



Message from the Hon'ble President

Dear esteemed colleagues,

It's great pleasure of mine to anticipate that I welcome you all in this tech fest as on National Conference on "Indigenous Methods in Science and Technology for Sustainable Development," organized by Chhatrapati Shivaji Maharaj University.

As we shall be gathered on April 27th April, 2024, I am confident that the conference will be a catalyst and instrumental for intellectual exchange, fostering interdisciplinary discussions and forging partnerships that transcending geographical boundaries.

Our University takes pride in hosting this national gathering, and I extend my gratitude to organizing committee for their dedicated efforts in making this event a reality. The abstracts volume accompanying this conference encapsulates a wealth of knowledge, presenting a snapshot of the varied and impactful research that will be shared over the day.

This conference provides a platform for dialogue, collaboration, and exchange of expertise among scholars, postgraduates, graduates and indigenous communities. It is an opportunity to celebrate the richness and diversity of indigenous knowledge systems and to explore how they can inform and enhance our efforts towards sustainable development goals.

As we embark on this journey together, I encourage you to approach the discussions with an open mind and a spirit of humility. Let us listen attentively to the voices of indigenous peoples, honoring their wisdom and perspectives. Let us also draw inspiration from their innovative practices and explore ways to integrate them into our scientific and technological endeavors.

May this conference serve as a source of inspiration, collaboration, and forward-thinking solutions? Let us come together with open minds and hearts, ready to learn from each other and from the indigenous communities whose wisdom guides us towards harmony with the natural world.

I wish you all a rewarding and enlightening experience throughout the conference. May your interactions spark new ideas, foster meaningful connections, and pave the way for transformative change.

Dr. Keshav Badaya



Message from the Hon'ble Vice- Chancellor

Dear Participants,

It is with immense pleasure and enthusiasm that I extend a warm welcome to each of you as we gather for the National Conference on "Indigenous Methods in Science and Technology for Sustainable Development."

This conference as benchmarks a significant opportunity for us to delve into and celebrate the profound heritage of indigenous knowledge and to explore how it can be seamlessly integrated with modern science and technology. Your presence here is not merely a passive participation; rather, it is an active engagement in shaping the discourse towards a more sustainable future.

I strongly encourage you to share your insights, experiences, and perspectives openly and freely during the scientific discussions. Each contribution you make adds immense value and depth to our collective understanding, propelling us forward towards innovative solutions and approaches that are vital for sustainable development.

Let us embrace this gathering as a platform for collaboration, inspiration, and transformative change. Together, we have the power to harness the wisdom of indigenous knowledge alongside the advancements of modern science and technology to create a more harmonious and sustainable

I am confident that your active involvement and thoughtful contributions will make this conference a resounding success.

Warm regards,

Prof. (Dr.) Keshari Lal Verma

Message from the Registrar

Dear Participants,

It is with satisfaction and anticipation that I extend my warmest welcome to each of you to the National Conference on Indigenous Methods in Science and Technology. As the Registrar of this esteemed institution, I am honored to witness the convergence of brilliant minds from across the nation to delve into the rich tapestry of indigenous knowledge systems.

Science and technology have always been deeply intertwined with culture and tradition. However, the recognition and incorporation of indigenous methods into mainstream discourse have often been overlooked. As we embark on this journey of exploration, let us pay homage to the wisdom passed down through generations and honor the custodians of this knowledge.

The theme of this conference, "Indigenous Methods in Science and Technology," underscores the need for inclusivity and diversity in our quest for innovation. By recognizing and embracing indigenous methodologies, we not only enrich our scientific endeavors but also foster cultural preservation and social equity.

I encourage each participant to engage whole heartedly in the exchange of ideas, experiences, and insights. Let us cultivate an atmosphere of mutual respect and collaboration, where every voice is heard and valued. Together, let us chart a path towards a more inclusive and sustainable future, guided by the wisdom of indigenous knowledge.

As we gather here, let us remember that our journey does not end with this conference but marks the beginning of a collective endeavor to integrate indigenous wisdom into the fabric of scientific inquiry. May this conference serve as a catalyst for transformative change, inspiring us to embrace diversity and innovation in our pursuit of knowledge.

Once again, I extend my heartfelt welcome to all participants. May your time here be filled with inspiration, enlightenment, and fruitful collaboration.

Warm regards,

Prof. (Dr.) R. P. Sharma

Message from the Convener



Dear Esteemed Participants, Researchers, and Distinguished Guests,

It is with immense pleasure and anticipation that I extend a heartfelt welcome to each one of you to the National Conference on "Indigenous Methods in Science and Technology for Sustainable Development." As the Convener of this significant event, I am honored to be part of an initiative that brings together experts, scholars, and practitioners from around the world to deliberate on crucial issues affecting our environment.

Nowadays the rapid development and urbanization demand our collective attention, and it is inspiring to witness the diverse expertise and perspectives that will be shared during this conference. The socio-scientific and technological approaches we will explore over the next two days promise to pave the way for innovative solutions and sustainable practices.

This abstract volume serves as a repository of knowledge, encapsulating the essence of the groundbreaking research and insights that each of you brings to the table. I encourage you to delve into these abstracts, fostering a collaborative spirit that transcends geographical boundaries and disciplinary silos.

I express my sincere gratitude to Chhatrapati Shivaji Maharaj University for their unwavering support and collaboration in organizing this conference. Special thanks to the organizing committee, sponsors, and all participants for contributing to the success of this endeavor.

To the participants, I encourage you to actively engage in the discussions, share your experiences, and seize this opportunity to forge connections with fellow researchers. May this conference be a catalyst for transformative ideas, fostering collaborations that endure beyond these two days. Thank you for being an integral part of this journey.

I wish you a stimulating and enriching experience throughout the conference.

Best Regards

Dr. Aurab Chakrabarty

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CONCEPT NOTE

In the face of escalating challenges related to Rapid development and environmental hazards, there is an urgent need for collaborative and innovative solutions. Recognizing the critical

importance of addressing these challenges, Chhatrapati Shivaji Maharaj University is delighted to announce the organization of an International Conference on “Indigenous Methods in Science and Technology for Sustainable Development.”

CONFERENCE OBJECTIVES:

- ❖ **Knowledge Exchange:** Facilitate the exchange of cutting-edge knowledge, research findings, and experiences among scholars, researchers, and practitioners in the fields of hydrogeology and environmental science.
- ❖ **Interdisciplinary Dialogue:** Foster interdisciplinary discussions that integrate socio-scientific and technological approaches to address the complex challenges of developmental process and environmental hazards.
- ❖ **Innovation and Solutions:** Provide a platform for showcasing and exploring innovative solutions and technologies that contribute to sustainable development and effective environmental hazard mitigation.
- ❖ **Global Collaboration:** Create opportunities for networking and collaboration among participants from diverse geographical locations, promoting a global perspective on the shared challenges we face.

CONFERENCE HIGHLIGHTS:

- ❖ **Keynote Presentations:** Renowned experts in hydrogeology, environmental science, and related fields will deliver keynote presentations, offering insights into the latest advancements and future directions in addressing environmental challenges.
- ❖ **Technical Sessions:** Concurrent sessions will feature research paper presentations, poster sessions, and panel discussions, providing a comprehensive overview of current research and fostering dialogue among participants.
- ❖ **Workshops and Tutorials:** Pre-conference workshops and tutorials will offer participants hands on experiences and training in cutting-edge technologies and methodologies.

❖ **Networking Opportunities:** Social events and networking sessions will facilitate interactions among participants, encouraging the exchange of ideas and the formation of collaborative partnerships.

THEMATIC TRACKS

- ❖ Renewable energy and sustainable development
- ❖ Nanotechnology and material science for sustainable development.
- ❖ Sustainable development AI and ML approach
- ❖ Innovation in biotechnology for human welfare.
- ❖ Indian knowledge system in sustainable development.
- ❖ Sustainable innovation in food technology.

Outcome:

The conference aims to produce a collective understanding of the challenges at hand, inspire collaborative initiatives, and result in a set of recommendations and best practices that contribute to sustainable solutions for developmental processes and mitigating environmental hazards.

ABOUT CHHATRAPATI SHIVAJI MAHARAJ UNIVERSITY

Chhatrapati Shivaji Maharaj University is established with a vision and mission dedicated imparting high-quality education across diverse disciplines in India. The university strives to

nurture students who are equipped to excel in various facets of life, making significant contributions to society while upholding strong moral values. Our commitment lies in fostering holistic development, providing students with opportunities to refine their skills and attain mastery in their chosen fields.

Chhatrapati Shivaji Maharaj University is situated in Navi Mumbai, the educational hub of Maharashtra in sprawling and lush green campus. The state-of-the-art infrastructure, comprising independent academic and administration blocks, hostels, laboratories, playgrounds, and more, creates a conducive environment for scholarly pursuits and the overall growth of our students.

Chhatrapati Shivaji Maharaj University is not just a place of learning; it is where the best courses are within reach. We are dedicated to cultivating a cooperative and healthy environment, fostering a professional attitude among students to prepare them for the challenges of global competition. The university brings together a diverse community with interests spanning Engineering, Architecture, Design, Management, Law, Humanities, Commerce, Applied Science, Life Science, Art, and more.

At CSMU education is not merely a pursuit of knowledge but a transformative experience that empowers individuals to meet the demands of a dynamic world.

Beneficial effects of green tea

Gyanendra Yadav, Dr. Kalpana dhabade

Abstract:

The health benefits of green tea for a wide variety of ailments, including different types of cancer, heart disease, and liver disease, were reported. Many of these beneficial effects of green tea are related to its catechin, particularly (-)-epigallocatechin-3-gallate, content. There is evidence from

in vitro and animal studies on the underlying mechanisms of green tea catechins and their biological actions. There are also human studies on using green tea catechins to treat metabolic syndrome, such as obesity, type II diabetes, and cardiovascular risk factors.

Long-term consumption of tea catechins could be beneficial against high-fat diet-induced obesity and type II diabetes and could reduce the risk of coronary disease. Further research that conforms to international standards should be performed to monitor the pharmacological and clinical effects of green tea and to elucidate its mechanisms of action.

The plant *Camellia sinensis* yields a variety of white, green and black tea. Tea is one of the most widely consumed beverages in the world, next only to water for enjoyment and health. In general, green tea has been found to be superior to black tea in terms of health benefits. The major components of interest are the polyphenols which are responsible for the antioxidant and other health benefits of green tea. The Major polyphenols in green tea are flavonoids. The four major flavonoids in green tea are the catechins, epicatechin (EC), epigallocatechin (EGC), epicatechin gallate (ECG) and epigallocatechin gallate (EGCG). Epigallocatechin gallate is viewed as the most significant active component. The processes used in the manufacture of black tea are known to decrease levels of the monomeric catechins to a much greater extent than the less severe conditions applied to other teas. Much research is available depicting the health benefits of green tea for a wide variety of implications, including different types of cancer, heart disease, liver disease, etc. There is also a wide range of uses for green tea in diabetes, exercise enhancement, inflammatory bowel disease, skin disorders, hair loss, weight loss and iron overload. This paper will review the major health benefits of green tea, focusing on the catechins.

Study of Fermented Food on Prevention of IBS (Irritable Bowel Syndrome) and IBD (Inflammatory Bowel Disease)

Mrs. Esther Almeida

Abstract

Probiotics and fermented foods are becoming increasingly popular as a means of promoting gut health and managing digestive disorders. This demand for probiotics and fermented foods stems from growing awareness of the role fermented food in improving gut health and target diseases such as Ulcerative Colitis (UC), Crohn's disease and IBS.

Production of lipase enzyme by *Bacillus subtilis*

Nisha Viswakarma

Abstract

Enzymes are biologic polymer. They catalyze the bio-chemical reaction that makes life possible. The enzyme should be present in balance and should be maintained to perform the breakdown of nutrients to supply energy and other chemical building blocks. In addition to serving as the

catalysts for all metabolic processes their impressive catalytic activity, steno specificity and substrate specificity enable enzymes to fulfill key roles in other process related to human well-being. Lipases (triacylglycerol acyl hydrolases, E.C.3.1.1.3) are a class of enzymes which catalyze the hydrolysis of long chain triglycerides. Lipases constitute as one of the most important group of biocatalysts for biotechnological applications. Lipase was first identified in the pancreas by J. Eberle in 1834 and by C.I. Bernard in 1856. Under aqueous conditions they act on carboxyl ester bonds present in triacylglycerol's to release fatty acids and glycerol. Lipases are serine hydrolases and they can work without support from any cofactor.

The sources of lipase enzyme are generally found in nature such as plants, animals, yeast, fungi and bacteria. Bacterial lipases are important enzymes applications in various industries, because of friendly for environment, non-toxic and no harmful residues. For instant, there are widely uses in dairy industry and pharmaceutical industry, detergent and surfactant, taste or flavor industry, agricultural industry, chemical, cosmetic and perfume.

Bacillus subtilis is a Gram-positive, aerobic, spore-forming bacterium found in soil and water, and in association with plants. The organism is of substantial commercial interest because of its highly efficient protein secretion system. *B. subtilis* produces and excretes lipases, which catalyze both the hydrolysis and the synthesis of long-chain triacylglycerols. Because of their wide diversity in substrate specificity, lipases have found important industrial applications in the resolution of racemic mixtures, the synthesis of esters and in transesterification reactions.

Study of Synergistic Bioactive Potential of Seed And Peel Extracts of *Pithecellobium dulce*.

Khan Aisha khatoon , Dr. Kalpana Dabhade , Dr. K P Ganesh

Abstract

Bacterial illnesses have increased dramatically as antibiotic resistance has increased and so have diseases connected to oxidative stress and numerous inflammatory disorders. The side effects associated with the use of synthetic medication has necessitated the use of natural alternatives,

especially medicinal plants which have been extensively explored. The utilization of agro-waste, molding seeds and peels, in the health domain presents a promising avenue for sustainable and innovative approaches to improve human well-being. Thus, this study aimed in investigate the combined bioactive potential of aqueous and ethanolic extracts derived from the seeds and peels of *Pithecellobium dulce*. The evaluation encompassed several aspects, including qualitative phytochemical analysis and GC-MS analysis which were conducted to identify the chemical constituents present in the extracts. Furthermore, the study involved assessing their antioxidant activity using the DPPH and FRAP assays, as well as studying their antimicrobial activity and anti-inflammatory activity which was detected using the HRBC method. Qualitative phytochemical analysis of aqueous extract showed the presence of tannins, flavonoids, steroids and saponins, whereas ethanolic extract showed the presence of alkaloids, phenols, tannins and steroids GC-MS analysis of aqueous extract presented with 12 compounds Tetraacetyl-d-xylonic nitrile, 2,3-Butanediol, Phenyl-B-d-Glucoside, Methanamine. N-methoxy, Benzofuran-2,3-dihydro: 9-Octadecenoic acid, (2-phenyl-1,3-dioxolan 4-yl) methyl ester, cis; pui pai-Carotenn, 1,12,2'-tetrahydro-1,1-dimethoxy, Dasycarpidan-1-methanol, acetsie fester), 9-Octadecenoic acid (2-phenyl-1,3- dioxolan-4-yl) methyl ester, cis, Deoxyspergualin, Ingenol and 3TMS; 9 Octadecenamide (2). On the other hand, ethanolic extract showed the presence of eight compounds in the GC-MS analysis Ethyl Acetate, Strychane 1-acetyl 200-hydroxy 16- methylene: Octadecanol-2-Bromo; 2-nonadecanone 2,4-dinitrophenylhydrazine, Oxirane Octanoic acid; Oleic acid; 9-octadecenamide and 6-12-13-Hydroxy 2.2.5- trimethyl-7-methylidene 4.5.6,8,9n hexahydro 31-benzo(b)oxepin. The antimicrobial activity and MIC against six human pathogens *Bacillus subtilis* *Escherichia coli*, *Staphylococcus aureus*, *Streptococcus pyogenes*. *Salmonella typhi* and *Klebsiella pneumoniae* was tested using the agar cup method. Both the extracts exhibited comparable antimicrobial activity against all the microbes studied with similar MIC values against all of them. The results of antioxidant activity and anti-inflammatory activity revealed that both the extracts possess significant antioxidant activity as well as anti-inflammatory activities with the aqueous extract having the upper edge. These findings contribute to the exploration of *Pithecellobium dulce* as a promising source of natural bioactive agent with potential therapeutic applications in various domains

Keywords: *Pithecellobium dulce*, seeds, peels, GC-MS, Antimicrobial, Antioxidant, Anti-inflammatory.

