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*NATIONAL CONFERENCE ON*  
**INNOVATIVE RESEARCH IN BIOTECHNOLOGY  
AND ENGINEERING FOR PUBLIC HEALTH**

**(IRBEP 2016)**

SUPPORTED BY NABARD

**ABSTRACT PROCEEDINGS**



**NATIONAL BANK FOR AGRICULTURE  
AND RURAL DEVELOPMENT**



*Organized by:*

**Department of Biotechnology**

**Vinayaka Mission's Kirupananda Variyar Engineering College,**

A Constituent College of Vinayaka Mission's University,

(NAAC Accredited Institution)

NH-47, Sankari Main Road, Periya Seeragapadi, Salem – 636 308, Tamil Nadu.

&

**Alpha Omega Hi Tech Bio Research Centre**

16, Anbu Nagar, Gorimedu, Salem – 636 008, Tamil Nadu.

*With best compliments from:*  
**NATIONAL BANK FOR AGRICULTURE AND RURAL DEVELOPMENT**  
*(Printing of this document is supported by NABARD)*

**MISSION**

*Promotion of sustainable and equitable agriculture and rural development through effective credit support, related services, institution development and other innovative initiatives.*

**MAJOR ACTIVITIES**

**Credit Functions** : Refinance for production credit (Short Term) and investment credit (Medium and Long Term) to eligible Banks and financing institutions.

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- Micro Finance Development and Equity Fund (MFDEF)
- Financial Inclusion Fund (FIF)
- Financial Inclusion Technology Fund (FITF)
- Farm Innovation and Promotion Fund (FIPF)
- Farmers' Technology Transfer Fund (FTTF)
- Watershed Development Fund (WDF)
- Rural Infrastructure Development Fund (RIDF)
- Tribal Development Fund (TDF)
- Cooperative Development Fund (CDF)
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- Supervisory Functions: NABARD shares with RBI certain regulatory and supervisory functions in respect of Cooperative Banks and RRBs.
- Provides consultancy services relating to Agriculture & Rural Development ([nabcons@vsnl.net](mailto:nabcons@vsnl.net))



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# **ACKNOWLEDGEMENT**

**The Financial Assistance received from the Research and Development Fund of National Bank for Agriculture and Rural Development (NABARD) towards publication of journal/printing of abstract proceedings of the conference is gratefully acknowledged.**

# ABOUT THE UNIVERSITY

In the year 2001, the University status was conferred by Ministry of Human Resources Development, Government of India with the recommendation of UGC (Declared Under Section 3 of the UGC Act 1956) to Vinayaka Mission as an acknowledgement of excellence and satisfaction for the highest levels of academic standards and its best infrastructure provided to achieve excellence in education. About 3000 staff members including renowned Professors, Readers, Lecturers, Technical and other Experts serve our community to achieve excellence in education.



Vinayaka Missions University, Salem

# ABOUT THE COLLEGE

Vinayaka Missions Kirupananda Variyar Engineering College (VMKVEC) is an initiated educational background, aimed to provide quality education to aspiring technocrats in various fields of engineering science. It started way back in 1987 with 3 branches approved by AICTE, New Delhi. Initially it was affiliated to the University of Madras, Periyar University and later on to Anna University. Later, elevated to Deemed University status and henceforth, it has been a constituent college of Vinayaka Missions' Research Foundation Deemed University in 2004. At present, the institution has 11 branches under UG & 21 specialization programs under PG along with MCA & MBA under various specializations offering higher education. The institution is accredited by NAAC. The college has established Dr. A.P.J. Abdul Kalam Business Incubator sponsored by Ministry of Micro, Small and Medium Enterprises, Government of India. The incubator encourages the budding technocrats to transform their innovative ideas to product.



Vinayaka Missions Kirupananda Variyar Engineering College, Salem

# ABOUT THE ALPHA OMEGA

Alpha Omega Hi-Tech Bio Research Centre was established with an aim to serve as a means for updating the scientific knowledge in all biological fields. The research centre is related with the research work/projects for the students of M.Sc., M. Phil., Ph.D., B. Pharm., B-Tech. and M. Tech. Conferences, Patents, Career Oriented Training programs are also conducted in the various fields. The research centre was registered under the “Bio Vision Trust” Reg No.: 883/2009 of 16th Oct 2012, when the Director of the centre assumed charge. 16 Patents has been filed from Alpha Omega and 4 different awards have been received. Different types of Services are going on in the centre like Patent filing, Projects, Certificate courses, training programs, psychiatric counseling and paper publication.



# ORGANIZING COMMITTEE

<b>Chair Person:</b>	<b>Dr. A. Nagappan,</b> Principal, VMKVEC
<b>Convener:</b>	<b>Dr. M. Sridevi</b> Professor & Head, Department of Biotechnology VMKVEC <b>Mrs. V. K. Evanjelene,</b> R & D Manager, Alpha Omega Hi-Tech Bio Research Centre, Salem
<b>Organizing Secretary:</b>	<b>Mrs. C. Nirmala</b> Assistant Professor, Department of Biotechnology VMKVEC
<b>Advisors:</b>	<b>Dr. V. Anbazhagan</b> Associate Professor, Department of Chemistry VMKVEC <b>Mr. V. Ganesh</b> Director, Alpha Omega Hi-Tech Bio Research Centre, Salem
<b>Organizing Members:</b>	<b>Mrs. G. Arthi</b> Assistant Professor, Department of Biotechnology VMKVEC <b>Mr. N. Jawahar</b> Assistant Professor, Department of Biotechnology VMKVEC <b>Mr. K. Tamilselvan</b> R&D Assistant, Alpha Omega Hi-Tech Bio Research Centre, Salem
<b>Students Co-ordinators</b>	<b>Sambhasan Baneerjee,</b> III year BTE <b>N.A.Abdul Nasir,</b> III year BTE <b>Faizan A,</b> III year BTE <b>Lankeshwar Kalundia,</b> III year BTE



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**Dr. A. Nagappan**  
**Principal**

**Date: 10/03/2016**

## **MESSAGE**

I am happy to note that our Department of Biotechnology is organizing a National Conference on “Innovative Research in Biotechnology and Engineering for Public Health” with an aim to provide a forum to present original contribution by researchers and Students to highlight the importance of Biotechnology in providing solution to mankind struggles. Biotechnology is emerging field and it is certain that human existence and survival on the coming days rest on the development and rapidly advancement of biotechnology. I request the researches and young students to contribute immensely by presenting their research papers in large number and participate in the discussions for acquiring and sharing knowledge.

My Best Wishes for the Success of the Conference.

**Dr. A. Nagappan**  
**Principal, VMKVEC**



## ALPHA OMEGA HI-TECH BIO RESEARCH CENTRE

16, Anbu Nagar, Gorimedu, Salem - 636 008

Reg. No. 962 / 2012

Date: 10/03/2016



Mr. V. Ganesh  
Director, Alpha Omega Hi Tech Bio research  
Centre

### MESSAGE

Dear delegates,

I welcome you all with a warm heart to the 'National Conference on Innovative Research in Biotechnology and Engineering for Public Health', which is an interdisciplinary conference, and I believe, will bring together Academics, Researchers, Industry representatives, and Students different organizations to share and enhance knowledge on latest advancements in role of Biotechnology and Engineering for Public Health practice, challenges and opportunities.

Biotechnology is a highly interdisciplinary field that combines Biological Sciences with Engineering technologies. In the face of growing health disparities, the important contribution of Science and Technology to improving health cannot be overlooked. It is crucial to recognize that science and Technology can be used very effectively in partnership with conventional public health practices in developing countries and can enhance their efficacy.

I hope this conference will lead to the promotion of newer technologies and innovation which is the need of the hour. It is imperative to have health innovation reach the masses and add a value to the public health system of Nations across the Globe. With adequate impetus let's hope for innovation in fields of biotechnology and engineering, leading to development of platform technologies which can have Global implications.

With Warm regards,

Mr. V. Ganesh

## MESSAGE FROM THE CONVENERS



**Dr. M. Sridevi**  
**Professor and Head,**  
**Department of Biotechnology, VMKVEC**



**Mrs. V.K. Evanjelene**  
**R & D Manager,**  
**ALPHA OMEGA**

Dear All,

I deem it my privilege and honor to welcome you to the 'National Conference on Innovative Research in Biotechnology and Engineering for Public Health' which is to be held in Salem, Tamilnadu on 11<sup>th</sup> March, 2016. This conference will provide an excellent opportunity to showcase your work and share your expertise, so we as a community can move towards developing National for health and social wellbeing.

This is a premier event that provides a platform for Students, Industry Leaders, Teachers and Researchers to discuss the growth strategies in the research in improving public health through biotechnology and engineering. I hope that the platform that we have created for ourselves for learning from each other and sharing the excitement of the profession will also be a launching pad for the future collaborations and fascinating results.

I hope the deliberations, the interactions and the exchange of the knowledge and the facilitating of collaboration will provide a road map for development. I also believe this conference is a step towards the path which brings us to the forefront of new innovations and technologies that transcend all aspects of research and have high significance in the public health arena.

With warm regards,



**Dr. M.Sridevi**  
**The Conveners**  
**IRBEP-2016**



**Mrs. V. K. Evanjelene,**

## MESSAGE FROM THE ORGANIZING SECRETARY



**Mrs. C. Nirmala**  
**Assistant Professor, VMKVEC**

Dear friends,  
Greetings!!!

On behalf of organizing team, I am delighted to invite you all to the National Conference On “Innovative Research In Biotechnology and Engineering For Public Health”- IRBEP-2016 organized by Department of Biotechnology, Vinayaka Mission’s Kirupananda Variyar Engineering College, Salem together with Alpha Omega HiTech Bioresearch centre, Salem. The applications of Biotechnology are so broad and the advantages so compelling, that virtually every industry is using this technology. The Conference will educate the importance of Environment health, Biodiversity, Bioconservation and genetics. Moreover it pays way for younger students and budding scientist to investigate and understand the issues in research to improve environment and public health. The conference also raise awareness and prompt action in the promotion of regular reporting of progress made in the field of Environment, Biotechnology and related areas.

In tune with the theme of the conference, the organizing committee is preparing an array of speakers of repute which will make the scientific sessions highly informative. The conference is one of the effective reflections of its scientific, academic, and social contribution. Not only does it allow us to meet, greet, and eat but it also provides a unique forum for exchange of ideas, offers and opportunities. We are bestowed to organize the conference in our Institution with Alpha Omega HiTech Bioresearch centre and our herculean will reap fruitfully with your esteemed presence. Let us together infuse new enthusiasm in young and veteran scientists to make Biotechnology a relevant, dynamic, contemporary, and most sought after discipline.

With Warm Regards,

A handwritten signature in blue ink, appearing to read 'C. Nirmala', on a light-colored rectangular background.

Mrs. C. Nirmala,  
Organising Secretary,  
IRBEP-2016.

**“NABARD Support National Conference on Innovative Research in Biotechnology  
and Engineering for Public Health”**

**IRBEP 2016**

**11<sup>th</sup> March 2016**

**SPECIAL LECTURES**

<b>SI No.</b>	<b>Invited Speaker</b>	<b>Title</b>
1	<b>Dr. Mathish Nambiar Veetil</b> Scientist E, Genetic Transformation Lab, Plant Biotechnology Division, Institute of Forest Genetics and Tree Breeding, Coimbatore.	Advances in transgenesis and genome engineering: applications in agriculture and forestry crops
2	<b>Dr. V. N. Balaji</b> Discovery Research Advisor, 579 First Main, Second Stage, Third Block, RMV Extension, Dollars Colony, Bangalore 560 094, India	"An overview of Information based Drug Discovery Process".
3	<b>Dr. M. C. Jobin Christ</b> Professor & Head Department of Biomedical Engineering Adhiyamaan College of Engineering (Autonomous), Hosur	Role of Biomedical Engineering in Healthcare

**INVITED ABSTRACTS (ORAL PRESENTATION)**

<b>Abstract No.</b>	<b>Author(s)</b>	<b>Title of the paper</b>
IRBEP/OP/01	R. S. Subhasree, Priyadarshani Choudhary, B. Ramalingam, T. Paranthaman and Sujoy K Das	A detailed study on <i>R. oryzae</i> mediated synthesis of Silver Nanoparticles and its antibacterial effects on <i>Escherichia coli</i> and <i>Pseudomonas aeruginosa</i>
IRBEP/OP/02	S.Ishwarya and M.Sridevi	A study on chemical constituents, antioxidant, antimicrobial and anti-cancerous properties of <i>Gmelina arborea</i> Roxb. from different agro silvi culture regions.
IRBEP/OP/03	Auwalu Muttaka, Yusif Ado Usman, Shamsiyya Mohammad Sani and Preeti Bajaj	Comparative Analysis of Heat Shock Proteins
IRBEP/OP/04	Dr Maya Ramesh	Effects of Fluoride and Its Biomarkers
IRBEP/OP/05	E. Sri Akshaya	Osmotic Dehydration of Coconut
IRBEP/OP/06	Yamini Kommi, Rathish Prabhakaran, Balasubramanian Aiyar, John Prasanth Jacob and Mathish Nambiar-Veetil	Identification and analysis of potential micro RNA transcripts and their target genes in the Eucalyptus gall inducing pest, <i>Leptocybe invasa</i> Fisher & La Salle (Hymenoptera: Eulophidae)

IRBEP/OP/07	Zaitun Mahmud Aminu, Dr. P. Nazni, BinkuMondal, Naushaba Rasheed, DibyaToppo, P.S. Adhiyamaan, BalaSundari	Nutrition and Community Health
IRBEP/OP/08	S.Priyasharshini * and Mrs.G.Arthi	Comparative studies on different growth hormones Levels for the Production of rapid growth sugarcane
IRBEP/OP/09	D.Gowshiga and V.Vishnu Priyan	Comparative Study of Linalool extracted from <i>Coriandrum Sativum</i> , <i>Mentha Lamiaceae</i> and <i>Murraya Koenigii</i> for the antifungal and insecticidal activity
IRBEP/OP/10	Sanjay Kumar. K	Characterization of Protease and Lipase from <i>Bacillus Subtilis</i> for the Removal of Fatty Stains in Fabrics: Evaluation as Detergent Additives
IRBEP/OP/11	Sajith S.Nair and Mrs. S.Mathan Kumar	Mobi Heart Rate Monitoring Device
IRBEP/OP/12	S.Manisagar	Studies on Pythium Control Using Chitinase Extracted From Microbes of Turmeric Rhizosphere Soil
IRBEP/OP/13	S. Ananth Kumar and R. Rajadurai	Antibacterial Activity of <i>Oxystelma esculentum</i> Leaf (Alkaloids) Extracts against Some Human Pathogenic Bacterial Strains
IRBEP/OP/14	Sri Akshaya. E, Ashika. S and D. Dhivya Bharathi	Tender Coconut Water as a Functional Blended Beverage
IRBEP/OP/15	S.Gokulan and R.Subbaiya	Hepatoprotective Studies of Methanolic Leaf Extract of <i>Barringtonia acutangula</i> (L) Against Carbon Tetrachloride Induced Liver Injury In <i>Wistar</i> Rats
IRBEP/OP/16	S.Shanmuga priya * and S. Poornima	Extraction and Purification of Secondary Metabolites from Lichen <i>Roccella montagnei</i> for Evaluation of Antimicrobial Activity.
IRBEP/OP/17	Umar Muhammad Ibrahim*, Khalid D. Khalid, Mustapha Balarabe Idris	Removal of Dyes from Aqueous Solution Using Low Cost Magnetite/Activated Carbon Composite Bio-sorbent
IRBEP/OP/18	K. Vinoth	Performance of the Effluent Adapted Bacteria in Degradation of Dyeing Industry Effluent with Sequential Batch Reactor
IRBEP/OP/19	Sambhasan Banerjee, Abdul Nasir N A, Dr. M. Sridevi	Development of Probiotics from Mysore Raspberry
IRBEP/OP/20	Sowndharya.R.D <sup>1*</sup> , Gowri.P <sup>2</sup> and Hemapriya.S.T <sup>3</sup>	Utilisation of Pomace from Wine Industries
IRBEP/OP/21	K. S. Poornamathi, K. Vikashini and S. Heeba.	Automatic Pineapple Peeler Cum Slicer
IRBEP/OP/22	M.Pavithra and Sb.Karthik Raja	Foam-Mat drying of Mint Leaf Juice
IRBEP/OP/23	M.Somesh	Studies on Anti-Fading Properties of Quercetin Extracted From Onion Peel in Fabrics
IRBEP/OP/24	V.Vallinayagi <sup>1</sup> and P. Kavitha Arivazhagan <sup>2</sup>	A Study on the Formulation and Standardization of Bajra Flakes with Its Nutrient and Microbial Analysis

