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Department of Biotechnology, MIT Manipal
and
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Itinerary - 16th October

Timings	Event
9:30 AM - 10:00 AM	**Inauguration**
10:00 AM - 10:50 AM	**Talk by Mr. Jagadish Bennale** Business Development Manager Beckman Coulter Life Sciences "Implementation of QbD (Quality by Design) principles by Next Gen High Throughput Fermentation systems"
11:00 AM - 12:30 PM	**Paper & Poster Presentations**
12:30 PM - 1:30 PM	**Lunch Break**
1:45 PM - 2:35 PM	**Talk by Dr. Chitta Ranjan Patra** Principal Scientist Indian Institute of Chemical Technology, Hyderabad "Nanomedicine for Cancers and Angiogenesis"
2:45 PM - 4:45 PM	**Paper & Poster Presentations**
5:00 PM - 5:30 PM	**Closing Ceremony & Valedictory**

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MAHE

Manipal, today, is a knowledge powerhouse and a brand name in higher education. Over five and half decades ago, one man, Dr Tonse Madhava Anantha Pai, had a vision which ensured that everything he did then, was consigned to posterity, making sure that generation after generation of students enjoy the fruits of his labour till eternity on this lateritic plateau. And the students will, forever, have one name on their lips, that of Manipal. Manipal Academy of Higher Education (MAHE) is a name to remember, not just across the length and breadth of India, but worldwide. The fact that students from 52 countries are studying here is a testimony to this fame. Fired by the desire to provide health care and other essential services to the people of this region, Dr TMA Pai transformed the plateau into what it now is. He turned the wilderness into a sanctuary of education.

In 1953, he set up Kasturba Medical College, the first private medical college in the voluntary sector. And, with that began the story of MAHE. Then, in 1957 came the engineering college, the dental college, Pharmacy College and so on and so forth. Initially, these institutes were affiliated to different universities. Dr TMA Pai passed on the baton of leadership to his son, Dr Ramdas M Pai who is the present President and Chancellor of the University. Located on the west coast of South India, Manipal was a barren wasteland, a plateau with wild animals. It was this plateau that Dr TMA Pai decided to change. His vision for Manipal covered a wide spectrum of interests because he himself donned many hats. He was a physician, an educationist, a banker and above all, a philanthropist at heart. Then in 1993, MAHE was accorded a deemed university status under Section 3 of the UGC Act 1956, by the Ministry of Human Resource Development, Government of India. At the time of receiving the deemed university status, only five professional institutions existed. Today, it has 20 constituent institutions comprising medical, dental, engineering, architecture, nursing, allied health, pharmacy, management, communication, information science, hotel management, biotechnology, regenerative medicine etc. The university offers Bachelors', Masters' and Doctoral degrees in various specialties.

ncouraged by the new status, MAHE grew by leaps and bounds. The emphasis has always been and still is, on quality education, which is why the degrees offered by the university are recognized the world over. MAHE provides excellent educational facilities to over 17,000 students in its constituent colleges. It also has an active alumni base of over 65,000 students across the world. With all the experience gained from producing several thousands of graduates, backed by experienced faculty, excellent academic and clinical facilities, MAHE boasts of an educational environment with a touch of world-class.

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MAHE

MAHE has branch campuses in Bangalore, Malaysia, Dubai and Antigua in the Caribbean Island. There is also a campus in Mangalore with a medical college, a dental college and a nursing college with attached teaching hospitals. MAHE has an international academic collaboration for twinning programmes in engineering with universities in the US, UK, Australia and other countries. Manipal Group institutions are located on scenic campuses, which provide a high-quality lifestyle and ideal environment for study. All campuses have excellent infrastructure for academic activities, sports and other extracurricular activities. The infrastructure includes air-conditioned lecture halls, a skills lab, air-conditioned hostels, and a multi-cuisine food court. The state-of-the-art health sciences library is fully air-conditioned, accommodates 1300 learners and has over 62,000 books and over 600 journals. The library facilities include Medline, Proquest medical library of online databases, audio-visual, Cochrane library, e-learning, computer and Internet services. The Skills Lab and Anatomy Museum are considered amongst the best in the world. The latest addition to the facilities, a Simulation Lab with computer-driven mannequins, is an achievement, which the university is proud of. It is of considerable help to students in the field of health care.

MAHE believes in providing the finest in infrastructure and facilities to its students when it comes to learning and research. In fact, some of the facilities, like the Innovation Centre, have served as a valuable 'incubation centre' for industry and research. The state-of-the-art innovation centre bridges the gap between universities and industries for industrial-academic research.
Other facilities on the campus include a gym, swimming pools, and football and cricket grounds.

The new indoor sports complex is perhaps one of its kind in Asia. The complex has five badminton courts, four squash courts, three tennis courts, a basketball court, gymnasiums and a walking track. Besides being an ISO 9001:2008 and ISO 14001: 2004 certified University, it is home to many top 10 ranked institutions of India. MAHE has won the prestigious IMC Ramkrishna Bajaj National Quality Award and International Asia Pacific Quality Award during 2007- 2008. MAHE attained the Institute of Eminence by MHRD in 2018.

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MANIPAL INSTITUTE OF TECHNOLOGY

Manipal Institute of Technology (MIT), one of the Premier Engineering Institutes in India, was among the first self – financed engineering colleges in the country. It was started in 1957 by Padmashree late Dr.T.M.A Pai, as Manipal Engineering College with an undergraduate course in Civil Engineering. In 1965, the institute got affiliated to the University of Mysore from Karnataka University. In 1974, it was renamed as Manipal Institute of Technology (MIT). In 1980 it got affiliated to the University of Mangalore. After the creation of the Visveswaraiah Technological University (VTU), MIT along with a number of other engineering colleges in the state got affiliated to the VTU in 1998. As the Manipal Academy of Higher Education (MAHE) had acquired a Deemed University status, MIT became a constitution institution of MAHE in May 2000.

In 2003, MIT obtained full academic autonomy and adopted credit system with 10 point grading. In 2007 MAHE was renamed as Manipal University and MIT retained its status as a constituent institution of Manipal University. With total student strength of over 7500, MIT has emerged as the largest institute of University. MIT currently offers undergraduate programs (B.TECH) in 16 disciplines and postgraduate courses (M.TECH/MCA) in 24 different streams and Doctoral programs (Ph.D) in all streams of engineering, basic sciences, humanities and management. Academic programs offered by institute are approved by AICTE and have been accredited by the National Board of Accreditation (NBA). The institution plays a vital role in producing world – class engineers tuned to the demands of a fast changing global village.