**Phytochemical Profiling and Antioxidant Activity Of Green Tea Using High Performance
Thin Layer Chromatography.**

Neha Dubey¹, Dr. Amit Saraf¹, Dr. Kalpana Dabhade¹,

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Ismail Yusuf College Arts, Science And Commerce – Natwar Nagar, Jogeshwari East, Mumbai, Maharashtra 400060

Abstract

Green tea is currently an area of intense scientific research because of its exceptional and effective actions in anticancer therapy. The aim of this research was to determine the antioxidant properties of polyphenols contained in green tea. India is one of the largest tea producers in the world, renowned for its high-quality tea varieties. The major polyphenolic compounds in tea are the flavan-3-ols (catechins) which include: epicatechin (EC), epigallocatechin (EGC), epicatechin gallate (ECG), epigallocatechin gallate (EGCG), Gallo catechins (GC) and galocatechin gallate (GCG). recent years. Tea is celebrated not only for its taste but also for its potential health benefits. Depending on the type of tea and its processing method, it may contain antioxidants, polyphenols, and other compounds that are believed to have various health-promoting properties, such as boosting immunity, improving heart health, and aiding digestion. The major flavonoids present in green tea include catechins (flavan-3-ols) such as epicatechin (EC), epicatechin-3-gallate (ECG), epigallocatechin (EGC) and epigallocatechin-3-gallate (EGCG). Catechins are also reported to be involved in the prevention of degenerative diseases and diabetes mellitus along with multifunctional properties, behave as singlet oxygen scavengers and also act as antimicrobial and anti-AIDS agents. Epicatechin gallate (ECG) and epigallocatechin gallate (EGCG) are reported to exhibit 50% inhibition of the AIDS virus. This study analyzed the chemicals in Green tea and tested its antioxidant properties because of its medicinal history. Four market samples of Green tea were chosen and extracted using maceration and sonication methods. The antioxidant capacity of the extracts was measured using the FRAP assay, with L-ascorbic acid as the standard. The amounts of phenolic compounds, flavonoids, and tannins were quantified using different methods. Thin Layer Chromatography (TLC) was performed to identify the constituents of the tea extracts, using Gallic Acid, Ellagic Acid, Catechin, and Quercetin as standards. This study proposes that Green tea powder could be a natural source of antioxidants. It suggests that Green tea powder could be beneficial in industries like beverages, food and pharmaceuticals. However, more research, including in vivo studies, is needed to fully understand its potential.

Key terms - Green tea, Antioxidant extraction, solvent, polyphenol, TLC, HPTLC, and FRAP.

Exploring the Antimicrobial Potential of Clove Oil

Laxmi singh

Abstract

Clove oil, derived from the aromatic flower buds of *Syzygium aromaticum*, has garnered significant attention for its diverse medicinal properties, including potent antimicrobial effects. This study investigates the antimicrobial activity of clove oil extracted by steam distillation process and further using the Kirby Bauer method, a well-established technique for assessing the

susceptibility of microorganisms to antimicrobial agents. Through a series of agar diffusion assays, the susceptibility of various bacterial and fungal strains to different concentrations of clove oil is evaluated. The results reveal a spectrum of inhibitory effects, with notable sensitivity observed against both Gram-positive and Gram-negative bacteria, as well as fungal pathogens. The zones of inhibition are measured and compared to standard antimicrobial agents, providing valuable insights into the relative efficacy of clove oil in inhibiting microbial growth.

Furthermore, the study explores the potential mechanisms underlying clove oil's antimicrobial action, including its rich composition of bioactive compounds such as eugenol, eugenyl acetate, and β -caryophyllene. These constituents are known for their ability to disrupt microbial cell membranes, inhibit enzymatic activity, and interfere with cellular processes essential for microbial survival. Overall, this investigation underscores the promising antimicrobial potential of clove oil and highlights its possible utility as a natural alternative or adjunct to conventional antimicrobial agents. Further research is warranted to elucidate its mechanisms of action fully and explore its applications in clinical settings and the development of novel antimicrobial therapies

Detection of Microbial Communities in Food and Their Metagenomic Analysis

Tejaswini

Abstract-

Microbial communities in food play crucial roles in food quality, safety, and spoilage. Culture-based methods remain a cornerstone in the detection and characterization of these microbial communities due to their ability to selectively isolate and enumerate viable microorganisms. In this study, we employed culture-based techniques to assess the microbial diversity and abundance

in various food samples. Samples were collected from different food sources, including dairy products, meat, fruits, and vegetables. Using selective and non-selective culture media, we successfully isolated and identified a wide range of bacterial and fungal species present in the food samples. Morphological, biochemical, and molecular methods were employed for microbial characterization, including colony morphology observation, biochemical tests, and 16S rRNA gene sequencing for bacterial identification. Our results revealed diverse microbial communities inhabiting the sampled foods, with notable species such as lactic acid bacteria, Enterobacteriaceae, yeasts, and molds.

Furthermore for Metagenomic analysis, DNA was extracted from the samples, and metagenomic libraries were prepared for high-throughput sequencing using next-generation sequencing platforms. Raw sequencing data were processed to remove adapters, filter out low-quality reads, and analyze taxonomic composition and functional potential of the microbial communities.

Taxonomic profiling revealed the presence of diverse microbial taxa in the food samples, including bacteria, fungi, archaea, and viruses. Bacterial genera commonly associated with food spoilage, such as *Pseudomonas*, *Lactobacillus*, and *Enterobacter*, were identified across multiple samples. Fungal species known to produce mycotoxins, such as *Aspergillus* and *Penicillium*, were also detected in some food samples.

Functional annotation of the metagenomic data provided insights into the metabolic capabilities and functional diversity of the microbial communities. Genes associated with carbohydrate metabolism, amino acid biosynthesis, and food degradation pathways were prevalent in the metagenomes, reflecting the metabolic activities of the microbial communities in the food environment.

Overall, this study highlights the utility of metagenomic analysis for detecting and characterizing microbial communities in food samples. By elucidating the microbial composition and functional potential of food-associated microbiota, metagenomic approaches can inform food safety practices, quality control measures, and product development strategies in the food industry.

**Phytochemical Profiling and Antioxidant Activity of Black Tea Using High Performance
Thin Layer Chromatography.**

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Abstract

Tea is the most consumed beverage in the world which is second only to water. Tea contains a broad spectrum of active ingredients which are responsible for its health benefits. The composition of constituents extracted to the tea brew depends on the method of preparation for its consumption. The chemical composition of tea includes polyphenols, alkaloids (caffeine and theobromine), amino acids (mainly L-theanine), carbohydrates, proteins, chlorophyll, volatile compounds, minerals (aluminum, manganese and fluoride) and other unidentified compounds. Among these, polyphenols are one of the main bioactive compounds in tea. The major polyphenolic compounds in tea are the flavan-3-ols (catechins) which include: epicatechin (EC), epigallocatechin (EGC), epicatechin gallate (ECG), epigallocatechin gallate (EGCG), Gallo catechins (GC) and gallocatechin gallate (GCG). This study examined the Phytochemical profiling of Black tea. Pharmacological history of this plant inspired us to evaluate the possible antioxidant activity. For measuring the antioxidant activity, the four Market sample was selected and extracted using maceration and sonication method. Antioxidant capacity of extracted black tea samples was evaluated in vitro with the spectrophotometric method based on the Ferric Reducing Antioxidant Power (FRAP) Assay, L- ascorbic acid was used as standard . Then the quantification of Phenolics compound, Flavonoids and Tannins was done using Folin Ciocalteu method, Aluminium Chloride Method and Vanillin reagent method respectively. Preliminary Thin Layer chromatography was performed using two solvent system to select the best mobile phase for HPTLC. TLC was used for analysis of the constituents of extracts of tea (*Camellia sinensis* L). Gallic Acid, Ellagic Acid, Catechin and Quercetin Standard was selected for TLC. This study suggests that powder of black tea are the possible sources of natural radical scavengers. Thus, black tea powder could be used as natural antioxidants in the beverage, food and pharmaceutical industries that need further wide range in vivo studies.

Keyword –Black tea; extraction; solvent; polyphenol; HPTLC; FRAP;

Analysis of the microbial composition of raw and processed food products

Shraddha Patil

Abstract

This study aims to investigate the microbial composition of both raw and processed food products to understand the impact of processing methods on microbial populations. A comprehensive literature review was conducted to identify key microorganisms commonly found in different types of food products and to understand the effects of various processing techniques on microbial growth and survival. Samples of raw and processed food products were collected following a standardized sampling plan, considering factors such as food type, source, processing methods,

and storage conditions. Microbial analysis was performed using both culture-based and molecular techniques to quantify microbial populations and identify specific microorganisms present in each sample. Statistical analysis was employed to compare microbial populations between raw and processed food products. The results provide insights into the changes in microbial composition induced by processing methods and their implications for food safety and quality. This study contributes to the understanding of microbial dynamics in food products and informs strategies for improving food safety practices in food processing and handling.

Samples of various raw and processed food products were collected and subjected to standardized sample preparation techniques. Microbial analysis was conducted using a combination of culture-based and molecular methods to quantify and identify microbial populations. Statistical analysis was employed to compare microbial compositions between raw and processed food products and assess the significance of differences observed.

Prevalence of Extended Spectrum of β -lactamase From Urine and Pus Sample By Using Antibiotic Susceptibility Testing

Vaishnavi sanjay salunkhe

Abstract

The resistance to broad spectrum β -lactams which is mediated by the extended spectrum beta lactamase(ESBL) enzyme is an increasing problem now-a-days. This resistance mechanism has been responsible for nosocomial outbreaks, serious therapeutic failure if it is not detected on time and the outbreak of multidrug resistant, gram negative pathogens that need expensive control measures.

Extended-spectrum β lactamases (ESBLs), have the ability to hydrolyze and cause resistance to various types of the β -lactam antibiotics, including the extended-spectrum (or thirdgeneration) cephalosporins (e.g., cefotaxime, , ceftazidime) .We used combined disc diffusion technique to establish the presence of ESBLsproducing bacteria .The sample size will be 30 patient .

The objective of study is to Isolate, identify and phenotypically characterize extended spectrum beta-lactamase (ESBL)-producing Escherichia coli and Klebsiella spp from urine and pus sample .

This process typically entails isolating the bacteria from the sample, culturing them in a laboratory setting, and exposing them to different antibiotics to determine which ones are most effective in inhibiting their growth or killing them.

The results of this testing help healthcare providers select the most appropriate antibiotic treatment for urinary tract infections (UTIs), pusfilled infections, or other bacterial infections affecting the urinary or genitourinary system.

ESBL activity among Enterbacteriaceae class of bacteria were confirmed by phenotypic confirmatory disc diffusion test according to Clinical Laboratory Standards Institute guidelines (CLSI).

Enterobacteriaceae isolates showing zone of diameter of ≤ 27 mm for cefotaxime (30 mcg), ≤ 22 mm for ceftazidime (30 mcg), , that is which had screening test positive were selected for further confirmation of ESBL production by phenotypic screening disc diffusion method.

In Phenotypic confirmatory disc diffusion test, cefotaxime, ceftazidime singly and along with combination antibiotic that is cefotaxime/clavulanic acid (30/10 mcg) and ceftazidime/clavulanic acid (30/10 mcg) were used for confirmation.

Indian Knowledge System in Sustainable Development

Shajina Sukumar

Abstract

This abstract deals with the significance of Indian knowledge systems in achieving our goals of sustainable development. Considering our ancient and modern practices, the Indian knowledge system provides insights of strongly defined holistic principles and environmental care. Our goal here is to understand the relevance and contributions of these knowledge systems towards the present sustainable development issues.

This involves a thorough examination of ancient Indian texts, intellectual concepts, and traditional practices, by research and case studies methods. The research aims on the ethical basis of the Indian knowledge system and its implications on sustainable development by investigating

on fundamental concepts such as 'dharma' and principles like 'ahimsa' (nonviolence), 'satya' (truth), and 'seva' (selflessness).

The Indian knowledge systems gives us a 'holistic worldview, stressing on the interconnection of all life forms and the significance of nature. Ayurveda, traditional agriculture, and community-based resource management , and examples of activities that help in sustainable development.

This study identifies practical answers influenced by Indian knowledge systems, such as natural farming practices, renewable energy technology that utilises ancient concepts, and community-led conservation initiatives. These findings emphasise the potential of indigenous knowledge to address modern problems like climate change, biodiversity loss, and socioeconomic inequities.

Lastly , the study stresses on the importance of incorporating Indian knowledge systems into sustainable development frameworks. By combining ancient wisdom with modern science and technology, promoting intergenerational knowledge transmission, and building beneficial policy frameworks, India may use its rich legacy to chart the path to a more fair, resilient, and secure future for all stakeholders.

Application of Laplace Transform For Solving Problems On Population Growth

Dr. SONI PATHAK

Department of Mathematics, Chhatrapati Shivaji Maharaj University, Panvel, Navi Mumbai

Abstract:

Laplace Transform is the mathematical tool used to solve ordinary and partial differential equations with initial conditions without finding general solutions and the values of arbitrary constants. In this article Laplace Transform is used for solving problems on population growth and one problem has been solved in order to demonstrate the application of Laplace Transform for solving population growth problems.

Extraction of Citric Acid From Pineapple Juice And Prepare A Mini Bath Bomb

Anuja Shivaji Raut, Prof. Sonal Gupta, Dr. Kalpana Dabhade, Manju Shahaare

Tilak College of Science and Commerce, Vashi

Chhatrapati Shivaji Maharaj University Navi Mumbai

Abstract

Citric acid ($C_6H_8O_7$) is one of the most important organic acids which is colorless, translucent and naturally occurs in citrus fruits such as lemon, lime, orange, pineapple etc. A citrate is a derivative of citric acid that was first isolated in 1784 by the chemist Carl Scheele, who crystallized it from lemon juice until the early 1900s when researchers discovered that it could also be made from *Aspergillus niger* by fermentation method.

