels where vegetables were planted. Heavy metal soil contamination has grown widespread due to increased natural and anthropogenic activity. These soils result in decreased plant growth, performance, and production. In a study, the level of heavy metals in edible plants was examined. The presence of heavy metals is investigated using AAS in three urban sites in the Korba district using the plants *Lycopersicum esculentum* and *Solanum melongena* and the soils utilised for their cultivation. According to the current investigation's findings, the soil and particular edible plants were contaminated with heavy metals. The Cd, Cr, Ni, Zn, Pb, and Cu (mg /Kg) in the vegetables and soil was measured using an Atomic Absorption Spectrophotometer. The average heavy metal levels in vegetables and the soil where they were cultivated were found to be higher than the combined FAO/WHO guidelines. The significant number of heavy metals identified in soil and crops indicates that these substances should be checked frequently because of their potentially hazardous consequences.

Keywords: Heavy metals pollution, Vegetables contamination, Hazardous effect

Boron Carbon Nitride Coated Conducting Carbon Cloth for High Performance Flexible Supercapacitor

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Abstract: The potential application of flexible supercapacitors in wearable electronics has attracted a lot of attention. Carbon cloth (CC) is gaining significant interest as a SC electrode material because of its particular adaptability to the application of wearable or flexible electronics, which is difficult to accomplish with other carbonaceous matrix materials. In this study, BCN was directly deposited on carbon cloth (CC). Specifically, the CC@BCN electrode exhibits outstanding a high areal specific capacitance of 2200 mF cm^{-2} at 2 mA cm^{-2} flexibility. This study is anticipated to provide ideas for the creation of high-performance FSCs.

Keywords –CC@BCN, Flexible, Energy storage, Supercapacitor.

Bioactive Component of Cinnamon: A Review

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Abstract: Cinnamon (*Cinnamomum Zylanicum*) is a spice made from the inner bark of numerous trees from the family Lauracea. Currently, cinnamon oil is widely used in a variety of industries, including food, daily necessities, agrochemicals, cosmetics, pharmaceuticals, flavorings and fragrances, and many more. In addition to a variety of thick soups and drinks, liqueurs, tea, hot chocolate, and spicy candies. The Western Ghats and adjacent hills are where it is grown from April to July and from October to December. It has over 250 different species, and they may be found in tropical and subtropical regions of Southeast Asia, Australia, North, Central, and South America, as well as Sri Lanka, Indonesia, India, and China. The majority of cinnamon was exported from Indonesia, one of the nations with the greatest global production rates for the spice. The flowers, leaves, stems, roots, seeds, bark, resin, and fruit rinds are used to extract the "essential" oils of cinnamon. Cinnamaldehyde (C_9H_8O) and cinnamic acid ($C_9H_8O_2$) are the two primary ingredients of cinnamon oil. The cinnamon plant contains alkaloids, phenolic compounds, flavonoids, saponins, and tannins. Cinnamon oil possesses characteristics that include analgesic, immunomodulatory, anticancer, antifungal, antibacterial, antimicrobial, and antiviral. Cinnamon is used medicinally to treat a wide range of conditions, including diarrhoea, flatulent dyspepsia, poor appetite, low vitality, kidney weakness, rheumatism, influenza, cough, bronchitis, fever, arthritic angina, palpitations, hypertension, and neurological disorders. It is also used to treat skin infections, lower blood sugar levels in diabetics, control infections, and lessen spasms, vomiting, and infections.

Keywords: Cinnamon, flavonoids, bactericidal, mycocidal

Bio active properties of Papaver somniferum : A Review

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Abstract: Poppy seeds (Papaver somniferum L) Its health advantages are well established as like relieving headaches, coughing, and asthma as well as enhancing skin and hair health and supporting digestion. Poppy seed is a tiny dried seed used as a food, flavoring, and source of poppy-seed oil. It is high in nutrients like as proteins, oil, dietary fiber, antioxidants, tocopherols, and other micronutrient but doesn't have any narcotic characteristics. Poppy seeds include a variety of vital bioactive chemicals, including as alkaloids, flavonoids, phenolic compounds, and polyunsaturated fatty acids, which may be employed as culinary ingredients in a variety of applications. Poppy seeds are crushed to produce poppyseed oil, a valuable commercial oil with several culinary and industrial applications. Poppy seeds are frequently utilized as bird seed, in which case they are known as maw seeds. My review is based on above character of poppy seeds about medicinal character of poppy seeds.

Keywords – poppy seeds, medicinal properties

Bio active properties of Star anise : A Review

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Abstract: *Illicium verum* is a medium-sized evergreen tree native to northeast Vietnam and southwest China. A spice commonly known as staranise. Anethole, the same chemical that gives anise its flavour, is found in star anise. Star anise has recently gained popularity in the West as a less expensive replacement for anise in baking and liquor manufacture, most notably in the making of the liqueur Galliano. The chemical molecule shikimic acid, a main precursor in the pharmaceutical production of the anti-influenza medication oseltamivir, is derived mostly from star anise. All across the Indian subcontinent, it is used as a spice in the making of biryani and masala chai.

Keywords: flavoring agent, anti-influenza, medicinal plant,

Bio active properties of Piper cubeba : A Review

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Abstract: We know that from ancient times plants and herbs have been used to cure acute diseases due to their bioactive components, i.e., their chemical compositions, metabolites, alkaloids properties. Piper cubeba, commonly known as Kabab chini, is used in many Asian countries as spices. Due to its medicinal value, it is also used in pharmaceutical compositions to treat illnesses of Asthma, bacterial and microbial diseases, cancer, inflammatory causes, diabetic etc. From the dried seeds of Kabab Chini, we can also extract essential oil. It has a specific aroma due to which it is also is used in perfumes or in several Indian foods to enhance its taste.

Keywords: Medicinal value, metabolites, alkaloids.

Biogenesis of silver nanoparticles and its antibacterial studies

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Abstract: The environmentally friendly nanoparticles are created using a technology that uses microorganisms like bacteria as an alternative to the traditional chemical process. The silver nanoparticles in the current study were created using gram-negative *E. coli* that was isolated from contaminated soil (AgNPs). After being incubated for 3 to 5 days at room temperature, the bacteria's enzyme reduced the silver nitrate solution to create the AgNPs. An initial sign of the synthesis was a colour shift from pale white to brown, which was later validated by UV-Vis spectroscopy. FTIR and SEM measurements were used to further characterize the AgNPs. The produced nanoparticles, which ranged in size from 20 to 40 nm and had a minor aggregation, were discovered to be spherical. The existence of elemental silver was confirmed by the energy-dispersive spectra of the nanoparticle dispersion. It was discovered that the AgNPs have antibacterial action. Silver nanoparticles with possible antibacterial properties were created by the *E. coli* bacterium.

Keywords: AgNPs, Ecoli, Green synthesis, Antibacterial activity.

Bioactive Component of Chirayata: A Review

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Abstract: The chirayata plant found in Himalaya of India, has been used in the traditional system of medicine for thousands of years for treatment of various diseases. Chemical characterization of the constituents of chirayata as well as experimental re-verification of the medicinal properties of this plant has generated interest in the medicinal value of swertia chirayata. The main bioactive substances of chirayata are xanthenes, flavonoids, iridoids, saccharoses, glycosides which play an important role in antioxidative, antimalarial, antibacterial, antiviral, analgesic, anti-carcinogenic, anti-inflammatory properties. Recent reports of antioxidative, anti-carcinogenic and anti-inflammatory activities have led to their use in the drug industry for the treatment and prevention of disease such as diabetes, heart problems and cancer. To do this more specialized tests are required. Medicinal plants are being used continuously in the form of traditional medicinal herbs. It gave the sign of its healing and positive effect in the treatment of various diseases. This modern medicine gives hope to the people, who have miscalculated the process of being successful in living rituals and human trials.

Keywords: Xanthenes, flavonoids, iridoids, saccharides, anti-inflammatory

Biodiesel production using Soybeans: A green approach

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Abstract: The major reasons behind the development of renewable energy sources are the constantly rising need for energy on a worldwide scale and the drawbacks of using fossil fuels, mostly connected to the gas emissions that occur during their burning. In this light, biodiesel is an intriguing option that may help to reduce the amount of greenhouse gases released into the sky. This study looked at the soybean-based biodiesel synthesis method. Gas chromatography was used to examine the physical properties of the biodiesel, including density, viscosity, and acid content, as well as the ester concentration. The outcomes were then utilized to track the reaction's development and the catalyst's gradual deactivation over time, allowing researchers to confirm that the biodiesel's quality is maintained throughout. For this reason, we may draw the conclusion that the recycling reactor utilized in this study contributes positively to innovation in the manufacture of biodiesel.

Keywords: Biodiesel; Soyabean; gas chromatography.

Bioactive Component of Clove: A Review

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Abstract: Clove (*Syzygium aromaticum*) is a plant from the Myrtaceae family that is used to make spices. Eugenol ($C_{10}H_{12}O_2$; 4-allyl-2-methoxy phenol), a phenylpropene and an allyl chain substituted guaiacol, is the main active component in clove oil. The main component predominantly responsible for the smell of cloves is eugenol, which accounts for 72–90% of the essential oil extracted from cloves. Clove is presently farmed all over the world, particularly in the Brazilian state of Bahia. Also in South America, Africa, and Asia, despite its Indonesian origins. These are frequently used in consumer goods like toothpaste, soaps, cosmetics and as a spice, for taste, or aroma. Many civilizations utilize herbal medicine, which ranges from the use of standardized and triturated herbal extracts to the use of conventional and well-liked pharmaceuticals, to treat ailments and treat disease. Many civilizations utilize herbal medicine, which ranges from the use of standardized and triturated herbal extracts to the use of conventional and well-liked pharmaceuticals, to treat ailments and treat disease. People are using the dried flower buds, stems, leaves, and oils to treat medical conditions. Clove possesses analgesic, anticancer, antibacterial, antioxidant, and antiseptic effects. Cloves have a wide range of therapeutic uses, including the treatment of kidney and intestinal diseases, impotence, and genital pain. They are also reported to be stomachic and have smooth muscle relaxant properties. Cloves can be used in natural herbal medicines to relieve headaches, nausea, hypertension, and pain from cuts and burns.