IRBEP/OP/25	Nandhinee N and Gokula Priya V	Millet Milk Ice Cream
IRBEP/OP/26	Abdulrahim Ibrahim,* Abdussamad Mukhtar Muhammad, Sadiq Danladi Attahir, Naziru Alhassan Muhammad	Synthesis of magnetite nanoparticles/Activated Carbon Composite Prepared from <i>Althea Rosea (Holyock)</i> leaves for the removal of crystal violet and methylene blue dyes from aqueous medium
IRBEP/OP/27	Harikrishna K S	Role of Water, Sanitation and Health in developing countries for Sustainable Development
IRBEP/OP/28	Rashmi Bhambhani and Kannan Natarajan	Optimization of Azo Dyes Degradation Using Biological Agents
IRBEP/OP/29	K.Balaji and K.Raguraman	Carbon Buster
IRBEP/OP/30	Aravinth.S <sup>1</sup> and Philip robinson.J <sup>2</sup>	Influence of Nutritional Elements on Morphological and Physiological Responses of Banana against Water Resistance
IRBEP/OP/31	P. Arunsankar and M. Prasanth	Green Building
IRBEP/OP/32	E. Sri Akshya, M. S. Shivaswamy, Jony Blessing Manoj and N.M. Subhmanjari	Potential of Vallarai in Indian Dairy Product Ghee
IRBEP/OP/33	A. Sudha, R. Kirankumar and E. Gunaseelan	Physicochemical Properties and Sensory Characteristics of Multi Millet Ice Cream.
IRBEP/OP/34	V. Hariganesh and A. Karthikeyan	Experimental Analysis of Four Layered Lamina Bamboo Composite
IRBEP/OP/35	Shrinivasan. G. B	Bio Formulation of Eco Friendly Fertilizer Using Vegetable Waste and PGPR for the Establishment of Home Terrace Vegetable Farming
IRBEP/OP/36	Shantharam. Y, Boobalan. M, Arivazhagan. G	An Innovative Study on Green Concrete To Diminish of Global Warming Effect Responsible of Cement Industry- By Using Low Calcium Fly Ash Green Concrete
IRBEP/OP/37	Ilungongle Sephe	Green technology: Turbine Light on Highways
IRBEP/OP/38	Haseena H., T. Sharmathi, M. S. Shivaswamy, Jony Blessing Manoj	Mango Seed Oil (Mso) - An Economical Way of Mango Processing Waste Disposal
IRBEP/OP/39	G. Selvam and M. Balasubramanian	Antiuro lithiatic Potential of The Edible Plant Extracts of Radish, winter melon And Stem of Banana Tree: <i>In Vitro</i> Study
IRBEP/OP/40	J.Jony Blessing Manoj <sup>1</sup> , D.Tiroutchelvame <sup>2</sup> , J.Prakash Maran <sup>1</sup> , J.S.Ruthra Priya <sup>3</sup> , M.S.Shivaswamy <sup>1</sup>	Experimental Studies on Properties of Banana (Musa X ParadisiacaL) Pith Flour and Its Utilization as a Healthy Food Additive
IRBEP/OP/41	T. Radhiga and N. Rajendra Prasad	Preventive effect of Galangin on isoproterenol-induced oxidative stress in H9C2 cardiomyoblast cells
IRBEP/OP/42	S. Mohammed Harshulkhan <sup>1</sup> , K. Janaki <sup>2</sup> , G. Velraj <sup>3</sup> , M.Nagarajan <sup>1</sup>	Microwave Synthesis and Characterizations of Cobalt doped tungsten oxide for photocatalytic application

IRBEP/OP/43	HarshaVarthini. R <sup>1</sup> and Dr.J.Philip Robinson <sup>2</sup>	Irradiation of <i>Musa acuminata</i> and Characterization by RAPD Analysis
IRBEP/OP/44	A.Faizan and C. Nirmala	Screening of Microorganisms to Produce Antibiotics from Rhizosphere Soil sample of Medicinal Plants
IRBEP/OP/45	S. Mohammed Harshulkhan <sup>1</sup> , K. Janaki <sup>2</sup> , G.Velraj <sup>3</sup> , R.Sakthi Ganapathy <sup>1</sup>	Photocatalytic degradation and colourization of Ni doped WO <sub>3</sub> nanoparticles using microwave irradiation method
IRBEP/OP/46	P.Kathirvel	Turbidity Removal from Domestic Wastewater Using Cactus Species as a Natural Coagulant
IRBEP/OP/47	B. Sathish Kumar, P. Meena and Boopathi	Study on Mechanical Properties of Eco-Friendly Economic Concrete
IRBEP/OP/48	M. P. Kiran, K. Bharathi and Arun Kumar	Waste Land Development
IRBEP/OP/49	S. Mohammed Harshulkhan <sup>1</sup> , K. Janaki <sup>2</sup> , G.Velraj <sup>3</sup> , S.Krishnaraj <sup>1</sup>	Synthesis of MG Doped Tungsten oxide Nanoparticles Via microwave Irradiation Method
IRBEP/OP/50	S. Prabaharan and P. Usharani	Remote Sensing and GIS approaches in Artificial Recharge of the Ground Water Potential Zones in Watershed of Namakkal District Tamilnadu
IRBEP/OP/51	M. Devi* <sup>a</sup> and P. Latha <sup>b</sup>	Hepatoprotective Activity of Methanolic Extract of <i>Decalepis Hamiltonii</i> against Acetaminophen-Induced Hepatic Injury in Rats
IRBEP/OP/52	P.Shobana Devi and M.Shabana Begum	Effect of <i>Ipomoea staphylina</i> ethanol leaf extract in Oxidative Enzymes in STZ-induced Diabetic Albino Rats
IRBEP/OP/53	R. Vallipriya and M.Shabana Begum	Screening of Antioxidants Activity in <i>Ipomoea Biloba Leaves</i> Extract
IRBEP/OP/54	Nirubama K <sup>1</sup> , Shabana Begum M*and Rubalakshmi G <sup>2</sup>	Biosynthesis of Silver Nanoparticles towards a Nanodrug Design from an Indigenous Medicinal Plant: <i>Andrographis echioides</i>
IRBEP/OP/55	P.Varutharaju <sup>1</sup> and K.Soundhirarajan <sup>2</sup>	Experimental Investigations on Properties of Concrete with Paper Sludge as Self Curing Agent
IRBEP/OP/56	Sankari. T, Pavithra .A and Divya Laxmi G. S	Sustainable Development
IRBEP/OP/57	Mythilipriyaga. S, Kavinila. R And Lakshaya. B	Green Technology
IRBEP/OP/58	Sharika .D and Sekar	Global warming - Defend for the Poor Carbon
IRBEP/OP/59	Vasanthi Padmanabhan <sup>1</sup> , Manimekalai Ganapathy <sup>2</sup> and Vasthi Kennedy Evanjelene <sup>3</sup>	Evaluation of the <i>In Vivo</i> Anticancer Activity of <i>Albizia Lebbeck</i> Benth.
IRBEP/OP/60	Dr.K.Vidhya and Dr.T.Palanisamy	Innovative Manufacturing Techniques of I-Bricks
IRBEP/OP/61	L.Vijayan <sup>1</sup> , K.Divya <sup>2</sup> , P.Saradha <sup>3</sup> and E.Geethamozhi <sup>4</sup>	RSM Analysis for Distillery Waste

IRBEP/OP/62	C.Sangavai <sup>1</sup> , S.Sengol Jenifer <sup>2</sup> and J.Gowri <sup>2</sup>	Enhanced Nutrient Recovery
IRBEP/OP/63	Dr. K. Sasikala	Green Communication Networks for Minimizing Network Contention in Server-Based Manets for Wireless Access
IRBEP/OP/64	K. Thiyagarajan and C. Saravanan	Alternative Fuel
IRBEP/OP/65	S.Manikandan <sup>1</sup> A.Shanmugam <sup>2</sup> , P.Balaganesh <sup>3</sup>	Technologies and Performance Study on Grey water Treatment
IRBEP/OP/66	R.Vijayakumar and S.Krishnapriya	Global Warming
IRBEP/OP/67	K.Akila, G.Neelavathi, A.Tamilselvan	Development of temperature-managed traceability system for frozen and chilled food during storage and transportation
IRBEP/OP/68	R.Priya, N.Vijayanandam, G.Dineshkumar	Efficiency and mechanisms of alternative food preservation technologies
IRBEP/OP/69	S.Gomathi, P.S.Sudarshana, D.Gayathiri	Energy saving and reducing CO2 in mobile towers using green radio technology
IRBEP/OP/70	K.Aswini, K.Rathina KumarR.Rasu	Fetal monitoring system
IRBEP/OP/71	P.Elamathi, K.Gomathi , P.Shanmuga Sundaram, A.Lelina Devi	Food Preservation By Hurdle Technology
IRBEP/OP/72	P.Rajeswari R.Shanmuga Sundaram M.Nithya	Identification of Marek's diseases in poultry using edge detection
IRBEP/OP/73	K.Nithya, C.Gomathi, M.Gayathiri	Identification Of Wax Coating In Apple By Using Edge Detection Method
IRBEP/OP/74	P.Sureshbabu R.Hemalatha, N.Santhiyakumari,	Improving Health and Healthcare with Interactive Visualization Using Dashboard Methods
IRBEP/OP/75	M.Hariharasudhan, R.Kalidasan, V.SridharA.Sakthivel R.Prasanna and R.Nithya	Smart information management system for blood bank using UTLP
IRBEP/OP/76	S. Thilagavathi, C.Babu, S.Radhika	Introduction To M-Health On Mobility And Global Wireless Health-Care Connectivity
IRBEP/OP/77	S.Suvarna, K.Rajesh, S.Veerakumar	A new method for food processing and preservation with life cycle assessment
IRBEP/OP/78	P.Nethaji M.Chandraman M.Dinesh kumar	Protection Of Foods From Microbes
IRBEP/OP/79	B.Ponmalathi M.Shenbagapriya M.Bharanidharan	Role of Renewable Energy Resources for Green Electronics
IRBEP/OP/80	B.S.T.Ragu S.Maragatharaj T.Radhu	Sustainable development in an urban water supply network

**INVITED ABSTRACTS (POSTER PRESENTATIONS)**

<b>Abstract No.</b>	<b>Author(s)</b>	<b>Title of the paper</b>
IRBEP/PP/01	R. Prakash <sup>1</sup> , J .Sagaya Metilda <sup>2</sup> , M .Senthil kumaran <sup>3</sup> , N.Sumitha <sup>4</sup> , P. Deepan <sup>5</sup>	Green technology
IRBEP/PP/02	C Vignesh, P Ravi and S Mohan	Disaster Management
IRBEP/PP/03	R Prabhakar <sup>1</sup> and T Raja <sup>2</sup>	Optimized Biodiesel Production from <i>Calophyllum inophyllum</i> Oil Using Response Surface Methodology
IRBEP/PP/04	Mr. T.Raja <sup>1</sup> and Mr. R. Prabhakar <sup>2</sup>	Optimization of Bio-Diesel Preparation of Various Catalysts Using <i>Hevea brasiliensis</i> Seed Oil
IRBEP/PP/05	Mr. J.Sathees Babu <sup>1</sup> and Dr. K.Balamurugan <sup>2</sup>	Preparation and Testing of Water Hyacinth Composites
IRBEP/PP/06	*Dr.N. Buvanewari	Removal of Malachite Green Dye On Palm Tree Sawdust from Aqueous Solution
IRBEP/PP/07	S.Sadhishkumar <sup>1</sup> , Dr. T.Balusamy <sup>2</sup>	Theoretical and experimental studies on thermal performance of water-in-glass evacuated tube solar water heaters
IRBEP/PP/08	*T. Sivakami <sup>1</sup> , M. Kannan <sup>2</sup> and <sup>1</sup> K. Sudha <sup>1</sup>	Kitchen Waste Recycling By Vermicomposting – An Eco friendly Approach.
IRBEP/PP/09	M. Kannan <sup>1</sup> , T. Senthil Kumar <sup>2</sup> and M.V. Rao <sup>1</sup>	Impact of Human Activities in the Forest Ecosystem of Kalrayan Hills, Salem District, Tamil Nadu, India
IRBEP/PP/10	*Sudha K <sup>1</sup> , Sivakami T <sup>1</sup> and Kannan M <sup>2</sup>	A Preliminary Study on the Production and Purification of Bacteriocins from Lactic Acid Bacteria
IRBEP/PP/11	N. Kannan <sup>1</sup> and N.Thirunavukkarasu <sup>2</sup>	Bioaccumulation of Heavy Metals in Six Commercial Fish Species of Ennore Mangrove Ecosystem, North Chennai, East Coast India.
IRBEP/PP/12	Sambhasan Banerjee, Lankeshwar Kalundia and Mrs. C. Nirmala	Production of Soap from Food Waste
IRBEP/PP/13	Sekar.s <sup>1</sup> and kathirvel.c <sup>2</sup>	Geomatics Based Site Selection of Muncial Solid Waste Disposal
IRBEP/PP/14	C.Kathirvel <sup>1</sup> and S. Sekar <sup>2</sup> ,	Site Suitability Evaluation for Textile Sewage Water Treatment Plant Using Remote Sensing Techniquesin Jalaknadapuram, Salem District, Tamilnadu
IRBEP/PP/15	Dr. P. Kalaiarasi	Comparative Study on the Black and White <i>Sesamum indicum</i> Seeds (Raw and Roasted) - <i>In Vitro</i>
IRBEP/PP/16	A.Sheela	<i>In vitro</i> study of the <i>Rosa indica</i> and <i>Rosa centifolia</i> on antioxidant activity and a comparative study of the aqueous, methanol and petroleum ether extracts

IRBEP/PP/17	G. Gomathy	Gastroprotective potentials of the ethanolic extract of <i>Mukia maderaspatana</i> against indomethacin-induced gastric ulcer in rats
IRBEP/PP/18	Arjunan Sundaresan <sup>1</sup> and Kodukkur Viswanathan Pugalendi <sup>2</sup>	Effect of ursolic acid and Rosiglitazone combination on hepatic lipid accumulation in high fat diet-fed C57BL/6J mice
IRBEP/PP/19	Revathi. K <sup>2</sup> , Saranya. A.M <sup>1</sup> and V.K. Evanjelene <sup>3</sup>	Antibacterial Activity and Physicochemical Activity of the Methanol Extract of <i>Gloriosa Superba</i>
IRBEP/PP/20	Manju. B <sup>2</sup> , Rajeswari. M <sup>1</sup> and V.K. Evanjelene <sup>3</sup>	Anticancer and Antioxidant Activities of Algae <i>Caulerpa Racemosa</i>
IRBEP/PP/21	Indhumathi. S <sup>2</sup> , Kalaivani. S <sup>1</sup> and V.K. Evanjelene <sup>3</sup>	A Study on the Antidiabetic and Antifungal Activity of <i>Colocasia esculenta</i>
IRBEP/PP/22	Ramya. S <sup>2</sup> , Hamsa. K <sup>1</sup> and V.K. Evanjelene <sup>3</sup>	Medicinal Properties of <i>Euphorbia Hitra</i>
IRBEP/PP/23	<sup>2</sup> Divya Bharathi. K, <sup>1</sup> Menaka.Cand V.K. Evanjelene <sup>3</sup>	Green Synthesis of Zinc oxide Nanoparticles from <i>Sargassum fluitans</i>
IRBEP/PP/24	<sup>2</sup> Narmatha. V, <sup>1</sup> Selvi and V.K. Evanjelene <sup>3</sup>	Medicinal Activities of <i>Polyalthia longifolia</i>
IRBEP/PP/25	<sup>2</sup> Chitradevi. K, <sup>1</sup> Selvi and V.K. Evanjelene <sup>3</sup>	Synthesis of Aluminium Nanoparticles from <i>Rivina humilis</i> and their Antifungal Activity
IRBEP/PP/26	<sup>2</sup> Ezhilarasi. R, <sup>1</sup> Selvi and V.K. Evanjelene <sup>3</sup>	Silver Nanoparticles from <i>Durvillaea antarctica</i> Extract
IRBEP/PP/27	A.Gilbert Sunderraj	Evaluating the effect of background water chemistry on the aquatic toxicity of major ion salts
IRBEP/PP/28	Abdul Nasir N.Aand Dr. M. Sridevi	Production of Bio-fertilizer from fruit and vegetable waste
IRBEP/PP/29	R. Sethupathi <sup>1</sup> and R. Palanivel <sup>2</sup>	Vibrational Spectral Analysis of Ortho, Meta and Para – Amino benzoic acids
IRBEP/PP/30	C. Senthil Kumar <sup>1</sup> and Jayanirmala <sup>2</sup>	Quadrilinearization of (2+1) Dimensional Breaking Soliton Equation
IRBEP/PP/31	D.Dhanasree	Social impact and healthy diet plan on obesity
IRBEP/PP/32	G. Dhanush, P. HIndrajith, B. Naveen Raj, Saurabh Kumar	Review on Genetically Modified Mosquitos
IRBEP/PP/33	James Reginald. R, Jayaram. P. N and Dewakar. M	Biotechnology and the Utilization of Solid Wastes as a Resource for Product Development
IRBEP/PP/34	N.Roopa* and Sridevi M**	Effect of naringin on UVB induced antioxidant status and DNA damage in NIH 3T3 cells
IRBEP/PP/35	Shanly P K	Handle Bar Cardiac Heart Rate Meter
IRBEP/PP/36	Vinusha.R	Doppler Ultrasound Fetal Heart Rate Monitor
IRBEP/PP/37	Tissa Mary	Handicap Access to a Four-Wheeler
IRBEP/PP/38	Ancy Babu	Medication Reminder Bottle Cap
IRBEP/PP/39	Vaishnodevi.S	Hearing Aid Systems for Impaired People
IRBEP/PP/40	Natarajan. K	Collagen as a Bio-Material

IRBEP/PP/41	Dr.N.Buveneswari <sup>a*</sup> , R.Razim Meeran <sup>b</sup> and P.Saisantosh <sup>c</sup>	Adsorption of Cationic Malachite Green and Anionic Methyl Orange Dyes on Silica
IRBEP/PP/42	Sureshkumar.G	Nanorobots for Laparoscopic
IRBEP/PP/43	Azhaguraja	Synthesis of Aluminium Nanoparticles from <i>Tagetes Erecta</i> and their Antimicrobial Activity
IRBEP/PP/44	Vennila. B	Degradation of Feather Waste by Bacteria Isolated from Poultry Farm Soils
IRBEP/PP/45	R.Subbaiya, R. Karamachand	Recent trends in food preservation
IRBEP/PP/46	S.Surya and Tamilselvi	Design and implementation of safer cards via RFID security
IRBEP/PP/47	Lekshmi	Waste management
IRBEP/PP/48	A.Ahamed Masood and V.Bala Krishnan	Alternate fuel-Jatropha oil (performance analysis using kirloskar engine)
IRBEP/PP/49	P.Karthika and Dr. L. Uthira	Association between bone mineral density and lean body mass among adolescent and effect of intervention
IRBEP/PP/50	Dr.T.Subramani	Study of air pollution due to magnesite in Salem town

## Advances in Transgenesis and Genome Engineering: Applications in Agriculture and Forestry Crops

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### Abstract

Transgenesis is the process of introducing genes from an organism to an unrelated organism so as to genetically modify it to express a desired character that is inherited to its progeny. Transgenic technology has expanded the plant breeder's repertoire of tools for imparting desired traits. However, unfounded fears of the consequences of using the newer genetic modification technologies have resulted in their slower adoption. Cisgenics have therefore, been proposed as a more acceptable technology for rapid introgression of desired traits. Cisgenesis refers to the introduction of exogenous genes from a wild relative of the same species.