Types of citric acid –

Monohydrate citric acid

Monohydrate citric acid ($C_6H_8O_7 \cdot H_2O$) has one water molecule associated with one citric acid molecule. Its molar mass is 210.138g/mol. Citric acid crystallized from cold water forms monohydrate. It is stored in clean, dry, cool and ventilated place.

Anhydrous citric acid

Anhydrous citric acid ($C_6H_8O_7$) is the water free form of citric acid. Its molar mass is 192.12g/mol. We can produce anhydrous citric acid via crystallization from hot water. Can be stored in cool, dry conditions in well-sealed containers.

Pineapple scientific name- *Ananas comosus* the juice of the pineapple contains about 87% citric acid with pH around 3.71.

Bath bomb contains moisture rich ingredients to help your skin soak in hydration. If your bath bomb contains essential oil like lavender, rose it can help you relieve any pains after a stressful day. It may help to cleanse, repair, detoxify your body. When bath bomb gets absorbed by your skin, it helps to loosen your muscles and joints.

The main objective of citric acid and bath bomb is to access the pineapple juice sample for citric acid extraction. To determine the use of Sodium Chloride in extraction of citric acid. To observe the chemical reaction between citric acid and sodium bicarbonate in a bath bomb. To observe the time required for a bath bomb to dissolve completely. Application of citric acid and bath bomb in cosmetic industry, it acts as antioxidant. It is used to neutralize the residual lye (NaOH). It prevents the turbidity of wines and ciders. In pharmaceutical industry, it is used in mild astringent formulation. Bath bomb can be used as aromatherapy. We prepared extraction of citric acid in pineapple take 5ml of pineapple juice add 95ml water, add 80ml sodium hydroxide, filter the solution, continue to filter until clear solution, add 30g calcium chloride to 100ml distilled water dissolve it completely and mix with juice and bring it to boil, after boiling filter the solution and separate calcium citrate from liquid waste, combine the calcium citrate with dilute sulfuric acid. A pure white solution form filter the solution with water, heat a solution to evaporate water, filter citric acid and let cool, boil solution 1 hour to form crystals of citric acid. Prepared bath bomb weight 6g of sodium bicarbonate and 3g citric acid, add 3 drops of food color and 2 drops of essential oil and 5-6 drops of water, add 1ml of sodium lauryl sulphate, mix well take mold fill the mixture for one day to dry.

Keywords: *Ananas comosus*, sodium hydroxide, calcium citrate, sodium lauryl sulphate,

Customers Perception towards Green Banking in India

Dr. Jaishree Saxena

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Abstract

The term green banking is make the banks further sustainable in environment, economically and in social magnitudes. The purpose of green banking for achieving sustainability in the future is to mark banking procedures vastly digitized, green and eco-friendly. Especially in-service industries, well-organized IT provision and environmentally safe physical infrastructure can help in reduction of carbon emission and radiation. The aim of this paper is to study the position of green banking performs in India and to recognize the consumer's perception towards green banking. The main issue to save our planet from unusual development of industries and human interferences in order to Sustainable development goals and climate change. Sustainability matters and commercial broadcasting are discussed globally across all fragments and industries. It is a basic study to which aim is to find out the status of present green banking practices, customer's observation and awareness among customer insight towards green banking performs in India

Key words: Green banking, Online Payments, Fund Transfer, E-Tax Payment etc.

Bacterial profile and there antibiotic susceptibility pattern in clinically diagnosed urinary tract infection

Jyoti Savita

Abstract:

Urinary tract infection (UTI) is one of the most common bacterial infections encountered in clinical practice . It can range from uncomplicated cystitis to pyelonephritis (kidney infection), and may result in serious complications if not treated promptly. The incidence of UTI is high in females as compared to males.. . UTIs can be caused by a variety of bacterial species, and the increasing incidence of antibiotic resistance among these bacteria has become a major public health concern . Therefore, it is important to understand the bacterial profile and antibiotic susceptibility patterns of UTIs in order to guide appropriate treatment decisions and prevent the development of resistance .The study included all patients with clinically diagnosed UTIs who underwent urine culture and sensitivity testing .The data collected from the medical records included age, gender, urine culture report, and antibiotic sensitivity pattern. A total of 50 urine culture reports will be analysed .

samples should be collected in sterile container and open wide , sample should be of early morning urine . and then sample urine routine is done physical appearance , wet mount with their findings such as bacteria and pus cell . and then urine culture processing is done , and then we have to observe the growth of colonies , and then we have to make secondary smear .after that , gram staining , and then observing under microscope and identify the findings of gram positive bacteria and gram negative bacteria .after that we have to do AST in that we take MH (muller hinton agar)plates and then we have to we have to do spreading and then add disc to it and then we have to incubate it 24 hours and then observe the resistant and sensitivity .oxidase , catalase test are done after AST.

Escherichia coli is the most common organism isolated , followed by *Klebsiella* spp , *Proteus* spp. ,and *Pseudomonas aeruginosa* as expected from previous researches . A study as expected will found that the most common pathogens in urinary tract infections (UTIs) are Gram-negative bacteria, including *E. coli* and *Klebsiella pneumoniae*.

In this study, we aimed to determine the bacterial profile and antibiotic susceptibility patterns of clinically diagnosed UTIs . We also aimed to compare the susceptibility patterns between bacterial species to identify any significant differences that could guide treatment decisions. Our findings may contribute to the development of local guidelines for the management of UTIs and the prevention of antibiotic resistance

The Study of Neuroblastoma Genes, Mycn Using Bioinformatic Data Bases and Sequence Analysis Tool

Nikita Jayanand Tembhekar

Abstract

Cancer is a disease in which the cells undergo uncontrollable cell division and spread to the other parts. Cancer can start at any portion of the human body. The cancerous cells are made up of trillion of cells . Human cells grow and multiply through a process called cell division. When the cells become old or become damage they'll die. This is a natural process occurs in the human body. Sometimes this normal process breaks down and abnormal cells or damaged cells grow causing tumours. Cancerous tum spread and invade nearby tissues and can travel different places in the body to form a new tumours by a process called metastasis. Cancerous tumours are malignant tomours.

Malignant cell grows in an uncontrolled way and it can invade nearby tissues and spread to the other parts of the body through blood stream and lymph system . Cancer is a genetic disease which is caused by a change in genes. It controls the cell function such as grow and divide . Metastatic cancer is defined as , the place where it is formed for the first time and spread to another part of

the body and the process is defined as Metastasis. Metastatic cancer has the same type of cancer cells. Under microscope the cells of metastatic cancer look similar to the original cells. Metastatic cancer cells and cells of original cancer have similar molecular features such as change of specific chromosome

Relationship Of Lipid Profile Parameters In Patients With Coronary Heart Disease

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ITM Institute of Health Sciences, Panvel - B Optometry, BSc MLT College in Navi Mumbai.

Abstract

Despite medical advancements that reduce numerous risk factors, coronary heart disease (CHD) continues to be the leading cause of mortality and morbidity worldwide. One major thought to be involved in the development of coronary heart disease is lipid profile. Numerous investigations conducted in most Western and Asian countries have confirmed the link between hyperlipidaemias and coronary heart disease. But our knowledge of the relationship between lipid profile and CHD is extremely limited. The study's objective This study set out to evaluate the relationship between aberrant lipid levels and coronary heart disease.

The comparative study between lipid profile and CHD was conducted in (Metropolis Healthcare Ltd - Best Diagnostic Centre In Panvel). the subjects were selected based on the inclusion and exclusion criteria decided for the study. A total of 100 patients suffering from CHD And 100 healthy controls were selected for the present study. 2 ml of blood after fasting was collected from

each subject and serum was separated for further analysis of the lipid profile. Serum cholesterol, triglycerides, HDL, LDL and VLDL were analysed spectroscopically on Chem 7, ERBA machine. Reagents were procured from ERBA. All necessary data were collected, analysed, and disseminated by MS-Office and SPSS version 23.

The study sample comprised of 65% male and 35% female. Serum cholesterol, triglycerides, High Density Lipoprotein (HDL), Low Density Lipoprotein (LDL) and Very Low-Density Lipoprotein (VLDL) of controls were found to be 188 ± 45.03 , 129.5 ± 85.41 , 46.3 ± 13.11 , 67.84 ± 11.75 , 13.01 ± 18.65 respectively. Serum cholesterol, triglycerides, HDL, LDL and VLDL of CHD Patients were found to be 231.88 ± 25.60 , 181.27 ± 31.55 , 34.02 ± 58.22 , 136.99 ± 44.53 , 37.28 ± 61.40 respectively. It was also found that there was an extremely significant difference ($p < 0.001$) in Serum cholesterol, triglycerides, LDL and VLDL between controls and CHD patients. And significant difference in HDL ($p < 0.049$) between controls and CHD patients.

In this study, we found that the total cholesterol, triglycerides, HDL cholesterol, and LDL cholesterol concentrations were significantly higher in coronary heart disease (CHD) patients. These results could be useful for CHD therapy and related future research.

Keywords: Coronary heart disease, Lipid profile, Cholesterol, HDL, LDL, VLDL

Whole genome sequence analysis of *Salmonella* under antibiotic stress

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Abstract

Salmonella is a genus of rod shaped (bacillus) Gram-negative bacteria of the family Enterobacteriaceae. The two known species of salmonella are salmonella Enterica and salmonella bongori. salmonella spp are the most important bacterial pathogens that causes food borne disease although it are self limiting and occur occasionally which cause infection for which the mortality rate is particular among weakened immune system and elderly patient. In such case antimicrobial Treatment is required. Three antibiotic have been approved by the FDA in the united states to treat infection caused by salmonella: ciprofloxacin, ceftriaxone, Azithromycin. For around three decades the fluoroquinolone antibiotic ciprofloxacin has been used to treat a variety of Gram-positive and Gram-Negative bacteria. Resistance to ciprofloxacin (CIP) has increased dramatically in both clinical and food Salmonella isolates around the world in recent years, particularly in China and adjacent areas. Ciprofloxacin resistance is attributed mainly to double mutations in the gyrA gene and a single mutation in the parC gene in Salmonella. Mutations in the gyrB and parE genes have rarely been detected in Salmonella strains and have not been confirmed to be associated with

fluoroquinolone resistance in Salmonella. Efflux pumps and the presence of plasmid-mediated quinolone resistance (PMQR) determinants have also been regarded as factors contributing to the development of low-level resistance to quinolones and fluoroquinolones.

At least three types of PMQR elements have been reported to date: (i) the Qnr types, pentapeptide repeat proteins that bind to DNA gyrase by mimicking double-stranded DNA, reduce the binding of gyrase to DNA, and protect topoisomerase IV from the quinolone; (ii) AAC(6')-Ib-cr, a modified aminoglycoside acetyltransferase that modifies quinolones; and (iii) the efflux pumps QepA and OqxAB

Transcriptomic Profiling of Mare Endometrium at different stages of Endometriosis

Maurya shivangani

Chhatrapati Shivaji Maharaj University

Abstract

In the current study, transcriptome profiles of mare endometrium, classified I, IIA, and IIB, according to Kenny and Doig, were compared using RNA sequencing, analyzed, and functionally annotated using in silico analysis. In the mild stage (IIA) of endometriosis compared to category I endometrium, differentially expressed genes (DEG's) were annotated to inflammation, abnormal metabolism, wound healing, and quantity of connective tissue. In the moderate stage (IIB) of endometriosis compared to category I endometrium, DEG's annotated to inflammation, fibrosis, cellular homeostasis, mitochondrial dysfunction, and pregnancy disorders. Ingenuity pathway analysis (IPA) Identified cytokines such as transforming growth factor (TGF)- β 1, interleukin (IL)-4, IL-13, and IL-17 as upstream regulators of DEG's associated with cellular homeostasis, metabolism, and fibrosis signaling pathways. The effect of cytokines on ADAMTS members' gene transcription in fibroblasts differs according to the severity of endometriosis. The identified transcriptomic changes associated with endometriosis suggest that inflammation and metabolic changes are features of mild and moderate stages of endometriosis. The changes of *ADAMTS-1*, -

4, -5, -9, in fibrotic *endometrium* as well as in endometrial fibroblast in response to TGF- β 1, IL-4, IL-13, and IL-17 suggest the important role of these factors in the development of endometriosis.

Study of Color Blindness Gene CNGB3, CNGA3, OPN1LW Using Bio Informatics Database and Tools

Kunnathuru Shailendra Pritham

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Abstract:

Color blindness, a condition affecting millions worldwide, is primarily caused by mutations in genes encoding for key components of the visual system. Among these, CNGB3, CNGA3, and OPN1LW play crucial roles in color perception and signal transduction within the retina. This abstract provides a comprehensive overview of the genetic aspects of color blindness, focusing on the molecular characteristics and functional significance of CNGB3, CNGA3, and OPN1LW genes. We discuss the structure and function of these genes, their encoded proteins, and the impact of genetic variations on their expression and activity. Furthermore, we explore the spectrum of mutations identified in these genes, their distribution among different populations, and their association with various forms of color vision deficiency. Leveraging bioinformatics databases and tools, we highlight recent advancements in understanding the molecular mechanisms underlying color blindness, paving the way for improved diagnostics and targeted therapeutic interventions. This abstract serves as a foundation for further research aimed at unraveling the

complexities of color vision and advancing personalized approaches to manage color vision deficiency.

Characterizing Insecticide Resistance Profile in mosquitoes in Mumbai Metropolitan Region (MMR)

Mohsin Sayyad

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Abstract

Mosquito-borne diseases is one of the main causes of mortality for people worldwide. The most important part of the global plan for controlling diseases caused by mosquitoes is vector control which includes insecticide treatment.

However, insecticide-resistant mosquito vectors and drug-resistant infections are mostly to blame for the recent rise in mosquito-borne disease cases. In order to control vectors for the Municipal Corporation of Mumbai and surrounding cities, it was necessary to identify and assess the effectiveness of the phenotypic and genotypic evaluation of insecticide resistance of frequently utilised insecticides. In this study, we employed insecticides to determine the survivability and resistance activities of adult mosquitoes. We subsequently evaluated the results using the Bottle Bioassay method, following the criteria provided by the Centres for Disease Control and Prevention (CDC). From CDC Bottle assay we conclude that carbamate Propoxur is more effective than pyrethroid Deltamethrin. Phenotypic Assays performed were based on Pyrethroid &

Carbamate and it was observed that insects sensitive to pyrethroid and carbamate were potentially resistant to organophosphate. From CDC Bottle assay we conclude that carbamate Propoxur is more effective than pyrethroid Deltamethrin. Most of the mosquitoes were found to be resistant to Deltamethrin than Propoxur irrespective of environmental factors. The pattern of resistance and the mechanisms involved can be expected to have a number of implications on resistance management strategies.