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DEPARTMENT OF BIOTECHNOLOGY

The undergraduate Biotechnology Programme (B.Tech.) in MIT was started in the academic year 2005-06. The course objective is to mould students with a technical base for employment in the diverse areas of Biotechnology, where the industry based arena is expanding rapidly. This course has been designed to provide the students with both theoretical knowledge and practical skills in biochemical engineering, molecular biology, enzymology, bioinformatics etc. to keep pace with the latest developments and to cater to the needs of industrial biotechnology sector.

This professional course opens up avenues for its graduates to promote entrepreneurship as well as careers in biotechnology-related industries. The department offers a total of eleven laboratories from the 3rd to 7th semester, with 30% weightage to science, 30% to computers and 40% to Bio-processing technology. Students gain hands-on experience in all these three areas, which is unique to the Biotechnology programme at M.I.T., Manipal. In this programme, while constancy on essential areas of biology and engineering curriculum is maintained, considerable flexibility is built-in through the electives offered in the study. The students are encouraged to select areas that fit his/ her aptitude and interest, so that they are allowed to specialize in the area of choice as follows: genetic engineering, process development, computer application in bioprocess, design and development of materials and equipment in bioprocess.

The faculty of the department have published many papers in National/International Journals. They are also participating in summer schools, workshops and International/National conferences. Many of our past students are pursuing higher studies in various international universities abroad. The students are encouraged to participate in curricular and co-curricular activities and their efforts have resulted in appreciation for the department.

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Abstracts

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Evaluation and characterization of novel sources of sustainable lignocellulosic residues for bioethanol production using ultrasound-assisted alkaline pre-treatment

Anithashalini A, Ashwin Raj Suresh*

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During the recent decade of rapid industrialization and globalization, the demand for fossil fuels has expanded substantially, resulting in a rapid depletion of non-renewable fuel resources and increased environmental problems. So, many researchers have started moving towards finding a substitute for petroleum based fuel sources which can be novel, clean, low-cost and eco-friendly pure. Biobutanol can easily mix with gasoline, and may blend even at 100% at high concentration. Because of fuel reduction and our serious problem about environmental issues, research on biofuels production has attracted increased attention.

Lignocellulose is the most readily available renewable resource for bio butanol production. In bio butanol production, microbial fermentation is widely concerned for production. In current trends, biobutanol is produced from conventional sugar and starch based feed stocks such as sugarcane, molasses, corn, etc. Spent Mushroom Substrate into other significant products, such as bio - fuel.

The volume aims to contribute in the present study, Biobutanol could become a promising alternative to petro-fuels attempts were made to revise all aspects of ABE production with process improvements, and mushroom spent substrate as a biomass for biobutanol production. Lignocelluloses are the most abundant non-food resources for the production of large-scale sustainable biobutanol, in which the pretreatment and hydrolysis of lingocelloses play major roles. The application could marginally cut down the cost and improve productivity, however, large-scale evaluation and viability should be investigated It provided essential guidance and a technique for efficient production of bio butanol from lignocellulosic materials.

Keywords: Biobutanol, Spent Mushroom Substrate, Pretreatment, Petroleum, Lignocellulose

Rationally designed CoNiO 2 /BiFeO 3 /NiS ternary nanoheterostructure: Photocatalytic degradation, kinetic and mechanistic insights, toxicity assessment and degradation pathway

B. Hari kumar, S. Sudheer Khan*

Nanobiotechnology Laboratory, Department of Bio Technology, Bannari amman Institute of Technology, Sathyamangalam, Tamil Nadu, India.

In-situ construction of newly constructed CoNiO2 -BiFeO3 -NiS ternary heterojunction nanocomposite for the first time using a simple ultra-sonication and chemical co-precipitation technique. The developed CoNiO2 -BiFeO3 -NiS NCs have been utilized in the treatment of toxic MO (Methyl Orange) and RhB (Rhodamine B). The constructed nanocomposite was characterized by various physiochemical techniques, including HR-TEM, SEM, XPS, FT-IR, ESR, GC-MS, EIS, PL, UV-visible DRS and N 2 adsorption and desorption. The RhB and MO dye intermediate toxicity were predicted. The newly developed CoNiO2 -BiFeO3 -NiS ternary nanocomposite shows excellent photodegradation efficiency compared to the individual nanoparticles. The kinetic study of the photocatalysis reaction was investigated through various methods in order to determine the reaction. The fabricated CoNiO2 -BiFeO3 -NiS ternary nanocomposite were studied under various parameters such as different pH, and concentrations. The mechanism of photo degradation process were investigated using scavenging test and GC-MS analysis. The CoNiO2 -BiFeO3 -NiS ternary nanocomposite shows enhanced photodegradation of RhB and MO.

Keywords: photocatalysis, ternary nanocomposite, Methyl orange, Rhodamine B

Development and optimization of a quaternary nanocomposite r-GO/CuFe 2 O4/CdS/Bi 2 S 3 QDs for the effective photocatalytic degradation of atenolol

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Water pollution can be attributed to all toxic contaminants released from various industrial, pharmaceutical and domestic sources. With the advancements in technology new strategies are being developed for the effective degradation of these contaminants in water sources. This research work comprises the preparation of a quaternary r-GO/CuFe2O4 /CdS/Bi2S3 QDs nanocomposite (NC) and the optimization of various process parameters such as pH, drug concentration and catalyst concentration for the effective degradation of atenolol (ATN) from wastewater. Atenolol is a beta-blocker drug and a major robust pollutant among the PPCPs (Pharmaceutical and Personal Care Products) which is released as such into the environment.

About 5 mg of NC concentration was used to degrade 20 mg/L ATN. The H2O2 -assisted binary and ternary NC controls showed 40% and 55% degradation of ATN in 370 min respectively. And about 75% degradation was achieved in 370 min in the presence of H2O2 under visible light irradiation. The free radical species involved in degradation were confirmed by free radical scavengers and the stability of our catalyst was tested by its performance in six consecutive cycles. The best performance was obtained under pH 5, 5 mg NC, and 20 mg/L ATN concentrations. All the four possible radical species including O 2 •- , OH •- , h + , and e - were produced where, majority of degradation was due to the production of OH •- and h + radicals.

The presence of Fe 2+ in the catalyst and the use of H 2 O 2 , favours the occurrence of Fenton reaction in the process. Thus, this work can be very useful for future studies in the degradation of similar pharmaceutical pollutants that contaminate water.