In plants, transgenesis/and cisgenesis have relied on *Agrobacterium* mediated and biolistic approaches. *Agrobacterium tumefaciens* is however, less effective on monocotyledons and woody species. Transformed individual cells need to regenerate into whole plantlet to produce a non-chimeric transgenic plant. The poor transformation efficiency necessitates the use of selectable marker genes that confer resistance to an antibiotic or herbicide or confers a metabolic advantage on transformed cells in the presence of a nontoxic selective agent. Screenable markers like GUS and GFPs permit identification of transgenic plants in the absence of a selective agent. Several strategies have been developed to remove selectable markers after they have served their function. Techniques like molecular markers need to be used to confirm that the transgenics are essentially similar to the parent variety with respect to all the other traits. Molecular farming using transgenic plants are considered potent and cost effective strategies for production of therapeutic proteins like vaccines and antibodies.

While early transformation technologies enabled inter-kingdom transfer of genes, new tools were developed for knock-down and knock-out of native genes enabling applications in generating plants with desired traits in addition to their use in reverse genetics approaches for functional characterisation of genes. Suppression of undesirable native genes have been successfully used in developing Cassava with low cyanogenic glucoside (linamarin), tomato with reduced allergen (Lyc e3), gossypol free cotton seeds, mustard pods with reduced shattering, and tobacco with reduced normicotine. Enhancing virus, insect and nematode resistance in plants have also been made possible due to these technologies. Knock down of genes via RNA interference (RNAi) approaches has thus far been the most widely used technique for gene silencing in plants. Application of RNAi in plants has been made possible through transformation vectors that generate double stranded hairpin RNA. RNAi relies on the cyclic generation of double stranded RNA and small interfering RNAs that effect destruction of cognate mRNA molecules in the cytoplasm using cellular components. RNAi has been shown to have systemic effects. The effectiveness of gene silencing by dsRNA over sense or antisense RNA was first demonstrated in *Caenorhabditis elegans* by Fire and others, in 1988.



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While knock down of genes using RNAi approaches disrupts gene expression without actually mutating the DNA of interest, gene knock techniques rely on specifically mutating the genes. Earlier techniques like insertional mutagenesis for generating gene knockouts were labour intensive. Recent years have witnessed the development of genome editing technologies like Zinc Finger Nucleases, TALENS (TALE effector nucleases) and CRISPER- Cas 9. Genome editing technologies rely on generation of double stranded breaks that are repaired by the error-prone Non-Homologous End Joining (NHEJ) repair pathway resulting in introduction of mutations and loss of function. The endonuclease domain of the type II restriction enzyme, FokI, fused to different DNA-binding domains such as Zinc fingers or the Transcription Activator Like Effectors enabled targeting mutations in the desired gene sequences. However, these techniques were not widely adopted due to the complexity in designing these nucleases for targeting specific sequences. The year 2012 saw the unravelling of the mechanisms of the CRISPR (Clustered regularly interspaced short palindromic repeats)/Cas (CRISPR- associated system), enabling harnessing of the RNA directed Cas9 system to introduce double stranded breaks at desired DNA sequences in the genome. The genome editing based on programmable RNA in a CRISPR/Cas system rather than a protein programmable system used in ZFNs and TALENs has enabled its rapid adoption for research on curing human genetic disorders. These technologies have a number of applications in genetically modifying trees for desired traits. Ongoing programmes at the Institute of Forest Genetics and Tree Breeding, Coimbatore, include techniques of transgenesis and RNAi for gene function analysis and genetic modification for enhancing salt tolerance, improving insect pest tolerance, modifying wood properties for a more environment friendly pulping, in addition to applications of hairy root transgenics for secondary metabolite production from roots of medicinal trees.



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Invited Lectures

IRBEP/PL/02

## An Overview of Information Based Drug Discovery Process

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### Abstract

Pharmaceutical and Biotech industry employs various methods of bioinformatics and computational chemistry for research and development of products. We will review some of the practical aspects of using bioinformatics and chemo informatics approaches to drug discovery paradigm. A general outline of the drug discovery process will be followed by the problems faced with pharmaceutical and biotech industry in the dried up drug discovery pipeline. Major hurdle in drug discovery is identification of validated targets. The present method has components from literature data curation, pathway elucidation, system biology and hypothesis generation towards validation in different in vivo models. This will improve many folds with the ongoing revolution in the Next Generation Sequencing efforts and possible access to quality tissue samples. Once a target is identified, we will discuss how to prioritize, optimize and apply different molecular modeling approaches for discovery of modulators. This includes assimilation and analysis of public/ patent literature data. Importance of target sequence analysis at global and putative binding site for specificity issues will be addressed. Target homology and plasticity analysis at the binding pocket when X-ray crystal structures with several ligands are available for molecular design and screening will be illustrated. Generation of hits from screening chemical libraries focused chemical library design and screening, structure based screening, pharmacophore based screening, lead generation from SAR, and lead optimization by SAR will be outlined. Examples of success in generation of hits, leads and optimized leads achieved in various drug discovery projects will be summarized.

Invited Lectures

IRBEP/PL/03

## Role of Biomedical Engineering in Healthcare

**Dr. M. C. Jobin Christ**

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### Abstract

In the industrialized nations, technological innovation has progressed at such an accelerated pace that it has permeated almost every facet of our lives. This is especially true in the area of medicine and the delivery of health care services. Although the art of medicine has a long history, the evolution of a technologically based health care system capable of providing a wide range of effective diagnostic and therapeutic treatments is a relatively new phenomenon. Of particular importance in this evolutionary process has been the establishment of the modern hospital as the centre of a technologically sophisticated health care system. Since technology has had such a dramatic impact on medical care, engineering professionals have become intimately involved in many medical ventures. As a result, the discipline of biomedical engineering has emerged as an integrating medium for two dynamic professions, medicine and engineering, and has assisted in the struggle against illness and disease by providing tools (such as biosensors, biomaterials, image processing, and artificial intelligence) that can be utilized for research, diagnosis, and treatment by health care professionals. Thus, biomedical engineers serve as relatively new members of the health care delivery team that seeks new solutions for the difficult problems confronting modern society. The purpose of this article is to provide a broad overview of technology's role in shaping our modern health care system, highlight the basic roles biomedical engineers play, and present a view of the professional status of this dynamic field.

Many of the problems confronting health professionals today are of extreme importance to the engineer because they involve the fundamental aspects of device and systems analysis, design, and practical application—all of which lie at the heart of processes that are fundamental to engineering practice. These medically relevant design problems can range from very complex large-scale constructs, such as the design and implementation of automated clinical laboratories, multiphase screening facilities (i.e., centers that permit many tests to be conducted), and hospital information systems, to the creation of relatively small and simple devices, such as recording electrodes and transducers that may be used to monitor the activity of specific physiological processes in either a research or clinical setting. They encompass the many complexities of remote monitoring and telemetry and include the requirements of emergency vehicles, operating rooms, and intensive care units.

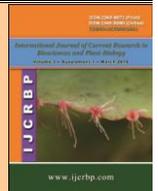
Biomedical engineers may become involved, for example, in the design of a new medical imaging modality or development of new medical prosthetic devices to aid people with disabilities. Although what is included in the field of biomedical engineering is considered by many to be quite clear, many conflicting opinions concerning the field can be traced to disagreements about its definition. For example, consider the terms biomedical engineering, bioengineering, biological engineering, and clinical (or medical) engineer, which are defined in the Bioengineering Education Directory. Bioengineering is usually defined as a basic-research-oriented activity closely related to biotechnology and genetic engineering, that is, the modification of animal or plant cells or parts of cells to improve plants or animals or to develop new microorganisms for beneficial ends. In the food industry, for example, this has meant the improvement of strains of yeast for fermentation. In agriculture, bioengineers may be



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concerned with the improvement of crop yields by treating plants with organisms to reduce frost damage. It is clear that bioengineers for the future will have tremendous impact on the quality of human life. The full potential of this specialty is difficult to imagine. Typical pursuits include the following:

- Development of improved species of plants and animals for food production
- Invention of new medical diagnostic tests for diseases
- Production of synthetic vaccines from clone cells
- Bioenvironmental engineering to protect human, animal, and plant life from toxicants and pollutants
- Study of protein-surface interactions
- Modeling of the growth kinetics of yeast and hybridoma cells
- Research in immobilized enzyme technology
- Development of therapeutic proteins and monoclonal antibodies

The field of biomedical engineering now includes many new career areas. These areas include:

- Application of engineering system analysis (physiologic modeling, simulation, and control to biological problems)
- Detection, measurement, and monitoring of physiologic signals (i.e., biosensors and biomedical instrumentation)
- Diagnostic interpretation via signal-processing techniques of bioelectric data
- Therapeutic and rehabilitation procedures and devices (rehabilitation engineering)
- Devices for replacement or augmentation of bodily functions (artificial organs)
- Computer analysis of patient-related data and clinical decision making (i.e., medical informatics and artificial intelligence)
- Medical imaging; that is, the graphical display of anatomic detail or physiologic function
- The creation of new biologic products (i.e., biotechnology and tissue engineering)

Typical pursuits of biomedical engineers include:

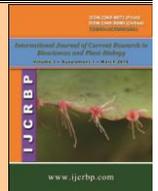
- Research in new materials for implanted artificial organs
- Development of new diagnostic instruments for blood analysis
- Writing software for analysis of medical research data
- Analysis of medical device hazards for safety and efficacy
- Development of new diagnostic imaging systems
- Design of telemetry systems for patient monitoring
- Design of biomedical sensors
- Development of expert systems for diagnosis and treatment of diseases
- Design of closed-loop control systems for drug administration
- Modeling of the physiologic systems of the human body
- Design of instrumentation for sports medicine
- Development of new dental materials
- Design of communication aids for individuals with disabilities
- Study of pulmonary fluid dynamics
- Study of biomechanics of the human body
- Development of material to be used as replacement for human skin



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Biomedical engineering involves training essentially three types of individuals: (1) the clinical engineer in health care, (2) the biomedical design engineer for industry, and (3) the research scientist. Currently, one might also distinguish among three specific roles these biomedical engineers can play. Each is different enough to merit a separate description. The first type, the most common, might be called the “problem solver.” This biomedical engineer (most likely the clinical engineer or biomedical design engineer) maintains the traditional service relationship with the life scientists who originate a problem that can be solved by applying the specific expertise of the engineer. For this problem-solving process to be efficient and successful, however, some knowledge of each other’s language and a ready interchange of information must exist. Biomedical engineers must understand the biological situation to apply their judgment and contribute their knowledge toward the solution of the given problem as well as to defend their methods in terms that the life scientist can understand. If they are unable to do these things, they do not merit the biomedical appellation.

The ultimate role of the biomedical engineer, like that of the nurse and physician, is to serve society. This is a profession, not just a skilled technical service. To use this new breed effectively, health care practitioners and administrators should be aware of the needs for these new professionals and the roles for which they are being trained. The great potential, challenge, and promise in this endeavor offer not only significant technological benefits but also humanitarian benefits.



## **A Detailed Study on *Rhizopus oryzae* Mediated Synthesis of Silver Nanoparticles and Its Antibacterial Effects on *Escherichia coli* and *Pseudomonas aeruginosa***

**R. S. Subhasree, Priyadarshani Choudhary, B. Ramalingam, T. Paranthaman and Sujoy K. Das**

Biological Materials Laboratory, CSIR-Central Leather Research institute, Adyar, Chennai-600 020, Tamil Nadu

### **Abstract**

The evaluation of interactions of silver nanoparticles (AgNPs) with bacteria and understanding the bactericidal mechanism is very critical for advanced biomedical applications. The synthesis of AgNPs was carried out *via* green chemical approach. *In situ* bioreduction of silver nitrate (AgNO<sub>3</sub>) was achieved utilizing protein extract of *Rhizopus oryzae* without using any exogenous chemical agent. The as-synthesized AgNPs was characterized by UV-Vis spectroscopy, high resolution transmission electron microscopy (HRTEM), dynamic light scattering (DLS) and FTIR spectroscopy. The size of AgNPs were in the range of  $7.1 \pm 1.2$  nm as measured from HRTEM, whereas DLS study demonstrated the average hydrodynamic size of AgNPs was  $9.1 \pm 1.6$  nm. The antibacterial efficacy was evaluated against Gram-negative bacteria such as *Escherichia coli* and *Pseudomonas aeruginosa* and the efficiency was observed in a dose-dependent manner exhibiting 100% killing when the cells were treated with 4.5 and 2.7  $\mu\text{g/mL}$  AgNPs, respectively. In addition, AgNPs induced the intracellular reactive oxygen species (ROS) production, which suppressed the antioxidant defence and exerted mechanical damage to the membrane of these bacteria. The binding of AgNPs on the cell wall also resulted in surface charge neutralization and altered cell membrane permeability causing non-viability of the cells. The alteration of ultra-structural and nano-mechanical properties of the cell surface following interaction with AgNPs was clearly revealed from Atomic Force Microscopy (AFM) studies. FTIR spectroscopic analysis further demonstrated that cell membrane of the treated cells underwent an order-to-disorder transition during the killing process and chemical composition of the cell membrane including fatty acids, proteins, and carbohydrates was decomposed following interaction with AgNPs.



Invited Abstracts

IRBEP/OP/02

## **A Study on Chemical Constituents, Antioxidant, Antimicrobial and Anti-cancerous Properties of *Gmelina arborea* Roxb. from Different Agro-silviculture Regions**

**S. Ishwarya<sup>1</sup> and M. Sridevi<sup>2</sup>**

<sup>1</sup>IV-Year Student, Department of Biotechnology, Vinayaka Missions Kirupananda Variyar Engineering College, Salem-636 308, Tamil Nadu

<sup>2</sup>Professor & Head, Department of Biotechnology, Vinayaka Missions Kirupananda Variyar Engineering College, Salem-636 308, Tamil Nadu

### **Abstract**

*Gmelina arborea* (Common name: Gamhar; Family: Verbenaceae) is a fast growing deciduous tree species that occur throughout the peninsular India. It is one of the highly cultivated plant species and is renowned as a traditional Indian medicinal plant with notably high pharmacological activity. The present study focuses on to elicit the phytochemical constituents, antioxidant, antimicrobial and anticancer properties of different parts of the plant from various agrosilviculture regions. Leaf, bark, twig and root samples from each tree were collected from four different agrosilviculture zones and extracts was prepared with methanol and n-hexane. Phytochemical characterization revealed the presence of alkaloids, saponins, tannins, phenols, sterols and terpenoid. Bark has high concentrations of phytochemicals except for saponins which was observed significantly high in leaf (8.26mg/g) and was followed by root (7.79 mg/g). Tannin was comparatively high in twigs (3.10 mg/g). By employing differential chromatography techniques secondary metabolites were separated and tested for free radical scavenging activity by various assays. These phytochemicals can be having antagonistic activity against forest and human pathogens and also could have a substantial anticancerous property that is to be yet tested on this study. These biological properties of bioactive compounds can stand as a guide to explore in the field of pharmacology for drug development against certain tropical contagious diseases.



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Invited Abstracts

IRBEP/OP/03

## Comparative Analysis of Heat Shock Proteins

**Auwalu Muttaka, Yusif Ado Usman, Shamsiyya Mohammad Sani and Preeti Bajaj**

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### Abstract

The heat shock proteins (HSPs) are highly conserved and expressed in a small quantity under normal condition in all organisms. They expressed due oxidative stress, electric shock, some diseased condition and variation of temperature etc. Knowledge of heat shock proteins (HSPs) play significant roles in posttranslational modification of proteins, cell growth and viability as well as targeting cancer cell survival, proliferation and its resistance to therapy. The HSPs were classified into Hsp100, Hsp90, Hsp70, Hsp60, Hsp40 and small heat shock proteins (sHsps) based on their molecular weights and functions. However, the function of one HSP is directly or indirectly related to others. Several researches were carried out about a particular heat shock protein but up-to-date there is no single paper that compare and contrast the entire families of these novel proteins. This reviewed paper compared and assessed various families of heat shock proteins with the help of latest research papers.



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Invited Abstracts

IRBEP/OP/04

## Effects of Fluoride and Its Biomarkers

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### Abstract

Fluoride is the 13<sup>th</sup> most abundant element in the earth's crust. F has a high affinity for mineralized tissues, can be found in teeth and bone and it is proved to prevent dental Caries. Fluoride is often called as a "Double-edged sword", as deficiency and excess cause's deleterious effects in the body. Fluoridation of drinking water, release of man-made industrial fluoride compounds in environment, use of aluminium flocculating agents in water treatment plants, use of fluoride in industry, agriculture and medicine resulted in the ill effects of fluoride in living beings. Fluoride has a role on blood cells, hepatocytes, photoreceptor cells, heart cells, lung endothelial cells, brain cells and bone cells. Fluoride is absorbed from gastrointestinal tract and is seen in body fluids in different concentration in plasma, saliva, urine, chord plasma, amniotic fluid and mother s milk. Increased fluoride level in the body causes dental and skeletal fluorosis, nephrotoxicity, psychiatric and mental disturbances, deficient intelligence quotient, disturbance in the function of pineal gland, thyroid gland and testes. Fluoride biomarkers are classified into contemporary markers, recent markers and historic markers. The main historical biomarkers that could indicate total fluoride body burden are bone and dentin. The concentrations in urine, plasma and saliva reflect the fluoride concentrations during the recent hours. The concentrations in hair and nail reflect the average plasmafluoride concentrations over time. Different fluoride markers may aid in the prevention of future disease in the population by providing reasonable evidence of impending disease at early stage.