Method Validation of Salmonella Species by RT-PCR/Advanced Technology in Food and Agriculture Products

Pallabika Borah

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Abstract

Salmonella is one of the major causes of foodborne infection in humans, referred to as salmonellosis. It is common worldwide and widespread in food & agricultural products because of poor handling. The conventional microbiological detection methods of Salmonella require more time and need many tests for the confirmation of pathogenicity. Therefore, the requirement for more rapid and confirmatory methods of Salmonella detection becomes apparent. The purpose of this study was to apply the RT-PCR (Real Time-Polymerase Chain Reaction) method for detection of Salmonella spp. in food and agricultural products which is more convenient and less time consuming than conventional microbiological methods. Each detection method was tested using artificially contaminated food & agricultural samples. The sensitivity of the real-time PCR, as well as the decreased time requirements of this detection method, would suggest its usefulness in commercial laboratory practices.

Salmonella-related large-scale foodborne outbreaks are extremely uncommon today, mainly to the sophistication of the medical system. Small, localised outbreaks do still occur in some areas,

though, and if eradication measures are not taken, they could pose a serious threat to the public's health. The development of Salmonella detection methods is covered in this review along with their fundamental ideas, traits, uses, and results. Salmonella is typically detected via a culture-based approach, which is labour-intensive, time-consuming, and inappropriate for high-throughput analysis and on-site testing so RT-PCR/advanced technology is being used.

The objective of this research is to create an efficient and trustworthy RT-PCR method using SYBR Green that can be applied to routinely assess samples of food and agricultural products for Salmonella species.

Applications of Graph Theory in Biological Networks

Aruna Devi Sonti

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Abstract

Graph theory is a branch of mathematics that deals with the study of graphs, which are mathematical structures used to represent pairwise relationships between objects. Graph theory finds applications in diverse fields such as computer science, biology, sociology, and transportation, among others. Its versatility lies in its ability to model and analyze complex relationships and systems using graph-based representations.

Applications of Graph Theory in Biological Networks includes biology and bioinformatics, graph theory is used to model and analyze biological networks such as gene regulatory networks, protein-protein interaction networks, and metabolic pathways. It aids in understanding biological processes, predicting gene functions, and identifying potential drug targets.

AUTS-2 Syndrome: Molecular mechanisms and model systems

Bobby Bob

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Abstract

This research investigates the molecular mechanisms underlying AUTS2 Syndrome, aiming to elucidate the genetic factors and biological processes contributing to its pathogenesis. Through a comprehensive review of existing literature, we explore the genetic landscape of AUTS2 Syndrome, analyzing the spectrum of mutations and their potential impact on the AUTS2 gene. Our examination extends to the regulatory networks and downstream pathways influenced by AUTS2, shedding light on its role in neurodevelopment and synaptic function. The thesis also explores the utility of model systems, including animal models and cellular cultures, in elucidating the molecular mechanisms of AUTS2 Syndrome. We aim to bridge the gap between bench and bedside by synthesizing findings from genetic studies and model organisms, translating molecular insights into potential therapeutic avenues. Furthermore, the research critically evaluates the limitations and advantages of existing model systems, offering perspectives on their relevance for understanding the pathophysiology of AUTS2 Syndrome. In conclusion, this study contributes to the growing body of knowledge surrounding AUTS2 Syndrome by comprehensively analyzing its

molecular mechanisms. I look forward to discussing the work further and exploring the insights of development and model systems at the conference.

Arget Prediction And Molecular Dociking Of Ibuprofen.

Yohan Daya Karan

Chhatrapati Shivaji Maharaj University

Abstract:

Ibuprofen is a non-steroidal anti-inflammatory drug, it effectively alleviates pain such as headache, backpain, arthritis, and inflammation such as muscle pain, the primary mechanism of action involves inhibition if the enzyme cyclooxygenase (COX), especially COX-1 and COX-2, these enzymes are responsible for the synthesis of prostaglandins, which are involved in inflammation, pain, and fever, ADME known as Absorption, Distribution, Metabolism, and Excretion, is a fundamental of Pharmacokinetics used in the field of pharmacology, and drug development used to study how a drug processes within a living organism,

The first step is to identify the target protein using Swiss Target prediction, after identifying the target based on the probability, the PDB format of the protein is downloaded using Protein database, by using Zinc we can obtain the MOL2 file of the drug (Ibuprofen), then the target protein was dock prepped using chimera and by using Swiss Docking, molecular docking was performed between the target protein structure and the ligand, then the docked structure was later

analyzed using chimera and Pymol, using Swiss ADME, we can obtain the pharmacokinetics of the drug such as lipophilicity, drug likeness, water solubility, and medicinal chemistry of the drug.

The main objective is to predict the target protein for the compound, and predict its binding affinity, to identify new therapeutic uses for the existing drug, and to simulate molecular docking with the predicted compound, and to analyze the physiochemical properties of the compound and to study the protein-ligand interaction between the molecules.

Targeting Acetylcholinesterase with Donepezil: Implications for Alzheimer's Disease Treatment

Ritesh Dange

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Abstract

Alzheimer's disease (AD) is a neurodegenerative disorder characterized by progressive cognitive decline, memory loss, and impairments in daily functioning. Acetylcholinesterase (AChE) inhibitors represent a cornerstone of AD pharmacotherapy, aiming to mitigate symptoms by increasing the availability of acetylcholine in the brain. Donepezil, a potent and selective AChE inhibitor, has emerged as a frontline treatment option for AD patients. This abstract explores the therapeutic implications of targeting AChE with donepezil in the context of AD management. Donepezil exerts its therapeutic effects by binding reversibly to AChE, thereby preventing the hydrolysis of acetylcholine and maintaining higher synaptic levels of this neurotransmitter. In conclusion, the targeted inhibition of AChE with donepezil represents a valuable therapeutic strategy for managing cognitive symptoms in AD. Continued research efforts aimed at optimizing dosing regimens and exploring novel drug combinations hold promise for further enhancing the efficacy and long-term outcomes of AD treatment. By enhancing cholinergic neurotransmission, donepezil helps to ameliorate cognitive deficits and alleviate symptoms

associated with AD, such as memory impairment and executive dysfunction. Clinical trials have demonstrated the efficacy of donepezil in improving cognitive function and delaying disease progression in AD patients across various stages of the illness. Moreover, donepezil exhibits a favorable safety profile, with most adverse effects being mild to moderate and transient in nature. Common side effects include gastrointestinal disturbances, dizziness, and insomnia, which often diminish with continued treatment. The well-established efficacy and tolerability of donepezil underscore its utility as a first-line pharmacological intervention for AD. In conclusion, the targeted inhibition of AChE with donepezil represents a valuable therapeutic strategy for managing cognitive symptoms in AD. Continued research efforts aimed at optimizing dosing regimens and exploring novel drug combinations hold promise for further enhancing the efficacy and long-term outcomes of AD treatment.

Efficiency of drug resistance against selected microorganisms.

Ibtisam Liyaqat Munshi

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Abstract

Globally, antimicrobial resistance (AMR) has become a serious hazard to public health. Controlling the emergence and spread of antimicrobial resistance (AMR) requires accurate and timely identification of drug resistance to antimicrobials, appropriate antimicrobial therapy, and antimicrobial stewardship. This article examines popular techniques for antimicrobial susceptibility testing (AST) and pertinent questions about the benefits and drawbacks of each approach. Traditional clinical microbiology methods for profiling antibiotic susceptibility are time-consuming and rather costly, notwithstanding their accuracy.

Comprehensive validation is necessary to integrate recently developed AST systems into clinical practice, despite their demonstrated advantages over conventional approaches in terms of testing speed and the potential to offer a deeper understanding of resistance mechanisms. The development of novel, quick, precise, and portable AST diagnostic methods is imperative due to the ongoing rise in antimicrobial resistance. The widespread use of innovative devices would make it possible to monitor and more effectively combat the formation of antimicrobial resistance

(AMR) by identifying the best treatment modalities and monitoring antibiotic resistance in the environment, agriculture, and health.

Standardised phenotypic techniques are frequently used to identify AMR in bacteria that could endanger veterinary and public health. Although molecular techniques are frequently employed in conjunction with phenotypic techniques, they are soon to supersede them in many labs because of their increased speed and precision in identifying the underlying genetic mechanism(s) causing AMR. We outline some of the popular molecular techniques used today to identify AMR genes in this post. PCR is one among these.

The goal of the broth and agar dilution procedures is to find the lowest dosage of the antimicrobial agent being tested (minimal inhibitory concentration, or MIC) that, in certain test circumstances, prevents the bacterium under investigation from growing visibly. MIC values are employed to assess novel antimicrobial medicines' activity as well as the susceptibilities of bacteria to medications. Agar dilution is the process of adding various antimicrobial drug concentrations to a nutritional agar medium and then applying a fixed number of cells to the agar plate's surface. Bacteria are injected into a liquid growth medium with varying amounts of an antimicrobial agent for broth dilution, which is commonly measured in 96-well microtiter plate format. After incubation, growth is evaluated.

The strengths and weaknesses of these methods are discussed, especially in the context of implementing them for routine surveillance activities on a global scale for mitigating the risk posed by AMR worldwide. Based on current popularity and ease of use, PCR and single-isolate whole-genome sequencing seem irreplaceable

This abstract concludes by highlighting how critical it is to comprehend and treat resistance in recognised species in order to protect the public's health and maintain the efficacy of antibiotics. This abstract seeks to guide therapeutic approaches, support policy measures aiming at minimising the threat of antimicrobial resistance (AMR), and inform research objectives by clarifying the many resistance mechanisms displayed by bacteria, viruses, fungi

Homemade Organic Fertilizer

Sonde Samiya, Dr. Kalpana Dabhade, Dr. K.P Ganesh

Chhatrapati Shivaji Maharaj University

Abstract

This project is about making organic fertilizer in house using degradable waste materials. These wastes creates nuisance to environment. The study consist of a literature review on composting, compost application to agricultural soil, important ingredients for composting, process of composting and phases of composting. The purpose of composting has been used as a means of recycling organic matter back into the soil to improve soil structure and fertility. The composting process has received much attention in recent years because of pollution concerns and environmentally sound methods for treating waste. Waste volumes continue to rise, which leads to loss of resources and increased environmental risks. Composting aims to stabilization of waste for land filling , volume and mass reduction of solid waste and return of organic substances to the natural cycle .This paper review information on the composting and preparation of compost in the house for treating waste as a means of addressing the environmental pollution concerns. A pot experiment evaluating the influence of compost, performance was conducted in the house.

As sustainability and environmental consciousness continue to gain traction, the demand for organic gardening practices has surged. Organic fertilizers, derived from natural sources, offer a sustainable alternative to chemical fertilizers, promoting soil health, biodiversity, and plant vitality. This abstract explores the formulation and benefits of homemade organic fertilizers, emphasizing their role in fostering resilient ecosystems and reducing environmental impact. Various organic materials such as compost, manure, bone meal, and seaweed are examined for their nutrient content and soil conditioning properties. Additionally, the process of composting and vermiculture is elucidated as effective methods for recycling organic waste into nutrient-rich amendments. The efficiency of homemade organic fertilizers is discussed in relation to plant growth, soil fertility, and long-term sustainability. Furthermore, the economic and ecological advantages of homemade organic fertilizers over synthetic counterparts are highlighted, encouraging individuals to embrace natural solutions for cultivating thriving gardens while minimizing their carbon footprint.

Comparitive Study For Breast Cancer Using Histopathology And Fine Needle Aspiration Cytology(Fnac)

Santoshee Rohidas Dhonde, Dr. Kalpana Dabhade, Manju Shahaare

Chhatrapati Shivaji Maharaj University,

Abstract

Cancer is a disease in which some of the body's cells grow uncontrollably and spread to other parts of the body. Cancer can start almost anywhere in the human body, which is made up of trillions of cells. Normally, human cells grow and multiply (through a process called cell division) to form new cells as the body needs them. When cells grow old or become damaged, they die, and new cells take their place. Sometimes this orderly process breaks down, and abnormal or damaged cells grow and multiply when they shouldn't. These cells may form tumors, which are lumps of tissue. Tumors can be cancerous or not cancerous (benign). Cancerous tumors spread into, or invade, nearby tissues and can travel to distant places in the body to form new tumors (a process called metastasis). Cancerous tumors may also be called malignant tumors. Many cancers form solid tumors, but cancers of the blood, such as leukemias, generally do not. Benign tumors do not spread into, or invade, nearby tissues. When removed, benign tumors usually don't grow back, whereas cancerous tumors sometimes do.

Breast cancer is the most common cancer in women. Mammograms can detect breast cancer early, possibly before it has spread. Breast cancer is when breast cells mutate and become cancerous cells that multiply and form tumors.

The FNAC test is a simple, rapid, and low-cost test used to assess a specific condition or body region. It involves aspirating cells from a particular region of the body using a fine gauge needle. The sample is examined under a microscope. This test is quite helpful in diagnosing inflammatory diseases and malignancies of varying types. This technique is commonly used for examination of the breast, kidney, liver, lungs, prostate, pancreas, salivary glands, retroperitoneum, and lymph nodes.

Histopathologists provide a diagnostic service for cancer; they handle the cells and tissues removed from suspicious 'lumps and bumps', identify the nature of the abnormality and, if malignant, provide information to the clinician about the type of cancer, its grade and, for some cancers, Most cells are transparent and appear almost colorless when unstained. Histochemical stains, such as hematoxylin and eosin, which is the routine stain, are therefore used to provide contrast to tissue sections, making tissue structures more visible and easier to evaluate. Following the staining process, a cover slip is mounted over the tissue specimen on the slide, using optical grade glue (DPX), to help protect the specimen for microscopic examination.

Keywords: Benign, Malignant, Tumors, Hematoxylin, Eosin, leukemia, Mammogram, DPX, Metastasis

Ground water quality assessed by the artificial intelligence

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Abstract:

The quantity and quality of groundwater are among the essential needs for maintaining human existence and civilization. The most widely used metric for assessing water quality in the world is the Water Quality Index (WQI). However, as it entails managing enormous data sets and the computation of multiple subindices and the typical method for calculating the WQI is frequently difficult and time-consuming. Despite certain drawbacks, artificial neural network (ANN) performed better when handling a large number of data sets and produced accurate predictions because it could represent complex, non-linear relationships. The results of this study will help strategies for groundwater development and enhance the use of artificial intelligence (AI) in groundwater quality applications.

Keywords: Water quality index, artificial neural network, ground water, AI, complex

Machine learning-enabled Identifying illegal activities in Bitcoin organization

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Abstract

Introduced in 2009, Bitcoin has drawn considerable criticism due to its potential misuse in illegal endeavors, facilitated by the veil of anonymity it offers. A variety of illicit mechanisms are commonly leveraged by individuals exploiting this anonymous nature, surfacing these hidden activities is critical for legal scrutiny. Prevailing strategies involve the application of Artificial Intelligence for the comparison and identification of these anonymous entities, however, this approach predominantly focuses on a restricted number of illicit transactions.

The current research aims to address this limitation by implementing an automated, rule-based classifying method powered by machine learning, enabling the categorization of a plethora of illegal endeavors, including but not limited to, ponzi schemes, blackmail, fraud, scams, extortion, spamming activities, gambling websites, darknet markets, terrorist-related transactions and sextortion. In addition, a dataset integrating transaction details from Bitcoin cryptocurrency has been collated with the aim of employing machine learning models for the detection of illicit actors or activities. A report detailing the predictive capabilities of these sophisticated models is also included, offering possibilities for future research directions in this domain.