Keywords: Atenolol, Photodegradation, Nanocomposite, Beta blockers.

ZnS/CuO nanoflower on organic entrapment matrix for photocatalytic degradation of tetracycline by visible-light and bactericidal application

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The novel ZnS-CuO/PVA/Chitosan binary heterojunction is synthesized using the sonochemical technique as a nano-photocatalyst and bactericidal agent. SEM image indicates CuO nanocapsules attached on the surface of ZnS nanoflower. ZnS-CuO/PVA/Chitosan nano-heterojunction was constructed using ultrasonic assisted chemical co-precipitation method. The interface in nanocomposites (NCs) promotes migration of charge carriers and improves its life time that was verified using photoluminescence study. The elemental composition of NCs was verified using XPS and EDAX. The photon absorption ability of NCs in visible region was favored by the energy bandgap of 2.7 eV. The tetracycline photocatalysis was performed with ZnS-CuO/PVA/Chitosan that exhibited 3.3 to 5 folds boosted activity than its individual parts owing to synergism. TOC analysis of end products indicated maximum mineralization of tetracycline. The ZnS-CuO/PVA/Chitosan showed excellent recycling ability. The key photo-degradation of tetracycline was occurred by the generation of hydroxyl radical owing to S-scheme heterojunction. The ZnS-CuO/PVA/Chitosan exhibited high antibacterial activity that ensures the dual functionality of the prepared nanocomposites (NCs). Therefore, this study displays ZnS-CuO/PVA/Chitosan nanoflower as an ideal candidate for their application in environmental remediation.

Keywords: ZnS-CuO/PVA/Chitosan; Nano-heterostructure; Tetracycline; Photocatalyst; Antibacterial activity.

Ternary g-C 3 N 4 -NiCo 2 O 4 -Zn 0.3 Fe 2.7 O 4 visible light driven photocatalyst: Synthesis, characterization and photocatalytic application for antibiotic degradation

G. Harini, S. Balasurya, S. Sudheer Khan*

Nanobiotechnology Laboratory, Department of Biotechnology, Bannari Amman Institute of Technology, Sathyamangalam, Tamil Nadu, India.

Fluoroquinolone class of antibiotics are one of the widely prescribed class of antibiotics for the treatment and prevention of bacterial infections. Ciprofloxacin, being the prominently used, unfortunately pose a foremost threat for the environment as a major pharmaceutical contaminant. Advanced oxidation process has been widely recognized for its enhanced degradation and mineralization efficiency. This presentation focus on elucidating the exploitation of g-C 3 N 4 -NiCo 2 O 4 -Zn 0.3 Fe 2.7 O 4 (CNZ) photocatalyst for the degradation of Ciprofloxacin antibiotic. The presence of Fe in the photocatalytic material and the H 2 O 2 in reaction mixture favors the Fenton's reaction. The degradation efficiency of ciprofloxacin is found to be 92% in 140 min under visible light illumination. The degradation of Ciprofloxacin has been examined under a wide range of pH (3-6), NCs concentration (25-150mg/L) and drug dose (20-60 mg/L), where the most suitable environment has been determined. The NCs exhibited excellent stability up-to six cycles. This work could be useful for further studies on similar pharmaceutical contaminants.

Keywords: CNZ nanocomposite, Pharmaceutically active compounds remediation, Photodegradation

Novel Ni3 (VO4)2 /ZnCr2 O4 decorated g-C3N4 nanosheet ternary nanocomposite for photocatalytic removal of p-Chlorophenol and 5-Fluorouracil: Fabrication, mechanism and pathway

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The Pharmaceutically Active Compounds (PhACs) are becoming one of the persistent pollutants due to their uncontrolled release and accumulation in the aqueous environment. These PhACs are hardly biodegradable. Designing of compactible and stable photocatalyst, yet remains a challenge. In the present study, Ni3 (VO4)2 /ZnCr2 O4 Z-scheme heterostructure was decorated on g-C 3 N 4 nanosheets and the photocatalytic activity of the nanocomposite was studied by 4-cholorophenol and 5-Flurouracil. The fabricated nanocomposite exhibited an enhanced photocatalytic activity against hardly bio degradable pharmaceutically active compounds:

100% for p-Chlorophenol and 99% for 5-Fluorouracil in 160 and 200 min respectively under visible light. Complete removal of p-CP was achieved by the fabricated nanocomposite at 20mg/L photocatalyst dose, 200mg/L of p-CP and pH 4. In the case of 5-FU, 99% removal was done by 20mg/L g-C 3 N 4 /Ni 3 (VO 4) 2 /ZnCr 2 O 4 dosage, pH 5 and 20mg/L 5-FU dosage. The degradation efficiency of synthesized nanocomposite against both the drugs were found greater than pristine Ni 3 (VO 4) 2 (77.65% and 62% in case of p-CP and 5-FU respectively) and ZnCr 2 O 4 (77.65% and 73.6% against p-CP and 5-FU respectively). The radical quenching test showed •OH - radical as predominant reactive species in the degradation. The fabricated nanohybrid showed excellent stability, almost same removal efficiency even after six cycles. The fabricated nanocomposite is thus proven to be a cost effective and efficient tool for the removal of these toxic compounds.

Nanocrystalline Fe3O4 loaded nano assembled liposome based nanocarrier for stepwise platform for MR and pH assisted for targeted delivery for the treatment of breast cancer

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In the present study the Garlic liposome loaded Fe 3 O 4 nanocarriers was prepare for the targeted delivery of cisplatin for breast cancer. The invitro drug loading of etoposide (etp) on Liposome/Fe 3 O 4 nanocarriers was estimated by UV-visible spectrophotometer. Here, the nanocarriers showed effective drug loading efficiency of 89.5%. The invitro drug release study was performed at different pH and magnetic resonance (MR) burst out of drug for the targeted drug deliver for the treatment of breast cancer. The results indicate that the Liposome/Fe3O4 /Cis showed effective drug release at pH 4.5 and pH 5.5. Thus, the results indicate that the enhanced intensive environmental and mechanical stress during acidic pH and MR, which shows the enhanced therapeutic effect. Therefore, the Liposome/Fe3O4 /etp phosphate complex loaded drug showed efficient and targeted drug delivery on cancer cells, which showed as a potential and effective strategy for the treatment of breast cancer.

Keywords: Liposome/Fe 3 O 4 /Cis; pH response; Magnetic response; Breast cancer; Targeted delivery.