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Invited Abstracts

IRBEP/OP/05

## Osmotic Dehydration of Coconut

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### Abstract

Coconut (*Cocos nucifera* L.) being one of the most important crops in the tropical countries and is an integral part of *Asian cuisine*. Fresh coconut meat is naturally sweet. Studies conducted for preservation scraped coconut by addition of humectant to control water activity and preserve the colour. Due to the lipase activity and free fatty acids coconut gets spoiled as soon as possible. In this project study the activity of lipase enzyme is inactivated by steam blanching for 90°C for 5 mins. Blanched coconuts are mixed with saturated humectant solution (sucrose and sorbitol) of 30, 50 and 70% of the total weight of scrapped coconut. The humectant drives out the water molecules from the produce and reduces the water activity to a safe level. Due to osmotic process the remaining water molecules were replaced by sugar molecules. Table sugar and novel sugar were selected for the osmotic process. Even though the colour was maintained in the packed, the effect of rancidity problem during shelf life extension of coconut in refrigerated condition could not be addressed. The further work is to eliminate rancidity and nutritional analysis during the storage period of coconut.



Invited Abstracts

IRBEP/OP/06

## Identification and Analysis of Potential Micro RNA Transcripts and their Target Genes in the *Eucalyptus* Gall Inducing Pest, *Leptocybe invasa* Fisher & La Salle (Hymenoptera: Eulophidae)

**Yamini Kommi, Rathish Prabhakaran, Balasubramanian Aiyar, John Prasanth Jacob and Mathish Nambiar-Veetil**

*Institute of Forest Genetics and Tree Breeding, Coimbatore-641 002, Tamil Nadu*

### Abstract

*Leptocybe invasa* is a major gall inducing pest of Eucalyptus. MicroRNAs (miRs) play a crucial role in insect growth and development, and are therefore potential targets for insect control. Transcriptome sequence analysis identified 31 potential miRs encoded by *L. invasa*. Of these, 10 *L. invasa* miRs that had mature region in stem-loop structure, along with 10 insect origin miRs were analysed to show that *L. invasa* transcripts have multiple microRNA Recognition Elements (MRE) for different miRs and that all miRs have target sites in multiple genes. lin-mir-3p-6273 was identified as a potential miR that regulates 262 genes in *L. invasa*.



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Invited Abstracts

IRBEP/OP/07

## Nutrition and Community Health

**Zaitun Mahmud Aminu, Dr. P. Nazni (Associate Professor), Binku Mondal, Naushaba Rasheed, Dibya Toppo, P.S. Adhiyamaan and Bala Sundari**

*Department of Food Science and Nutrition, Periyar University, Salem -636 011, Tamil Nadu*

### Abstract

The health status of every community depends directly or indirectly on the nutritional status of that community. This is especially more obvious in primitive communities of under developed or developing countries. Most of the disease prevalence in such communities is related to deficiencies of important nutrients in the body of individuals within the community. Communities that are at a balanced nutritional status are nearly disease-free. Nowadays, various researches have shown how diets influence health status of a community. To assess the health status of a community, the nutritional assessment should be carried out. The method of assessing nutritional status of a community is divided into two; Direct and Indirect methods. This paper is focused only on the direct methods of nutritional assessment which include Anthropometric assessment, Biochemical assessment, Clinical assessment and Dietary assessment. Genetically Modified Crops (GMCs) may be used as a tool of tackling nutritional problems in a community, although use of such biotechnological methods is still not accepted worldwide especially in the developing countries.



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Invited Abstracts

IRBEP/OP/08

## Comparative Studies on Different Growth Hormone Levels for the Production of Rapid Growth Sugarcane

**S. Priyasharshini and G. Arthi**

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### Abstract

Sugarcane belongs to the grass family Poaceae. Sugarcane (*Saccharum officinarum*) is an important sugarcane variety in Tamilnadu. *Saccharum officinarum* species is widely cultivated in India because of high sucrose content. In our present study sugarcane production is carried out through micro-propagation with different combination of auxins by using meristem tip culture Method. In this method shoot proliferations were observed by using four different combination and concentration of BAP and kinetin containing in MS medium. The minimum and maximum concentrations of BAP and kinetin ranged from 0.2mg to 0.5mg and 0.010 mg to 0.066mg respectively. After 15 days the media has to be changed. The enhanced R4 medium is used for root growth. In R4 medium different combination and concentration of IBA and NAA has been carried out. During this study the growing levels were studied and thus resulting in identifying the best combination for cultivation of sugarcane with “Less days and More growth”.



## Comparative Study of Linalool Extracted from *Coriandrum sativum*, *Mentha sp.* and *Murraya koenigii* for Antifungal and Insecticidal Activity

**D. Gowshiga and V. Vishnu Priyan**

Department of Biotechnology, K.S.Rangasamy College of Technology, Tiruchengode-637 215, Tamil Nadu

### Abstract

Linalool, a monoterpene alcohol, is a major volatile component found in many flowers and species plants, herbs, fruits with many commercial applications, the majority of which are based on its pleasant scent. The essential oil from aromatic plants are the most part lend themselves to several methods of extraction such as hydro distillation, water and steam distillation and solvent extraction. In this study the linalool was extracted from three different plants leaves such as *Coriandrum sativum*, *Mentha sp.* and *Murraya koenigii* by hydro-distillation method. The calorimetric determination of linalool from *Coriandrum sativum*, *Menthamiaceae* and *Murrayakoenigii* showed the quantity of 0.63mg/ml, 0.45mg/ml and 0.23mg/ml respectively. Linalool has antimicrobial, antibacterial, antifungal and antiviral effect as well as anti-inflammatory, analgesic and local anesthetics activities. Therefore the linalool extracted from *Coriandrum sativum*, *Mentha sp.* and *Murraya koenigii* were tested for its antifungal and insecticidal activity against the fungus namely *Aspergillus spp.*, *Fusarium spp.* and *Sitophilus granaries* obtained from food grains. The result showed that the linalool extracted from all the three plant leaves were more effective against the fungus and the insect. A pink colour spot was visualized in the TLC plate with  $R_f$  values as measured as 0.36, 0.37 and 0.39 for *Coriandrum sativum*, *Mentha sp.* and *Murraya koenigii* respectively.



## Characterization of Protease and Lipase from *Bacillus Subtilis* for the Removal of Fatty Stains in Fabrics: Evaluation as Detergent Additives

**K. Sanjay Kumar**

B. Tech. Biotechnology, Department of Biotechnology, K.S.Rangasamy College of Technology, Tiruchengode-637 215, Tamil Nadu

### Abstract

Protease and lipase are the ideal enzymes suitable for manufacturing various detergents and other dish washing liquids. Production of these enzymes in a cheap and efficient method enables them most economically viable. These enzymes should be capable of tolerating and stable even in alkaline conditions. Combination of these enzymes can increase the activity and stability of detergents to remove the proteinaceous and fatty stains. This will increase the proteolytic and lipolytic than the chemically synthesized detergents or other stain removing liquids. *Bacillus* spp. is widely found in the environment. They are known to produce both intracellular and extracellular enzymes. In this study, the protease and lipase enzymes are produced from *Bacillus subtilis* and their proteolytic and lipolytic activity is studied to determine the capacity to act as a detergent additives.



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*Invited Abstracts*

IRBEP/OP/11

## Mobi Heart Rate Monitoring Device

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### Abstract

Heart Attack is the one of the main problem that human beings are facing today. The proposed Mobi heart rate monitoring device can detect heart attack symptoms at very initial stage itself, this device study heart rate monitoring, frequency range study, temperature monitoring, Spo2 monitoring and even navigation system is also added which will allow the user to get the direction to reach the destination and vibration alert with arrow indication in the LCD display, when change of direction needed also available in Mobi pocket device.



## Studies on *Pythium* Control Using Chitinase Extracted from Microbes of Turmeric Rhizosphere Soil

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### Abstract

Microorganisms which secrete complex of mycolytic enzymes are considered to be possible biological control agents of plant diseases. Since chitinases are digestive enzymes that break down glycosidic bonds in chitin. In this study, a chitinase enzyme produced by the chitinolytic microorganism is isolated from turmeric plantation soil sample and it was identified by staining techniques, plating on selective media, biochemical characteristics and 16s rRNA sequence. The microorganism showed highest chitinolytic activity in colloidal chitin agars that degrade chitin by forming the zone of clearance. The production of chitinase by microorganisms was optimized under different media, substrate concentration and incubation period. The maximum chitinase production was observed in Luria Bertaini Broth amended with colloidal chitin at pH 7.0 and temperature 35°C after four days of incubation. The enzyme was partially purified by dialysis method. The chitinase has antifungal activity against the plant pathogen, *Pythium spp.*



*Invited Abstracts*

IRBEP/OP/13

## **Antibacterial Activity of *Oxystelma esculentum* Leaf (Alkaloids) Extracts against Some Human Pathogenic Bacterial Strains**

**S. Ananth Kumar and R. Rajadurai**

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### **Abstract**

Present communication consolidates information on antibacterial activity of the crude leaf extracts and alkaloid extracts of *Oxystelma esculentum* tested against some isolated human pathogenic bacterial strains such as *Shigella sonnei* - G - ve (human enteric infectious disease), *Salmonella typhi* - G -ve (typhoid fever), *Escherichia coli* G +ve (gastroenteritis, urinary tract infections, and neonatal meningitis). The plant extracts (prepared in methanol) using four different concentrations (10, 20, 30 and 40 Conc) were tested for their antibacterial activity. Maximum inhibition was obtained by alkaloid extracts of the plant when compared to the crude plant extracts.



## Tender Coconut Water as a Functional Blended Beverage

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### Abstract

Tender coconut water is a ready to serve blended beverage. It is one of the highest sources of electrolyte. It contains sugar, vitamins, minerals, potassium, magnesium, fiber, proteins and antioxidants. Pulsed electric field is a non-thermal process that involves the usage of high voltage pulses to a fluid medium flowing between a pair of electrode. Thermal processing is a mild heat treatment. It is used for inactivation of microorganism and enzymes at 96°C for 360 s. The developed blended beverage is processed using pulsed electric field with 31 kV/cm of electric field, pulse width of 20 and frequency of 100Hz are used to minimise the losses in nutritional and sensory attributes. Pulsed electric field is compared with the conventional thermal pasteurization. High pressure carbon dioxide (HPDC) for the reduction of microbes without change in the physical and chemical analyses and compared to heat pasteurization. Thermal treatment pasteurization with the *p*-value of 8.03. The significant value  $p < 0.05$  is showed in the thermal pasteurization i.e, decrease in colour value, radical scavenging activity and over all acceptability after treatment and also during storage. PEF treatment also achieved  $3.01 \pm 0.69$  log inactivation. Pulsed electric field treated tender coconut water was stable upto 120 days under ambient storage condition. HPCD resulted in a reduction of volatile fraction.



Invited Abstracts

IRBEP/OP/15

## Hepatoprotective Studies of Methanolic Leaf Extract of *Barringtonia acutangula* (L.) against Carbon Tetrachloride Induced Liver Injury in Wistar Rats

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### Abstract

Physiological activities of liver result in the generation of highly reactive free radicals and various biochemical reactions make liver cells prone to attack and necrosis also excessive release of reactive oxygen species results in the organ damage. Herbal drugs plays important role as antioxidant in the management of various liver disorders which can even speed up the natural healing processes of the liver. *Barringtonia acutangula* L. an evergreen tree of moderate size was used in various indigenous systems of medicine against several diseases and almost every part of the plant has diverse pharmacological properties. The hepatoprotective property of this plant extracts was analysed in this study in which leaf extracts were obtained using methanol further phytochemical and antioxidant properties were analysed. *In vivo* studies were carried out for hepatoprotective studies on CCl<sub>4</sub> induced liver damage following histopathological studies of rat liver tissues to support the induction of hepatoprotective efficacy. The grouping of animals consists of 6 rats per group in which group I has CCl<sub>4</sub> induced rats treated with Silymarin (100 mg/kg b.w) for 30 days, group II and III has CCl<sub>4</sub> induced rats treated with methanolic extract of *Barringtonia acutangula* (250 mg/kg b.w) and (500 mg/kg b.w) for 30 days. Then, potential of the plant extract over DNA damage from serum of animal models was analyzed.



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Invited Abstracts

IRBEP/OP/16

## Extraction and Purification of Secondary Metabolites from the Lichen *Roccella montagnei* for the Evaluation of Antimicrobial Activity

**S. Shanmuga Priya and S. Poornima**

Department of Biotechnology, K.S. Rangasamy College of Technology, Tiruchengode-637 215, Tamil Nadu

### Abstract

Lichens are composite organisms consisting of a symbiotic association of a fungus with a photosynthetic partner usually either a green algae or cyanobacterium. These produce a great variety of secondary metabolites which exhibit various biological activities. The aim of this study was to extract and purify secondary metabolites from lichen *Roccella montagnei* by using chromatographic techniques. The solvent system for column chromatography was optimized at different ratios by using TLC in order to obtain pure compounds separately. The purified compounds were further analyzed for its antimicrobial activities against human clinical pathogens and those results may be helpful in future industrial production of antibiotic for biomedical applications.



*Invited Abstracts*

IRBEP/OP/17

## Removal of Dyes from Aqueous Solution Using Low Cost Magnetite/Activated Carbon Composite Bio-sorbent

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### Abstract

Textile industries are growing day by day with increasing population. One of the major problems concerning textile wastage is their colour effluent. Dyes are used from ancient times as a colouring material in clothes as well as artificial colorants to various food products. Excess and waste dyes are mainly dumped into aquifer which shows detrimental effect to the environment and living organisms. Various chemical adsorbents and few agricultural waste materials are used as adsorbents for their removal which includes neem sawdust, cellulose, bacteria and fungi, groundnut shell, coconut husk, banana peel, garlic peel and many more. We report Crystal Violet (CV) and Methylene Blue (MB) removal by a bio-sorbent. This novel adsorbent was prepared in laboratory from *Cassia/Senna siamea* leaves. The adsorbent was characterized for presence of functional groups and nature of bonding with adsorbate using various techniques. Batch studies were conducted to evaluate the effect of adsorbent dose, contact time, pH, agitation speed, and change in concentration at  $30\pm 2^\circ\text{C}$ . This bio-adsorbent has a capacity of 80% dye from 30 ppm stock solution. All adsorption experiment was carried out in orbital shaker at 150 RPM. Absorbance was measured in UV-Vis Spectrophotometer. Equilibrium was achieved in 60 minutes. Adsorption isotherm and kinetics experiments have been carried out. It was found that adsorption process follows pseudo second order model. These bio-adsorbent are very effective as they are eco-friendly and cost effective.



Invited Abstracts

IRBEP/OP/18

## Performance of the Effluent Adapted Bacteria in Degradation of Dyeing Industry Effluent with Sequential Batch Reactor

**K. Vinoth**

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### Abstract

The study focuses on biodegradation of the dyeing effluent by bacterial consortium in sequencing batch reactor system. The effluent samples were collected at discharge point using a sterile plastic container from Common Effluent Treatment Plant, Karur, India. The characteristics of the effluent were studied immediately after collection. BOD was found to be 2300 mg/l. COD value obtained as 15000 mg/l and other major effluent parameters like Chloride-6900 mg/l, Hardness -600 mg/l, pH 9.45, sulphate -370 mg/l were found. The predominant native microbes present in the textile dyeing effluent were identified, isolated mass cultured and their degradation efficiency was analyzed for every 24 hours. Among the four predominant such as *Alcaligenes* sp., *Pseudomonas* sp., *Streptococcus* sp. and *Micrococcus* sp. *Micrococcus* sp. showed high biodegradation activity compared to other species in 48 hours. The different microbial consortium was developed by mixing the predominant microbes present in the effluent. Among the five consortia, the consortium of *Alcaligenes* sp., *Pseudomonas* sp., *Streptococcus* sp. and *Micrococcus* sp. *Micrococcus* sp. had higher degradation efficiency. The degradation efficiencies of the selected consortia was studied in laboratory scale sequencing batch reactor (SBR) under different metabolic phases such as aerobic, anaerobic, combined anoxic/ oxic phase environments for 96 hours of Hydraulic Retention Time(HRT). The anoxic / oxic phase sequencing batch reactor with consortium of four bacteria had high removal efficiency on selected parameters of textile dyeing effluent.



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Invited Abstracts

IRBEP/OP/19

## Development of Probiotics from Mysore Raspberry

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Department of Biotechnology, Vinayaka Missions Kirupananda Variyar Engineering College,  
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### Abstract

Malnutrition and metabolic disorders are some of the common scenes found in the community health statistics. In India, more than 40% people suffer from undernutrition. In consequence of the malnutrition and changing global environment several diseases such as gastroenteritis, colo-rectal cancer etc are common among the masses. To adapt the pace of the modern corporate life the introduction of functional food is most needed. A functional food or drink is a multi-nutrient food supplement to supply the regular nutrient need of the body. The project aims at the development of a probiotic drink from Mysore raspberry. Strains of *Lactobacillus plantarum* and *Saccharomyces boulardii* are used for the fermentation of the drink and the development of the drink. The drink in association with the strains shall act as a typical probiotic drink for the smooth functioning of the metabolic activity. In addition to probiotic activity, the drink is also aimed at the prevention of colo-rectal cancer, gastroenteritis and immune modulatory effect in the body. The drink is to elevate the quality of food consumption in the community and fill the gaps between the deficiencies of the nutrition uptake at a low cost.



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Invited Abstracts

IRBEP/OP/20

## Utilisation of Pomace from Wine Industries

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### Abstract

China is the largest producer of grapes and is followed by Italy contributing 12-13 per cent of world's production. In present days Indian wine industry has the potential to be a global market competitor. At the same time the wastes that are produced from wine industry is huge and utilising the waste effectively is a challenging thing which every wine industry faces. Grape pomace wastes about 15 % as dry and about 22-45% as wet. In order to prevent such waste from wine industries, we have produced a value added product in the form of candy. We had analysed its nutritive property and is found to be more nutritive than the normal market candies which will be discussed in the paper in detail. We also did sensory evaluations on our product with various age groups. The preparation process is same as that of other candies available today. It acts as anti-inflammatory and it has many therapeutic applications like lowering the cholesterol level, preventing heart diseases, maintains the blood pressure etc.,. The production cost for this candy is also low. The end users can be more of children who love to eat candies. This will help in reducing pomace waste as well as it is converted into a product.