Keywords: Clove, herbal medicine, antibiotic

Bioinspired Nanomaterial in Drug Delivery

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Abstract: Due to their special qualities that can be employed to increase the effectiveness and safety of therapeutic products, Nanomaterials are becoming significant in drug delivery. Targeted, effective, and secure medication delivery systems using bio inspired Nanomaterials are gaining popularity. Bio inspired Nanomaterials have a wide range of potential uses in medication administration since they are made to resemble biological systems, like cells and proteins. This paper gives a general overview of the design concepts, possible uses, and present difficulties of using bio inspired Nanomaterials for medication delivery. The potential of bio inspired Nanomaterials for the creation of fresh medication delivery systems is highlighted in the final section.

Keywords: Drug Delivery, Nanomaterials, Bioinspired, Targeted Delivery, Polymeric Nanoparticles,

Catalytic Application of Modified Biochar for the efficient production of Cyclic Carbonates from Carbon Dioxide and Epoxides: Synthesis, performance & mechanism

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Abstract: The reforestation, pulp, and paper production' hard- and softwood residues (from birch and pine, specifically) were utilized to make biochar, which was subsequently oxidized with nitric acid to create catalytic carboxylic acid functionalized biochar. This oxidized biochar demonstrated high catalytic activity towards the cycloaddition process between CO₂ and epoxides at moderate conditions in the presence of a co-catalyst (CO₂ pressure, 10 bar). Despite the hardwood ox-bc having a substantially bigger surface area than the other kind, there were no changes in the catalytic activity between the two forms of oxidized biochar. The catalysts work by forming hydrogen bonds with carboxylic acid groups on their surface, which activates the epoxide reagent. The reaction with 3-aminopropyltriethoxysilane decreased the number of surface acid groups, and the resultant substance was inert in the processes under investigation. For the production of cyclic carbonates from epoxides and CO₂, the ox-bc catalysts are the first carbon-based materials derived from biomass to exhibit good recyclability (over five runs) with a broad substrate scope. They are also economical, financially viable, and eco-friendly alternative solutions for presently utilized heterogeneous networks.

Keywords: carbon-based materials, co-catalyst, epoxide,

Cyclotrimetaphosphate-Assisted Ruthenium Catalyst for the Hydration of Nitriles and Oxidation of Primary Amines to Amides Under Aerobic Conditions in Water

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Abstract : Amide bonds are ubiquitous and regarded as an essential constituent of many biologically active drug molecules and fine chemicals. We report a practical and operationally simple ruthenium-based catalytic system for the hydration of the nitriles and aerobic oxidation of primary amines to the corresponding amides. Both reactions proceed without any external oxidant in water under aerobic conditions and encompass a broad substrate scope. The mechanistic investigation was executed with the aid of control experiments and kinetic and spectroscopic studies of the reaction mixture.

Keywords: Aerobic oxidation, spectroscopic studies,

Designing Of Nano-Co-Crystal Of An Anti-Hyperlipidemic Drug For The Management Of Hyperlipidemia.

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Abstract: The risk of atherosclerosis (ASHD) and coronary heart disease (CHD) is raised by the condition known as hyperlipidemia. The risk of CHD is increased by the interaction of hyperlipidemia, obesity, sedentary behavior, smoking, and other risk factors. Many persons with normal lipid profiles could develop ASHD, although others with concerning lipid profiles might not. In order to increase the solubility of active medicinal components, nanotechnology has been extensively researched active pharmaceutical ingredients (API). The development of drugs has paid a lot of attention to co-crystal finding. A novel method for achieving the superior character of pharmaceuticals is "nano-co-crystallization," which results from the combination of the two processes. A new co-crystal of the same API that was produced using slow solvent evaporation was previously used for initial research, and the solvent evaporation method was then used to scale up the process. The goal of the current study was to create an anti-hyperlipidemic drug in the form of a nano-co-crystal (NCC). The NCC was prepared using a slow evaporation method. Differential scanning calorimetry, Transmission electron microscopy, Fourier transform infrared spectrophotometry, and powder x-ray diffractometry were then used to describe the NCCs that were formed. Using solvent as the only medium for mixing, the NCC suspension was prepared. Both solutions readily blended into 100 ml of 0.4% (w/v) SLS solution at close to 2 °C under ultrasonic conditions. NCC suspensions were described in further detail. The centrifugation time for the NCC suspension was close to 5 minutes at 10,000 rpm. At that point, the supernatant was removed, and the settling particles were vacuum-dried. SEM, DSC and PXRD were used to characterize the obtained NCC. Franz diffusion cells were used to test for diffusion whereas type 2 apparatus was used to test for dissolution. The FTIR analysis of the NCC formation kinetics revealed that it follows first order. Finally, compared to traditional API dosage forms, NCC demonstrated a better solubility and diffusion profile. In this study, we showed that nano-co-crystallization offers a promising substitute for enhancing the drug's solubility and diffusion.

Keywords: Nano-co-crystal, Anti-hyperlipidemic drug, Hyperlipidemia

Designing Nanoemulsion Of An Antiretroviral Drug For The Management Of Neuroaids

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Abstract: HIV (human immunodeficiency virus) is a retrovirus that mostly affects essential immune system cells in humans. It affects CD4+ T-cells. For the immune system to operate properly, CD4+ T-cells are necessary. HIV-1 can disrupt multiple systems, including the CNS (central nervous system). Early in the course of infection, HIV-1 penetrates the CNS, where it remains and causes a number of motor and cognitive problems that affect behavior. Most of the treatments used nowadays have bioavailability problems, either as a result of poor solubility or as a result of excessive first pass metabolism. Particularly in relation to its uses in medicine, nanotechnology has been a topic of active research. The modification at the nanoscale enables the best delivery and targeting. Nanocarrier aided drug delivery system, one of several medical uses for nanotechnology, has drawn a lot of attention from researchers because of its excellent translational value. Drugs can get through some biological barriers due to the small size and reach affected areas of nanocarriers. Nano emulsions, which consist of two immiscible liquids combined with emulsifying agents (surfactants and co-surfactants) to produce a single phase, are colloidal scattering frameworks that are thermodynamically stable. A nano emulsion is made up of an emulsifier, water, and oil. The goal of the current research was to develop nano emulsions of antiretroviral drug with increased bioavailability. With the use of a pseudoternary phase diagram, a nano emulsion was fabricated utilizing the ultrasonication technique. With CCRD, formulation was further refined. TEM examination verified the globule size of the improved formulation was less than 30 nm. The development of a nano emulsion used thyme oil as the oil phase in accordance with the results of solubility studies. Transcutol was chosen as the cosurfactant while Tween 80 was employed as the surfactant. To develop the nano emulsion, the drug was absorbed into the oil phase. Smix was used to combine surfactant and cosurfactant in ratios of 1:0, 1:1, 2:1, 3:1, and 4:1. distilled water was used as the aqueous phase. A vortex mixer was used to properly combine the oil and Smix. Step-by-step addition of water to oil/Smix combinations at 25°C was used to produce nano emulsions. The area of O/W nano emulsion generation in the water/surfactant/oil system was visually evaluated. The physical status of the mixture was noted after each addition of aqueous phase, indicating whether it is transparent or opaque. This study came to the conclusion that the management of NeuroAIDS may benefit from the use of nano emulsions loaded with antiretroviral drugs.

Keywords: NeuroAIDS, Nano emulsion, Antiretroviral drug.

Development of Printed Electrode Using Graphene Nanomaterial

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Abstract : This review illustrates the method for the preparation of graphene and graphene nanocomposites. The unification of graphene and graphene nanocomposites with polymer substrate by using direct writing, screen printing and three-dimensional printing techniques is explained. The conductive property of graphene for electrode formation in electrochemical sensing advantages is also explained. We have discussed the different methods like cyclic voltammetry, linear sweep voltammetry, differential pulse voltammetry, and anodic stripping voltammetry for electrochemical sensing of biological, environmental, food and clinical samples by using polymeric-based graphene electrodes.

Keywords: graphene and graphene nanocomposites.

Development of Polyacrylate Films with Polymer Nanocomposite

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Abstract: This work concerns the Co-Polymerization of Methyl Methacrylates (MMA) and Ethyl Hexyl Acrylates (EHA) with a Diacrylate as a crosslinking agent monomer. Eco friendly Emulsion Polymerization technique was used for studies. The effect of Polymerization Parameters viz. comonomer concentration ratio, Percentage of Diacrylate, Initiator concentration. The FTIR was used to confirm the formation of cross linkable Polymer. The films of different Copolymers were prepared for studying of Swelling Properties.