Designing Z-scheme 3D AgIO4 nanorods embedded with Bi2S3 nanoflakes: excellent visible light photodegradation, Optimization, characterization and catalytic mechanism

S. Kokilavani, S. Sudheer Khan*

Nanobiotechnology Laboratory, Department of Bio Technology, Bannari amman Institute of Technology, Sathyamangalam, Tamil Nadu, India.

Highly efficient Bi2S3 nanoflakes decorated AgIO4 nanorods were synthesized in various proportions of AgIO4 contents using sono-chemical route for successful photodegradation of CR and RhB dye. The deposition of different proportion of AgIO4 plays a pivotal part in improving the photocatalytic activity. The characterization of the as-synthesised nanohybrids were assessed by XRD, UV-vis DRS, PL, EIS, ESR, FT-IR, XPS, HR-TEM, FE-SEM, N 2 adsorption and desorption. The effect of initial CR and RhB dye concentration, reaction pH, nanohybrid concentration were investigated. The as-achieved Bi 2 S 3 nanoparticles exhibits an excellent photo reactivity and stability toward degradation of CR and RhB dyes with optimal concentration 30 wt% AgIO 4 that is responsible for photodegradation of 95.58 % of CR and 96.11 % of RhB dyes at 140 min and 100 min in the visible region. The superoxide and hydroxyl radicals plays predominant role in the photodegradation of CR and RhB as experimentally confirmed by radical trapping experiments. Also, benefited from the good photocatalytic activity, the photocatalysts can be reused after six consecutive cycles revealing its high photo stability. The outstanding photocatalytic performance were ascribed to the double Z-scheme charge transfer path, which effectively promotes the separation and transfer of e -/ h + pairs, resulting in a strong redox activity of the accumulated charge to decompose organic dyes during a degradation reaction.

Keywords: Bismuth sulphide; Silver Iodate; Congo red; Rhodamine B; Z-scheme

A Review on the Latest Developments in the Field of Heart Valve Monitoring

Prerana Balasubramanian
Vellore Institute of Technology

Recent advancements in medical technology have led to the development of numerous devices with greater efficiency and superiority. Valve associated diseases serve as a leading form of complications in the cardiovascular system, affecting almost 30 million people worldwide. Damaged valves are often replaced by artificial valves, which can be either mechanical or bioprosthetic in nature. However, they structurally fail within 10 to 15 years of implantation. This can be due to thromboembolisms, pannus formation, paravalvular leak, etc. Thus, there is a need to develop efficient monitoring systems for artificial valves. Integration of technological advancements along with the blood flow characteristics are exploited to analyze the functioning of the valves. In a world that is becoming increasingly mobile, the demand for small and more portable devices with high accuracy are in great demand. There are various existing monitoring devices which indicate heart function. These include Holter Monitors, implantable sensors, Magnetic LINQ insertable cardiac monitoring system and Thrombocheck. The ideal device here would be the one that is accurate, non-invasive and easy to use. In this paper, we aim to review the following, along with their principles, advantages, disadvantages and future prospects.

Keywords: Heart valve, biomedical technology, monitoring devices, sensor applications, magnetism, acoustics

Bladder & Co.: A Novel Wearable Device to self-manage Urinary Incontinence

Tooba Khaja Arifuddin Subhani, Swati Ramtilak
B.Tech Bioengineering, MIT-ADT School of Bioengineering Sciences and Research,

According to the Global Forum on Incontinence, about 400 million people worldwide experience urinary incontinence or involuntary urine leakage. This condition affects senior citizens, men, women who have had C-section pregnancies, and expectant mothers alike, and is considered embarrassing. Products in the market to assist this population include adult diapers and invasive catheters, both of which are often uncomfortable, require frequent medical/caregiver assistance, and could potentially lead to skin infections and urinary tract infections (UTIs), which account for an expenditure of 6 million USD annually in hospitalizations. A recent Reuters survey also indicated that adult diaper sales will outnumber infant diaper sales by 2022. This calls for a non-invasive, self-assistive wearable technology to aid urinary incontinence. We propose a wearable, non-invasive device that can detect urethral pressure via miniature sensors attached to the body in the form of stickers in the pelvic region.

These sensors can further be connected to a belt with a custom-designed PCB board that can comfortably be worn underneath clothes. The sensors continuously monitor urethral pressure and feed this data into an ML algorithm, hence, training data is generated uniquely for every individual. As the bladder is full and the individual needs to urinate, the sensors detect the 'peak pressure', which, using IoT technology, can send a notification to the individual's smartphone via an alert system of an application. Such a novel, gender-neutral device can ensure the individual is self-dependent while managing incontinence, and mitigates unnecessary hospitalizations due to UTIs.

Keywords: urinary incontinence, wearable technology, non-invasive device, IoT technology, ML data generation.

Targeting D614G mutant variant of SARS-CoV-2 spike protein with anti-viral phytochemicals and studying the impact against wild type spike protein

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Bioprospecting Research Laboratory, Department of Biotechnology, Bannari Amman Institute of Technology, Sathyamangalam, Erode

At present, the world is facing the most destructive pandemic outbreak caused by SARS-Cov-2. According to WHO, 21/9 crore individuals were infected including 45.5 lakhs deaths (as of September 2021). With the advantage of the RNA genome, SARS-Cov-2 is exhibiting rapid mutations across the world. Among the mutations, D614G shows an increase in virulence associated with the conformational change of spike protein. D614G is a missense mutation where aspartic acid (D) is replaced by glycine (G) at the 614 position of the amino acid sequence. In this study comparison of wild type and D614G mutant variant of spike protein is performed by homology modeling and docking studies. To obtain Root mean square deviation (RMSD), Root mean square fluctuation (RMSF), and Radius of gyration (ROG) variations both the systems are subjected to molecular dynamic studies. At first spike protein sequence (PDB ID: 6VSB) was derived from the NCBI database and mutated at 614 position of the amino acid sequence from D to G. The mutant type was modeled using modeler v9.25 and subjected to model validation using PROCHECK webserver to obtain Ramachandran plot. RMSD score for the modeled protein was obtained by utilizing UCSF chimera. A set of 90 phytochemical compounds were scrutinized and screened using the PyRx tool. From that Dihydroquinopimaric acid was chosen as the lead molecule due to its low binding energy of –6.53Kcal/mol against the target protein by docking in Autodock with Receptor Binding domain (RBD) as the active site. The protein interaction profile was obtained from the PLIP webserver where the hydrogen bonds between the molecule and the protein are examined. The molecular dynamics simulation has to be performed for the obtained mutant and wild type protein-ligand complex for 100ns using GROMACS software.