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Invited Abstracts

IRBEP/OP/21

## Automatic Pineapple Peeler Cum Slicer

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### Abstract

*Ananas comosus* is commercially known as Pineapple which is a tropical fruit. Pineapple peeling and slicing are very important in the industries like minimal processing industries like canning, ringing of pineapple, small scale industries, fruit pulp industries etc., It is crucial for food (processing) industry to operate at minimal operating cost. Peeling using hands is time consuming and may require several workers to perform the operation and thus may increase the operating cost. Peeling of pineapple is not very easy due to its thick skin. There are many automatic and semi-automatic equipments available for peeling the pineapple. But the major difference between this equipment and the existing machines is the capability of peeling and slicing automatically in a continuous manner. Therefore in this study, a machine was designed to combine the process of peeling and slicing in one device. This new designed machine is suitable to be used for industrial purpose. The machine comprises of the two pneumatic cylinders with different dimensions, solenoid valve, motor, lead screw setup, pushing plate, supporting frame, cutting cylinder, proximity sensor and knife. The prototype was tested for automatic peeling and slicing process and manual peeling and slicing was also performed for the pineapple. Yield of the prototype is about 26 seconds per fruit. During this operation 28% of the fruits weight is removed as waste and it could be used for methane production, citric acid production and it could also be used in production of the single cell protein.



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Invited Abstracts

IRBEP/OP/22

## Foam-Mat drying of Mint Leaf Juice

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### Abstract

Foam-mat drying is one of the methods to produce food powder with high nutritional value. The objective of the present study is to evaluate and optimize to produce mint leaf juice powder using foam mat drying method. For this purpose, foaming properties of mint juice was optimized using response surface methodology (RSM) and the effect of drying temperature was also investigated. Two different foaming agent and foam stabilizer is used to produce the powder from leaf juice. The independent variable for RSM were egg albumen (5-15%) and whey protein concentrate (2-6%) as foaming agent, carboxy methyl cellulose (CMC) as foaming stabilizer and whipping time (WT). The optimum condition for minimizing the foam density and foam drainage value and maximizing the foam expansion as responses were found to be foaming agent as egg albumen (10.15% w/w), CMC (0.68%) and WT (5.40 min) and foaming agent as whey protein concentrate (3.98%), CMC (0.82%) and WT (4 min). The drying of optimized foam was carried out in hot air drier at 3 drying temperature (40, 50 and 60°C). The physio chemical properties of mint juice powder like moisture content, pH, TSS, water absorption capacity, ash content and ascorbic acid were observed.



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Invited Abstracts

IRBEP/OP/23

## Studies on Anti-Fading Properties of Quercetin Extracted from Onion Peel in Fabrics

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### Abstract

Quercetin is a flavonoid found in many vegetables, fruits, leaves and grains. And the quercetin is an ideal flavonoid which is suitable for various purposes like antioxidants, strong anti-inflammatory effects, flavoring agents etc. Quercetin helps protect skin from the effects of disorders like dermatitis and photosensitivity. Onion (*Allium cepa* L.) is the widely used vegetable whose peel is mostly discarded. The peel of onion contains various flavonoids like pelargonidin, rutin, quercetin etc. Quercetin can increase the activity and stability as a dyeing agent. Onion peel is widely found in the environment as a common vegetable waste. The extracted quercetin serves as an organic dye which contains the anti-fading property and safer than the chemical dyes used in fabrics. In this present study Quercetin along with different mordants (copper sulphate, Zinc sulphate and Potassium dichromate), are used to test the anti-fading properties using cotton fabrics of Quercetin from onion peel were studied and used as an organic dye in fabrics.



## **A Study on the Formulation and Standardization of Bajra Flakes with its Nutrient and Microbial Analysis**

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<sup>2</sup>Food and Nutrition, School Nutritionist and Consulting Dietitian, Nutrihouse Diet Clinic, Salem, Tamil Nadu

### **Abstract**

Food is the prime necessity of life. The selection of food should be best suited for promoting good health. Millets are one of the oldest foods known to human and possibly the first cereal grain to be used for domestic purpose. In this study pearl millet was selected .the pearl Millet byproduct i.e. pearl millet flakes was selected and was subjected for nutritional analysis, microbial analysis. Various recipes were formulated in different proportions and receipes were standardized. Five south Indian receipes were selected and the products were formulated. The receipes selected for the study were Bajra flakes palpayasam, bajra flakes uppma, bajraflakes puttu, bajra flakes laddu and bajra flakes murrukku. Organoleptic evaluations were done using a five hedonic scale. The criteria analysed were appearance, color, flavour, texture and taste. The mean values were obtained and statistical analyses were done and results interpreted.



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Invited Abstracts

IRBEP/OP/25

## Millet Milk Ice Cream

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### Abstract

Most people have not even heard of millet; much less understand the benefits of millet nutrition. It is full of nutrients our body needs such as digest easily, act as prebiotic, is a smart carb with lots of fibre and low simple sugars. Because of this it has a relatively low glycemic index and has been shown to produce lower blood sugar levels than wheat or rice, its high protein content (15 percent) makes it a substantial addition to vegetarian diet etc. Millet has a host of nutritional benefits has a sweet nutty flavour and is considered to be one of the most digestible and non-allergenic grain. It contains eight essential amino acids. Barley is a great source of magnesium, potassium, selenium, phosphorous. Sorghum contains essential nutrients like iron, calcium, potassium, and phosphorous, B-vitamins like thiamin and riboflavin. Bajra high in protein as compared to other cereals, Ragi has a high content of protein and is an extremely good source of iron and calcium. Vargu Rice helps in controlling blood sugar and cholesterol, Samai is rich in phytochemicals and it has excellent antioxidant properties and dietary fibre protects against hyperglycemia. Kuthiravaali is rich in minerals and acts as antioxidant, dietary fiber lowers glycemic response. Protection from duodenal ulcers and colorectal cancers. Ice cream is a frozen food typically taken as snacks or dessert and everyone likes it, as the millets have lot of nutritional benefits by making ice cream everyone likes to have it.



## Synthesis of Magnetite Nanoparticles/Activated Carbon Composite Prepared from *Althea rosea* (Holyock) Leaves for the Removal of Crystal Violet and Methylene Blue Dyes from Aqueous Medium

**Abdulrahim Ibrahim, Abdussamad Mukhtar Muhammad, Sadiq Danladi Attahir and Naziru Alhassan Muhammad**

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### Abstract

Adsorption of dyes as a remediation technique for dye-loaded wastewater remains an area of interest. On the one hand, adsorption using bio-derived, renewable sorbent materials can be seen as environmentally friendly, on the other hand adsorption can provide us with a trouble-free and commercially cheap operation. The main objective of this Work is adsorption of the dyes Crystal Violet (CV) and Methylene Blue (MB) on activated carbon derived from *Althea rosea* leaves. For this purpose, activated carbon was prepared via chemical treatment of *Althea rosea* leaves with sulfuric acid ( $H_2SO_4$ ), phosphoric acid ( $H_3PO_4$ ), and nitric acid ( $HNO_3$ ), respectively, with subsequent carbonization through thermal treatment. Dye adsorption studies with this activated carbon were carried out under different conditions, and the influence of different parameters such as temperature, time, pH, dye concentration, dose and particle size of activated carbon (AC) was investigated in batch experiments. Furthermore, dynamic sorption experiments were performed successively. The present study found AC from *Althea rosea* leaves to be a promising low cost adsorbent to remove CV and MB from aqueous solutions.



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Invited Abstracts

IRBEP/OP/27

## Role of Water, Sanitation and Health in Developing Countries for Sustainable Development

**K. S. Harikrishna**

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### Abstract

Water's quality and quantity plays an important role in sustainable development. In water and sanitation perspective there is a consequence of imbalance does exist with respect to sustainable development. Public health involves water as an important constituent and there failure in supply of safe water will lead to a burden on the entries population. 21<sup>st</sup> century has witnessed a great advancement in wealth and development but it's quite less realized everywhere many countries still striving hard to access to meet the most basic human needs like food, shelter, safe drinking water and adequate sanitation. Current scenario conceals the various imbalances particularly with respect to sanitation coverage in rural and urban areas. The main challenges here lies is water scarcity and water governance in particular which in turn causes a serious threat to sustainable development goals. In the view of policy option for developing countries within the content of water, sanitation, sustainable development is a confusing concept primarily. This paper aims to summarize and evaluate the evidence of studies published in relation with water sanitation and health and to identify relevant solution to reduce public health. Improving water and sanitation services will evidently result in significant and gains in health and development of economy.



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Invited Abstracts

IRBEP/OP/28

## Optimization of Azo Dyes Degradation Using Biological Agents

**Rashmi Bhambhani and Kannan Natarajan**

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### Abstract

Synthetic dyes have a wide application in the food, pharmaceutical, textile, cosmetic and paper industries due to their ease of production, fastness and color variety as compared to natural dyes. Azo dyes are the largest group of dyes used in industry representing more than half of the annual production. Biodegradation is a cost-effective method to remove the residues of azo dyes prior to their discharge in wastewater streams from dye product industries. The objective of this work was to study the aerobic degradation of azo dye congo red and to optimize its degradation using Taguchi statistical method. Selected strains were screened for the ability to degrade congo red. The best strain was then optimized upon by free cell and immobilization studies. It was observed that *Bacillus spp.* was a suitable degrader in both free cell and immobilized state. It was also observed that the overall handling of the biological agent became much more convenient, and the risk of contamination was greatly reduced.



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Invited Abstracts

IRBEP/OP/29

## Carbon Buster

**K. Balaji and K. Raguraman**

*Mahendra College of Engineering, Salem, Tamil Nadu*

### Abstract

The carbon buster made up of more than 50% of recycled material. Capture more carbon dioxide than is emitted during its manufacture. use internally and externally above and below the ground and high level of air tightness, sound insulations and fire resistance .carbon buster blocks are suitable for using commercial and housing projects. It was founded in 1992 specializes in increasing the end use efficiency and decreasing the environmental Impact. This achieved not only by using carefully selected raw material but by incorporating lightweight aggregates, including graded wood particles, that sequester a large amount of carbon dioxide. Carbon foot print up to -14kg of carbon dioxide per ton. The includes the carbon pellets which are produced by combining carbon dioxide, sand, cement and water. The result is a unique aggregate that, when incorporated into lignacite's products, creates the first ever carbon negative building block.



## **Influence of Nutritional Elements on Morphological and Physiological Responses of Banana against Water Resistance**

**S. Aravinth and J. Philip Robinson**

Department of Biotechnology, K.S.Rangasamy College of Technology, Tiruchengode-637 215, Tamil Nadu

### **Abstract**

Water deficit is one of the most environmental stresses affecting agricultural productivity in the earth. It affects plant growth and productivity of banana is seriously restricted by water deficit. By inducing salicylic acid biotic and abiotic stress in plants. Polyethylene glycol induced water stress by adding MS media. Salicylic acid concentrations (0 and 1mM) and incubated on MS media containing different levels (0, 1, 2, 3 and 4%) of PEG *in vitro*. Whereas the *in vivo* leaf nitrate reductase activity and after hardening, the leaves sample were taken to perform estimation of proline compound, measurement of relative water content, chlorophyll content, free amino acid content, peroxidase and polyphenol oxidase activity. The water deficit condition analysed. Transfer the developed plants in rooting plants and polybags to transferring in field.



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Invited Abstracts

IRBEP/OP/31

## Green Building

**P. Arunsankar and M. Prasanth**

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### Abstract

Green building will be a major step for building sector for eco-friendly design and on energy and environmental concern and also human friendly. The term "Green" refers to environmental friendly and practices from building design to landscaping choices. It also optimist and economic energy use, water use and storm water and waste water reuse. Green buildings consume at least 40-50% of less energy and 20-30% of less water visa-versa conventional building. It shows that green buildings are more eco-friendly than the conventional building. The green building use 26% less energy, 54% less consumption 13% reduction in an aggregate maintenance, 27% of higher occupant satisfaction and 33% of carbon dioxide emissions. The fractures are energy efficient equipment for air conditioning and lighting systems and use of one site renewable energy it use nontoxic and recycled/recyclable material. Green building are rated by "GRIHA" (GREEN RATING FOR INTEGRATED HABITAT ASSESSMENT) is rating tool that people assesses the performance. "LEED" (LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN) which are planned, constructed, maintained and operated by LEED and some other criteria.



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Invited Abstracts

IRBEP/OP/32

## Potential of Vallarai in Indian Dairy Product Ghee

**E. Sri Akshya, M. S. Shivaswamy, Jony Blessing Manoj and N. M. Subhmanjari**

Department of Food Technology, Kongu Engineering College, Perundurai-638052, Tamil Nadu

### Abstract

The use of medicinal plants has been a central module of health care for centuries. Plants are always an exceptionally good source of drugs; many of the presently accessible drugs were directly extracted from plants. The curative properties of herbs have long been known and documented in ancient manuscripts, such as Sanskrit Rig Veda, Garuda Purana and Agni Purana. For example, use of *Centella* in food and beverages has increased over the years basically due to its health benefits such as antioxidant, as anti-inflammatory, wound healing, memory enhancing property and many others. Ghee, also known as clarified butter, is used to promote a healthy appetite and to nourish the body. It helps perform vital functions, including protecting the stomach wall from digestive acids, building and strengthening cell membranes and supporting nerve, skin and brain health. A product is hereby developed having ghee with added functional benefits by incorporation of blend of selected herbs. By optimization of herb powder and ripening process of cream, functional ghee with optimum physicochemical properties and sensory characteristic is obtained. The level of ingredients in the process is optimized due to which chiefly anti-tumorigenic, antioxidant, anti-inflammatory, hepatoprotective, and diuretic properties are obtained, apart from benefits like improvement in digestion, neural system, nervous system, immune system and physical stamina, reduction in dermal problems.



*Invited Abstracts*

IRBEP/OP/33

## **Physicochemical Properties and Sensory Characteristics of Multi Millet Ice Cream**

**B. Sudha, R. Kirankumar and E. Gunaseelan**

*Department of Food Technology, Kongu Engineering College, Perundurai-638052, Tamil Nadu*

### **Abstract**

The aim of this study was to investigate the production of multi millet ice cream using gelatinized multi millet flour. In this study the malted Finger millet, Pearl millet, Foxtail millet flours were taken at the ratio of 3:1:2 and gelatinized at 95°C with no hold. Multi millet ice cream was prepared by using a laboratory type freezer using gelatinized millet flour at 6%, 7%, 8%, 9% and 10% by weight of the mix and compared with control made by using vanilla flavouring. Serum point method is used to calculate the required composition for producing a mix size of 0.4Kg medium fat ice cream. The basic ice cream mix had 6% Fat, 11.5% MSNF, 14% sucrose, 0.25% stabilizers and 0.2% emulsifier. Addition of gelatinized multi millet flour increases total solids, acidity, flow time, specific gravity and decreases pH and melting rate with higher levels of addition. Incorporation of gelatinized malted millet flour effectively functioned as stabilizer, fat replacer and improves the nutritional value of the ice cream by enhancing micro and macro nutrients.



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Invited Abstracts

IRBEP/OP/34

## Experimental Analysis of Four Layered Lamina Bamboo Composite

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### Abstract

Bamboo is a grass and is one of the fastest growing plants on earth. Considering the structure, it is just like wood. A big difference is that in a short time bamboo might be useful for any kind of production. It is a strong material, very durable and comparative cheap. Because of its strength, it is possible to use bamboo as a fibre in composite materials. Dry bamboo culms of *Dendrocalamus strictus* were processed into thin laminas and cold pressed using epoxy resin to produce layered bamboo epoxy composite laminates. Mechanical properties of layered bamboo–epoxy composite laminates including tensile strength, compressive strength, flexural strength and screw holding capability have been evaluated. Mode of failure were identified at macroscopic level as suggested in ASTM standard and their mechanism were examined at microscopic level using SEM analysis of fractured surfaces under different type of tests.



## **Bio Formulation of Eco-friendly Fertilizer using Vegetable Waste and PGPR for the Establishment of Home Terrace Vegetable Farming**

**G. B. Shrinivasan**

*Department of Biotechnology, K.S.Rangasamy College of Technology, Tiruchengode-637 215, Tamil Nadu*

### **Abstract**

Domestic wastes from human and animal are considered to be an important factor in environmental pollution and public health. Solid wastes are most widely exposed to the environment by the developing and rural cities cause severe health problems as well pollution. Solid waste management is considered to be difficult process. The conventional methods for solid waste management such as Incineration, gasification, refuse derived fuel (RFD). Now a day's composting of wastes are being suitable method for handling of solid waste as efficient process and eco-friendly. Manipulation of these wastes as compost is a vital technique to provide rich nutrients for the plants as to make sustainable agriculture. The aim of this study is to investigate the solid waste to convert as bio fertilizer eco-friendly. In this current study innovative idea has to be implemented. The solid wastes such as vegetable wastes are collected from local hostels. They were dried and powdered then mix with curd at the ratio of 3:1(powder: curd) (w/v). Mixing of curd contains the lactobacillus species such as *lactobacillus acetotolerans* and enterobactor species such as *E.coli*. These microorganisms help to provide the biodegradation of organic solids and promote nutrients for the enriched compost. During the field trial the compost is compared with the standard bio fertilizer of PGPR (Plant Growth Promoting Rhizobium). The reason behind the conversion of organic wastes and combinations of enriched compost and bio-fertilizer are implemented for home terrace vegetable farming.



## **An Innovative Study on Green Concrete to Diminish of Global Warming Effect Responsible of Cement Industry- By Using Low Calcium Fly Ash Green Concrete**

**Y. Shantharam, M. Boobalan and G. Arivazhagan**

*Department of Civil Engineering, Mahendra Engineering College, Mallasamudram, Namakkal-637 503, Tamil Nadu*

### **Abstract**

To reduce greenhouse gas emission, efforts are needed to develop ecofriendly construction materials. This project presents the development of fly ash-based geopolymer concrete. In geopolymer concrete, a by-product material rich in silicon and aluminium, such as low calcium (ASTM class F) fly ash is chemically activated by a high-alkaline solution to form a paste that binds the loose aggregates and fine aggregates and other unreacted materials in mixture. The test results presented in this paper show the effect of various parameters on the properties of geopolymer concrete. The concrete obtained after the reaction between sodium hydroxide, sodium silicate has high strength. In this project the geopolymer mix design & experimental studies on are made on the Mechanical properties Viz, Compressive Strength, Split tensile strength, Flexure strength & Modulus of elasticity of concrete. Results of investigation indicated that there was improvement in Mechanical properties. Viz, (Compressive strength, Modulus of elasticity, Split tensile strength, Flexural strength) with increase in Alkaline/Fly ash ratio (0.30 to 0.45). Strength also increased with increase in curing time and temperature.