Keywords: Crosslinking, Emulsion Polymerization, Nanofillers, Acrylates

Distribution of fluoride and arsenic in groundwater and human health risk evaluation from lower Gangetic plain of West Bengal, India

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Abstract: The manifestation of fluoride and arsenic in groundwater has affected more than 300 million people worldwide. The presence of fluoride in groundwater has been reported from southern and western parts of India; whereas, the northern and eastern part of India is well-known for groundwater arsenic contamination. The lower Gangetic plain located in West Bengal has been marked as a hotspot area due to presence of both the groundwater toxicants. Around 16% and 13% of the groundwater samples ($n = 984$) collected from 35 wards of Rajpur Sonarpur municipality (comes under Kolkata Metropolitan Development Authority) located in Sonarpur block of South 24 Parganas district have been crossed the acceptable limit of arsenic and fluoride in drinking water, respectively. Fluoride concentration > 1.5 mg/L in groundwater has been found in seven wards and arsenic concentration > 10 $\mu\text{g/L}$ in groundwater has been identified in twenty-six wards. The highest fluoride and arsenic concentrations were found in ward no. 21 (2.9 mg/L) and ward no. 20 (213 $\mu\text{g/L}$), respectively. Modelled average daily dose (ADD) and Targeted Hazard Quotient (THQ) of fluoride and arsenic were assessed for the studied population and found in the order of adults $>$ teenagers $>$ children. THQ for arsenic and fluoride were found > 1 in seven and four wards, respectively for both the adults and teenagers. Non-carcinogenic risk of fluoride and arsenic for adults was found above the allowable limit in four and twenty-five wards, respectively. Estimated carcinogenic risk values of arsenic for all the studied age groups were found much greater compared to the tolerable limit of 1×10^{-6} . Installation of surface water treatment plants, deep tube-wells, arsenic and fluoride removal plants and rainwater harvesting are badly needed to provide safe drinking water among the inhabitants in the studied area.

Keywords: Groundwater; Fluoride; Arsenic; Non-carcinogenic risk, Carcinogenic risk.

Design, Synthesis and Biological Activity of Methoxycyclohexyl Nicotinamide compounds

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Abstract: Over the past decade, the molecular targeted therapies have been found beneficial. These therapies consist of small chemical molecules which block the growth and spread of cancer by interfering with specific proteins involved in tumor growth and progression. Molecular anticancer targeted therapies are chemically cytotoxic molecules with a defined biological target. Targeted therapy treatment uses tyrosine kinase inhibitors (TKIs) that target cancer cells without affecting normal cells. It reduces the risk of side effects. A wealth of choices exists for first-line treatment selection, including the first-generation TKI imatinib and the second-generation TKIs bosutinib, dasatinib and nilotinib. Joseph Schoepfer reported Asciminib as tyrosine kinase inhibitor in Journal of Medicinal Chemistry (2018) and later U.S. Food and Drug Administration (FDA) granted it approval. We have designed and synthesized new Methoxycyclohexyl nicotinamide asciminib analogues. All synthesized compounds were characterized by ¹HNMR, ¹³CNMR and LCMS. Biological evaluation was carried out in vitro by Resazurin assay against two cancer cell lines K562 (Human CML cell line) and MV411 (Human AML cell line). ADME and toxicity prediction of novel heterocyclic compound by swiss ADME.

Keywords: Tyrosine kinase inhibitors, cytotoxic molecules, cancer cells

Efficacy of the Column method Adsorption and desorption via Gold nanoparticles encapsulated alginate microspheres for Safranin Orange dye and the metallic Chromium ions

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Abstract: The present paper elucidates the Column method verifying the effectiveness of the Adsorption and the desorption processes carried out by Batch method process with Gold nanoparticles encapsulated alginate microspheres for Safranin Orange dye and the metallic Chromium ions. Gold nanoparticles encapsulated alginate microspheres were synthesized and found as a nano-adsorbent for the removal of inorganic and organic contaminants from aqueous solutions. Gold nanoparticles were prepared and characterized by X-Ray Diffraction (XRD), Transmission Electron Microscopy (TEM) and Fourier Transform Infra-Red Spectroscopy (FT-IR). The adsorption process was carried out through the batch method and examined by column technique. The effects of bed column height, rate of flow and concentration on the efficiency of removal were studied for the column method. Repeated adsorption and desorption cycles were performed to examine the stability and reusability of the nano-adsorbent. Desorption with different concentration of acid solutions results in the regeneration of the adsorbent. This process can be repeated for multiple times. The result of this study proved high stability and reusability of Gold nanoparticles encapsulated alginate microspheres as an adsorbent. In this paper, we studied only the efficacy of the column method which was prior investigated by the batch process in the other published and communicated papers.

Keywords: Adsorption; Nanoparticles; Alginate; Kinetics; Isotherm

Effective traditional medication for snakebite and skin diseases

Achyranthes aspera

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Abstract: *Achyranthes aspera* a herb, is used medicinally. Since the Vedic era until the present, various diseases have been treated with this herb. Numerous experimental trials today demonstrate the value of several medicines in treating a variety of disorders. According to the literature, *Achyranthes aspera* is a very significant plant because of its numerous medical benefits. As a result, *Achyranthes aspera* has been shown to be a versatile pharmaceutical compound. In Marathi *Achyranthes aspera* Known as Aaghada, in Sanskrit Apamarg and in Hindi it is known as Chilchita or Latjira. AAGHADA is also known as Ganesha patri. Due to their diverse therapeutic applications in healthcare, there are 21 Ganesha patri that are incorporated in (pooja) worship of God throughout various festivals. Any form of cough, a typical cold, and viral infections can benefit greatly from aaghada. It is also used to those with urinary issues.

The leaves of *Achyranthes aspera* work well as antivenom for all snakebites. It is also particularly helpful for bites from dogs, rats, or scorpions. Crushed fresh leaves are commonly used to the biting region. To treat the bitten area, freshly crushed leaves are frequently employed. Until the poison is released by vomiting, crushed leaves are given to snake bite sufferers. To get rid of any poison in the blood, vomiting will be done. On the occasion of the Nagpanchami celebration in Maharashtra's Savan (Marathi month), an *Achyranthes aspera*'s garland is placed on the idol of Nagdevta, so that everyone is familiar with snake identification and snakebite treatment from an early age. Nature has provided the solution to the problem. In rainy season water is induced in anthills, where snakes and they come out as well as wild grass is grown everywhere hidden snakes are not spotted so increasing the risk of snake bites while working in the fields. Therefore, *Achyranthes aspera* is a fairly efficient snake bite remedy employed in rural areas of our nation. After being applied to the bite and taken internally, *Achyranthes aspera* can provide relief in 3 to 5 minutes. *Achyranthes aspera* contains Nonreducing sugar, Proteins, Alkaloids, Cardiac Glycosides, Flavonoids, Tannins by phytochemical analysis of acetone, ethanol water extract.

Keywords - Herbal skin care, Snakebite remedies, Chilchita, Apamarg, Aaghada

Economical model of organic waste management for sustainable development

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Abstract: By introducing a socioeconomic model based on contemporary biotechnological processes to convert animal wastes into high-quality manures on a large scale that can be effectively marketed in the rural areas, this study highlights the significance of combining organic and cattle farming along with human resource management in the rural areas of India.

Design/Methodology/approach-For analysis and data gathering, survey data from a site visit to Soraon in Prayagraj, India, as well as various research articles for reference, were employed.

Findings- Through metabolic research, we identified a number of variables that influence farmer communities' usage patterns. As a result, preparation requires more time than usual. It takes more labor because manual mixing is difficult to manage. These processes and procedures frequently produce undesirable results. It releases the strong odour (if not mixed properly). In order to prepare organic manure, we must therefore develop technology and a strategy that will address all of the drawbacks and boost farmers' income. It is important to establish a concept whereby cow farms have an electrically driven fermenter installed to produce the aforementioned organic manure in 7–10 days in order to combine all of these advantages. For success, such an agronomic model needs to take into account a variety of social and cultural values.

Practical Implications- By developing a socio-commercial model that can generate income by combining organic and animal farming practices for agronomic and rural development as well as to produce organic manure for contemporary farmers that have a short processing time, is more efficient, and gives a high yield, we are highlighting the possibility of organic farming across the nation.

Keywords: Agribusiness, Socio-economic, Panchagavya,

EFFECTS OF SOIL POLLUTION IN PATHALGAON AREA OF JASHPUR DISTRICT (C.G.)

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Abstract: Soil pollution is becoming the biggest cause of pollution at present. Modern agriculture also affects soil pollution; chemical fertilizers are being used for more production and income in less time. Due to this the structure of the soil is also changing, as well as the fertility rate of the soil is also continuously decreasing. In soil drought and the soil is becoming unusable for agriculture, from the research point of view industrial, domestic waste, volcanic eruption, forest fire, and other man-made activities are also increasing the rate of soil pollution and unusual soil changing structure. Research has shown that due to the use of chemical fertilizers, the mixing of harmful or toxic substances such as Lead (Pb), Aluminium (Al), Manganese (Mn), Nickel (Ni), Iron (Fe), Zinc (Zn), Cadmium (Cd) and Arsenic (As) in the soil is also a major cause of pollution and affects the fertility of the soil for a long time, Due to soil pollution, the soil is becoming unsuitable for agriculture by converting into desertification. Through research, organic farming, biologically made pesticides and soil pollution by planting more and more trees and converting soil into agricultural land or ways to preserve soil can be referred.

Keywords: pesticides, plants, water, fertilizers, Pathalgaon.

Environmental Remediation and Analysis of metalloids in Water by Novel Techniques

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Abstract: Heavy metal ions, such as Pb^{2+} , Cd^{2+} , Zn^{2+} , Ni^{2+} , and Hg^{2+} , are the most poisonous and non-biodegradable of all water contaminants and can seriously harm both humans and animals. Heavy metal ion contamination of effluent is seen as a severe ecological issue in modern civilization. The planet is seriously endangered by this contamination. As a result, innovative new systems and practices must be created for their eradication. Nanotechnology is virtually always used in research and innovation. This also helps in the search for solutions to a variety of environmental issues, particularly water toxicity. It is getting more difficult to develop extremely sophisticated, innovative water remedies because the existing methods are not capable of keeping up with the increased demand for reducing toxic metal concentrations in potable water and municipal wastewater. In this research, four distinct types of analysis methods based on nanotechnology are discussed, including colorimetric, fluorescence, electrochemical, and bio sensing technologies and to remove such as biosorption, electrokinetic process, supercritical fluid extraction, zeolite as nanosorbent, hydroxide precipitation, ultrafiltration, chemical coagulation, nanopolymer composite, magnetic nanomaterial and metal oxide nanomaterial are promising technique are used. The objective of this study is to give academics and industry a current assessment and recommendations in the area of developing nanotechnology and nanomaterials for the identification and removal of heavy metals in water.