Keywords: Spike protein, D614G mutation, MD stimulation, autodock, homology modelling

Targeting Protein Tyrosine Phosphatase 1B with Sweet Potato (Ipomoea batatas) derived Compounds in Obesity-linked Colon Cancer

Arindam Sain , CSIR Senior Research Fellow (SRF), Dipshikha Khamrai, Debdut Naskar

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Protein tyrosine phosphatase 1B (PTP1B) has been surfaced as one of the crucial links between obesity and colon cancer. Both the anti-obesity and anti-colon cancer attributes of sweet potato (Ipomoea batatas) has been reported in recent times though the molecular landscape of sweet potato action in colon cancer is yet to be achieved. In this study, our objective was to study the interaction between sweet potato derived compounds and PTP1B to establish PTP1B as a molecular target of sweet potato action in colon cancer, particularly in obese population. Expression and genomic alteration frequency of PTPN1 (PTP1B) were checked in colon cancer and as expected genomic alteration frequency of the PTPN1 was highest in the case of colon cancer among all cancer types and a high expression also observed in both the gene and the protein level, correlated to a poor overall survival. With the workflow containing drug likeness-toxicity study-molecular docking, 11 compounds from sweet potato identified as potential drug candidates against PTP1B without any notable toxicity and with excellent docking score (binding affinity) against PTP1B. In this study,

PTP1B has been identified as a potential target in obesity-linked colon cancer and sweet potato might exert its protective action by targeting the PTP1B. A few compounds present in sweet potato (e.g., formononetin, pelargonidin, isofucosterol) exhibited potential to target the catalytic P loop and the WPD loop of the PTP1B which are obligatory for normal physiological functions of the PTP1 enzyme, thus can be explored as therapeutic agent against obesity-linked colon cancer.

Keywords: Colon Cancer, Obesity, PTP1B, PTPN1, Sweet potato

Transforming Growth Factor-β1-Stimulation of Matrix Metalloproteinase13 Expression via Runx2 Activity in Osteoblastic Cells

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TGF-β1 (transforming growth factor beta 1) functions as a coupling factor between bone development and resorption. Matrix metalloproteinase 13 (MMP13) is important in bone remodeling, and skeletal dysplasia is caused by a deficiency in MMP13 expression. Runx2, a transcription factor is essential for bone development, and MMP13 is one of its target genes. TGF-β1 promoted Runx2 phosphorylation, which was necessary for MMP13 production in osteoblastic cells, as we previously shown. Since the phosphorylation of some proteins causes them to be degraded by the ubiquitin/proteasome pathway,

We hypothesized that TGF-β1 might stabilize the phosphorylated Runx2 protein for its activity by other post-translational modification. This study demonstrated that TGF-β1 stimulated Runx2 acetylation in rat osteoblastic cells. p300, a histone acetyltransferase interacted with Runx2, and it promoted Runx2 acetylation upon TGF-β1-treatment in these cells. Knockdown of p300 decreased the TGF-β1-stimulated Runx2 acetylation and MMP13 expression in rat osteoblastic cells. TGF-β1-treatment stimulated the acetylated Runx2 bound at the MMP13 promoter, and knockdown of p300 reduced this effect in these cells. Overall, our studies identified the transcriptional regulation of MMP13 by TGF-β1 via Runx2 acetylation in rat osteoblastic cells, and these findings contribute to the knowledge of events presiding bone metabolism.

Keywords: TGF-β1, Runx2, Acetylation, MMP13

Phytosome Loaded With Biosynthesized Ag-np's of Murraya Koeinji, Curcuma Longa & Allium Sativum for Combating Bone Cancer

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Biosynthesized AgNPs from the combined herbal extracts of M. koeinji, C. longa and A. sativum are analysed in the treatment of bone cancer. Morphological characteristics of AgNPs were analysed from UV, SEM, TEM and XRD technique. FTIR analyse was done to identify functionalization of NPs. Phytosome was prepared by the composition of herbal extract with the phospholipid. A carrier system has been chosen to improve efficiency in drug delivery. Phytosomes also called as synergistic complex helps in improving drug delivery at the site of infection. It shows more absorption of drug than the normal herbal extract. NPs showed excellent antibacterial effect against S. aureus, L. monocytogenes, B. subtilis and E. coli. The DPPH assay indicates the level of inhibition increased with rise in concentrate of the sample. Invitro-anticancer and cell toxicity of biosynthesized Ag NPs against Saos2 (osteosarcoma) human bone cancer cell lines compared to normal cells were premeditated.

Cell line studies conclude the level of cell viability of non-malignant growth cells gets diminished as concentration of Phytosome increases. Wide measures of anticancer phytochemicals from natural drugs are attractive because of its limited side effects. The present examination drags consideration on building up Phytosome, an effectual source for the drug of malignant growth. The outcomes from the exploration demonstrate that the combined extract exemplified in Phytosome was a good method for drug delivery with better value for bone malignant growth treatment.

Keywords: Biosynthesized silver nanoparticles; Herbal; Antibacterial; Osteosarcoma; Phytosomes.

SARS - CoV-2: A study on the Variant of Concerns

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SARS - CoV-2 much like any other virus has genetic variants that have been circulating around the world since the beginning of the pandemic. On average, the virus evolves at a rate of 1.1 x 10^3 substitutions a year which is about once every 11 days. Multiple variants have been documented and these variants have been classified based on their transmissibility and the severity of the disease caused. Based on this, the WHO classifies them as Variants of Concern, and Variants of Interest. A Variant of Concern or VOC is named on the basis of the evidence of an increase in transmissibility, severity, a reduction in neutralization by antibodies already present in the body, reduced effectiveness of treatments or vaccines, or diagnostic detection failures. Current analysis and studies by WHO recognizes 4 variants of concern - Alpha (B.1.1.7), Beta (B.1.351), Gamma (P.1), and finally Delta (B.1.617), however, as time passes and the virus accumulates more mutations, the chances of more variants of concern being identified. The essence of our poster is to highlight the variants of SARS - CoV-2 with an emphasis on variants of concerns.