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Invited Abstracts

IRBEP/OP/37

## Green Technology: Turbine Light on Highways

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### Abstract

The paper's main focus is to harness and utilize the wind energy produced by speeding vehicles in highways. The concept is ought to work with the similar principle as the 'Vertical Axis Wind Turbine', also known by the term 'VAWT'. The turbines can be attached to street lights in highways (or other types of roads if applicable and required), where the advantage is given for the utilization of the air force efficiently, thus converting kinetic energy into electrical energy. This energy can be implemented for lighting the streets, reducing road accidents and ensuring public safety and health. The foremost application of this idea over the conventional system of lighting the streets using solar energy is distinctly clear, provided there is no source of solar power during the night time. Hence, the turbine light concept fills the gap of that disadvantage. The rising consumption of natural resources for fuels and energy and the depletion of the same has become a major concern for every aspiring individual who strive for sustainable environment. This leads to the research and implementation of alternative fuels around the globe, or the least, conservation of the existing ones and green- efficient use of them. The paper needs more advanced study and analysing the possible future aspects on the environment is opted. The turbine light concept can work independently without the solar panel, since it can be functional the whole day and night; but utilization of both the technology is recommended to ensure ultimate conservation of natural resources possible, leading to a sustainable development for a sustainable life style.



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Invited Abstracts

IRBEP/OP/38

## Mango Seed Oil (Mso) - An Economical Way of Mango Processing Waste Disposal

**H. Haseena, T. Sharmathi, M. S. Shivaswamy and Jony Blessing Manoj**

Department of Food Technology, Kongu Engineering College, Perundurai-638052, Tamil Nadu

### Abstract

Mango (*Mangifera indica* L.), one of the most important fruits worldwide, is recognized for its attractive colour, delicious taste and exotic flavour. The edible fleshy portion is relished to the extent of commercialization. Consumption or industrial processing of the mango results in high amounts of waste materials like peels, seeds and oilseed meals. Mango seed kernel is generated as waste during mango fruit processing. Mango seed kernel fat, a promising safe source of edible oil, found to be nutritious and non-toxic. Present study was conducted with the objective to utilize it as by-product to extract oil from mango seed kernel, determine physicochemical characteristics of the oil extracted and comparing nutritional profile. Oil yield is more in mechanical press than in solvent extraction method particularly for the roasted seeds. Chips fried using mango seed oil contains high protein content compared to other oils. Recovery of oil from mango kernels was 33%. The peroxide value for mango seed oil is very less (9 meq/kg) when compared to other oils which reduces the rancidity and increases oil stability. Carbohydrate content in mango seed oil is higher (28 mg/100 g) than other oils. Protein content for mango seed oil chips was higher (24 mg/g) than the other oils.



## **Antiuro lithiatic Potential of the Edible Plant Extracts of Radish, Wintermelon and Stem of Banana Tree: *In Vitro* Study**

**G. Selvam and M. Balasubramanian**

*Department of Biotechnology, K.S.Rangasamy College of Technology, Tiruchengode-637 215, Tamil Nadu*

### **Abstract**

Formation of stone in the kidney and intolerant pain is due to many factors. Though many treatments in the form of medication and/or surgery, laser and etc., available in the market, they are giving temporary relief and not cure. But knowingly or unknowingly we are taking medicine as a food in day today life which rescue from many illness. Traditionally certain vegetables and food materials are widely used conventionally for the treatment of the Urolithiasis. In this study it is proposed to study the combinatorial effect of Radish, Winter melon and Stem of banana tree extracts for its antiuro lithiatic potential under *in vitro* condition. Antiuro lithiatic potential of the extracts of Radish, Winter melon and Stem of banana tree is tested. Synthetic kidney stone formation is studied under *in vitro* conditions using three critical assays such as crystal nucleation, aggregation and growth. The effect of extracts on the formation and inhibition of crystals are observed spectrophotometrically. The results of the *in vitro* assays performed indicate that the extracts of Radish, Winter melon and Stem of banana tree readily prevented crystal nucleation, growth and aggregation. Extracts of Radish, Winter melon, and Stem of banana tree are found to be an effective diuretic, and act as a promoter for inhibitors of calcium oxalate crystallization.



## **Experimental Studies on Properties of Banana (*Musa X paradisiaca* L.) Pith Flour and its Utilization as a Healthy Food Additive**

**J. Jony Blessing Manoj<sup>1</sup>, D. Tiroutchelvame<sup>2</sup>, J. Prakash Maran<sup>1</sup>, J. S. Ruthra Priya<sup>3</sup> and M.S.Shivaswamy<sup>1</sup>**

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<sup>2</sup> Department of Food Processing & Engineering, Karunya University, Coimbatore- 641 114, Tamil Nadu

<sup>3</sup> Department of Food Processing & Quality Control, Thassim Beevi Abdul Kader College for Women, Kilakarai-623517, Tamil Nadu

### **Abstract**

Banana tree is grown around the globe for its fruit and other medicinal properties. From leaves to roots, the whole banana tree can be utilized either as food or medicine or to make craft products. India is one among the top banana producing countries in the world. In India, Tamilnadu is in first place in banana cultivation. After producing a bunch of fruits, the banana trees were cut down. A few amount of banana pseudostem were utilized for making fibre and consumption and the remaining huge amount will be left in the fields as waste. Now days, the utilization of pseudostem is getting attention of researchers. Banana pseudostem contains more than 90% of water in it. Banana pseudostem also has phenolic compounds which show antioxidant properties. The soft tender core of the banana pseudostem is called the pith. It also acts as a good source of dietary fiber and potassium. Many researchers have studied the properties of banana pseudostem but many of them have omitted studying about banana pith, which is considered among vegetables and consumed after cooking in countries like India, Malaysia etc. This study aims at developing value added food products with banana pith. The objectives of this study are, to optimize the extraction condition for banana pith flour, to study the chemical composition, functional and structural properties of banana pith flour and to utilize the pith flour as a food additive. In this research, rheological properties, WHC, OHC, SEM images are reported for the first time for banana pith.



## **Preventive Effect of Galangin on Isoproterenol-induced Oxidative Stress in H9C2 Cardiomyoblast Cells**

**T. Radhiga\* and N. Rajendra Prasad**

*\*UGC-Postdoctoral Fellow, Department of Biochemistry & Biotechnology, Annamalai University, Annamalainagar-608 002, Tamil Nadu*

### **Abstract**

In this study, we examined the effect of galangin (GA) on isoproterenol hydrochloride (ISO)-induced intracellular ROS levels, loss of mitochondrial membrane potential (MMP), apoptotic morphological changes, lipid peroxidation, antioxidant status, DNA damage and apoptotic signaling pathway in cardiac H9C2 cell lines. H9C2 cells pretreated with GA (7.81  $\mu$ M) for 2 h prior to ISO (31.25  $\mu$ M) treatment and then cellular and molecular changes were analysed after 24 hrs of incubation. The levels of intracellular ROS, apoptotic morphological changes, lipid peroxidation, oxidative DNA damage and proapoptotic proteins i.e. Bax, Caspase-3, -8, -9, Fas and cytochrome c were significantly increased in ISO-induced H9C2 cells. It has been also observed that the activities of enzymatic antioxidants (superoxide dismutase, catalase and glutathione peroxidase), level of non-enzymatic antioxidant status (GSH), MMP and anti-apoptotic proteins i.e. Bcl-2, Bcl-xL were significantly decreased in ISO-treated cells. GA treatment prevented ISO induced ROS generation, apoptotic morphological changes, lipid peroxidation, oxidative DNA damages in H9C2 cells. Furthermore, GA prevented ISO induced apoptotic cell death by modulating the expressions of Bax, Caspase-3, -8, -9, Fas and cytochrome c in H9C2 cells. We have also observed that GA prevented ISO-induced activation of MMPs in H9C2 cells. In conclusion, ISO-induced MMPs alteration, cell fatality, lipid peroxidation, antioxidant depletion, oxidative DNA damage and apoptotic signaling in H9C2 cells is restored by GA, which may be probably through its ROS scavenging activity.



## Microwave Synthesis and Characterizations of Cobalt Doped Tungsten Oxide for Photocatalytic Application

S. Mohammed Harshulkhan<sup>1</sup>, K. Janaki<sup>2</sup>, G. Velraj<sup>3</sup> and M. Nagarajan<sup>1</sup>

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<sup>2</sup>Department of Physics, Government Arts College for Women, Salem-636 008, Tamil Nadu

<sup>3</sup>Department of Physics, Anna University, Chennai-600 025, Tamil Nadu

### Abstract

The pure and cobalt doped WO<sub>3</sub> nanoparticles were synthesized by microwave irradiation method. Nano Particles of Tungsten oxide (WO<sub>3</sub>) doped with Cobalt at different ratios were synthesized by Microwave synthesis method. Microwave irradiation has several advantages over conventional methods including short reaction time, small particle size, narrow size distribution, and high purity. The pure and cobalt doped WO<sub>3</sub> nanoparticles have been characterized by X-ray powder diffraction (XRD), UV-DRS and photoluminescence (PL) spectroscopy, Fourier transform infrared spectroscopy (FTIR). The structures of the synthesized materials were confirmed with powder X-ray diffraction patterns. The band gap energy of the nanoparticles were found to be in the range of 3.00 to 2.92 eV. The cobalt doped WO<sub>3</sub> nanoparticles exhibited a red shifted band gap and enhanced the visible light emission. The emission spectra of the pure and Co doped samples were analysed using PL spectroscopy. The structural bond vibrations of pure and Co doped WO<sub>3</sub> nanoparticles were analysed by FTIR spectroscopy. Finally, the photocatalytic activity of nanoparticles was evaluated by decolourization of methylene blue (MB) under visible light irradiation.



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Invited Abstracts

IRBEP/OP/43

## Irradiation of *Musa acuminata* and Characterization by RAPD Analysis

**R. HarshaVarthini and Dr. J. Philip Robinson**

Department of Biotechnology, K.S.Rangasamy College of Technology, Tiruchengode-637 215, Tamil Nadu

### Abstract

In Banana Tissue cultures, the occurrence of dwarf off types is a common phenomenon and their detection become relevant. In this study, tissue culture derived (Somaclonal) and UV radiation- induced off types in *Musa acuminata* was analysed using a RAPD based molecular diagnostic technique. The dwarfs were initially characterized at maturity, by height, leaf shape, so mentioned exomorphic and agronomic characters. At the molecular level, amplification with the RAPD primer is expected to result in the normal varieties not in the medium types. Furthermore, the amplication done with the Irradiated clones will show some morphological changes when compared with the control plant clones. This study shows that the dwarf off types isolated through tissue culture and radiation-mutagenesis were true dwarfs, validated by using the - specific RAPD marker for Banana. Larger the number of bands large is the mutation occurred within the cultures. RAPD can be validated with softwares.



## Screening of Microorganisms to Produce Antibiotics from Rhizosphere Soil Sample of Medicinal Plants

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Department of Biotechnology, Vinayaka Mission's Kirupananda Variyar Engineering College,  
Salem-636 308, Tamil Nadu

### Abstract

Antibiotics are one of the most important commercially exploited secondary metabolites isolated by the bacteria and employed in a wide range. Most of the antibiotic producers used today are the soil microbes. Bacillus species being the predominant soil bacteria because of their resistant endospore formation and production of vital antibiotics like bacitracin etc. are always found inhibiting the growth of the pathogenic organisms. In the present study the rhizosphere soil sample of selected medicinal plants from the Kanjamala hill in Salem district. Salem district of Tamilnadu is one of the most botanized areas of Southern India. Some notable hills are Shevaroy Hills, Kumaragiri Hills, Palamalai, Bodamalai, Suriyamalai, Kalvarayan and Kanjamalai Hills. The district is well for its peculiar assemblage of vegetarian wealth. Iron ore found in the hills had an average Fe content of 35% and it was more than 45% in the northern flank of the hills. The bacterial species were identified by their cellular characteristics, colonial morphology and biochemical tests. In the present investigation, antibiotics producing microorganisms were isolated from soil and tested against *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Mycobacterium smegmatis*, *Proteus vulgaris* and *Bacillus subtilis*. Disc diffusion method, agar well method, streak agar method and biochemical methods have been employed to investigate the antibiotics producing microorganisms.



## Photocatalytic Degradation and Decolourization of Ni Doped WO<sub>3</sub> Nanoparticles Using Microwave Irradiation Method

**S. Mohammed Harshulkhan<sup>1</sup>, K. Janaki<sup>2</sup>, G. Velraj<sup>3</sup> and R. Sakthi Ganapathy<sup>1</sup>**

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<sup>2</sup>Department of Physics, Government Arts College for Women, Salem-636 008, Tamil Nadu

<sup>3</sup>Department of Physics, Anna University, Chennai-600 025, Tamil Nadu

### Abstract

The undoped and Ni doped WO<sub>3</sub> nanoparticles were synthesized by microwave irradiation method. The undoped and Ni doped WO<sub>3</sub> nanoparticles have been characterized by X-ray powder diffraction (XRD), UV-DRS and photoluminescence (PL) spectroscopy, Fourier transform infrared spectroscopy (FTIR). The monoclinic structures of the WO<sub>3</sub> nanoparticles were determined by XRD with space group P21/n. The band gap energy of the nanoparticles was found to be in the range of 3.00 to 3.1eV. The emission spectra of the undoped and Ni doped samples were analyzed using PL spectroscopy. The structural bond vibrations of undoped and Ni doped WO<sub>3</sub> nanoparticles were analyzed by FTIR spectroscopy. Finally, the photocatalytic activity of nanoparticles was evaluated by decolorization of methylene blue (MB) under visible light irradiation.



## Turbidity Removal from Domestic Wastewater Using Cactus Species as a Natural Coagulant

**P. Kathirvel**

Assistant professor, Department of Civil Engineering, Mahendra Engineering College (Autonomous),  
Namakkal-637 503, Tamil Nadu

### Abstract

Coagulation is an important wastewater treatment process used to reduce water turbidity and normally precedes the more complex secondary and tertiary water treatment processes. In this study, the effectiveness of a natural macromolecular coagulant derived from a cactus species for turbidity removal from domestic waste water was valuated using jar test. Initial turbidity values measured at 185 NTU was reduced by as much as 95% .The optimizations in the treatment parameters such as pH, dosages, mixing speed and settling time highly influences the efficiency the turbidity removal in the domestic wastewater treatment. The settling time of 2 hours is the optimum time for maximum turbidity removal at 110°C, dosage of 100 mg/L and mixing speed of 40 RPM. Overall results from this study indicated that powdered *Trichocereus pachanoi* has good potential in the removal of turbidity.



## Study on Mechanical Properties of Eco-Friendly Economic Concrete

**B. Sathish Kumar<sup>1</sup>, P. Meena<sup>2</sup> and Y. Boopathi<sup>3</sup>**

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<sup>3</sup>Assistant Professor, Department of Civil Engineering, Mahendra Engineering College (Autonomous),  
Namakkal-637 503, Tamil Nadu

### Abstract

This paper outlines the method of preparation, testing procedure and salient results on the eco-friendly concrete that is manufactured using the waste products of steel industries and Manufacturing Sand industries. Steel slag can be used in the construction industry as aggregates in concrete by partial replacing natural aggregates. Natural aggregates are becoming increasingly scarce and their production and shipment is becoming more difficult. Most of the volume of concrete is aggregates. Replacing all or some portion of natural aggregates with steelslag would lead to considerable environmental benefits. The primary aim of this research was to evaluate the mechanical properties of concrete made with steelslag aggregates and steelslag. This Project has shown with the mechanical properties of concrete by partial replacing certain percentage of natural aggregates by steelslag and fine aggregates by M-sand. The optimum percentage value for replacing both natural coarse aggregate and fine aggregate seems to be 20% and 25%. The compressive strength, Split tensile strength, Modulus of rupture and Modulus of elasticity of specimens were tested and results were found. In this study M20 grade of concrete was used. The study indicates that concrete having high strength can be produced with the above mentioned waste products of steel industry and Manufacturing Sand industry.



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Invited Abstracts

IRBEP/OP/48

## Waste Land Development

**M. P. Kiran, K. Bharathi and Arun Kumar**

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### Abstract

According to Bhumbra and Khare which are eco logically unstable, whose top soil has been nearly completely lost, which have developed toxicity in root zones for growth of most plants, both annual crop and trees. According to NWDB degraded land which can be brought under vegetative cover with reasonable effort and which is currently under-utilized and land which is deteriorating for lack of appropriate water and soil management or on account of natural causes. Causes of degradation are over cultivation, deforestation, over grazing, improper irrigation practices. Government of India have made many schemes and policies Grants In Aid to NGOS, Decentralised People's Nurseries, Silviculture Farm. Activities- In situ soil/ moisture conservation, plantation, agro- forestry and horticulture, training, extension, awareness, capacity building, engineering structures etc.