Keywords: Water analysis, Nanomaterial, Heavy metals

Groundwater Fluoride Removal Techniques by Using Bio – Adsorbent Method

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Abstract: Fluoride is an essential constituent for both human and animal depending on the total amount of intake or its concentration in drinking water. Fluoride in drinking water should be within 0.5 to 1.0 mg/L as per BIS and WHO. Fluoride is beneficial for bones and teeth when present in prescribed limits, while its excessive intake causes irreversible damage to human health and results in dental and Skeletal “Fluorosis” manifested by mottling of teeth and softening of bones. groundwater fluoride removal is important as human health is associated with its concentration water. Innovative fluoride removal techniques from drinking water by using different Biomass adsorbent is discussed in this study which is economical and safe at the same time feasible for rural residents.

Keywords: Drinking Water, Fluoride, Bio-adsorbent.

Green synthesis of ZnO nanoparticle: A critical review

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Abstract: Due to its many properties, which have been enhanced by the production of this substance on a nanoscale, zinc oxide is significant in a number of industries. But as environmental concerns have grown, ecologically friendly manufacturing techniques have emerged. Recently, there has been an increase in interest in biological processes for making metal and metal oxide nanoparticles, according to the literature. This approach of producing these nanomaterials was given the name “green synthesis” because it is a less damaging process than the chemical and physical synthesis methods currently used in the industry. Zinc oxide nanoparticles can be produced sustainably using a variety of biological substrates. However, the complexity of biological extracts creates a barrier to the comprehension of the processes and mechanisms of formation that takes place throughout the synthesis, making it challenging to conduct large-scale production using green synthesis approaches. As a result, the current study includes information on the many biological substrates and methods that can be used to produce zinc oxide nanoparticles in an environmentally responsible manner.

Keywords: ZnO nanoparticle, Green synthesis, Biotechnological application.

Impact of Nanotechnology on Material Development

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Abstract: Nanotechnology is a science of the nanoscale, also one of the most critical cutting-edge technologies. Users of nanotechnology are agriculture, livestock, medicine and food. The introduction of nanoparticles creates prospects for enhancing feed consumption and efficiency in animal production given the breadth of nanotechnology uses in animal nutrition. Nano-based substances have established a market presence as consumer goods in various industries, including paints, building materials, cosmetics, medical treatments, and more. It is becoming increasingly harder to track where nanotech is not present. Even with realizing it, we are utilizing nanotechnology in our daily lives. Bioavailability can be increased, and pollution can be decreased using nano-minerals instead of inorganic and organic minerals. Nano-minerals strengthen anti-oxidant activity and improve animal products' nutritional value, immunological response, intestinal health, and development. In this poster, the impacts of nano-Se and nano-Zn in animal diets or cryopreservation mediums on human health are discussed, as well as their mechanisms of action, physiological consequences, and potential toxicity.

Keywords: - Nanotechnology, Nanomaterials, Consumer products, Cryopreservation medium.

Lemon juice-assisted hydrothermal synthesis of hydroxyapatite nanoplates for orthopedic applications

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Abstract: Owing to resemblance of hydroxyapatite (HA) nanoplates with mineral component of living bone tissue, it attracted appreciable attention as excellent bone material. This study presents a new environmental-friendly approach for the green synthesis of HA nanoplates using lemon juice as a soft template. X-ray diffraction (XRD), Scanning electron microscopy (SEM), Fourier transform infrared spectroscopy (FTIR) and Energy dispersive X-ray spectroscopy (EDX) are used to characterize the composition and morphology of developed HA NPs. Results clearly showed the round shaped plate-like morphology of HA with average diameter of about 213 nm and average thickness of about 25 nm. Further, the controlled mechanism behind the formation of HA nanoplates has also been proposed. Therefore, the developed HA nanoplates can be a potential material for orthopedic applications.

Keywords: XRD, FTIR, SEM

Microfluidics in the in-situ drug delivery of cancer medications

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Abstract: This research paper lays its prime focus on the application of microfluidics in the in-situ targeted drug delivery of cancer medications. Microfluidics is a field with tremendous potential that brings to use small volumes of fluids that are usually manipulated on a microscale. Over the past few years, researchers have been investigating the applications of microfluidics in the targeted drug delivery to improve the efficacy and specificity of cancer treatment and therapies.

This paper takes to account the several advancements in the field of microfluidics-based approach for drug delivery in treatment of cancer, with extensive emphasis on in-situ delivery, wherein a drug is not only delivered directly but starts acting exclusively upon the cancerous tissue, eliminating the potential risk of side effects.

The paper aims to highlight the plethora of microfluidic devices that exist today, techniques and procedures brought to use for drug delivery, including micro-pumps, micro-needles, and micro-channels. In addition to this, the paper also briefly discusses the pros and cons of microfluidics-based drug delivery in cancer treatment, including improved drug efficacy and reduced drug toxicity.

Towards the end, the paper elaborately also discusses the opportunities that lay forth for this amazing approach, their future trends and prospects.

Keywords :- Microfluidics, cancer medications, in-situ drug delivery.

Mitigation of nitrous oxide (N₂O) emissions from wheat crop through fertilizer management with increased nitrogen use efficiency and crop yield.

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Abstract: Nitrogen fertilizers play an important role in soil nitrous oxide (N₂O) emissions, which cause global warming and stratospheric ozone depletion. However, the mechanisms underlying N₂O emissions in response to different nitrogen fertilizer applications remain obscure. The aim of this study was to investigate the impacts of different N fertilizer treatments on N₂O emissions, net global warming potential (GWP) and greenhouse gas intensity (GHGI) of N₂O in wheat crop. The treatments were zero nitrogen (T0), recommended dose (RD) of NPK (150 kg-N ha⁻¹) (T1), 30% reduce NPK over RD (105 kg-N ha⁻¹) (T2), diammonium phosphate (T3) and ammonium sulphate (T4). N₂O gas was collected through static box method and concentration measured in a gas chromatograph instrument during the wheat crop growth season. The results showed that cumulative N₂O emission ranged from 30.52 to 37.82 kg N₂O-N ha⁻¹ and the lowest cumulative N₂O emission (30.52 kg N₂O-N ha⁻¹) was recorded from treatment T2. Similarly, GWP and GHGI were found to be lowest in treatment T2 when compared to the normal rate of fertilizer treatment (T1). In our study, higher N₂O flux was observed when the concentration of mineral N increased and a positive correlation was recorded between N₂O flux and mineral N content. The highest wheat crop yield (4.48 t ha⁻¹) was observed under treatment T2 with a significant reduction in yield scaled N₂O emission and increased agronomic N use efficiency by 13.16% and 34.36%, respectively over the normal rate of fertilizer. Overall, application of N fertilizer at the rate of 105 kg ha⁻¹ i.e., 30% reduction over the recommended rate (150 kg N ha⁻¹) for wheat crop could be used as a mitigation strategy for reducing N₂O emissions without compromising the crop productivity.

Keywords: Fertilizer; global warming; nitrous oxide; mitigation; wheat

Medicinal value of Calotropis procera : A Review

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Abstract: Calotropis procera is also known by the names of Aak or Madar in Hindi, and milkweed in English. Also, it belongs to family apocynaceae. Calotropis procera is present more or less overall the India and in other warm and dry places like Warizistan, Afghanistan including Egypt, and tropical Africa. Calotropis procera leaves are supposed to be beneficial because they use as an antidote for the bites of snakes and also useful for body pain. Identification of the tissues of leaves can be studied by histochemical studies i.e., branch of science which deals with the constitution of cells along with techniques of biochemistry. It involves the rows of cylindrical shaped palisade cells and vascular bundles, which shows its identification.

Keywords: Antidote, Anti-cancerous, social value.

Naturally Occurring Glycosides and Oligosaccharides as Future Drugs

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Abstract: Since the origin of Ayurveda, Ancient medicinal system has been taking care of the mankind by providing them various plant based extracts for the remedy of different ailments. Further, with the advent of science, the concept of active constituents was developed in which a particular compound having a specific activity, was isolated and its structure was established and further its synthesis was carried out for using it as a medicine, e.g., a cardiac glycoside Digoxin was isolated from digitalis perpuria and after its synthesis it was used against congestive heart failure. There are many other examples like Taxol which was isolated from Texas Japonica and was used as anti cancer drug, so the traditional medicinal system has always provided leads for the recent medicines. Further, by following the existing knowledge for invention of other perspective drugs, the plants of asclepiadaceous family, were investigated for their chemical constituents which lead to the isolation of cardiac and pregnane glycosides having cardiotonic, anti-cancer, and anti-inflammatory activities. These glycosides were comprised of pregnane and cardiac genies having C21 and C23 steroidal skeleton and the glycone part was made up of 2, 6-dideoxy monosaccharide and normal sugars. The structure of these biologically active glycosides was elucidated by various 2D NMR techniques and mass spectrometry. Novelty of these glycosides was, that they were comprised of 2-deoxy and 2, 6-di deoxy sugars which have recently acclaimed importance in COVID management, where 2 deoxy glucose was used as anti covid drug.