Keywords: SARS - CoV-2, Variants of Concern, Variants of Interest

Modulation of Quorum Sensing and biofilm formation by Butyl Isothiocyanate

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Management of infectious diseases caused by opportunistic pathogens like Pseudomonas aeruginosa and Candida albicans is a major challenge. These pathogens known to produce virulence factors, form intractable biofilm and acquire drug resistance which are major hurdle for treatment. Recent research focuses on discovering novel targets to combat drug resistance. Quorum Sensing (QS) is a cell density dependent mechanism used by microbes to modulate virulence factor production. Hence quorum sensing inhibitors could be developed as next generation anti-infective drugs. Isothiocyanates (ITCs) are most important secondary metabolites in plants from Brassicaceae family. The antimicrobial activity of ITCs are extensively studied, however their anti virulent properties were not well documented.

The present study investigated the anti QS and anti-biofilm properties of sub inhibitory concentrations of butyl isothiocyanate (BITC) against C. violaceum, P. aeruginosa and C. albicans. BITC exhibited significant quorum sensing inhibitory activity in C. violaceum, as seen by inhibition of violacein pigment production and biofilm inhibition. BITC also exhibited anti-biofilm activity in P. aeruginosa. Further, BITC inhibited the virulence factors including motility, pyocyanin production and elastase B activity. Gene expression studies demonstrated down regulated expression of vfr- a positive regulator of QS in P. aeruginosa. BITC did not show any effect on germ tube formation of C. albcans. Toxicity studies in C. elegans showed that lower concentration of BITC did not exhibited toxicity, while concentration above 100µg/ ml causes killing of C. elegans. Our results indicates that BITC is a potent quorum sensing inhibitor.

Keywords: Quorum sensing, Biofilm, Virulence, Butyl Isothiocayanate

Microbial bioremediation and its application

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Bioremediation is a biological mechanism of recycling wastes in to another form that can use and reused by other organisms. . Bioremediation involves the production of energy in a redox reaction within microbial cells an energy source , an electron acceptor, and nutrients. This technology is invaluable for reclaiming polluted soil and water Nowadays, the world is facing the problem of different environmental pollution. Microorganisms are essential for a key alternative solution to overcome challengesThe nutritional capacity of microorganisms is completely varied, so it is used as bioremidation of environmental pollutants..

The use of microbes (bacteria and fungi) and plants to break down or degrade toxic chemical compounds that have accumulated in the environment into less toxic or non toxic substances on one. Bioremediation is highly involved in degradation, eradication, immobilization, or detoxification diverse chemical wastes and physical hazardous materials from the surrounding through the all-inclusive and action of microorganisms.. From an ecological point of view, bioremediation depends on the various interactions between three factors: substrate (pollutant), organisms, and environment. The interactions of these factors affect biodegradability, bioavailability, and physiological requirements, which are important in assessing the feasibility of bioremediation Currently, different methods and strategies are applied in the area in different part of the world. For example, biostimulation, bioaugementation, bioventing, biopiles and bioattenuation.

Keywords: Microorganisms; Factors; Bioremediation; Pollutants; Biodegradation; Biostimulation; Bioaugementation; Bioventing; Biopiles; Bioattenuation

A study on extraction and purification of c-phycocyanin spirulina plantensis and its application towards nutrition enriched ice cream.

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Phycobiliproteins are the major photosynthetic accessory pigments, brilliantly colored, water-soluble with 20–28% dry weight of cyanobacteria. c-Phycocyanin is a pigment-protein complex from the light-harvesting phycobiliprotein family. It is a natural blue pigment that has excellent antioxidant, antitumor, anti-inflammatory, and antibacterial activity. In the present study, quantitative analyzes were done to optimize the extraction method for the c-phycocyanin. Extraction methods like ultrasonication, freezing, and thawing, homogenization were performed. UV-Spectrometric analysis resulted that the extraction method using ultrasonication followed by orbital shaking gives a maximum yield of 1.729mg/ml. The photocatalytic activity is responsible for the blue-color of the protein.

Protein is an essential macronutrient that helps build muscle, repair tissue, and make enzymes and hormones. Consuming c-phycocyanin will have more health benefits too. As a result, we can conclude that nourishing c-phycocyanin flavored ice creams will have great nutrition values.

Keywords: Spirulina plantisis, c-phycocyanin, Ultrasonication, UV-Spectrometer

Biological pretreatment of mushroom spent for biobutanol production

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International Energy Agency (IEA) 2021 review estimates that the carbon dioxide emission would rise almost 5% to 33 billion tonnes by this year. An increase of 1.5 billion tonnes of carbon emission in 2021 would make it the second-largest increase in history. Proper action should be taken in order to reduce the emission or the situation can get worse by 2022. Skyrocketing needs and the fluctuating price of fossil fuel demands affordable biofuel options.

Only a few biofuel productions are feasible since most of the production involves higher cost. This paper is about production of biobutanol from mushroom spent using biological pretreatment method. Around 38.22 to 63.7 million tonnes of spent mushroom substrate are obtained after termination of mushroom crop annually which can be used as a potential substrate for biobutanol production rather than using as a fertilizer after pyrolysis. Agaricus bisporus produces lignin modifying enzymes which aids in obtaining the cellulose and hemicellulose content easily rather than using chemical methods. Further the substrate is biologically pretreated using cellulase followed by fermentation for 2 days. Clostridium acetobutylicum is used in fermentation to obtain higher yield of biobutanol compared to acetone and ethanol. Biobutanol has a higher blending ratio and higher calorific energy when compared to other gasoline alternatives. Since the gasoline has compatible properties with biobutanol there is no need for engine modification.

Keywords: Biobutanol, Agaricus bisporus, lignin modifying enzymes, biological pretreatment.

Applications of Microbes in Bioremediation of Point Source Pollutants from Wastewater

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A brief outline of the development of bioremediation technologies is presented. The major features and limitations are presented and an overview of the current state of the art in the field applications is sketched. The term bioremediation has been introduced to describe the process of using biological agents to remove toxic waste from the environment. Bioremediation is the most effective management tool to manage the polluted environment and recover contaminated soil. Bioremediation, both in situ and ex-situ have also enjoyed strong scientific growth, in part due to the increased use of natural attenuation, since most natural attenuation is due to biodegradation. Bioremediation and natural attention are also seen as a solution for emerging contaminant problems. Microbes are very helpful to remediate the contaminated environment. Number of microbes including aerobes, anaerobes and fungi are involved in this process.