## Synthesis of MG Doped Tungsten Oxide Nanoparticles Via Microwave Irradiation Method

**S. Mohammed Harshulkhan<sup>1</sup>, K. Janaki<sup>2</sup>, G.Velraj<sup>3</sup> and S. Krishnaraj<sup>1</sup>**

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<sup>3</sup>Department of Physics, Anna University, Chennai-600 025, Tamil Nadu

### Abstract

Tungsten oxide ( $\text{WO}_3$ ) is an important n-type semiconductor oxide with high chemical response and high visible light absorption. It has got considerable attention as a multifunctional material due to its potential applications in the fields of gas sensors, electrochromic properties and photocatalysts. It is a narrow band gap material with a band gap of 2.6-3.00 eV and this type of narrow band gap materials can be effectively used for photocatalytic applications. The pure and magnesium doped tungsten oxide were synthesized by microwave irradiation method. XRD pattern shows the diffraction pattern correspond to tungsten oxide and all the peaks can be matched to monoclinic structure (JCPDS No.83-0950) with lattice constant  $a=7.300, b=7.538, c=7.689$  and  $\beta=90.892$ . For Mg doped tungsten oxide correspond to monoclinic structure matched with the JCPDS No.84-1516. The structural bond vibrations of undoped and Mg doped  $\text{WO}_3$  nanoparticles were analyzed by FTIR spectroscopy. The band gap energy of the nanoparticles was found to be in the range of 3.00 to 3.15eV. The doped  $\text{WO}_3$  nanoparticles exhibited a blue shifted band gap and enhanced the UV and visible light emission. The emission spectra of the undoped and Mg doped samples were analyzed using PL spectroscopy. As synthesized pure and Mg doped samples can be effectively used for the photocatalysis process in waste water treatment and water purification.



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Invited Abstracts

IRBEP/OP/50

## Remote Sensing and GIS Approaches in Artificial Recharge of the Ground Water Potential Zones in Watershed of Namakkal District, Tamil Nadu

**S. Prabaharan<sup>1</sup> and P. Usharani<sup>2</sup>**

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<sup>2</sup>Assistant Professor, Dept of Civil Engineering, Narasus Sarathy Institute of Technology, Salem 636305, Tamil Nadu

### Abstract

The importance of water is felt in all sectors as the demand and needs of the populace is growing. The remotely sensed data provides synoptic viewing and repetitive coverage for thematic mapping of natural resources. In the present study hydrogen morphological, soil, lineament and geomorphological mapping has been carried out in watershed in Namakkal District, Tamilnadu , The area is demarcated from the survey of India Topographical maps were used, it covers an area. In this paper LISS III Satellite Image data in conjunction with Survey of India Toposheet (1:50000 scale) and field inputs data were used for thematic mapping. Geomorphologic units identified through visual interpretation of FCC include: alluvial plain, plateau, pediment pediplain, lineament and land use land cover. In addition, lineaments were mapped since they act as conduit for groundwater recharge. The application of the increasingly and internationally accepted method of artificial recharge on the ground water aquifer was decided to be the most effective for the restoration of balance of the hydrogeological system. Scenes contour is digitized for preparing elevation map and drainage pattern analysis. Amount of rainfall, soil type and water level of the well were some important data points which are collected and estimated during the field study. They were key parameters for identifying groundwater prospective zones. Digital as well as visual interpretation techniques were applied for creating geological map, lineament map, and land use/land cover map and also creating DEM, and TIN. Groundwater elevation models were created through spatial interpolation method to analyze groundwater flow direction, groundwater flow accumulation and groundwater contour. All these thematic layers were analyses after converting them into overlay. The GIS technology provided suitable alternative for efficient management of large and complex database to study groundwater resource and design suitable exploration plan of artificial recharge zone. Use of state-of-the-art technology and estimation of all the parameters involved, which are necessary, have been taken into account. Keeping this as an objective, to identify the suitable sites for artificial recharge zones an integrated approach of remote sensing and GIS approach techniques were used.



## Hepatoprotective Activity of Methanolic Extract of *Decalepis hamiltonii* against Acetaminophen-Induced Hepatic Injury in Rats

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### Abstract

This study was undertaken to investigate the protective effect of methanol extract of *Decalepis hamiltonii* on acetaminophen-induced hepatotoxicity in rats. Hepatotoxicity was induced by administering an oral dose of acetaminophen (2 g/kg b.wt) to rats for 10 days resulted in significantly elevated levels of hepatic marker enzymes in serum alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP) and bilirubin and a significantly decreased serum levels of total protein were noted, compared to controls. In the liver, significantly elevated levels of lipid peroxidation (LPO), and lowered levels of antioxidant enzymes like catalase (CAT) and superoxide dismutase (SOD), and non-enzymatic antioxidants like reduced glutathione (GSH) and ascorbic acid were observed following acetaminophen administration. When rats with acetaminophen -induced hepatotoxicity were treated with the extract of *Decalepis hamiltonii*, the serum ALT, AST, ALP, bilirubin and total protein levels reverted to near normal, while the hepatic concentration of CAT, SOD, GSH and ascorbic acid were significantly increased and that of LPO significantly lowered, when compared to acetaminophen -induced rats. Histopathological studies confirmed the hepatoprotective effect conferred by the extract of *Decalepis hamiltonii*. These results reveal that a methanolic extract of *Decalepis hamiltonii* is able to significantly alleviate the hepatotoxicity induced by acetaminophen in the rat.



## Effect of *Ipomoea staphylina* Ethanol Leaf Extract on Oxidative Enzymes in STZ-induced Diabetic Albino Rats

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### Abstract

Diabetes mellitus is one of the most common non-communicable diseases globally. It is the fourth leading causes of death in the most developed countries and there is substantial evidence that it is epidemic in many developing and newly industrialized nations. Current studies have elaborated diabetes mellitus as one of the most prevalent endocrine disorder throughout the world. The present study was aimed to evaluate the therapeutic potential of *Ipomoea staphylina* by assaying the activities of selective mitochondrial enzymes in streptozotocin induced diabetic rats. Diabetic rats showed a significant ( $p < 0.01$ ) reduction in the activities of oxidative enzymes Succinate dehydrogenase (SDH), Malate dehydrogenase (MDH), Glutamate dehydrogenase (GDH) and isocitrate dehydrogenase (ICDH). Lactate dehydrogenase (LDH) activity was significantly ( $p < 0.01$ ) increased in diabetic rats. The daily oral treatment of *Ipomoea staphylina* alcohol extract (500 mg/kg body weight/day) to diabetic rats for 30 days reversed the above changes in a significant ( $p < 0.01$ ) manner. From our observations, we conclude that administration of *Ipomoea staphylina* altered the activities of oxidative enzymes, thereby suggesting its role in mitochondrial energy production. The obtained results were compared with Glibenclamide, a standard anti diabetic drug. Thus, the modulatory effects of *Ipomoea staphylina* on altering these enzymes activities afford a promise for widespread use for treatment of diabetes in the future.



*Invited Abstracts*

IRBEP/OP/53

## Screening of Antioxidants Activity in *Ipomoea biloba* Leaves Extract

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### Abstract

The antioxidant properties of the *Ipomoea biloba* were examined. The antioxidant and free radical scavenging activity of extract of this plant was investigated in -vitro using spectroscopic method against DPPH, Super oxide, Nitric oxide radical scavenging activity, total phenol and flavonoid were also determined to assess their effects on the antioxidant activity of this plant. It was found that the concentrations are 10,20,30,40 &50µg its fraction as well as its pure constituents has a significant antioxidant effect when tested by each method, respectively. The *in vitro* assays indicates that this *Ipomoea biloba* was the significant source of natural antioxidant, which might be helpful in preventing the progress of various oxidative stress.



## Biosynthesis of Silver Nanoparticles towards a Nanodrug Design from an Indigenous Medicinal Plant: *Andrographis echinoides*

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### Abstract

Green nanotechnology has attained a very big development in bio-manufacturing of nanoparticles (NPs), which is widely applied in the field of science and technology. Green synthesis of NPs using biological resources like plants and micro-organisms provide the range of advantages such as eco-friendly, cost effect, non-hazardous and non-toxic. Herbal drugs are the potential source of therapeutic aid for the treatment and prevention of number of ailments. There have always been counting emphases on the herbal medicines as a potential pipeline for novel bioactive molecules. The present study showed that the silver nano particles synthesised hydroalcoholic extract of whole plant parts of *Andrographis echinoides* is reported to possess several bioactive compounds (GC-MS) and the chemical constituents. *Andrographis echinoides* is a medicinal plant, belonging to Acanthaceae family, which is rich in flavones, echinoidinin and echinoidin. The investigation was carried out to determine the molecular docking analysis of hydro alcoholic extract of *Andrographis echinoides*. There is no systematic work that has been undertaken on this plant. The Molecular docking study was done in order to note the genes involved in anti diabetic properties. The findings of the present study suggest that the hydro alcoholic extract of *Andrographis echinoides* (AgNP-HEAE) possessed most bioactive compounds and higher anti diabetic activities. These findings provide scientific basis for traditional use of tarragon for treatment of diabetes.



## **Experimental Investigations on Properties of Concrete with Paper Sludge as Self Curing Agent**

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<sup>2</sup>Assistant professor, Department of Civil Engineering, Gnanamani College of Engineering, Namakkal- 637018, Tamil Nadu

### **Abstract**

In this study, focus was made on the investigation of the viability of using paper sludge, an industrial waste generated from paper mills as self-curing agent in concrete. Basically high absorptive materials, such as light weight aggregate, super absorber polymers, wood-derived fibres and powders etc., are increasingly being investigated for use as an internal curing agent in cement based materials. Recently many of the solid waste materials are replaced as construction materials such as fly ash, glass powder, construction and demolition wastes, silica fume, copper slag, E-waste, quarry dust, bottom ash, rice husk ash, wood pulp, waste rubber, granite industry waste etc. In this present work, out of above mentioned waste materials paper sludge a low cost materials and easily available from paper mill is used as self-curing agent. The pulp and paper industry generates large volume of wastes. A trail has been made with paper sludge as an internal curing agent with different sludge ratios. This project presents the paper sludge concrete (PSC) with different water sludge ratio and two different curing conduction

- 1) Air-dry or self-curing,
- 2) Full water or normal laboratory curing. The mechanical properties like compressive strength, split tensile strength, flexural strength results shows that the PSC was good when compared with conventional concrete.



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Invited Abstracts

IRBEP/OP/56

## Sustainable Development

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### Abstract

Like democracy and globalization, the concept of sustainable development has become one of the most ubiquitous, contested and indispensable concepts of our time. Although the concept was first introduced in response to environmental concerns, it has been defined primarily by the main stream tradition of economical analysis which tends to marginalize the issue of ecological sustainability itself. This essay examines the major themes of sustainable development. It promotes the idea that social, environmental and economic progress are all attainable within the limits of our earth's natural resources. In this we include the major goals to achieve the sustainable development. The purpose is to bring the satisfies the needs of present generation without compromising the future generation. It can be reduced to two key concepts: needs and limitations. In this we include the need for sustainable development in agriculture field. Instead of this there is an additional focus on the present generation's responsibility to regenerate, maintain and improve planetary resources for use by future generations. This presentation also focus on production of public health, environmental preservation, sustaining vibrant communities, upholding animal welfare, industrial agricultural, industrial livestock production. And also give the knowledge of some innovative ways to attain the sustainable development like addressing poverty, providing food security, promoting conservation and sustainable use of biological diversity, protecting soils and combating desertifications. We prefer the advantages and disadvantages of sustainable development. This topic concludes with the benefits, outcome of sustainable development in future.



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Invited Abstracts

IRBEP/OP/57

## Green Technology

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### Abstract

Green technology implies to a system that uses innovative methods to create environment friendly products mainly it comprises of various everyday cleaning products, energy sources, inventions, wasteclothing and a host of others. Green technology (green tech) or clean technology is the application of one or more of environmental science, green chemistry, environmental monitoring and electronic device to monitor, model and conserve the natural environment and resources and to curb the negative impacts of the human involvement. The green technology is established in Sustainable energy generation technologies such as photovoltaics, wind turbine, bioreactors, etc. Sustainable development is the core of green technology uses renewable natural resources that never depletes. Green chemistry, green nanotechnology and green engineering are the latest in green technology. Green technology uses new and innovative techniques. One of the important factors for environmental pollution is the disposal of wastes. But in green technology we can go green by change the waste pattern and production in a way that doesn't harm the planet. The growth are expected from the possible areas like green energy, eco-friendly textiles, green building construction, organic agriculture and eco friendly products. This may attract many people who are looking towards new products with eco-friendly manner and also it provides way for our future generation to fulfill their needs without producing impact on environment "balancing the fulfillment of human needs with the protection of the natural environment and resources so that this needs can be met not only in the present, but in the indefinite future". This presentation focuses on advantages of green technology and the design improvement in green technology.



*Invited Abstracts*

IRBEP/OP/58

## Globalwarming - Defend for the Poor Carbon

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### Abstract

Global Warming is the increase of earth's average surface temperature due to effect of greenhouse gases, such as carbon dioxide emissions from burning fossil fuels or from deforestation, which trap heat that would otherwise escape from earth. This is a type of greenhouse effect. The fourth Assessment Report prepared by intergovernmental panel on Climate Change was published in year 2007. The report anticipates that very likely the climate change is caused by Green House Gases. It is explained here that the carbonated GHG is not the major contributor to global warming and the effect is minimal. Global Warming is controlled by the ocean, which related to the heat balance mechanism of solar energy while the climate is determined by the earth thermal energy. Reducing carbon footprint will not significantly prevent global warming. As analysed by the Antarctic Vostok Ice Core data and Epic Ice Core data, climate change is a repetitive cycle happened far before 420,000 and 740,000 years ago respectively, where without human's activities. Since then, the earth had gone through few cycles of glacial period with drastic change of climate. The ice core data is explained and the projection of the next interglacial warm peak period is anticipated; where more life will be diminished from now until the next warm peak period is reached.



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Invited Abstracts

IRBEP/OP/59

## Evaluation of the *In Vivo* Anticancer Activity of *Albizia lebbek* Benth.

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### Abstract

Cancer is a disease of multicellular organisms characterized by uncontrolled multiplication of subtly modified normal human cells. Cancer is a leading cause of death all over the world and represents a major public health burden. Natural products, especially the plant kingdom, offer an inexhaustible reservoir for investigation. Plants have a long history of use in the treatment of cancer and the interest in nature as a source of potential chemotherapeutic agents continues. *Albizia lebbek* Benth. is widely distributed in India. It is reported to have antiseptic, antimicrobial, antiovaratory, antifertility, antiprotozoal, anti-dysenteric, anti-tubercular and anti-cancer activities. This study was designed to evaluate the *in vivo* anticancer activity of *Albizia lebbek*. *In vivo* antitumor activity of plant material was carried out for hydroalcoholic extracts with ascetic tumour in Dalton's lymphoma-bearing mice model and categorized into five groups. The following parameters were analysed i.e., Average life span, Percentage increase in life span, analysis on body weight, packed cell volume and Viable tumor cell count along with Haematological parameters and Biochemical parameters.



Invited Abstracts

IRBEP/OP/60

## Innovative Manufacturing Techniques of I-Bricks

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<sup>2</sup>Professor of Civil Engineering, K.S.R. College of Engineering (Autonomous), Tiruchengode, Nammakkal, Tamil Nadu

### Abstract

Bricks are one of the popular construction materials since olden days and are used for a variety of applications such as load bearing and non-load bearing walls, piers, bridges, bunkers and so on. Vast tracts of fertile soil are turned into wastelands due to mining of clay for the manufacture of clay bricks and fuel required for brick kilns becomes scarce and costlier. Coal-based thermal power plants contribute to about 50 % of the total electricity produced in India. In doing so, they generate large volume of coal ash (pond ash and fly ash). Sugar-cane bagasse is a fibrous waste-product of the sugar refining industry, along with ethanol vapor. This waste product (Sugar-cane Bagasse ash) is already causing serious environmental pollution, which calls for urgent ways of handling the waste. The safe disposal of coal ash requires vast land area. To overcome the environmental hazards created by the production of clay bricks and coal ash from thermal power plants, effective utilization of coal ash replacing natural clay in brick making is studied. In the present study an attempt has been made to find out the optimum proportion of I-Ash in brick manufacturing and experimental testing of I-Brick masonry has been conducted. The bricks made with incorporation of industrial ash were studied for individual brick properties and the behaviour of brick masonry wall in compression and flexure. Durability studies were also conducted to ascertain the feasibility of using I -Bricks in construction.



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Invited Abstracts

IRBEP/OP/61

## RSM Analysis for Distillery Waste

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### Abstract

Composting is a biological process in which organic material is decomposed by microorganism, moist and aerobic environment. During this process, the degradable organic substrate undergoes chemical and physical transformation to give a stable end product. The product provides good value in agriculture both as an organic fertilizer and soil improver. In this study, press mud and distillery waste from sugarcane industry along with coir pith, cow dung are subjected to aerobic composting at various combined proportions for 60 days. During this process proper daily and intermediate sand covers were provided in order to avoid leaching. Later optimized blend proportion of the effective combination has been determined after analyzing through “Design of experiments tool” based on Response Surface Methodology. In RSM 13 blends were analyzed and found that the combination of press mud: coir pith: distillery waste in the proportion 1:1.5:1 gives the maximum nutrient supplement with high C : N ratio greater than 1:30.



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Invited Abstracts

IRBEP/OP/62

## Enhanced Nutrient Recovery

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### Abstract

Though nutrient recycling occurs naturally, there is a vast difference in the rate of absorption of nutrient from the soil and the fixation of nutrients back in to the soil. The production mechanism relies heavily on mineral resources whose reserves are limited and depleting. Recovery of nutrients from bio waste represents a promising sustainable resource which could play a part when finding solutions to the foreseen global nutrient shortage. The potential to further source nutrients from waste streams requires the applications of cost effective nutrient recovery processes free of hazardous elements which provide readily available nutrients for crops, while competing in quality and price with current fertilizers. One such technique which can prove to be efficient is vermicomposting.