Analytical Method Development And Validation For Determination Of Nitrosamine Impurity In Sitagliptin and Metformin HCl Drug Product By Liquid Chromatography Equipped With Triple Quad Mass Spectroscopy (LCMS/MS)

Sapna Rautela

Abstract

In the current study, a feasible and sensitive liquid chromatography-atmospheric pressure chemical ionization tandem mass spectrometry (LC-APCI-MS/MS) method was developed and validated for the determination of nitrosamine in pharmaceutical ingredients (APIs). The proposed LC-APCI-MS/MS method was validated as per regulatory guidelines.

For nearly three years, the concerns regarding trace levels of N-nitrosamines in pharmaceuticals and the associated cancer risk have significantly expanded and are a major issue facing the global pharmaceutical industry. N-nitrosodimethylamine (NDMA) found in formulations of the popular anti-diabetic drug metformin and sitagliptin is a prominent example. This has resulted in product recalls raising the profile within the media. Issues of method robustness, sample preparation and

several unexpected sources of nitrosamine contamination have been highlighted as false positive risks.

The method was validated according to the current International Council for Harmonisation (ICH) guidelines with respect to acceptable limits, specificity, reproducibility, accuracy, linearity, precision, ruggedness and robustness.

This method could help to determine the impurity in the regular analysis of metformin and sitagliptin drug substances and drug products.

An In Silico Approach To Target RNA-Dependent RNA Polymerase of COVID-19 With Naturally Occurring Phytochemical

Sakshi Mishra

Abstract

The novel coronavirus disease 2019 (COVID-19) was firstly reported from Wuhan city of China and found as a highly contagious, transmittable and pathogenic viral infection. The World Health Organization declared COVID-19 as a pandemic since its emergence from China. The RNA-dependent RNA polymerase (nsp-12) is a complex with nsp-7 and nsp-8 cofactors and is a major constituent of viral replication and RNA synthesis machinery. In the current study, the RdRp of the virus was selected as a receptor protein for computational drug discovery. Computational homology modelling was done in order to find the hidden secondary structures and structural assessment of the viral protein to target them via antiviral drugs. The study was based on molecular docking of different phytochemicals' to check their potentials against viral replicative proteins. Out of 200 ligands used in this study from different plants, the best ten were selected based on drug

discovery parameter's such as S-score, ligand interactions, hydrophobic interactions and druglikeness. The ten best selected ligands were found to be verbenalin, epigallocatechin, swertisin, nobi-letin, pinoresinol, caftaric acid, hesperidin, islandic in, neochlorogenic acid and sesamin that exploit the potency as antagonists of viral protein. Among binding interactions of all ligands, Arg339 centred as the main interacting residue among almost all the ligands. Till now, many antiviral agents have shown potency in only mild cases of SARS-CoV-2, but no effective drug has been found for critical pulmonary cases. In clinical trials, many broad-spectrum antiviral agents have been still in trial periods of testing against SARS-CoV-2. Till date, no effective drug or vaccine has been validated with significant efficacy and potency against the SARS-CoV-2; therefore, there is an urgent need to design effective vaccine against nCoV-19 infection.

Keywords SARS-CoV-2 · Molecular docking · Phytochemicals · RNA-dependent RNA polymerase · Nsp-12

Exploring Prognostic Candidate Genes and Biomarkers in Cancer through Integrated Bioinformatics Analysis: A Comprehensive Review and Identification Study

Chetana Galav

Abstract:

Cancer remains a complex and heterogeneous group of diseases, posing challenges for prognosis and treatment planning. This research project aims to improve prognostic indicators in cancer through comprehensive bioinformatics analyses. By integrating diverse datasets from genomics, transcriptomics, and epigenomics, the study seeks to identify reliable prognostic candidate genes and biomarkers for various types of cancer.

The project involves a thorough review of existing literature to establish a foundation, followed by data integration and bioinformatics analysis to pinpoint potential prognostic markers. The study incorporates functional annotation, pathway analysis, and validation with independent datasets to confirm the biological relevance and robustness of the identified markers. Moreover, the project aims to correlate these markers with clinical outcomes and patient characteristics to assess their predictive value.

Ethical considerations are prioritized throughout the research process, ensuring responsible handling of patient data and adherence to ethical standards. The findings will contribute to the development of predictive models for personalized therapeutic approaches and advance the understanding of cancer prognosis. This research strives to bridge the gap between computational predictions and clinical relevance, offering meaningful insights for improving patient outcomes and treatment strategies.

Preparation and Evaluation of an Antimicrobial Herbal Disinfectant"

Riya singh, Dr.Madhura Nerurkar, Dr.Kalpana Dabhade, DR.Anubha Khare.

Chhatrapati Shivaji Maharaj University

CALANTHA BIOTECH PVT.LTD. Andheri (E Mumbai 400072), Saki Vihar RD. C- wing,

Abstract:-

This study focuses on the antifungal and antibacterial effects of disinfectant agents. Various laboratory tests were performed to evaluate the antimicrobial activity of the disinfectant agents, including the minimum inhibitory concentration test, sensitive test zone growth diameter test, and inhibition zone test.

In this study, an herbal disinfectant was formulated using extracts of Dumb cane, peppermint, Manipuri flower, Manipuri leaves, Ixora coccinea, and bougainvillea. The preparation process involved extracting bioactive compounds from the plant materials using suitable solvents. The antimicrobial efficacy of the herbal disinfectant was then evaluated against a panel of pathogenic microorganisms, including bacteria, fungi, and viruses.

Standard microbiological methods such as agar diffusion assay and broth microdilution assay were employed to determine the minimum inhibitory concentration (MIC) and zone of inhibition (ZOI) of the herbal disinfectant against the test organisms. The results revealed that the formulated herbal disinfectant exhibited significant antimicrobial activity against a broad spectrum of microorganisms.

Notably, it demonstrated potent inhibitory effects against common pathogens such as *Escherichia coli*, *Candida*, and *Bacillus*. The MIC value indicated the concentration at which the herbal disinfectant effectively inhibited microbial growth, while the ZOI measurement provided insights into its ability to prevent microbial proliferation in agar plants.

Overall, the findings of this study suggest that the herbal disinfectant derived from Dumb cane, peppermint, Manipuri flower, Manipuri leaves, *Ixora coccinea*, and *Bougainvillea* possesses promising antimicrobial properties, making it a potential candidate for use in various disinfection applications. Its practical utility in healthcare settings, food processing industries, and household environments is worth exploring., and household environments.

Synthesis Of Zinc Oxide Nanoparticles From *Hibiscus rosasinesis* And Application In Food Packaging For *Solanum lycopersicum* and *Musa acuminata*

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Abstract

Nanotechnology is an emerging field with applications in science and technology. Nanoparticles have diverse types of applications, from food packaging to engineering techniques. Food packaging is an industry that manufactures food packaging material to preserve food from microorganisms and environmental conditions. Green synthesis is a method that eliminates toxic waste, reduces energy consumption, and uses plant parts for the bio-reduction of metal ions into elemental form in a wide size range. The main objective of this project is the sustainable development of zinc oxide nanoparticles from *Hibiscus rosa sinensis*. Characterizing the zinc oxide nanoparticles by UV spectroscopy, FTIR, SEM /TEM. Zinc oxide nanoparticles' antimicrobial

activity was checked by the agar cup method and the application of zinc oxide nanoparticles with agar-glycerol to synthesize the nanofilms. Determine the quality of the synthesized nanofilm. We prepared high-quality zinc oxide nanoparticles from hibiscus rosa-sinensis leaf extract by dissolving g of hibiscus rosa-sinensis leaf powder in 100 ml of distilled water and boiling for 60 min. Further, in 50 ml of plant extract, 5 g of zinc nitrate was added and boiled at 60 degrees Celsius to obtain a mixture kept at 37 degrees Celsius for 1 week. The antimicrobial activity of zinc oxide nanoparticles was checked against *S. aureus*, *S. typhi*, and *E. coli* in Muller-Hinton agar by the agar-well diffusion method. Preparation of agar-glycerol nanofilm by putting 2.5 g of molten agar in a beaker containing 100 ml of distilled water and heating for 1 hour Add 50 mg of zinc oxide nanoparticles, heat at 90 °C for 30 minutes, and add 0.75 g of glycerol. Pour the mixture on a Petri plate and settle for 1 week. Quality tests of nanofilm are checked by moisture content, swelling index, solubility, and biodegradability. This nanofilm preserves food materials and is biodegradable, as it degrades 65.33% within just one week. Keyword – Nanoparticles Zinc oxide nanoparticles , Antimicrobial activity , Green synthesizes , SEM , FTIR ,*E.coli* .

Production Of Biodiesel From Waste Plastic & Yellow Grease

Vaishnavi Chainpuria

Abstract

The Continuous demand for Plastics causes plastic costs to accumulate in Landfills, which consumes a lot of space and contributes to Environmental problems. The Recovery of plastic to liquid oil through the Pyrolysis process had great potential since petroleum was the main source of plastic manufacturing. Pyrolysis is a technology used to heat substances in the absence of oxygen that dissolves all these types of waste plastic. To reduce and recycle plastic waste. Biodiesel offers many advantages because it is renewable, nontoxic, biodegradable, and suitable for sensitive environments. Yellow greases contain great quantities of free fatty acids which, the biodiesel producers are forced to turn to lower cost. The current two-step commercial processes used to convert yellow grease to biodiesel incur added costs for pre-treatment of the yellow grease before transesterification to remove the fatty acids by the addition of extra alkali catalyst of Esterification of the free fatty acids using a Homogenous acid catalyst, eliminating the advantage of the cheaper raw material. To Convert waste Yellow grease used for Mechanical

Purposes covered to Biodiesel using an alkali-catalyzed transesterification process. To Recycle waste Yellow Grease for Renewable energy source with less pollution.

**Comparative Analysis of ZN Microscopy and GeneXpert for Rapid Diagnosis of
Mycobacterium Tuberculosis in Multi-Drug Resistant Tuberculosis Cases: A Tertiary Care
Hospital Study**

Alkiya Siddiqui

Abstract

Tuberculosis (TB) remains a significant global health challenge, particularly with the emergence of multi-drug resistant (MDR) strains. Rapid and accurate diagnosis of TB, especially MDR-TB, is crucial for effective disease management and prevention of transmission. This study aims to compare the diagnostic efficacy of Ziehl-Nelsen (ZN) microscopy and GeneXpert for the rapid detection of *Mycobacterium tuberculosis* in clinically suspected cases of MDR-TB in a tertiary care hospital setting.

Overview of Phytochemicals, Green Nanoparticles Extract of *Psidium Guajava* And Its Medicinal Applications

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Abstract

Psidium Guajava (family myrtaceae), is widely cultivated in tropical and subtropical regions. Its fruit varies size from apricot grapefruit. Its leaves contain several phytochemicals like tannines, terpenes, triterpenes and glycosides. Due to its high production & diversity of products derived from its fruit, It has great economic importance in many countries of the world .This article aims to review the phytochemicals of the extracts of *Psidium Guajava* and biological activities like antimicrobial , antidiarrheal, antidiabetic, antacid, antiulcer activities etc. This review also focuses on applications of *Psidium Guajava* leaves extract in fabrication of nanoparticles of various metals like titanium dioxide, silver, gold, zinc oxide, copper oxide. These metallic nanoparticles were evaluated applications like antimicrobial , photocatalytic activities etc.

Keywords: Psidium guajava, phytochemicals, Antimicrobial activity, Antidiarrheal, antidiabetic activity, Metallic nanoparticles, photocatalytic activity.

Ensuring water purity and safety essential practices for health and well being

Sakshi Patil

Abstract :

Water analysis is a multifaceted process that involves the systematic evaluation of various physical, chemical, and biological parameters to assess the quality and safety of water for human consumption, environmental health, industrial processes, and agricultural activities. This abstract provides an in-depth exploration of water analysis techniques, the significance of different parameters measured, emerging trends in water quality monitoring, and the importance of ensuring clean and sustainable water resources. Water analysis encompasses a wide array of tests and measurements that help in understanding the composition and characteristics of water. Physical parameters such as temperature, turbidity, color, and odor provide insights into the visual and sensory aspects of water quality. Chemical parameters include pH levels, dissolved oxygen, nutrients (nitrogen and phosphorus), heavy metals, organic compounds, and various contaminants from industrial and agricultural sources. Microbiological tests are essential for detecting pathogens and indicators of fecal contamination, which are crucial for assessing the microbiological safety of water.

Analytical techniques used in water analysis range from traditional methods like titration, gravimetric analysis, and colorimetry to more advanced techniques such as chromatography, spectroscopy, mass spectrometry, and molecular biology-based methods. These methods enable the accurate quantification of contaminants at trace levels and provide valuable data for regulatory compliance, pollution control, and risk assessment. Continuous monitoring of water quality is essential to detect changes in water composition over time and to identify emerging contaminants or trends that may pose risks to public health or the environment. Automated sensor networks, remote monitoring systems, and real-time data analysis tools have revolutionized water quality monitoring by providing timely information on water quality parameters and enabling rapid response to potential threats.

Ensuring clean and sustainable water resources is paramount for human health, ecosystem preservation, and economic development. Water analysis plays a crucial role in identifying sources of contamination, evaluating treatment efficacy, and guiding policy decisions to protect water quality. By integrating innovative technologies, interdisciplinary approaches, and community engagement, we can work towards achieving the goal of safe, accessible, and sustainable water for all.

In conclusion, water analysis is a fundamental tool for safeguarding our most precious resource and promoting a healthy environment for current and future generations. Through collaborative efforts, scientific advancements, and informed decision-making, we can address the complex challenges facing water quality and work towards a future where clean water is a universal right.

**RENEWABLE ENERGY FOR SUSTAINABLE DEVELOPMENT OF INDIA:
CURRENT SCENARIO**

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Abstract:

India is currently the most populous country in the world and it has significant impact on the demand for the energy. Economic growth in India relies on it. As a matter of concern India is the world's third-largest emitter of greenhouse gases (GHG)[statista.com] and faces the challenge of balancing development with environmental sustainability. Sources like solar, wind, and hydro offer a solution as they are renewable. This paper explores the potential of renewable energy to contribute to India's sustainable development.

Keywords: Renewable energy, sustainable development, Greenhouse gases, Land degradation

An Overview of Energy, Renewable Energy Development and Technologies and The Role of Renewable Energy in Sustainable Development

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Abstract:

Energy is most important and valuable for today's living life. An energy a necessary element of socioeconomic development. It has been found that in the last decades, there is tremendous economic growth in developing countries due to accelerated increase in energy consumption. Global energy demand is accelerating almost daily by all population and its related services to satisfy human social and economic development, welfare and health. [1]. The demand for energy is growing across many countries in the world as the world is fast becoming a global village. However, the earth in its form itself cannot change [1]. If this increased demand of energy by the world is not offset by improvements in energy efficiency elsewhere, then the global energy consumption will continue to grow year-on-year. This growing energy consumption makes tremendous challenges in transforming the energy systems away from fossil fuels towards low-

carbon sources. This will result in an energy crisis [4]. Energy from fossil fuels (e.g. coal, natural gas and oil) remains non-sustainable as finite sources and limited and exhausting supplies. and the. Also, these have environmental impact and are harmful to the planet when burned daily for energy [2]. One day the whole world will run out of finite exhaustible fossil fuels. Hence there has risen a need for alternate energy sources which are ecofriendly and sustainable [3]. Renewable resources are infinite and inexhaustible in duration, however little bit limited in the amount of energy that is available per unit of time [7]. Even if these renewable energy technologies now becoming increasingly important as the world facing the challenges of negative impacts of climate change and alternatively reducing the dependence on finite and polluting fossil fuels energy sources. In promoting the sustainable development, the use of renewable energy sources becoming a key factor that meets the needs of the present generation without compromising the future [5]. Renewable energy that comes from natural sources or processes that are constantly replenished, so , commonly referred to as clean energy (zero emission sources that do not pollute the atmosphere when used, as well as energy saved by energy efficiency measures), for example, Solar Energy, Wind Energy, Geothermal Energy, Biomass Energy, Hydroelectric Energy, Marine energy [6]. It is also known as green energy that is generated from natural resources, such as sunlight, wind or water.