KEYWORDS: Bioremediation, Biotechnology, Microbes, and Carbon Sequestration

Detection of environmentally available toxic trivalent chromium complexes using citrate and PVP functionalized Ag NPs

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Chromium is one of the major heavy metal pollutants released into the water bodies and it causes several harmful effects on human health and the ecosystem. Currently, there are numerous techniques available for Cr(III) detection, however, these ions commonly exist as metal-organic complexes when they interact with the organic compounds present in the polluted water bodies. Cr(III) sensing statergies are not efficient enough to distinguish these Cr(III)- organic complexes from the ions. Since these complexes are even more toxic, they require special attention for both detection and treatment. In this study, we have selectively detected Cr(III)-acetate, Cr(III)-citrate, Cr(III)-EDTA and Cr(III)-Tartaric acid complexes using silver nanoparticles. The Ag NPs were synthesised using NaBH 4 reduction method with trisodium citrate and PVP functionalisation in the presence of H2O2 . When the solution containing the Cr(III)-organic complexes were added to the Ag nanoparticles, the colour changed from yellow to red and brown due to the aggregation of the NPs. The detection limit of the sensors were found to be 0.1 nm and the sensor was found highly sensitive upto 1 mM. The effect of different temperature (15-45 0 C), salinity (0.01-0.4%) and pH (3-9) were done to assess the overall effectiveness of the sensor for real world application. The selectivity of the sensor was ensured after studying various other metal salts and ions.

Keywords: Cr(III)-organic complex sensor, Environmental remediation, Nanosensor, Silver nanoparticles, Pollution management

Isolation and identification of plastic degrading bacteria.

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Plastic is an integral part of daily life. The major problem of plastic is the safe disposal of plastic wastes. The plastic accumulates in our Terrestrial, Coastal and Ocean habitats. Plastic have a detrimental effect in our human and animal lives. The only solution for this is bioremediation by using microbes and efficient tools of biotechnology. Soil samples were taken from different plastic products contaminated sites in Kerala. SPOT tests on LLDPE (Linear Low Density Polyethylene) was done to show the indentation of plastics. The isolation of bacteria was done by the primary test plastic degradation assay. Determination of weight loss of low density polyethylene(LLDPE) by bacterial inoculums was done and about 23% of LLDPE is degraded after 60 days of inoculation. Weight loss was further analysed by scanning electron microscope and the site with maximum degradation was constructed as superior strain of bacteria. The superior strain of bacteria is identified as Bacillus mycoides by DNA sequencing. The phylogenetic tree was created in the NCBI(National centre for biotechnological information)site by using Neighbour joining. The phylogenetic tree presents the closeness of Bacillus sp.

Keywords: Plastic, LLDPE, Scanning Electron Microscope, DNA sequencing, Phylogenetic tree

Antibiotic sensitivity pattern of Escherichia coli causing urinary tract infection (UTI) in pregnant women presenting to a Government tertiary care centre.

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Introduction: During pregnancy there is increased chances of contracting UTI which can be harmful to the mother and foetus. Many antibiotics are contraindicated during pregnancy. This limits the choice of antibiotics. This study aims at analysing the incidence and antibiotic sensitivity pattern of the most common pathogen, E.coli, responsible for UTI in pregnant women presenting to the Government tertiary care Hospital, Mangalore.

Material and methods: The semiquantitiative urine culture data (i.e, wet mount, culture on CLED and MacConkey, sensitivity pattern) was collected for over a period of 18 months (January 2020- June 2021) after the institutional ethics committee approval.

Result: On analysis, it was found that out of 2192 suspected samples, 409 were culture positive. E.coli was the most predominant bacteria isolated from 42.79% cases. The isolates were 90 to 100% sensitive to betalactam betalactam inhibitors and carbapenems. 45% of the E.coli were ESBL producers.

Conclusion: The increasing resistance to the oral drugs reduces the choice of empiric antibiotics to injectable ones. The antibiotics can be deescalated once the urine culture sensitivity report is received.

Keywords: semiquantitative culture, E.coli, antibiotic sensitivity, carbapenems, ESBL

Microbial co-culture and its products obtained under solid state fermentation (SSF) for industrial applications.

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Production of enzymes from microorganisms is a common practice in many industries for a long time now. In recent years, studies have proved that co-culturing microorganisms increases the yield of products by synergistically degrading the solid substrate when compared to using the cultures individually. This study highlights the benefits of co-culturing microorganisms using SSF to achieve higher productivity. Filamentous fungi of genus Trichoderma, Penicillium and Aspergillus are extensively studied and used for co-culturing and mixed culturing under Solid State Fermentation. Optimisation of various process parameters is a key step to improve the overall efficacy in this process. The most commonly used optimisation methods, one factor at a time (OFAT) and Plackett Burman (PB) methods have proved to be reliable. The bioreactors used for different processes and microorganisms are commented upon. Depending on the nature of the process and microorganism, the bioreactors are engineered accordingly. This study mentions various purification methods that are used to improve the purity of the products obtained. The strengths and weaknesses of various bioreactors and its effect on the microorganisms used are explained in detail. The drawbacks of co-culturing microorganisms and the diverse set of fields in which SSF finds its applications are identified.

Keywords: Co-culture; Microbial Enzymes; Solid State Fermentation; Bioreactors; Optimization; Purification; Applications

Biorefinery for phycoblue from green algae and its techno economic feasibility.

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Phycobiliproteins are the brilliantly colored, major photosynthetic accessory pigments that are water- soluble comprising 20–28% dry weight of cyanobacteria. c-Phycocyanin is a protein-pigment complex included within the light-harvesting phycobiliprotein family. It is a natural blue pigment that has excellent antioxidant, antitumor, anti-inflammatory, and antibacterial activity. In the present study, quantitative analysis was done to optimize the extraction method for c-phycocyanin.

Extraction methods like ultrasonication, freezing and thawing, and homogenization were performed. The UV-Spectrometric analysis results for the extraction method using ultrasonication followed by orbital shaking gave a maximum yield of 1.729mg/ml. The photocatalytic activity is responsible for the blue-color of the protein. Protein is an essential macronutrient that helps in building muscle, repairing tissues, and in producing enzymes and hormones. Consuming c-phycocyanin has various health benefits as well.

Keywords: Spirulina plantensis, C-Phycocyanin, Ultrasonication, UV-Spectrometer

Removal of cadmium ions using chitosan/sodium alginate composite beads

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Chitosan and sodium alginate composite beads have been successfully prepared and applied for Cd(II) removal from aqueous solution. The preparation of beads was conducted with varying ratio of chitosan and sodium alginate complex. The obtained beads would be characterized using XRD, FTIR, and SEM. Adsorption study was performed for Cd(II) removal from water. The adsorption capacities of beads for Cd(II) was higher than adsorption capacities of pure chitosan. Adsorption study was performed for Cd(II) removal from water. Chitosan presented potential and viability for use in the remediation of the impacts of the metals with high adsorption capacity.