After the excessive work on plant sources up to exhaustion, the other biological resources were also tapped for their glycon contents. It appeared quite challenging to isolate the oligosaccharides from the milk of the various mammals. During the course of the investigations we have isolated the oligosaccharides from the milk of rare animals like Yak, Camel, Gaddi sheep, Donkey, mare, goat, buffalo and cow etc. A number of oligosaccharides congaing two to fourteen monosaccharides in straight or branched chain structure having immunomodulatory, brain development activities, the structures of these biologically active oligosaccharides were established by using 2D NMR spectrum techniques like, COSY, TOCSY, HSQC and HMBC experiments. Some of the oligosaccharides are on the path of the drug development and show enough potential as a future drug.

Keywords: Pregnane, milk oligosaccharide, bioactive properties, 2D NMR.

“Nanotechnology” Current Status in Pharmaceutical Science

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Abstract: One of the most fundamental unit operations that is crucial in pharmacy is size reduction. It aids in boosting release, decreasing toxicity, increasing stability and bioavailability, and enabling improved drug formulation prospects. Drugs in the nanoscale size range have been discovered to work better recently in a number of dosage formulations. The Latin word "nano" means "dwarf" in English. Nanometers are 10^{-9} of a metre since nano size is defined as 10^{-9} of a given unit. The study of molecular processes and small-scale processes at the nanoscale is known as nanotechnology. However, biological and pharmaceutical fields have not yet been fully investigated. Despite this, nanotechnology has had a significant impact on a number of medical fields, including molecular biology, bioengineering, cardiology, cancer, ophthalmology, endocrinology, immunology, and other fields. Better pharmaceutical applications are made possible by the intelligent systems, tools, and materials that nanotechnology offers. Nanotechnology is currently being used in the pharmaceutical industry to produce nanomedicine, tissue engineering, nanorobots, biosensors, and biomarkers, among other things. Although older and more established technologies may be reaching their limits, pharmaceutical nanotechnology offers chances to enhance materials, medical devices, and aid in the development of new technology. Hence, improvements in drug delivery as well as other prospects for medicine and pharmacy will result from this field's developments in the years to come.

Keywords: Pharmaceutical Nanotechnology, Bio-nanotechnology, Nanoscale, Nanoparticles

Preparation of Nanoparticle through Terpenoid: An Overview

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Abstract: When a large class of organic compounds contain isoprene unit is called as terpenoids. They are mainly derived from 5 carbon isoprene units and are also called isoprenoids. Terpenoids mostly found in plants and from the major constituent of essential oils from plants and also in some bacteria and fungi. The different types of terpenes are used in different medical uses such as malaria treatment, in the treatment of bacterial infection, anti-inflammatory and also in wound healing. The techniques that have been used in the characterization of the nanoparticles are XRD, FTIR, SEM, TEM and UV Visible and these techniques are also used to know the - size of the particles. There applications are used in different antimicrobial antibacterial activity. After the extraction of the plant leaves we get a phytochemical and a nanoparticle is formed. The synthesis of the nanoparticles takes place at room temperature. The biosynthesis of the nanoparticles in case of extracted plant takes place in presence of pathogenic bacteria. Thus, it shows different zone of inhibition at different concentration.

Keyword : Nanoparticle , Terpenoid , bacteria, essential oil.

Physicochemical Studies on Assessment of Ground Water Quality of Raipur District

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Abstract: Water is a crucial component for all living things. The water table, temperature, drinking water supply, household needs, and irrigation requirements are all maintained. Examining the quality of several water sources in Raipur, the state capital of Chhattisgarh, is the goal of the present water testing. Turbidity, pH, total alkalinity, chloride, total hardness, total dissolved solids, dissolved oxygen, and total coliform were among the physico-chemical characteristics of pond water samples that were evaluated and analyzed. Among these nine ponds, is the most contaminated. All of these water sources must undergo sufficient purification before being utilized in the home because none of them are suitable for drinking or domestic usage. The result of the ongoing effort is the water in Bendri area.

Keywords: Raipur; groundwater; pre-monsoon; water analysis.

Production of Nano ZnO Thin Films by Sol-Gel Spin Coating for Use in Transparent Solar Cell Layers

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Abstract: The low-temperature and cheap sol-gel spin coating process has been used to produce nano-structured thin films of zinc oxide. Soda lime glass substrates have had two different thicknesses (250.15 and 311.32 nm) of adhering zinc oxide coatings formed on them. Zinc oxide films with high transmission (>95%) and desirable interference fringes in the visible and near infrared range were successfully developed. Swanepoel method, which relies on the interference fringes of the transmission spectra, has been used to correctly measure film thickness, optical constants, and dispersion parameters. Direct optical band gap measurements for zinc oxide films vary slightly with annealing temperatures and film thickness. Zinc oxide films have been found to have a hexagonal wurtzite structure, with a preferential orientation along the (002) plane, as determined by X-ray diffraction analyses. As predicted by Raman spectroscopy, the films have a hexagonal structure. As annealing temperatures and film thickness rise, the average particle size decreases to the nanoscale.

Keywords: Sol-gel, Spin coating, ZnO transparent layer, Thin-film solar cells, Optical properties, Crystal structure.

Physico-chemical parameters of the ground water in the Navapara in the Raipur district, Chhattisgarh, India.

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Abstract: The assessment for this inquiry focused on the physical and chemical characteristics of the ground water in the Navapara Raipur district of Chhattisgarh, India. The geographical area of the study is located between latitudes 21.5257 and 82.7202. Monitoring bore-well and ground water was a part of the current investigation. Physical, chemical, and biological characteristics can all affect the quality of water. Chemical properties include elements like pH and dissolved oxygen. All forms of water can be tested using these parameters. A vast range of chemicals, pathogens, and physical changes are only a few of the various contaminants that cause water pollution. To determine the quality of the water, a number of water quality parameters should typically be sampled and analyzed.

Keywords: Temperature, BOD, COD

Production and characterization of Polyhydroxy butyrate using *Achromobacter kerstersii* KUMBNGBT-36 isolated from dump yard soil sample

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Abstract: Plastic pollution is fueling the grave environmental threats currently facing humans, the animal kingdom, and the planet. The pursuit of renewable resourced biodegradable materials commenced in the 1970s with the need for carbon neutral fully sustainable products driving important progress in recent years. The development of bio plastic materials is highlighted as imperative to the solutions to our global environment challenges and to the restoration of the wellbeing of our planet. Bio-based plastics are becoming increasingly sustainable and are expected to substitute fossil-based plastics. The present research work was aimed to isolate and characterize PHB producing bacterium from scrap yard soil sample collected from Savalanga, Davanagere District, Karnataka. The isolated bacterium was screened by viable staining techniques and solvent extraction method using chloroform. The bacterium was characterized using morphological and biochemical characters. The *Achromobacter kerstersii* KUMBNGBT- 36 was confirmed by molecular characterization using 16s r-RNA sequence and deposited to GenBank, NCBI and assigned with the accession No. OK161008. The production of PHB was optimized using various physico-chemical characters such as media, incubation period, Temperature, pH, different carbon sources, different nitrogen sources and carbon to nitrogen ratio. The cheaper substrates are used for large scale production of PHB in submerged fermentation. The extracted PHB from bacterial cells was quantified and confirmed using Bio-spectrophotometer to get the λ max at 235nm.

Keywords: Polyhydroxy butyrate, *Achromobacter kerstersii*, viable staining, optimization, agro-industrial wastes and Bio-spectrophotometer

PHISICO-CHEMICAL STUDIES OF WATER SUPPLIED BY AREA OF RAJIM MUNICIPALITY DISTRICT –RAIPUR

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Abstract: The drinking water quality at area of Rajim supplied by the municipality was assessed by examining various physico-chemical parameters such as pH, turbidity, conductivity, TDS, electrical conductivity DO, alkalinity hardness chlorides sulphate, nitrate, phosphate and B.O.D of raw water, treated water and at the consumer end in various selected residential areas. It has been observed that there are significant variations in the physico-chemical characteristics of drinking water; the study indicates that some remedial steps in the existing water supply are urgently needed as the water quality is unsatisfactory in some areas of the city. An effort has also been made to study the performance of the water treatment plant at Rajim region district Raipur.

Keyword - COD, BOD, Alkalinity

Polythiophene-based metal oxide nanocomposites and their effect on supercapacitor applications

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Abstract: Supercapacitors are a type of energy storage device that incorporates the advantages of conventional capacitors (greater power density) with the large energy density of rechargeable batteries. Since they are naturally flexible and have great electrical conductivity, conducting polymers like, polythiophene, polyaniline, polypyrrole, PEDOT, etc. are suitable materials for high-performance flexible supercapacitors. Composite materials of polythiophene and metal oxides such as Al_2O_3 , RuO_2 , MnO_2 , ZnO , Co_3O_4 , and NiO are the ideal choices for the attractive, flexible, and high-energy storage supercapacitor. The present study centered on the polythiophene-based supercapacitor. Among the abovementioned conducting polymers, polythiophene is particularly desired and perfect for the construction of supercapacitors due to its enormous pseudocapacitance, high electrical conductivity, higher energy density, long cycle life stability, inexpensive, and environmentally friendly nature.

Keywords: - Polythiophene, Metal oxide, Supercapacitor, Specific capacitance, Cycle life, energy density.

Review paper on difference in chemical composition of cancer cells and normal cells

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Abstract: Cancer cells are fast growing cells with a varied composition as compared to the normal cells. In this paper, I tried to report the change in chemical composition of various chemical compounds such as glycolipids, glycoprotein, mucin and histone, etc present in the cell when the human body gets infected. The chemistry of cancer cells also includes various ions and ion channels, which can be stated through potassium and chlorine channels present at the cell membranes. Besides, the cytoskeleton of cell is not well developed other than the poor development of most cell organelles. As the cancer cell affects the composition and formation of various cell organelles, it results in an overall collapse of the cell biology leading to failure of human system.