Biotechnology: A tool for the improvement of human life

Shaikh Aqsa

Abstract:

Increase in human population has given a big challenge to science to combat food and health enhancement. With the initiation of biotechnological science a new world of science has opened the doors to overcome these challenges. Utilisation of biological systems to design beneficial technologies for human welfare comes under the umbrella of biotechnology. The discipline of biotechnology has now many allied fields. New inventions in the life sciences in the past few years have come through biotechnology. That is the reason biotechnology is today's science in which happenings are occurring. Whether there are new inventions of vaccines, whether we have to make new crop varieties, improve livestock, poultry meat and feed and milk quality and even in war industry biotechnology is playing its important role. It is well proven that biotechnology has no limits. If it comes to GM crops, biotech crops are unstoppable in yield outcome. The basic aim of this research paper is to light on latest happenings in biotechnology and to aware the people about its significance in every field of science. All the biotechnology industry with its allied applications is considered in this research paper.

Keywords: Agriculture, biotechnology, GM crops, human health, livestock, vaccine, war industry.

Bridging the Past and Present: Ancient Practices of Sustainable Development and their Contemporary Utility

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Abstract

The sustainable development of Earth holds profound importance as it encompasses the collective efforts to preserve our planet's resources, safeguard its ecosystems, and enhance the well-being of all its inhabitants. At its core, sustainable development is about striking a delicate balance between meeting present needs and ensuring the ability of future generations to thrive. By adopting sustainable practices, we can protect vital resources such as water, air, and biodiversity, ensuring their availability for generations to come. India has a rich history of sustainable practices deeply rooted in its cultural heritage and traditional knowledge systems. Various indigenous communities across India have practiced sustainable agriculture, water management, and resource conservation for centuries. For example, traditional farming methods such as agroforestry, crop rotation, and organic farming are sustainable practices that promote soil health, biodiversity, and resilience to climate change.

India has a long history of sustainable water management practices, including rainwater harvesting, building traditional water storage structures like stepwells and tanks, and community-based water governance systems. Among these are the iconic stepwells, ingeniously designed to

harvest rainwater and provide access to groundwater, ensuring water availability even in arid regions. Terraced farming, prevalent in mountainous areas, prevents soil erosion and maximizes agricultural productivity while conserving water resources. Traditional irrigation systems like the Kuhl in Himachal Pradesh exemplify efficient water management, utilizing natural water sources to irrigate crops sustainably. Agroforestry practices, deeply rooted in Indian agriculture, enhance soil fertility, biodiversity, and resilience to climate change by integrating trees into farming landscapes. Furthermore, traditional architecture incorporates sustainable design principles suited to local climates, promoting natural ventilation and thermal comfort. Community-based resource management systems and the preservation of sacred groves highlight the importance of collective stewardship and cultural values in sustaining ecosystems. These ancient sustainable features showcase India's rich heritage of environmental wisdom, offering inspiration and guidance for building a more sustainable future. The ancient practices of sustainable water management in India are still evident today through various methods aimed at preserving and efficiently utilizing water resources. Some of these practices include: Rainwater Harvesting, Community-based Water Management, Check Dams and Contour Trenches, Traditional Irrigation System. By integrating these ancient practices with modern technologies and conservation strategies, India can continue to preserve and sustainably manage its water resources for future generations.

**Isolation and characterization of pectinolytic bacteria from the fruits and Vegetables
compost and their role in fruit juice clarification.**

Anubha Khare

Abstract

Microbial pectinases are important industrial enzymes that are employed in a range of processes, including tea production, wastewater treatment, and the clarifying of liquids in the beverage industry. The goal of the current experiment was to separate pectinase-producing bacteria from natural environments. Samples from the soil, fruit and vegetable wastes were gathered to increase the diversity of isolated bacteria that generate pectinase. Pectinases, commonly referred to as pectic enzymes, are an important class of enzymes used in industries such as wine, papermaking, fruit, vegetable, tea and coffee food processing. Commercial enzyme manufacturing by bacteria, including pectinase, has long been preferred by industry. In order to extract pectinase-producing bacteria, decomposing fruit materials (apples and oranges) were selected. Different microorganisms were then tested for pectinolytic activity. Pectinase enzymes have attracted attention for their many benefits. Pectinase has numerous uses in the fruit juice industry to improve fruit juice clarity and yield. Apart from this Pectinases has many other industrial uses such as cotton washing, vegetable fibre degumming, wastewater treatment, and vegetable oil extraction, and is used in various industries such as the pulp industry, textile industry, and food industry. The use of pectinase enzymes to modify the texture or flavor of fruit juices, increasing extraction and

clarity, and reducing viscosity is also described. Considering all these advantages of pectinase enzymes, the aim of this study is to isolate potential pectin-degrading microorganisms, optimize the culture conditions for maximum pectinase production, and analyse the various strains responsible for maximum pectinase activity. The purpose of the study was to investigate various factors and evaluate the clarification potential of various fruit juices. In the research study, we discuss the structure of pectin substances, substrates for pectinase production, factors affecting pectinase production, industrial applications of microbial pectinases, and also discuss the challenges and future opportunities of industrial application of microbial pectinases. With the increasing industrial demand for these enzymes, it would be useful to isolate organisms that produce large amounts of pectinase and possess multiple stabilizing factors such as temperature and pH. Enzymes are produced and purified by ammonium sulphate precipitation followed by dialysis. It was observed that as the substrate concentration increased, the amount of enzyme produced also increased whereas the specific activity of the enzyme decreased. The objectives of the study was-Collection of soil sample from different vegetable and fruit waste dump areas. Isolation and Screening of the pectinase producing bacteria. Identification of isolates by morphological and physiological characteristics. Production of pectinase by submerged fermentation and their applications was studied.

Opportunities and Challenges in Harnessing Geothermal Energy Potential in Maharashtra, India

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India, as the world's third-largest consumer of energy, faces significant challenges in meeting its energy demands while mitigating environmental impacts. With approximately 75% of its electricity generated from coal, India's energy landscape is in dire need of diversification towards cleaner and more sustainable sources. In response to this urgent need, India has set ambitious renewable energy targets, including 500 GW of renewable energy capacity by 2030, as announced at COP26.

This abstract focuses on the potential of geothermal energy in Maharashtra, one of India's key states, to contribute to the nation's renewable energy goals. Geothermal energy, harnessed from the natural heat generated within the Earth offers a promising avenue for clean energy production. Maharashtra boasts significant geothermal potential, with various identified sites spread across the state, including the West Coast (Konkan) geothermal province, Narmada-Tapi Garben geothermal province, and Godavari valley geothermal province. The Geological Survey of India (GSI) has conducted surveys revealing the presence of approximately 340 hot springs in the country, with temperatures ranging from 60-120°C. Maharashtra alone hosts 60 hot springs clustered around 18 localities, predominantly in districts such as Thane, Ratnagiri, Dhule,

Jalgaon, Yeotmal, and Amravati. These hot springs offer low to moderate temperature ranges suitable for various applications, including power generation and direct thermal utilization. Among the identified sites in Maharashtra, Unhaware (Khed) stands out with the available temperature of 71°C and a maximum flow rate of 43,920 liters per hour. Other notable sites include Tural in Ratnagiri district, with a temperature of 61°C and a flow rate of 20,160 liters per hour. However, commercial exploitation of these sites requires deep drilling ranging from 1.0 to 3.0 km depth to access sustainable reservoirs. Geothermal power generation in Maharashtra presents a commercially viable opportunity, provided proper geological assessments and economic feasibility studies are conducted. In addition to electricity generation, geothermal energy can be utilized for various non-electrical applications as well. Efforts to harness geothermal energy in Maharashtra must be supported by comprehensive geological surveys, technological advancements in drilling techniques, and favourable policy frameworks to incentivize investment in renewable energy infrastructure. Collaboration between government agencies and private enterprises, to unlock the full potential of geothermal resources in Maharashtra and accelerate India's transition towards a sustainable energy future. Maharashtra's geothermal energy potential presents a valuable opportunity to diversify India's energy portfolio, reduce dependence on fossil fuels, and mitigate greenhouse gas emissions. By leveraging these resources effectively, Maharashtra can emerge as a leader in renewable energy innovation, contributing significantly to India's broader sustainable development goals.

Biogenesis and Characterization of *Pilea microphylla* cobalt nanoparticles

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Abstract:

The aim of this article is to synthesize Cobalt oxide nanoparticles(CoO). The CoNPs are synthesized by applying principles green chemistry to minimize hazardous materials. The purpose of this study is to synthesize and characterize cobalt nanoparticles using pilea microphylla plant to reduce the use of toxic substance to human health and environment. Cobalt nanoparticle are synthesized by blending cobalt nitrate $[\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}]$ and pilea microphylla plant extract. In this study, at 0.5 M concentration of cobalt nitrate $[\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}]$, stable CoNPs were synthesized and the crystalline nature of these CoNPs is detected through an X-Ray Diffraction (XRD) pattern. To study the morphology and size of the CoNPs Field Emission Scanning Electron Microscopy (FESEM) analysis was done.

Keywords:- Pilea microphylla,CoNPs, FESEM, XRD

Soil Erosion : Cause and Natural solution by Succulent Plant

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Abstract

Sustainable development in terms of meeting present need without compromise the need of future generation. This development can be achieved by adopting feasible and convenient methodology using bioextract. As whole is facing problem of soil erosion. Soil erosion results in continuous loss of topsoil, ecological degradation and soil collapse. The major effects of soil erosion are loss of arable land, clogging of water ways, air pollution, desertification, destruction of infrastructure. Soil Erosion is a natural process of wearing away topsoil but human activities accelerated it. Degraded lands results into its low water holding capacity which results in floods. The solution to reduce such degradation is the adaptation of Perennial succulents which possess drought resistant property. This plant has water storing ability as it has thick and fleshy stems and leaves. There are around 60 different types of succulents. Not only its leaves and stems but also its underground organs have water storing tissues. *Notonia Grandiflora* is a perennial succulent plant of Asteraceae family which is widely utilised for traditional medicinal purpose. This succulent cultivation can be used in synthesis of nanoparticles too. Precisely controlling size ; shape of nanoparticles, catalytic activity, optical properties and surface activity can be obtained. Natural sources which are readily available can be utilized for sustainable and eco-friendly approach to produce functional nanoparticles with diverse applications.

Wound healing property of hemigraphis colorata in rat model

Shaikh Noor Saba 1 , Sahil Bansode 1 , Dr.Kalpana Dabhade 1 ,Anubha Khare 1 .

Abstract

Herbal medications are made from various plant parts, including leaves, stems, roots, and bark. They often contain many biologically active components and are generally used to treat mild or chronic conditions. People have been treating their wounds for millennia. Traditional wound management is confined to what is readily available or can be obtained locally, such as water, dirt, plant and animal items, and is frequently supplemented with ceremony and ritual as an extra measure. For millions of people throughout Asia, Africa, the Middle East, and Latin America, traditional remedies made from local plants, animals, and natural products are the primary source of wound care and for others, they are the only source. India has a long history of plant-based expertise in healing. In India, tribals and folklore traditions employ a wide range of plants, plant extracts, decoctions, and pastes to cure cuts, wounds, and burns. We examined the wound healing activity of *H.colorata* using incision and excision wound models on wistar rats. Extracts of plant were made with solvents (pet ether, chloroform, ethanol) using Soxhlet apparatus. Each group contained 6 rats for each extract and 6 rats were kept as control. We found that in excision wound model the control rats showed healing in 25 days average, while the extracts showed closure of wound on 18,18 and 21 days respectively. Wound closure were measured using graph paper. In

incision wound model we measured the healing and tensile strength of the wound. It was observed that the healing and tensile strength was higher in the extracts when compared to control.

Current trends in wound care are moving toward the development of innovative wound care treatments that combine the use of herbal healing agents with modern products and practices. We can incorporate our extracts in nanostructures or bandage to improve wound healing. The possibility of using a biocompatible formulation made of our extracts would give the consumer a “green” option and almost no side effects once it was put on the skin.

Keywords: Wound healing, Herbal extracts, Animal wound model, Herbal wound management.

Overview of Liver Health through Interpretation of Liver Function Tests

Aditya Sunil Bhosale

Abstract

The liver plays a crucial role in maintaining overall health, performing various functions essential for metabolism, detoxification, and nutrient storage. Liver Function Tests (LFTs) serve as valuable diagnostic tools to assess liver health by measuring various enzymes, proteins, and other substances in the blood. Understanding the interpretation of these tests is vital for early detection, diagnosis, and monitoring of liver diseases. This research proposal aims to provide a comprehensive overview of liver health through the interpretation of liver function tests.

Green nanoparticles:-A Potential Source in Medical Science

Mohini Mhase

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Abstract

The primary goal of review nanoparticles in drug delivery systems is to enable precise and effective administration of therapeutic or diagnostic chemicals to specific locations with minimal adverse effects. Nano systems can achieve various therapeutic or diagnostic tasks simultaneously while acquiring desirable biological characteristics such as prolonged blood circulation, targeted delivery, stimuli sensitivity, and intracellular targeting. Particle size distribution and shape exhibit unique and enhanced characteristics when reduced to the Nano scale. This change in specific surface area contributes to its high value and influences critical metrics such as surface reactivity. The use of nanoparticles across industries, including energy, health, and nutrition, has significantly increased in recent years, especially in pharmaceutical and medical sciences.

Globally, the application of metal nanoparticles in biomedicine and related fields is steadily expanding. Due to their notable properties, metal nanoparticles and nanomaterial production are currently focal points of research.

Investigation of Protein-Ligand Docking For Covid-19 Therapeutics

Lekha Chandran

Abstract

The quest, for remedies against COVID 19, which is caused by the SARS-CoV 2 virus has become a global mission. In this research we utilize methods to investigate potential healing substances from chemical and plant origins. Our focus is on evaluating how these substances interact with proteins through a technique called protein ligand docking. This method enables us to forecast how these substances could attach to the proteins possibly hindering their functions and halting replication. Moreover we analyze the properties of the chosen substances using In-Silico ADME profiling. By simulating how these substances are absorbed, distributed, metabolized and excreted in the body we gain insights into their effectiveness and safety as treatments for COVID 19. This thorough examination aids in identifying compounds with drug characteristics guiding subsequent experimental validations.