Analysis of biochemical and bioactive properties of wild seasonal fruits

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Food and nutrition security has gained utmost significance in the recent years due to climatic changes, urbanization and increasing population. Furthermore, anticancer drugs and medications for cardiovascular diseases are the need of the hour. Simultaneously, plant-based products are gaining popularity owing to the increasing number of vegans. All of these concerns have increased the demand for plant-based products. To overcome this demand, we need to look for unexplored plant sources. This is where Wild Seasonal Fruits (WSF) comes to the rescue. The aim of the present study was to investigate the phytochemical and bioactive properties of WSF namely Cordia dichotoma (CD), Flueggea leucopyrus(FL) and Lantana camara (LC).

Water and Ethanol extracts of these 3 WSF were used for the study. GC analysis of the fruit samples confirmed the presence of a wide array of beneficial fatty acids including EPA and DHA. Among the 3 tested WSF, FL had highest concentration of phenolics (4.04mg/g), tannins (22.22mg/g) and anthocyanins (0.017mg/g). FL has also exhibited very good antioxidant activity in DPPH radical scavenging assay. Cytotoxic activity of these fruit extracts were tested against A549 (Adenocarcinomic human alveolar basal epithelial cells) cell line, and found promising results with FL fruit extracts. This Cytotoxic activity was further validated by apoptosis study. The overall results from the experiments conducted show that all the three fruits have beneficial biochemical and bioactive properties which serve as the basis for their utilization as functional foods, nutraceuticals and biopharmaceuticals. Additionally, the fruits of Flueggea leucopyrus were found to possess potent anticancer and antioxidant activities. Therefore, this study has opened avenues to look for and explore more in the areas of new and better anticancer and antioxidant agents, with less side-effects, more easily affordable and available towards achieving the UN SDGs 2, 3 and 12.

Keywords:: Cordia dichotoma, Flueggea leucopyrus, Lantana camara, nutraceuticals, biopharmaceuticals

Phytochemical evaluation and antioxidant property of white pepper(piper nigrum l.)

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Indian species that give flavor, color, and aroma to food also possess many therapeutic properties. Ancient Indian texts of Ayurveda, an Indian system of medication, detailed about their medicinal properties of these plants and their therapeutic usage. Recent scientific research has established the presence of many active compounds in these spices that are known to possess specific pharmacological properties. The main objective of the study is to screen the antibacterial activity of white pepper (Piper nigrum L.). Among the plants investigated to date,
one showing enormous potential is the Piperaceae. Piperine is an alkaloid found naturally in plants belonging to the pyridine group of Piperaceae family, such as Piper nigrum. It is widely used in various herbal cough syrups and it is also used in anti inflammatory, anti malarial, anti leukemia treatment. The result of the antioxidant assays shows that the fermented white pepper have good antioxidant property when compared with other pepper species. FTIR results also have the presence of hydroxyl groups which corresponding to flavonoid groups contributing to the observed activity.

Keywords: Piper nigrum L, Phytochemical, Antioxidant activity, FTIR.

Invitro studies on phytochemicals, antioxidant and antimicrobial activities from Mimusops elengi

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The medicinal plant of Mimusops elengi LMagizham (in Tamil) from sathyamangalam forest area, TamilNadu found to contain many dental important compounds, pulp is widely used as to cure chronic dysentery. In this present study, the Mimusops elengi L.leaves were collected from Sathyamangalam forest area, Tamil Nadu. The leaves were washed and shade dried for 14 days and carried out soxlet ethanolic extraction. The extracted plant sample was examined for the phytochemical analysis, Antioxidant assays like (2,2 Di-Phenyl 1-Picryl Hydrazyl Assay,

Total Phenolic Content, Thiobarbituric Acid Assay, Ferric Thiocyanite Assay, Ferric-ion Reducing Antioxidant power Assay) and Antimicrobial Activities were performed against MTCC 121(Bacillus subtilis), MTCC 3160 (Staphylococcus aureus), MTCC 433(Escherichia coli) MTCC 530 (Klebsiella planticola) by Agar-Well Diffusion Method/Disc Diffusion Method and Minimum Inhibitory Concentration. The results showed that, the plant extracts contains phytochemicals like Saponins, Terpenoids, Cardiac glycosides, Steroids, Flavanoids and Phenols qualitatively. The Antimicrobial assays of Disc Diffusion assay inhibit the range of 20-24 mm and Agar-well Diffusion assay showed the average of 22-25 mm. The results will be discussed in detail.

Keywords: Mimusops elengi L., Phytochemicals, Minimum Inhibitory Concentration and DPPH.

Phytochemical extraction, screening and HPLC analysis of different extracts of cissus quadrangularis.Linn

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Cissus quadrangularis is a common indigenous Indian plant which has been used by people as a food supplement for its various medicinal properties. Bone fracture is temporary damage to the bone, the human body can heal it automatically but it takes a long time and also requires a cast for up to minimum six months. Studies have proven that the phytocompounds present in Cissus quadrangularis can improve or fasten bone fracture healing to a certain amount. A study was carried out by us to identify and analyse the phytochemicals present in various Cissus quadrangularis which are responsible for improving bone fracture healing ability.

Extracts of Cissus quadrangularis were produced using different solvents namely methanol, petroleum ether and hexane using soxhlet apparatus. The extracts were subjected to Thin Layer chromatography (TLC) for phytochemical screening. The TLC plate of methanolic extract showed good separation between the phytochemicals present in Cissus quadrangularis. For further analysis, High Performance Liquid Chromatography (HPLC) was carried out. Running conditions for HPLC were; mobile phase [acetonitrile: methanol (50:50)], flowrate 2ml/min and detection at 202 nm. The analysis of methanolic extract showed peaks at retention time 3.395, 5.026and 5.817.After comparing with HPLC standards of various phytocompounds, it was concluded that these peaks represent the flavonoids present in the extract. These were the first findings of the study. Further analysis is yet to be done to accurately find the compound responsible to improve bone healing ability and hopefully develop it as an herbal medicine.

Keywords: Cissus quadrangualaris.Linn, phytocompound Extraction and screening, TLC, HPLC analysis.