Keywords: cancer cells, chemical composition

Quinoline and its Derivatives: A Complete Survey of its Biological Significance

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Abstract: Due to the wide range of uses for which they are used in industrial, synthetic organic, and medicinal chemistry, quinolines have emerged as significant chemical. Among heterocyclic compounds, quinoline is a chosen framework that emerges as a major production strategy for the synthesis of new pharmaceutical agents. The present study provides a fresh assortment of quinoline-based medicines that are already on the market as well as concise natural sources of quinoline. Quinoline derivatives' biological effects include its bactericidal, antimicrobial, antiviral, anti-protozoal, antimalarial, cytotoxic, CVS, Neurological, anti - oxidant, epileptic, analgesic, anti-inflammatory, and anthelmintic properties, are also discussed in this literature.

Keywords: quinoline CVS, microbial

Role Of Polyamines In Pathogenesis Of Streptococcus Pyogenes

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Abstract: The polycations required for Streptococcus pyogenes development and proliferation are polyamines. Different mechanisms that involve both biosynthesis of polyamines and transport mechanisms for absorbing polyamines from the environment closely control the levels of polyamines in bacteria's intracellular fluid. The development and virulence characteristics of S. pyogenes are significantly influenced by the intracellular concentration of polyamines. The goal of this study is to comprehend how polyamines affect S. pyogenes' ability to grow and survive as well as to investigate how virulent S. pyogenes is when polyamines are present. Crystal violet assays were used to measure the formation of biofilms, and S. pyogenes growth curves were conducted in the presence of various concentrations of polyamines.

Keywords: Polyamine, S. pyogenes, Polycations

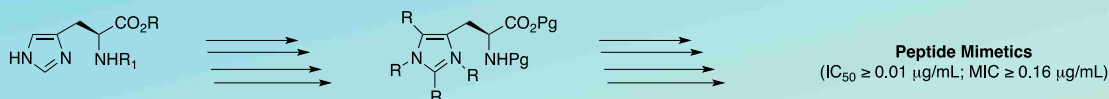
Ring-Modified Histidine-Containing Short Peptides as Antifungals

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Abstract: In recent years, the incidences of invasive fungal infections such as cryptococcosis, candidiasis and aspergillosis have increased rapidly and caused morbidity and mortality in immuno-compromised situations such as burn, acquired immune deficiency syndrome (AIDS) cancer and organ transplant. The infections caused by the yeast *Cryptococcus neoformans* is a human opportunistic fungal pathogen, responsible for approximately 600,000 deaths per year worldwide. In the past two decades, rapidly increasing antifungal drug resistance has emerged as a serious threat to public health, and a major challenge in search of novel antifungals with distinct mode of actions. In disparity to the steep rise in invasive fungal infections, there is a dearth of novel and new classes of clinically approved antifungal activity specific drugs.



The physicochemical properties of the side-chain imidazole ring, its acid-base characteristics, aromaticity, hydrogen bond donor/acceptor properties and ring tautomerism makes histidine a unique DNA encoded α -amino acid. The subtle variation in the reactivity at various position(s) of imidazole ring is exploited for direct C-H and C-N activation resulting in the synthesis of a variety of ring-substituted histidines. These synthetically designed histidines are used as building blocks for the synthesis of a cross-section of designer peptides/peptidomimetics exhibiting potent antifungal activities beside antibacterial activities. This presentation shall provide an overview on the synthesis of ring-modified histidines and their application in the synthesis and discovery of potent bioactive antifungal peptides.

Keywords: Histidine, amino acids, imidazole

Rapid Detection of Designer Drugs- Presents Challenges for Forensic Chemists

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Abstract: Designer drugs are analogs of controlled substances designed to mimic the effects of the original drug. They are becoming increasingly difficult for drug detection technologies to identify. The ability of these drugs to be synthesized in laboratories makes them difficult to detect in standard drug tests. Furthermore, the ever-changing nature of these drugs makes it difficult for detection methods to keep up with new iterations. To make matters worse, designer drugs are often mixed with other substances, making it harder to identify them in a drug test. Finally, designer drugs are often much more potent than other illicit drugs, making it difficult to accurately measure the amount taken. The rise of fentanyl analogs is creating new challenges for law enforcement and forensic toxicology labs. There are at least 16 fentanyl analogs that are thousands of times more powerful than pharmaceutical fentanyl. Rapid detection methods for designer drugs can include using specialized laboratory equipment such as mass spectrometers or gas chromatographs. These instruments can quickly analyze a sample and detect the presence of any drugs or metabolites. Additionally, immunoassay methods such as ELISA and lateral flow assays can be used to quickly detect designer drugs. Field tests have been developed to quickly detect the presence of certain drugs. Although there is no single answer to the question regarding the rapid identification of designer drugs since it depends on the specific forensic context in which the identification of designer drugs is a problem. Moreover, designer drugs are often sold under different names, making it difficult for law enforcement officials to track them down.

Keywords: designer drugs, fentanyl, rapid, detection, forensic.

Response surface methodology: A tool for modelling and optimization in microbial technology

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Abstract: Metabolite production using microbes is strongly influenced by several physical and nutritional parameters, therefore optimization of these variables at lower cost is necessary. Response surface methodology is a statistical and mathematical approach to model creation that evaluates the impact of multiple independent factors to determine the optimal value of each variable to produce desired results. The advantages of response surface methodology over traditional one-variable-at-a-time optimization, such as the generation of significant amounts of data from a limited number of experiments and the ability to evaluate the significant association between the variables on the response, have led to its widespread and consolidated use in the optimization of microbiological and analytical procedures today. To use this methodology for scientific optimization, one must select a research design, fit a suitable statistical function, and assess the fitted model's accuracy and reliability in order to make predictions of experimental results acquired. The symmetrical second order research design that is still most frequently used for the creation of analytical techniques is the central composite design. The employment of three-level factorial designs has not been recently reported, since its effectiveness is quite low for more than two factors. Nevertheless, more recent publications have been made using the Box-Behnken design, which present more effective matrices. RSM has been effectively utilized in pharmacological and microbiological systems to evaluate and optimize fermentation factors and has proven to be promising tool improvement in microbial metabolite and enzyme production.

Keywords: Response surface methodology, optimization, enzyme, metabolite, central composite design.

Recyclable Zerovalent Iron Mediated photoRDRP for synthesis of Stimuli-Responsive polymers

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Abstract: Stimuli-responsive polymers change their conformational properties with changes in pH, light, temperature, etc. The most often used stimuli are pH and temperature. The traditional temperature-sensitive polymers, such as poly (polyethylene glycol methacrylate), are based on changes in hydrogen bonding. When the pH of a solution changes, ionizable acidic or basic groups in pH-responsive polymers can accept or liberate protons. Although the traditional temperature and pH-sensitive polymers have made significant progress. Till date, it is still extremely challenging to develop such polymers with the essential response-specificity and tunability. It might be brought on by various processes, such as (a) complicated multi-step synthesis processes and (b) the challenge of regulating the functionality, degradability, and hydrophilicity or hydrophobicity of the final polymer. On the other hand, due to their ease of separation, lack of catalyst leaching, and reusability, Nickel-Cobalt alloy nanoparticle-mediated polymerization, recently developed by our group has been a desired choice for the development of functional polymers. In this research we are trying to develop the synthesis, properties, and application of amphiphilic diblock copolymers with dual-stimuli (pH/temperature) responsivity. At specific temperature and solution pH circumstances, poly (methacrylic acid)-block-poly (polyethyleneglycol methacrylate) displays temperature and pH-triggered amphiphilicity. The copolymer is prepared via photo-initiated reversible-deactivation radical polymerization (photoRDRP), mediated by recyclable nanoscale zerovalent iron using ionic liquid as a green solvent.

Keywords: pH-sensitive and pH-responsive polymers, photoRDRP.

RECENT REVIEW ON SYNTHESIS, SPECTRAL STUDIES, VERSATILE APPLICATIONS OF AZO DYES AND ITS METAL COMPLEXES

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Abstract: The review paper strives to concentrate on the categorization and diverse synthesis techniques of azo dyes and their complexes over the past ten years. Azo dyes are frequently included as the primary scaffold in many of organic compounds with its emerging commercial and biological properties. Present review article also covers several techniques for identifying and validating azo dyes along with their metal complexes, including all spectral techniques like UV, infrared, NMR, mass spectrometry etc., with auxiliary methods, such as X-ray diffraction TGA-DTA (thermal gravimetric analysis and differential thermal analysis), SEM AND TEM (scanning electron microscopy and tunnelling electron microscopy) methods, and ESR are used to investigate the nature of the azo dyes. The current review also discusses numerous uses for azo dyes and its complexes under the heading colorant, as well as non-colorant uses in a variety of industries and bio medical uses.

Keywords: Azo complexes, Diverse synthetic methods, Characterization techniques, versatile applications.