Our research introduces a strategy to accelerate the drug discovery process for COVID 19 by employing techniques to efficiently screen various chemical and plant derived compounds. By merging cutting edge technology with assessment our goal is to pinpoint promising candidates for further development as potential remedies, for addressing this worldwide health emergency. Our

discoveries support the fight, against COVID 19. Could potentially lead to the creation of crucial treatments that are urgently required.

Unveiling the Secrets of Drosophila Larvae: Investigating Infestation in Fruits through Digestive Tract Analysis

Nithya Mohan Nair

Abstract

This dissertation delves into the intricate world of Drosophila larvae infestation in fruits, aiming to unravel their secrets through meticulous analysis of their digestive tracts. Through a multidisciplinary approach encompassing morphological, genetic, and physiological analyses, this study aims to identify Drosophila species, analyze population distribution, explore developmental stages, and assess their impact on fruit quality. Methodologies for sample collection, larvae extraction, species identification, population analysis, life cycle study, and impact assessment are detailed, alongside a thorough discussion of chemicals, equipment, and preservation techniques. By employing advanced techniques such as DNA extraction, morphological observation, and biochemical analysis, we aim to elucidate key aspects of Drosophila larval biology and their interactions with host fruits. The findings of this study will contribute to a better understanding of Drosophila infestation dynamics and inform the development of targeted management strategies to mitigate their impact on fruit production and quality.

Renewable energy for sustainable development in India

Mr. Dinesh Eknath Kurhade, Dr. Pramod Awasthi

Abstract

The primary objective for deploying renewable energy in India is to advance economic development, improve energy security, improve access to energy, and mitigate climate change. Sustainable development is possible by use of sustainable energy and by ensuring access to affordable, reliable, sustainable, and modern energy for citizens. Strong government support and the increasingly opportune economic situation have pushed India to be one of the top leaders in the world's most attractive renewable energy markets. The government has designed policies, programs, and a liberal environment to attract foreign investments to ramp up the country in the renewable energy market at a rapid rate. Renewable energies are a significant step toward attaining sustainable development since they rely on renewable natural resources like the sun, wind, water, and biomass, as opposed to fossil fuels, which decrease over time. Renewable energies offer chances to create electricity and meet energy needs in a variety of industries, including industry, transportation, and housing. Furthermore, the usage of renewable energies helps to reduce greenhouse gas emissions and air pollution, which benefits the environment and public health.

Renewable energies also improve economic sustainability by creating new job opportunities and lowering a country's reliance on fuel imports. As a result, many economic, social, and environmental benefits increase and help to mitigate the harmful effects of traditional energy generation on the environment and public health. Renewable energies bring long-term cost savings, increase energy independence, create job opportunities, and promote foreign trade. Socially, it enhances communal life and public health, improves the social climate, promotes inclusion, and strengthens food security. Environmentally, they reduce harmful emissions, enhance air and water quality, slow the depletion of natural resources, and protect biodiversity. It can be said that investing in renewable energies represents an important step for achieving sustainable development in the long term, as it reduces production costs, improves quality, improves health, preserves the environment, and works to provide a more sustainable environment for current and future generations. Governments, businesses, and individuals can work together to promote the use of renewable energies and achieve sustainable development around the world. It has focused in particular on supporting global efforts to accelerate clean energy transition, mitigate climate change, reach net zero emission and prevent global temperature from rising above 1.5°C. Energy that comes from a source that is constantly renewed, such as the sun and wind, can be replenished naturally in a short period of time. We do not have to worry about them running out. Examples include: solar, wind, biomass, and hydropower. Currently, about 20% of the world's electricity comes from renewable resources.

Automated Machine Learning Approach For Ligand – Based Virtual Screening In Drug Discovery.

Suraj Yadav

Abstract

Artificial intelligence (AI) algorithms, including machine learning (ML) and deep learning (DL), are revolutionizing drug discovery. Challenges addressed by AI include predicting compound properties, protein structure prediction, novel compound design, and more. AI complements high-throughput screening (HTS) through virtual screening (VS) methods. For this project work the AI methodologies to carry out an automated ligand- based virtual screening. The screening process will be streamlined by automating several burdensome tasks of manual intervention using PyRMD. PyRMD is introduced as a novel, fully automated ligand-based virtual screening tool powered by the random matrix discriminant (RMD) algorithm. Designed to streamline the drug discovery process, It eliminates the need for expertise in AI paradigms and coding, making it accessible to non-experts. Leveraging bioactivity data from the ChEMBL repository, It autonomously identifies active and inactive compounds and learns their distinctive chemical features. With the capability to screen millions of compounds in hours, It offers an intuitive interface for parameter adjustment and provides comprehensive benchmark metrics to assess model performance. It is freely available as open-source software, facilitating its widespread adoption in drug discovery research.

Investigating the Utility of Biochemical Tests in Diabetes Management

Pooja Yadav

Abstract

Diabetes mellitus is a chronic metabolic disorder characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. It presents a significant public health challenge globally, with increasing prevalence rates. Biochemical tests play a crucial role in the diagnosis, management, and monitoring of diabetes. However, advancements in biochemical testing methodologies continue to evolve, warranting a comprehensive investigation into their efficacy and applicability in diabetes management. Evaluate the diagnostic accuracy of traditional and novel biochemical tests in differentiating between diabetes subtypes (type 1, type 2, gestational). Assess the utility of biochemical markers in predicting diabetes-related complications such as nephropathy, retinopathy, and neuropathy. Investigate the correlation between biochemical markers and glycemic variability in diabetic patients. Explore the potential of emerging biochemical tests in personalized diabetes management strategies. Determine the cost-effectiveness of incorporating biochemical tests into routine diabetes care protocols. Conduct a comprehensive review of existing literature to establish a baseline understanding of established and emerging biochemical tests in diabetes management.

This research aims to contribute to the optimization of diabetes management by providing evidence-based recommendations on the use of biochemical tests. The findings have the potential to improve diagnostic accuracy, risk stratification, and personalized treatment strategies, ultimately enhancing patient outcomes and reducing the burden of diabetes-related complications.

The study of biochemical tests in diabetes management is essential for advancing our understanding of the disease and optimizing patient care. By evaluating the diagnostic accuracy, predictive value, and cost-effectiveness of traditional and novel biochemical markers, this research seeks to provide valuable insights that can inform clinical practice and improve outcomes for individuals living with diabetes.

Isolation and Characterization of Methanotroph Bacteria for Potential Application in Mitigation Methane Emissions from Rice Fields.

Arshia shaikh 1 Dr. S.T Mehtre 1 Dr. Kalpana Dabhade 1 Dr. Anubha khare 1 .

Abstract

Methane emissions from agricultural activities, particularly from livestock production and paddy rice cultivation, are significant contributors to global warming and climate change. One innovative approach to reducing methane emissions involves the use of Methanotroph bacteria. Methanotrophs are aerobic to microaerophilic bacteria, which oxidise and utilise methane, the second most important greenhouse gas. There are only a few microbial strains available world over having capacity to degrade methane due to lack of rapid methodology. This research aimed to isolate, screen, and characterise methane-utilising bacteria.

In this present study we have isolated methane degrading bacteria (Methanotroph) by enrichment of biogas plant slurry in the flask containing methane gas as the sole source of carbon in its headspace and minimal media as a basal medium. They converted Methane into Methanol and formaldehyde then carbon dioxide within 15 days of incubation in incubator at 34 .c Here we used a Nitrate Mineral salt medium for the isolation of the bacteria which is a selective media for the

methane degrading bacteria (Methanotroph). with the help of streaking technique. The bacterial growth incubation period is 7 days at 34 .c .Also in this gram staining, biochemical tests, and PCR, Gel Electrophoresis was performed to detect and confirm the methane degrading bacteria (Methanotroph). The mitigation is observed with a pot assay of a rice plant.

Keywords: Methanotroph, Monooxygenase, Nitrate mineral salt medium, Biogas.

Relationship Of Lipid Profile Parameters In Patients With Coronary Heart Disease

Rumaisa Nakade,;Shaikh Shama, Dr.Kalpana Dabhade, Dr. Anubha Khare.

Despite medical advancements that reduce numerous risk factors, coronary heart disease(CHD) continues to be the leading cause of mortality and morbidity worldwide. One major thought to be involved in the development of coronary heart disease is lipid profile. Numerous investigations conducted in most Western and Asian countries have confirmed the link between hyperlipidaemias and coronary heart disease. But our knowledge of the relationship between lipid profile and CHD is extremely limited. The study`s objective This study set out to evaluate the relationship between aberrant lipid levels and coronary heart disease. The comparative study between lipid profile and CHD was conducted in (Metropolis Healthcare Ltd - Best Diagnostic Centre In Pannel). the subjects were selected based on the inclusion and exclusion criteria decided for the study. A total of 100 patients suffering from CHD And 100 healthy controls were selected for the present study. 2 ml of blood after fasting was collected from each subject and serum was separated for further analysis of the lipid profile. Serum cholesterol, triglycerides, HDL, LDL and VLDL were analysed spectroscopically on Chem 7, ERBA machine. Reagents were procured from ERBA. All necessary data were collected, analysed, and disseminated by MS-Office and SPSS version 23.

The study sample comprised of 65% male and 35% female. Serum cholesterol, triglycerides, High Density Lipoprotein (HDL), Low Density Lipoprotein (LDL) and Very Low-Density Lipoprotein

(VLDL) of controls were found to be 188 ± 45.03 , 129.5 ± 85.41 , 46.3 ± 13.11 , 67.84 ± 11.75 , 13.01 ± 18.65 respectively. Serum cholesterol, triglycerides, HDL, LDL and VLDL of CHD Patients were found to be 231.88 ± 25.60 , 181.27 ± 31.55 , 34.02 ± 58.22 , 136.99 ± 44.53 , 37.28 ± 61.40 respectively. It was also found that there was an extremely significant difference ($p < 0.001$) in Serum cholesterol, triglycerides, LDL and VLDL between controls and CHD patients. And significant difference in HDL ($p < 0.049$) between controls and CHD patients. In this study, we found that the total cholesterol, triglycerides, HDL cholesterol, and LDL cholesterol concentrations were significantly higher in coronary heart disease (CHD) patients. These results could be useful for CHD therapy and related future research.

Keywords: Coronary heart disease, Lipid profile, Cholesterol, HDL, LDL, VLDL

To Profiling of Microorganism Isolated from Environment of Pharmaceutical Company Core Area.

Retuja Dhanawade

Abstract

The microbiological quality of air, surface and working personnel in a pharmaceutical industry was investigated. This study reveals that the personnel involved in manufacturing were the main source of contamination and the common organisms found from samples of air, surface, and working personnel monitoring area. The common organisms found from samples of air, surface, and working personnel monitoring area were staphylococcus, Pseudomonas, and Escherichia sp. Among the commonly used disinfectants such as sodium hypochlorite, savlon (chlorhexidine gluconate 0.3 and cetrимide 3% w/v), ethanol, methanol and isopropyl alcohol were determined using standard methods against the most predominant organisms. The results of this study indicate that the microflora of the final product may represent contaminants from the atmosphere, from personnel operating the process, from raw materials, from the equipment with which it has been made, or from the final container into which the product has been packed and stored. The main purpose of the EM program is to provide information about the microbiological quality of the aseptic manufacturing environment and the degree of control provided by cleaning and sanitising regimes, work practices and the design and engineering of the facility. Without the data that an EM program provides it is impossible to verify that an aseptic environment is under proper control. Regular environmental monitoring samples for microbiological quality of different

locations in pharmaceutical facility are by far very critical measure in controlling clean area and environment which have direct impact on the microbiological quality of the final pharmaceutical products. Different methods were used to collect samples from different locations. These samples were processed and followed by isolation and identification. The obtained data were analyzed to find microbial distribution in the environment of pharmaceutical facility.

Standardization of conventional polymerase chain reaction assay (PCR) for detection of Trypanosoma evansi in dogs

Jui Ware

Abstract

Trypanosomiasis is one of the most widely prevalent haemoprotozoan diseases, caused by various members of *Trypanosoma* spp. It affects a variety of domestic and wild animals including cattle, camels, dogs, etc. It is the most common type of infection found in livestock animals in India and it is transmitted mechanically by biting flies, particularly *Tabanus* and *Stomoxys* Species. There are various impacts of this disease on the livestock, in endemic countries, its effects on host population dynamics, economic losses, and social impact on animal owners. There is no commercially available vaccine developed against this particular disease, the only control measure that can be followed is the control of flies which are the main vehicle for the transmission of the disease. . There are various methods utilized in the field for the detection of trypanosomal infection in dogs, such as serological-based assays like rapid lateral flow assays and ELISA assays, but the major limitation associated with these assays is their low sensitivity and specificity. The conventional microscopy technique is one of the simple and easy tools to screen suspected animals but due to its low sensitivity and specificity, the technique fails to prove its deployability as a confirmatory diagnostic technique. Therefore, there is a need for the development of sensitive and accurate detection techniques for confirmatory diagnosis of acute and chronic conditions. The current study comprises the standardization of molecular biology-based PCR assay for the

detection of *Trypanosoma evansi* in infected dogs. A total of 30 blood samples were collected from the Navi Mumbai region. Complete blood count was done by automated analyser. Suspected blood sample were sent for microscopy. Genomic DNA was extracted by Miniprep purification kit. Standardization was done by manipulating cycle parameters. A total of 30 samples were examined by using the microscopy technique, after extensive screening of the slides up to 200 fields 2 to 3 times, we found that 2 samples were found positive and 28 samples were found negative for the presence of *Trypanosoma evansi*. The advantage of the PCR diagnostics technique is its use in multiplex PCR assays i.e. the amplification of multiple targets in a single PCR tube by using multiple primer pair sets. This can be useful in the case of infectious agents where symptoms are not easily distinguished from others. So, we could develop a conventional multiplex PCR assay for simultaneous rapid detection of *Trypanosoma* spp along with other parasites.

Applications of Differential Equations

Ms. Shubhangi Pravin Gawade, Dr. Soni Pathak

Abstract

Differential Equation applications have significance in both academic and real life. An equation denotes the relation between two quantity or two functions or two variables or set of variables or between two functions. Differential equation denotes the relationship between a function and its derivatives, with some set of formulas. There are many examples, which signifies the use of these equations. The functions are the one which denotes some sort of operation performed and the rate of change during the performance is the derivative of that operation, and the relation between them is the differential equation. These equations are represented in the form of order of the degree, such as first order, second order, etc. Its applications are common to find in the field of engineering, physics etc. In this article, we will learn about various applications of differential equations in real life and in mathematics along with its definition and its types. In terms of mathematics, we say that the differential equation is the relationship that involves the derivative of a function or a dependent variable with respect to an independent variable.