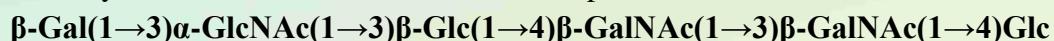
Structure elucidation of a novel hexasaccharides Urose from Shyamadhenu milk

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Abstract: The importance of Shyamadhenu (Black Cow) is well defined into ancient Indian medicinal system of Ayurveda and Charak Samhita. Besides, it is the most important and common food for human infant, though it is also helpful in development of brain, bones and immunological system. In all these ancient medicinal system, it is not described which part of milk i.e. protein, fat or the carbohydrates is responsible for its medicinal properties. After the detailed studies of its constituents, it was found that the carbohydrate part which contains oligosaccharide is mainly responsible for its biological activity. Keeping in mind the medicinal importance of cow milk and the availability of oligosaccharides into Shyamadhenu milk, it was collected in bulk (10 litre) and processed by modified method of Kobata and Ginsberg which incorporates deproteination, microfiltration, lyophilization followed by Sephadex filtration, acetylation and chromatographic techniques which led to isolation of a novel hexasaccharide **Urose** $C_{42}H_{71}O_{31}N_3$ $[\alpha]_D^{25} = +3.98$, gave positive phenol-sulphuric acid by Feigel test and Morgan Elson test and showed the presence of normal N-amino sugars in the compound. The HSQC spectrum of acetylated compound showed the presence of six cross peaks of seven anomeric protons and carbons in their respective region at δ 6.27X89.21, 5.69X91.75, 5.98X90.31, 4.76X95.47, 4.50X101.19, 4.48X101.19 and 4.42X100.84 confirmed the presence of seven anomeric protons and carbons in the Urose in the reducing form. Its reducing nature was further confirmed by its methyl glycosidation followed by acid-hydrolysis which led to the isolation of α - and β - methyl glucosides concluding that the glucose was present in the reducing form. Further by performing the TOCSY and COSY spectrum, the position of glycosidic linkage in the hexasaccharide was obtained. Further the glycosidic linkages were confirmed by HMBC spectrum of acetylated Urose. The configurations of the glycosidic linkages were confirmed by splitting pattern of anomeric proton in the 1H NMR spectrum of Urose acetate. Further the molecular weight of the Urose was confirmed by ES Mass spectrum which confirmed the molecular weight of the Urose and the sequence of monosaccharides present in the oligosaccharide. In the light of results obtained from 1H NMR, ^{13}C NMR, 2D NMR (COSY, TOCSY, HSQC, and HMBC) and mass spectrometry. The structure of isolated novel compound was established as-



Keywords: NMR and Mass Spectroscopy, milk oligosaccharides

Synthesis And Characterization of Biodegradable Plant Based Bioplastic

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Abstract: This study involves the quantitative analysis of high free fatty acid crude palm oil, the separation of palmitic acid and synthesis of palm palmitic acid-based bioplastic. Synthesis of dimethyl 2-tetradecylmalonate (DMTDM) using methyl palmitate (MP) with sodium hydride (NaH) in the presence of reactive solvent of dimethyl carbonate (DMC) was carried out. The reaction conditions comprise at a mole ratio of MP: DMC: NaH: dimethylformamide (DMF) (0.1:2:0.25:1) at 60 °C for 14 h with $88.3 \pm 1.4\%$ yield. FTIR spectra of DMTDM showed the ester carbonyl group at 1740 cm^{-1} . The polymerization of DMTDM with 1,6-hexandiol or 1,12-dodecandiol was carried out using titanium (IV) isopropoxide $\text{Ti}(\text{OiPr})_4$ as the catalyst and reaction time of 24 h. The results showed that the poly(dodecyl 2-tetradecylmalonte) (PDTDM) exhibited good thermal properties compared to poly(hexyl 2-tetradecylmalonte) (PHTDM). The increase of the chain length of diol in PDTDM improved the thermal properties of polyester with glass transition, T_g of 13 °C and melting point of 51 °C with a molecular weight of 12508 Da and polydispersity index (PDI) of 1.4. In general, the synthetic polyesters can be used as internal plasticizer in bio-based industry.

Keywords: Polyesters, methyl palmitate, dimethyl 2-tetradecylmalonate

Study of growth performance and biochemical responses of *Chrysopogon zizanioides* cultivated in abandoned bauxite mine soil

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Abstract: The abandoned bauxite mine (ABM) lands having several contaminants in excess level is an important global environmental issue. Reclamation of these sites is an utmost concern. In the present study, we examined the ability of *Chrysopogon zizanioides* for reclamation of ABM soil. The pot experiments were conducted to assess the impact of ABM soil on the growth along with biochemical responses in *Chrysopogon zizanioides*. The study was carried out for 120 days with ABM soil amended with different ratios of garden soil (GS). The treatments taken were T0 (100 % GS) as control, T1 (75% GS+25% ABM soil), T2 (50% GS+50% ABM soil), T3 (25% GS +75% ABM soil) and T4 (100% ABM soil). The ABM soil had significantly low pH (4.41), water holding capacity (37.04 %), organic carbon (0.33%), organic matter (0.57%) and low nutrients level i.e., available nitrogen (28.22 Kg ha⁻¹), phosphorus (66.56 Kg ha⁻¹) and potassium (25.21 Kg ha⁻¹) as compared with GS taken as control. The highest plant growth parameters including plant height, number of tillers and total plant biomass was found in T1 when compared with the control plants followed by in order of T2>T3>T4. The level of total chlorophyll and protein content were found highest in the control plants. In addition, proline, malondialdehyde, catalase and superoxide dismutase formed in leaves of plant significantly higher by 58.67%, 20%, 85.71% and 8.08%, respectively in T1 treatment when compared with control plants. After harvesting the plants, the physiochemical properties of ABM soil were also found improved when compared to GS. It is found that *Chrysopogon zizanioides* may be cultivated in ABM soil having soil in the ratio of 25% ABM soil and 75% GS.

Keywords: Abandoned bauxite mine; Contaminants; *Chrysopogon zizanioides*; Restoration.

Structural characterization of kankrej cow milk oligosaccharides by 2D NMR techniques

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Abstract: Milk of various origins is prescribed for various ailments in old and traditional systems of medicine such as Ayurveda and Unani. Milk is a rich source of several bioactive substances, including oligosaccharides, lactose, proteins, lipids, vitamins, and immunoglobulins. Ayurveda describes cow milk as nourishing and beneficial for the body's essential organs, including the heart, brain, and eyes. It is a good memory enhancer; it has the effect of enhancing medha, or intellect. In accordance with Ayurveda It is a perfect brain tonic since it has the power to calm Vatadosha, which is responsible for the normal operation of the nervous system. In order to protect newborns from infections and bacterial adherence to the intestinal mucosa, milk oligosaccharide is a crucial component of milk. In our laboratory, we have isolated a number of milk oligosaccharides from different species of cow, which are **rusose, uroses, asose, tausose, ausose, usose, and urose etc.** Due to the medicinal and nutritional value of cow's milk, in order to isolate the oligosaccharides in the milk from the Kankrej cow, a native of Rajasthan, it was collected in bulk (10 litres) from Hanuman Garhi and processed using a modified version of Kobata and Ginsburg method. This was followed by gel filtration, HPLC, and Column chromatography. This paper will describe the various chromatographic techniques like HPLC, TLC, and column chromatography used to analyse the oligosaccharide mixture, which showed various numbers of oligosaccharide units. The structure of isolated oligosaccharides will be confirmed further using ^1H , ^{13}C , and 2D NMR techniques such as HSQC, TOCSY, COSY, and HMBC, as well as mass spectrometry.

Keywords: Milk oligosaccharides, Kobata and Ginsburg and Kankrej cow milk

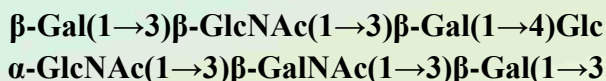
Structure Elucidation of a Novel Heptasaccharide Ausose from Black Cow milk by 2D NMR and Mass Spectrometry

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Abstract: The medicinal importance of the Black Cow milk is well defined in the ancient Indian Medicinal literature of the Ayurveda and Charka Samghita, where this bio fluid is described as a replacement for the mother's milk. It is responsible for the development of the immune system, brain and bones of the neonate. The chemical constituents of the milk are proteins, fats and carbohydrates as oligosaccharides. After reviewing the literature, it was postulated that, the oligosaccharide contents of the milk were responsible for the specific biological activities such as: brain development, immunostimulant, bifidus factors etc. Keeping in mind, the importance of the cow's milk and its oligosaccharide contents, it was procured and processed by the method developed by Deshdeepak et al incorporating deproteination, micro-filtration, lyophilization, gel-filtration, HPLC and column chromatography which resulted in the isolation of a novel heptasaccharide namely Ausose, $C_{28}H_{48}O_{21}N_2$, $[\alpha]_{D25} = -4.22$. It gave positive phenol-sulphuric acid, Feigl and Morgan Elson tests, hence showing the presence of normal and amino sugars in the compound. The 1H NMR spectrum of acetylated Ausose gave six doublets for eight anomeric protons at δ 6.22 (1H), 5.65 (1H), 5.39 (1H), 4.65 (1H), 4.58 (2H) and δ 4.52 (2H), besides that, the eight anomeric carbons appeared at δ 89.27, 91.67, 90.31, 95.40, 101.82, 101.96, 102.01 and δ 102.08 in the ^{13}C NMR spectrum of the acetylated outsource. These values were authenticated by HSQC spectrum of Ausose acetate. Further, the intricacies of the 2D COSY and TOCSY spectrum were resolved and the correlations and positions of the inter-glycosidic linkages were identified, which were further confirmed by the 2D HMBC experiments of the acetylated Ausose. The result so obtained were further substantiated and supported by the Electron Spray Mass spectrometry (ES-MS), which confirmed the molecular weight of Ausose and the sequence of the monosaccharides present in it. In the light of the results obtained from the above experiments, the structure of the novel heptasaccharide Ausose was ascertained as under...



Keywords: Heptasaccharide, milk oligosaccharide, glycosidic linkage, NMR.