Extraction of microbial colourant/ pigment form the soil sample

Varsha Kushwaha

Abstract

Colors are the most pleasing and first parameter to be noticed about any article by the receptor. Artificial or synthetic colors mostly used by the food processing and cosmetic industries are reliable and economical as compared to the natural colorants which are expensive, less stable, and possess lower intensity. Organizations like the World Health Organization (WHO), the U.S. Food and Drug Administration (FDA), and the European Food Standards Authority (EFSA) have recommended the safe dosage of artificial colors in food, drug and cosmetic items. However, many synthetic colorants have been banned or being banned due to their hyper-allergenicity, carcinogenicity and other toxicological problems. These adverse effects of synthetic colors have made the scientific community skewed towards natural colour. Many research efforts have been made to replace synthetic pigments with natural pigments because nature is a rich source of colored pigment producing organisms including plants, animals and microorganisms. Recent Research has prominently projected the value of natural colors over that of artificial/synthetic colors. In 2011, global sales of natural colors amounted to an estimated \$600 millions, up by almost 29 % from 2007, depicting annual growth in excess of 7 %. Microorganisms are known as a potential source for bio-pigment production due to their advantages over plants in terms of availability; stability; cost efficiency; labor; yield and easy downstream processing . Varieties of bio pigments have been

produced such as carotenoids, melanins, flavins, quinines, monascins, violancein using microorganisms. Cultivation of microorganisms can be attained through solid state and submerged fermentation on natural raw material / industrial organic waste. Many of the microbial pigments not only act as coloring agents in various food processing and cosmetics industry but also possess anticancer, antioxidant, anti-inflammatory, anti microbial activities. Furthermore there is huge demand for coloring agents in industries like textile, plastic, paint, paper and printing.

Nanotechnology and material science for sustainable development.-REVIEW

Dattatray Nandaram Thorat Dr. Pramod Awasthi

Abstract

The study and creation of objects on the scale of atoms and molecules is the focus of the field of nanotechnology. These objects are typically materials and devices. A nanometer is ten times the diameter of a hydrogen atom, or one billionth of a meter. Human hair has an average diameter of 80,000 nanometers. The standard laws of physics and chemistry do not apply to such scales. For example, properties of materials at the nano and macro scales can vary significantly, including color, strength, conductivity, and reactivity. Although carbon nanotubes are six times lighter than steel, they are 100 times stronger. Nanotechnology has the potential to improve energy efficiency, contribute to environmental cleanup, and provide significant health benefits. It can greatly boost manufacturing output while drastically lowering expenses.

Detection of pathogenic bacteria in aquatic species for safer consumption.

Ruchita Tavasalkar

Abstract

Fish plays an important role in the human diet. However, the growing industries may cause contamination to water bodies and may affect not only the health of fish, but also raise safety concerns with regard to fish used for human consumption. It is well known that fish and fish products are often associated with human diseases. Thus, it is necessary to study the impact of pathogens in fish to ensure the safety of fish products. Microbial assessment of fish also gives additional information about the hygienic status of environments, including lakes, rivers, ponds, and fish farms. The aim of this review was to describe and discuss the five most relevant bacterial genera and species linked to aquatic environments—*Vibrio cholerae*, *Listeria monocytogenes*, *Salmonella*, *Staphylococcus aureus* and *Clostridium botulinum*—causing human foodborne diseases. Fish is often contaminated with foodborne pathogens reflecting the microflora of the surrounding water. Contamination of the natural habitat of fish may affect not only the health of fish stocks, but also raise public health concerns as fish and fish products can be a potential source of human pathogenic bacteria. Various factors such as human activity, contaminated water sources, and poor hygiene during capture, handling, and transportation of fish could affect the prevalence of bacteria in fish and surrounding water. The hazard of these microorganisms is increased with the specific abilities of these bacteria to survive in the environment. The emergence of bacteria discussed is also based on the fact that fish and fish products often miss the heat treatment procedure before consumption, which has dramatic effects on human health. Pathogens

via contaminated fish and fish products may enter the food chain, and processing of fish may lead to cross-contamination of premises, equipment, and end-product, facilitating the distribution of pathogenic bacteria. However, Good Hygienic Practice is a measure to avoid contamination and to provide the safety of fish and fish products.

ISOLATION OF A ZERO-CALORIE SUPER SWEETENER TO COMBAT DIABETES AND OBESITY

Nene, Kanchan, Dept. of Biotechnology, CSMU

Abstract

Natural products are a source of bioactive compounds and have potential for developing some novel therapeutic agents. *Stevia rebaudiana* Bertoni, belonging to Family: Asteraceae is commonly known as honey leaf. It was discovered by Dr. M. S. Bertoni during the early 20th century. It contains many phytochemicals including well characterized Steviol, Stevioside and Rebaudioside A. Stevioside and Rebaudioside A are principal constituents. Stevioside is abundantly found in leaves (13 – 20 %) in dry leaves. It is 250 to 300 times sweeter than sugar. Rebaudioside A (1-3 %) in dry leaves is 350-450 times sweeter than sugar while the fresh leaves are 30 times sweeter than sugar. Besides intense sweetening, *Stevia* leaves also possess many medicinal properties such as Hypoglycemic, Cardiovascular, Antimicrobial, etc. these beneficial effects have focused on the importance of *Stevia*. Keeping in view the global economic aspects for *Stevia* cultivation and by comparing it with Indian scenario, it appears that *Stevia* can be potentially used as a source of comparatively cheaper substitute for conventional sugar free alternatives.

The present work is focused on developing an effective method for isolation and purification of Rebaudioside A which is the sweetest glycoside of the Steviol glycosides.

The extraction of *Stevia* leaf powder in water helps to extract all glycosides. The crude extract is passed through resin A which is responsible for adsorption of glycosides. the second and the third

column de-ashes and decolourises the extract and also purifies it. The elute from column three i.e. resin C can be crystalized.

Keywords: Stevia, Rebaudioside A, Chromatography, Natural sweetener

In vitro anti glycation activity of extract from onion and garlic

Veer Pratiksha

Abstract

Diabetes, a widespread health concern, brings about a surge in oxidative stress due to high blood sugar levels, which can lead to complications like eye, nerve, and heart problems. While typical treatments keep blood sugar in check, they often fall short in tackling this complication. Research shows that this oxidative stress plays a major role in causing these issues, creating a harmful loop of reactive oxygen species (ROS) production, advanced glycation end products (AGEs) formation, and lipid peroxidation. Traditional medicinal approaches, enriched with diverse herbal components possessing potent antioxidant properties, hold promise in disrupting this cycle by scavenging free radicals and inhibiting AGEs and LP formation. By neutralizing these harmful free radicals and preventing AGEs and lipid peroxidation, these herbal solutions could offer effective way to manage diabetes.

Our study is aimed to screen known antidiabetic herbs and polyherbal formulations for its potential to inhibit AGEs formation in vitro.

In this study the extracts of garlic and onion made by cold maceration method. In- vitro glycation inhibition of hemoglobin and bovine serum albumin was done by the method of thermal glycation. Glycated proteins were estimated by nitro blue tetrazolium reduction assay and protein carbonyl content was estimated by 2, 4 DNPH Assay. All experiment were done in triplicates.

It was seen that percent inhibition of glycation of onion and garlic extracts were significant in comparison to the control.

Our results underline the importance of anti-diabetic herbs and herbal formulation possessing anti-oxidative property as therapeutic agents to prevent formation of AGEs, thus preventing secondary diabetic and many age-related complications. Incorporating these antioxidant-rich herbs into treatment plans might just pave the way for better outcomes and improved quality of life for those dealing with this chronic condition.

Keywords: Diabetes, advance glycation end products, carbonyl contents, antidiabetic herbs.

A Pilot Study of Rs4340, A Single Nucleotide Polymorphism In Angiotensin Converting Enzyme (Ace) Gene Insertion/Deletion Polymorphism In Hypertension In An Urban Cohort

Dr Kalpana Dabhade 1 , Ms Seeth Sini 1 and Dr.A. Rosalind Marita 2

Abstract

The insertion /deletion polymorphism rs4340 of the Angiotensin Converting Enzyme (ACE)gene has been considered as a genetic risk factor for hypertension. Angiotensin Converting Enzyme (ACE) plays a crucial role in various physiological systems especially in monitoring blood pressure in human body. The present cross-sectional study aimed to evaluate the ACE gene insertion / Deletion polymorphism in a cohort of urban residents from Mumbai, India. Most study focused on an insertion / deletion (I/D) polymorphism in intron 16 of the ACE gene as a marker for a functional polymorphism. This study determines the Insertion/Deletion (I/D) polymorphism in hypertensive and normotensive subjects. The study project involves the analysis of an Insertion /deletion polymorphism, rs4340 in the gene encoding angiotensin converting enzyme (ACE). From the total of 75 subjects, 68 subjects were included in the study. The study subjects were divided into two groups. Group 1 consisted of 38 non- hypertensive and non-diabetic subjects. Group II included 30 hypertensive subjects. The subjects were aged 12-86 years (mean 54years) and 60% were men. All hypertensive subjects were under treatment. In the present study, subjects with hypertensive had a higher frequency of I/D genotype about 60% compared to normotensive subjects 29%. we found that the individual having homozygous D/D genotype shows a higher

Diastolic pressure for both normotensive and hypertensive subjects even though it is not statistically significant.

KEYWORDS: Angiotensin Converting Enzyme (ACE), Insertion/Deletion, Diastolic blood pressure, polymorphism.

Glass a Sustainable Material

Nagendra Kumar

Abstract

This paper discusses the potential applications of glass that enable buildings to be more energy efficient by making use of the most of daylight and solar heat gain, providing safety and at the same time protecting the environment as 100% cyclable material. The chapter also provides an overview of different types of glass products, recent developments and the requirements laid down in Energy Conservation & Sustainable Building Code (ECSBC). When glass is left in the natural environment, it is much less likely to pollute nature like plastic materials. Unlike plastics, which break down into microplastics that can leach into our soils and water, glass is non-toxic and 100% recyclable material. "Glass is mainly made of silica, which is a natural substance," Glass has been defined as a material which can infinitely be recycled without it impacting its quality, purity, or durability.

Keywords: Sustainability, embodied energy and carbon, flat glass, tinted glass, coated glass, solar control glass, low-e glass, DGU, IGU, Laminated Glass, Fire Rated Glass.

Development and formulation of herbal solid shampoo using biotechnological approach

Shaweleha Mukadam

Abstract

The development and formulation of a herbal solid shampoo using a biotechnological approach with neem leaves (*Azadirachta indica*) and cinnamon (*Cinnamomum aromaticum*). The objective of this study was to explore the potential of neem leaves and cinnamon, a widely recognized traditional medicinal plant, for the development of a natural and eco-friendly shampoo alternative. The study will employ a biotechnological approach, focusing on the extraction of active compounds from neem leaves using organic solvents. Additionally, cinnamon will be incorporated for its hair growth- promoting, blood circulation-stimulating, and aromatic properties. The research will optimize the formulation to ensure desirable physical and chemical attributes, such as foaming ability, cleansing properties, and sensory characteristics. The extraction of active compounds from neem leaves using organic solvents and subsequent formulation into a solid shampoo base. Stability tests, including pH determination, viscosity measurement, scent evaluation, and visual inspection, microbial analysis, will be conducted to assess the shampoo's longevity and effectiveness. Furthermore, the study will include laboratory experiments and a survey of individuals who have used this herbal solid shampoo. To gather data on their experiences and perceived efficacy. This comprehensive approach will contribute to the growing body of knowledge on herbal hair care products and potentially inform the development of more effective and sustainable hair care options.

This formulation resulted into a solid shampoo with desirable physical and chemical attributes, including good foaming ability, adequate cleansing properties, and pleasant sensory characteristics. Also the treatment and prevention of common scalp conditions, such as dandruff and itchiness, due to the antibacterial and antifungal properties of neem leaves. This makes it an attractive alternative to conventional shampoo products, which often contain synthetic and potentially harmful ingredients.

Keywords: Solid shampoo, biotechnological approach, neem leaves, cinnamon, antifungal, antidandruff, herbal hair care.

XOD Programmed Arduino Automated NFT Hydroponics System

Sukanya Ghosalkar

Abstract

The rapid advancement and improved accessibility of smart machines and sensors enable the automation of farming processes as well as the generation and processing of farming data of improved quality and quantity. Software such as XOD can be used in conjunction with an Arduino microchip to automate a hydroponics system to reduce the amount of manual labour involved in maintaining the system. Integration of programming with authentic agricultural practice is made possible by the use of microcontroller Arduino operated by a visual programming language XOD. Nutrient Film Technique Hydroponics System involves managements like pH check and regulation, EC levels and water flow which needs timely updates and constant presence of human. This is tried to be replaced partially using microcontroller hence constructing a semi-automated system. XOD, a virtual programming language is used instead of text based classic programming language to bridge the gap. The circuitry is established over the NFT hydroponics system which is controlled and instructed via PC.

Nanotechnology : a strong tool for future sustainability

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Abstract:

There are a number of nanoparticles that are being used for future sustainability in different fields . It helps in waste water treatment such as Metal Nanoparticles: Zerovalent Iron (Fe^0) Nanoparticles: These nanoparticles are widely used for the remediation of various contaminants, including heavy metals, chlorinated solvents, and organic pollutants, through processes such as reduction, oxidation, and adsorption. Silver (Ag) Nanoparticles: Silver nanoparticles exhibit strong antimicrobial properties, making them effective in disinfection and microbial control in wastewater treatment and water purification systems. Metal Oxide Nanoparticles Titanium Dioxide (TiO_2) Nanoparticles: TiO_2 nanoparticles are commonly employed in photocatalytic degradation of organic pollutants and disinfection of water and air due to their ability to generate reactive oxygen species (ROS) under ultraviolet (UV) light. Iron Oxide (Fe_2O_3 and Fe_3O_4) Nanoparticles: Iron oxide nanoparticles are utilized for the adsorption and removal of heavy metals, arsenic, and organic contaminants from wastewater due to their magnetic properties, allowing for easy separation and recovery. Carbon-Based Nanoparticles: Carbon Nanotubes (CNTs): CNTs possess high adsorption capacity and conductivity, making them suitable for

adsorption and electrochemical degradation of various contaminants, to an electric field within nanofluidic channels or porous materials. Nanoparticles with surface charges or functional groups can be dispersed in electrolyte solutions to enhance electrokinetic transport and increase the efficiency of energy conversion in nanofluidic devices. These nanoparticle-enhanced devices can be used to generate electricity from the movement of ions in biological fluids, wastewater streams, or environmental gradients, offering potential applications in energy harvesting and water purification.

Nanotechnology and its Application

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Abstract

This century's next frontier is nanotechnology. In order to meet the growing demand for finished goods (such as cell phones, cars, and airplanes), services (such as shelter, healthcare, and employment), and basic commodities (such as food, water, and energy), the world must reduce and minimize the impact of human activity on the planet's global environment and climate. The field of nanotechnology has shown great promise in offering practical, affordable, and ecologically friendly answers to the problems of global sustainability that civilization faces. Nanotechnology has rapidly expanded in the medical domain in recent years, particularly in the area of targeted drug delivery. Possibilities to apply nanotechnology to tackle global issues in the areas of (1) clean energy technologies, (2) water purification, (3) greenhouse gas management, (4) supply and exploitation of materials, and (5) green manufacturing and chemistry. Emerging themes in nanotechnology for food and agriculture include smart nutrient delivery, bio-separation of proteins, quick sampling of biological and chemical pollutants, and nanoencapsulation of nutraceuticals.

Keywords: Nanotechnology, Nanomaterial, drug delivery.