"Syntrophic Consortia: Recent Advances in Understanding Microbial Interspecies Interactions"

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Abstract: In our biosphere, microbes are all-pervasive and invariably dwell in communities. They promote the development of other microorganisms in a community and emit a range of metabolites. The law of chemical equilibrium states that recipient microorganisms' ingestion of discharged metabolites might hasten the metabolism of donor microbes. This is the idea of syntrophy, a form of mutualism that controls the growth and metabolism of a variety of bacteria in both natural and artificial habitats. In methanogenic communities, when reducing equivalents, such as hydrogen and formate, are transferred between syntrophic partners, syntrophy is demonstrated exemplarily. According to studies, syntrophy-related bacteria have developed molecular mechanisms to form particular alliances and interspecies communication, leading to effective metabolic cooperation. Moreover, new research has shown that microbial interspecies transmission of reducing equivalents may also take place as electric current via biotic (like pili) and abiotic (such conductive minerals and carbon particles) electric conduits. In today's study domains, Syntrophy Consortia is a highly emphasized topic, and scientists need to explore this area to understand more about the chemistry of microbes, since there are numerous unknown facts that could result in a notable discovery.

Keywords: syntrophy, microbes, natural

Surface polarization and external electrical stimulation effect on biocompatibility of MgSiO₃ bioceramics

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Abstract: The present study investigates the potential use of MgSiO₃ as an orthopedic biomaterial along with the effect of Ca and Zr as dopant. In this context, the current study combines dynamic pulsed electrical stimulation and the surface charge polarization on the biodegradable piezoelectric Ca/Zr doped MgSiO₃ bioceramics to obtain favorable biological response. The Mg_xCa_{1-x}Si_xZr_{1-x}O₃ (x = 0 to 0.2) were successfully synthesized by solid-state route and characterized by X-ray diffraction, scanning electron microscopy, Fourier transform infrared spectroscopy. All the elements (Mg, Ca, Si and Zr) play a crucial role in the bone metabolism of human body. The result indicated that the viability of osteoblast-like cells was found to be increased on the Ca and Zr doped Mg_xCa_{1-x}Si_xZr_{1-x}O₃ (x = 0 to 0.2) bioceramic as compared to HA (hydroxyapatite).

Keywords: bioceramics, SEM, X-rays

The Production of Goods Using Biological Systems, Processes or Organisms with the Goal of Modernizing Industry or Improving Human Life: A Review

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Abstract: Biotechnology is a segment of engineering that employs utilization biological systems, living creatures, or fragments thereof, to develop or create different goods. The notions of biotechnology are applied to activities like brewing and baking bread. The implementation of biology to the creation of novel tools, processes, and creatures with the goal of enhancing society and human health. The application of biology to the development of new devices, methods, and organisms with the intent to better the environment and human health. Traditional industrial microbiology and molecular biology were merged to create recombinant methods for the mass manufacture of metabolites of various types, protein biopharmaceuticals, and bioactive peptides. Novel genetic approaches including metabolic engineering, combinatorial biosynthesis, and molecular breeding techniques, and their modifications, are significantly establishing improved industrial processes. Consequently, the utilization of functional genomics, proteomics, and metabolomics is being made to find new, valuable small molecules for use in medicine and enzymes for catalysis. Industrial microbial genomes are now being sequenced, which is encouraging for the development of novel industrial goods and quality improvements in the future.

Keywords: Society, biosynthesis, genetic approach

Therapeutic applications and Health benefits of Water Lily: A Review

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Abstract: The most fascinating aquatic plants that control the wetlands' ecosystem structure and functions are water lilies and lotuses. It is thought to be a healing plant in Ayurvedic medication from India. Since the majority of aromatic plants create pleasing volatile organic compounds (VOCs), they are widely farmed and used in seasonings, fragrances, ethereal oils. Also thought of beneficial in treating dyspepsia, enteritis, fever, diarrhoea, urinary problems, and irregular heartbeat. Many well-known herbal extracts or active compounds, such as Ginkgo biloba extract, bilobalide extracted from Ginkgo biloba, and silybin derived from milk thistle, have been successfully enhanced through the application of phytosome technology (Silybum marianum), Curcumin can be created for a variety of therapeutic applications or dietary supplements using turmeric and green tea extract (Camellia sinensis). This study aims to give information on the botanical details, conventional usage, accumulation of flavonoids, antioxidant and other important possible biological activities, as well as upcoming research problems in the manufacture of N. lotus extracts for cosmetic uses. Yet, as certain infections evolve mechanisms for resistance, the effectiveness of a certain medical.

Keywords: Water lily, Biological activities, Therapeutic applications

Understanding the Anti-nutritional Factors & bioactive compound of Millets and Little Millets varieties grown in different locations in Chhattisgarh (especially Baster Region): A Review

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Abstract: Kodo millet (*Paspalum scrobiculate*) and little millet (*Panicum sumatrense*) are the most important millets in Chhattisgarh. Kodo and kutki millet contain many bioactive compounds, such as phenolics, bioactive peptides, and carotenoids, that have many physiological functions. Kodo and kutki millet have a variety of phytochemical elements, including derivatives of hydroxybenzoic acid and hydroxycinnamic acids, myricetin, catechin, luteolin, apigenin, daidzein, naringenin, kaempferol, and quercetin, with huge health benefits and thus can be utilised as purposeful food ingredients. Today, millet-based foods and their food products have physiological and health-promoting impacts on antidiabetic, anti-obesity, and cardiovascular diseases. Based on their actions, phytochemicals play a major role in the body's immune system as well. This review presents information on the extraction method, biochemical actions, and health-functional properties of kodo and kutki millet. Now we know the effectiveness of the extraction of bioactive compounds is influenced by the method and solvent. Fermentation of Kodo millet, which produces bioactive peptides, can also increase the antioxidant content. Phenolics in kodo and kutki millet are most bioavailable in gastrointestinal digestion. Bioactive compounds also displayed many health benefits and biological activities, including anti-proliferative, hyperglycemia, and hypertension prevention.

Keywords: Bioactive peptides, Kodo, Kutki

Various Approaches for Drug discovery using Natural products

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Abstract: Natural products (NPs) have historically played a significant role in medication discovery, not only for the treatment of infectious diseases and cancer, but also for other therapeutic areas like multiple sclerosis and cardiovascular conditions. The discovery of new drugs is also hampered by issues with profit and loss, partnerships and averages, and natural products. For instance, beginning in the 1990s, technological difficulties with isolation, characterization, and optimization caused a downturn in the pharmaceutical industry's hunt for innovative medications. Thanks to the advancement of molecular biological processes, there are now more novel chemicals readily available that can be produced from sources like bacteria, yeast, or plants. Additionally, natural product scaffolds are being employed in combinational chemistry approaches to build screening libraries that closely mimic drug-like molecules. By utilizing these technologies, we can perform research on the screening of new compounds using software and databases to locate natural products as a significant source for drug discovery. It also mentions the discovery of lead structures. Compounds made from living things like plants, animals, or microorganisms are used for medical purposes, and this practice predates recorded human history by thousands of years. Throughout human existence, natural goods have been essential to medicine and wellness. We can conduct research in the screening of new compounds using software and databases to find natural products as a substantial source for drug discovery by utilizing these technologies. It also mentions the discovery of lead structures. Compounds made from living things like plants, animals, or microorganisms are used for medical purposes, and this practice predates recorded human history by thousands of years. Throughout human existence, natural goods have been essential to medicine and wellness. additionally, consider any possible synergies. This holds great promise for the creation of cutting-edge treatments for numerous debilitating conditions, like dementia.

Keywords: Combinatorial chemistry, Natural Product, Lead structures, Dementia

Zebrafish as A fascinating animal Model: a robust platform for in vivo screening for Biomedical researches

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Abstract: When compared to other vertebrate models used to represent human illnesses, zebrafish are an excellent tool for biomedical research, in particular for large-scale hereditary variant and drug therapy testing. Due to major breakthroughs in CRISPR and then the next sequence analysis, sickness modelling in zebra is enhancing our knowledge of the biological basis of human hereditary diseases. These initiatives are essential for the development of targeted therapy since they offer novel diagnostic and treatment possibilities. The research focuses on studies using zebrafish in the field of medicine, with a particular emphasis on developmental disorders, mental disorders, and metabolic diseases. More and more research is being done on the function of an increasing spectrum of risk genes connected to neurological illnesses using zebra as a model system. This is largely attributable to the zebrafish's special qualities, which make it an ideal system for this purpose. For example, their active partner growth of translucent embryos, which allows direct observation of the immature brain all through the early stages, and their large progenies, which significantly improve controllability for highly effective therapeutic testing to find specific molecular effectors of simple behavioral genetic traits.

Keywords: Human hereditary diseases, Developmental disorders, CRISPR, Next sequencing, Zebra fish

A review on Nanoparticle as a Catalyst in Dyes

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Abstract: The twenty first century saw an explosion in nanotechnology, providing several answers to various environmental issues. With many different uses, nanoparticles are a component of nanotechnology. It has been shown that a catalyst may be made from nanoparticles of several elements. The reason behind using nanoparticles as catalysts (sometimes called nano-catalysts) over the normal catalyst is that these nano-catalysts have a high surface-to-volume ratio. A number of organic transformations, including coupling, reduction, and multi-component reactions, have recently seen a significant increase in the usage of nano-particles (NPs) as catalysts. These NPs can be synthesized through Physical, Chemical, or Biological methods. Due to highly active surface atoms, NPs are highly efficient in detecting and breaking down contaminants and thus are used in the detection and degradation of dyes in polluted water. Nano-catalysts exhibit unique reactivity and selectivity, stability and recyclability in catalytic reactions, in addition to the features of nano-catalysts. This study covers the numerous methods used to develop NPs, to observe their catalytic activity and different techniques for characterization. Dyes are among the most prevalent and challenging water contaminants to eliminate. The dyes were found to be reduced to a less hazardous product when NPs with NaBH₄ were used. The majority of the NPs are utilized 4-5 times and are recyclable.

Keyword: Nano-Catalyst, Nanoparticle, NaBH₄, Dyes, Water pollution.



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