*Invited Abstracts*

IRBEP/OP/63

## **Green Communication Networks for Minimizing Network Contention in Server-Based Manets for Wireless Access**

**Dr. K. Sasikala**

*Vinayaka Missions Kirupananda Variyar Engineering College, Salem-636 308, Tamil Nadu*

### **Abstract**

Wireless communication increasingly is becoming the first choice link to enter into the global information society. It is an essential part of broadband communication networks, due to its capacity to cover the end-user domain, outdoors or indoors. The use of mobile phones and broadband has already exceeded the one of the fixed telephones and has caused tremendous changes in people's life. In this paper the cache replication mechanism is discussed which overcomes the drawback of maximum hit ratio problem. The system improves the performance of the query response time and minimizes the maximum hit occurs in the particular query directory and caching nodes. The proposed method describes a server based scheme, implemented on top of the Cooperative and Adaptive Caching System (COACS) caching architecture in order to maintain the consistency between the server and the cache node. COACS provides an efficient and reliable caching in MANET environment. In COACS a node sends its request to the nearby Query Directory (QD), it maintains a table which consist of id of data item and the address of the Cache Node (CN) that caches the data. If the QD finds the Query in its cache, it forwards the request to the CN caching the item. Minimum Distance Packet Forwarding (MDPF) algorithm is used to forward the search message to the nearest node. Since COACS did not implement a consistency strategy, the system described in this work fills that void and adds several improvements such as enabling the server to be aware of the cache distribution in the Network, making the cached data items consistent with their version at the server, and adapting the cache update process to the data update rate at the server relative to the request rate by the clients. With these changes, the overall design provides a complete caching system in which the server sends to the clients selective updates that adapt to their needs and reduces the average query response time, and minimizes cache hit ratio. The goal was to get the highest data rate possible, without compromising the fidelity of the signal.



Invited Abstracts

IRBEP/OP/64

## Alternative Fuel

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### Abstract

The operation of a biodiesel fuelled boiler has been checked for some months. The engines have been bench-tested and then installed on urban buses for normal operation. Distances, fuel consumption and emissions ( $\text{CO}_2$ , CO, HC and  $\text{NO}_x$ ) have been monitored, in addition devices wear and tear, oil and air filters dirtiness and lubricant degradation have been checked. Further investigations have also been devoted to assess some environmental aspects of bio-diesel. In particular the benefit of biodiesel to the total net emission of  $\text{CO}_2$  during the whole life cycle has been studied and the net energy requirement has been evaluated. Finally, the global environmental support to the production of biodiesel has been studied according to the energy analysis. Vegetable oils are produced from numerous oil seed crops. While all vegetable oils have high energy content, most require some processing to assure safe use in internal combustion engines. Some of these oils already have been evaluated as substitutes for diesel fuels. The effects of vegetable oil fuels and their methyl esters (raw sunflower oil, raw cottonseed oil, raw soybean oil and their methyl esters, refined corn oil, distilled opium poppy oil and refined rapeseed oil) on a direct injected, four stroke, single cylinder diesel engine performance and exhaust emissions was investigated in this paper. The results show that from the performance viewpoint, both vegetable oils and their esters are promising alternatives as fuel for diesel engines. Because of their high viscosity, drying with time and thickening in cold conditions, vegetable oil fuels still have problems, such as flow, atomization and heavy particulate emissions.

- Ethanol: Ethanol is an alcohol fuel that's derived mainly from grain.
- Methanol: Methanol is an alcohol fuel that's derived primarily from coal.
- Blends: A transitional fuel, blends are mixtures of traditional and alternative fuels, such as E85 and B20.
- Natural Gas: A by-product of oil drilling and coal mining, natural gas can also be harvested from natural gas fields.
- Propane: Also known as liquefied petroleum gas, propane is a by-product of natural gas and crude oil refining.
- Hydrogen: Most commercial hydrogen is refined from petroleum, but can also be made by passing electricity through water (electrolysis).



*Invited Abstracts*

IRBEP/OP/65

## Technologies and Performance Study on Greywater Treatment

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### Abstract

Water is one resource that has no substitute. Even though water covers three quarters of the planet, 97% of the Earth's water is saline water. Less than 3% of water is fresh water. In the recent years, many events have occurred which point towards the decreasing fresh water resources of the world. Greywater is good alternative resources. Greywater recycling is the viable option that can be very useful in the water arid areas. The aim of the study is Evaluation and Performance study on Greywater Treatment. The treatment was carried out by using sedimentation tank and upflow –downflow roughing filters. Comparing the treated greywater quality parameters with the WHO standards. Since the intended use of water is for irrigation and toilet flushing, the required treatment standards are therefore less stringent as compared to that for drinking purposes. Greywater is maximum generated in Sollampallam located in Salem. In that area laundries are practiced. From that area about 5000 liters of grey water are generated out daily.



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Invited Abstracts

IRBEP/OP/66

## Global Warming

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### Abstract

Global warming has come across as a monumental factor of discussion among different countries. Wide-scale use of non-renewable energy resources has exponentially increased the levels of pollution. This has upended environmental stability and started increasing the global temperature (the surface temperature has raised by almost 5°C in the last 25 years. This has resulted in the rising rate of melting of the ice cap on mountains and thus the rise of oceanic levels. This also has a direct influence on rains and weather fluctuations. At this rate, while global warming may not cause much harm to the existent populace, it will surely be a menace for the coming generations. The rampant escalation of heat waves and retreat of glaciers are just small if not insignificant expressions of global warming. Over the last 15 years, many G30 summits have been on the matter. Most countries have adopted potent Renewable Energy Targets for the next 20 years and are planning to go partially or wholly off the grid. The establishment of renewable energy sources like sun, wind and water and processing of greenhouse gases are worthy solutions. This research work takes a detailed look at the potencies and stretches if global warming and how it can be curbed. It also provides a startling way out through the apparent holocaust the word is facing, say, in the next century. The comprehensive work zeroes in on typical topographies which relate to the aspects of global warming with greater credence and finds mercurial evidence of the levels of dismantling that global warming can cause. The research work makes one thing clear. We cannot just depend on what our respective Governments are doing for the motion; we have to proactive steps towards rendering stability to the environment through energy-conscious systematization at home. Some things that people do are increasing the amounts of the greenhouse gases in the atmosphere, so more heat is trapped. The heating of the earth through human activities is called the 'Enhanced Green-house Effect' and this is causing the earth to heat up, or global warming. Global warming doesn't just mean that the earth gets hotter, it means that the whole climate is changing. Global warming is affecting plants, animals, humans and the earth. We need to learn how to conserve our use of fossil fuels to minimize carbon dioxide production. This will slow down the effects of global warming.



Invited Abstracts

IRBEP/OP/67

## Development of Temperature-Managed Traceability System for Frozen and Chilled Food During Storage and Transportation

**K. Akila<sup>1</sup>, G. Neelavathi<sup>2</sup> and A. Tamilselvan<sup>3</sup>**

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<sup>3</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

### Abstract

Temperature is one of the most important parameters of the quality control for frozen and chilled food, and then freshness is almost exclusively a function of time and temperature. As the temperature management is a very important function for fresh foods, it is desirable that the quality conditions during storage and transport are clearly understood and traceable. This paper describes the development of a temperature-managed traceability system based on Radio frequency identification data logger tag, global positioning system, mobile communication based on Temperature time tolerance theory. The system has been tested with the transportation. The results show that the system is helpful for quality control, traceability and efficiency of frozen and chilled food during storage and transportation chain. In addition, the system also has significant impact on stake holders across the supply chain via improved quality and reduced cost.



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Invited Abstracts

IRBEP/OP/68

## Efficiency and Mechanisms of Alternative Food-Preservation Technologies

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### Abstract

High-pressure processing, ionizing radiation, pulsed electric field and ultraviolet radiation are emerging preservation technologies designed to produce safe food, while maintaining its nutritional and sensory qualities. A sigmoid inactivation pattern is observed in most kinetic studies. Damage to cell membranes, enzymes or DNA is the most commonly cited cause of death of microorganisms by alternative preservation technologies.



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Invited Abstracts

IRBEP/OP/69

## Energy Saving and Reducing CO<sub>2</sub> Emission in Mobile Towers Using Green Radio Technology

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<sup>3</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

### Abstract

The number of users and the use of telecommunication systems are increasing rapidly and this result in greater demands on energy usage. This paper deals with effective power utilization in Wireless Network using Green Radio technology and reduces the amount of CO<sub>2</sub> emission on the environment. Based on the extensive Life-cycle assessment (LCA) conducted by various network operators, it is learned that energy consumption in the usage phase of its radio access networks is the most imminent factor relating to impact on the environment. Green radio is the concept of decreasing the number of communication towers as per the number of users using the strong wireless sensor network by keeping the tower in idle mode. The amount of CO<sub>2</sub> emission is increasing in communication system, in parallel with increase in mobile consumers. And it is also observed that current wireless networks are not energy efficient, mainly the base stations (BS). This alarming growth in mobile users forces us to use higher data rate mobile broadband. The need for restructuring of existing network architecture, we need to control the systems in every base station. This paper discusses the current energy consumption scenario in base station devices. It also describes innovative and promising method for enhancing the energy-efficiency of the wireless networks and developing solutions that reduce operating costs and effects on the environment.



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Invited Abstracts

IRBEP/OP/70

## Fetal Monitoring System

**K. Aswini<sup>1</sup>, K. Rathina Kumar<sup>2</sup> and R. Rasu<sup>3</sup>**

<sup>1</sup>PG Scholar, Department of ECE, Knowledge Institute of Technology, Salem

<sup>2</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

<sup>3</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

### Abstract

Fetal monitoring plays an important role in pregnancy management. Fetal monitoring (FM) is used as a medical practice at the same time bioethics became reality. Bioethics changed the medical ethics by replacing the traditional Hippocratic. Electronic Fetal Monitoring is used to represent the opposite of bioethics principles. This paper provides an overview on fetal monitoring, covering a description of the fetal weight, heart rate, thyroid and growth rate monitoring devices and the techniques used to acquire clinical data, and their clinical application. Fetal monitoring helps us to know about the activities of the fetal baby.



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Invited Abstracts

IRBEP/OP/71

## Food Preservation by Hurdle Technology

**P. Elamathi<sup>1</sup>, K. Gomathi<sup>1</sup>, P. Shanmuga Sundaram<sup>2</sup> and A. Lelina Devi<sup>2</sup>**

<sup>1</sup>PG Scholar, Department of ECE, Knowledge Institute of Technology, Salem

<sup>2</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

### Abstract

Hurdle technology is used in industrialized as well as in developing countries for the gentle but effective preservation of foods. Hurdle technology was developed several years ago as a new concept for the production of safe, stable, nutritious, tasty and economical foods. Previously hurdle technology, i.e., a combination of preservation methods, was used empirically without much knowledge of the governing principles. The intelligent application of hurdle technology has become more prevalent now, because the principles of major preservative factors for foods (e.g., temperature, pH, aw, Eh, competitive flora), and their interactions, became better known. Recently, the influence of food preservation methods on the physiology and behavior of microorganisms in foods, i.e. their homeostasis, metabolic exhaustion, stress reactions, are taken into account, and the novel concept of multi-target food preservation emerged. The present contribution reviews the concept of the potential hurdles for foods, the hurdle effect, and the hurdle technology for the prospects of the future goal of a multi-target preservation of foods.



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Invited Abstracts

IRBEP/OP/72

## Identification of Marek's Diseases in Poultry using Edge Detection

**P. Rajeswari<sup>1</sup>, R. Shanmuga Sundaram<sup>2</sup> and N. Nithya<sup>2</sup>**

<sup>1</sup>PG scholar, Department of ECE, Knowledge Institute of Technology, Salem

<sup>2</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

### Abstract

Diagnosis of Marek's disease is critical to the tumors and not the infection because Marek's disease is considered ubiquitous within commercial poultry flocks. Marek's disease can develop in chickens as young as three weeks old. This virus can cause the paralysis of legs, wings and neck. It can be prevented at the early days. This is identified using edge detection methods like canny, prewitt, Robert and sobel. Performance of results is evaluated with the help of MATLAB.



## Identification of Wax Coating in Apple by Using Edge Detection Method

**K. Nithya<sup>1</sup>, C. Gomathi<sup>2</sup> and M. Gayathiri<sup>2</sup>**

<sup>1</sup>PG Scholar, Department of ECE, Knowledge Institute of Technology, Salem

<sup>2</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

<sup>3</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

### Abstract

A fruits and vegetables give the strength to all humans which keep the doctor away. Wax coating has been used for preserving the quality and safety of fresh fruit and vegetables and it gives the shine on the apple with less weight. The surface of coating is based on beeswax, candelilla wax, carnauba and shellac wax that are harmful to digestive system. The coated apples showed a significant delay in the change of weight loss, firmness, acidity, total soluble solids, decay and color compared to uncoated ones. In physical characteristics, general appearance (color and shape of fruit), weight loss percentage. In chemical characteristics, total soluble solids, pH, acidity, total sugar, reducing sugar and Vitamin C were analyzed after 15, 30, 45 and 60 days of storage. All the treatments had significant effect on the petroleum based waxes including paraffin and mineral oil that to be used in tropical fruit and variety of vegetables. However, the vinegar, lemon juice, baking soda is used to remove all waxes in vegetable and fruits.



## Improving Health and Healthcare with Interactive Visualization Using Dashboard Methods

**P. Sureshbabu<sup>1</sup>, R. Hemalatha<sup>2</sup> and N. Santhiyakumari<sup>3</sup>**

<sup>1</sup>PG Scholar, Department of ECE, Knowledge Institute of Technology, Salem

<sup>2</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

<sup>3</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

### Abstract

Fruits and vegetables give the strength to all humans which keep the doctor away. Wax coating has been used for preserving the quality and safety of fresh fruit and vegetables and it gives the shine on the apple with less weight. The surface of coating is based on beeswax, candelilla wax, carnauba and shellac wax that are harmful to digestive system. The coated apples showed a significant delay in the change of weight loss, firmness, acidity, total soluble solids, decay and color compared to uncoated ones. In physical characteristics, general appearance (color and shape of fruit), weight loss percentage. In chemical characteristics, total soluble solids, pH, acidity, total sugar, reducing sugar and Vitamin C were analyzed after 15, 30, 45 and 60 days of storage. All the treatments had significant effect on the petroleum based waxes including paraffin and mineral oil that to be used in tropical fruit and variety of vegetables. However, the vinegar, lemon juice, baking soda is used to remove all waxes in vegetable and fruits.



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Invited Abstracts

IRBEP/OP/75

## Smart Information Management System for Blood Bank using UTLP

**M. Hariharasudhan<sup>1</sup>, R. Kalidasan<sup>2</sup>, V. Sridhar<sup>2</sup>, A. Sakthivel<sup>1</sup>, R. Prasanna<sup>2</sup> and R. Nithya<sup>2</sup>**

<sup>1</sup>UG Scholar, Department of ECE, Knowledge Institute of Technology, Salem

<sup>2</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

### Abstract

This project is designed with the help of UTLP (Unified Technology Learning Platform) kit for information management in hospitals and blood banks. By using this donor can register his/her details and a person who wants blood can easily get the donor's information and directly contact them for blood. Verilog program is used for getting the information from the donor and to give the information about the donor which was already received and stored in server or memory element of the device. This system will be the solution for the problems such as wrong information of donors, misuse by third parties and updating the donated blood by the donor which replaces the older systems. Its produce accurate results so the life can be saved quickly.



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Invited Abstracts

IRBEP/OP/76

## Introduction to M-Health on Mobility and Global Wireless Health-Care Connectivity

**S. Thilagavathi<sup>1</sup>, C. Babu<sup>2</sup> and S. Radhika<sup>2</sup>**

<sup>1</sup>PG Scholar (VLSI Design), Knowledge Institute of Technology, Salem

<sup>2</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

### Abstract

M-Health can be defined as “mobile computing, medical sensor, and communications technologies for health-care.” This emerging concept represents the evolution of e-health systems from traditional desktop “telemedicine” platforms to wireless and mobile configurations. Current and emerging developments in wireless communications integrated with developments in pervasive and wearable technologies will have a radical impact on future health-care delivery systems. This editorial paper presents a snapshot of recent developments in these areas and addresses some of the challenges and future implementation issues from the m-Health perspective. The contributions presented in this special section represent some of these recent developments and illustrate the multidisciplinary nature of this important and emerging concept.



## **A New Method for Food Processing and Preservation with Life Cycle Assessment**

**S. Suvarna<sup>1</sup>, K. Rajesh<sup>2</sup> and S.Veerakumar<sup>2</sup>**

<sup>1</sup>PG Scholar, Department of ECE, Knowledge Institute of Technology, Salem

<sup>2</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

### **Abstract**

The environmental impacts of some traditional and novel food preservation technologies have been evaluated through LCA methodology in order to provide environmental criteria when selecting preservation methods for foods, as a way to develop more efficient and sustainable food products throughout its whole life cycle. Four thermal and non-thermal techniques (autoclave pasteurization, microwaves, high hydrostatic pressure and modified atmosphere packaging) were selected according to their suitability for the inactivation of the dish case study and a comparative cradle-to-grave LCA was performed following ReCiPe methodology for impact assessment. Emerging techniques showed reduced environmental impacts in terms of energy demand and CO<sub>2</sub> emissions in relation to conventional pasteurization. Additionally, lower water requirements were observed for non-thermal technologies (MAP, HPP) in comparison to equivalent thermal processes. Modified atmosphere packaging (MAP) was found to be the most sustainable option when a shelf life period below 30 days is required. The most significant impact sources of the life cycle from every technology were analysed and several potential improvements were identified, based on a technical and environmental point of view.



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Invited Abstracts

IRBEP/OP/78

## Protection of Foods from Microbes

**P. Nethaji<sup>1</sup>, M. Chandraman<sup>2</sup> and M. Dinesh Kumar<sup>2</sup>**

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<sup>2</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

### Abstract

The food processing industry is one of the largest manufacturing industries in the world. Undoubtedly, it possesses a global strategic importance and, as such has a critical need for growth based on future research determined by an integrated interdisciplinary approach to problems in food process engineering. Food processing means the ways that are used to change raw ingredients into food so that they can be eaten by humans or animals. The food processing industry uses these processes. Food processing often takes clean, harvested or slaughtered and butchered components and uses these to produce attractive and marketable food products. Similar processes are used to produce animal feed. Preservation is the most important process related to all the food products. Food preservation involves preventing the growth of bacteria, fungi, or other micro-organisms as well as retarding the oxidation of fats that cause rancidity. Preservation of food products can be achieved by various ways like addition of salt, sugars, preservatives, antioxidants, naturally occurring antimicrobial substances and also by the processes like drying, freezing, refrigerated storage, etc. Within the disposable arsenal of preservation techniques, the food industry investigates more and more the replacement of traditional food preservation techniques by new preservation techniques due to the increased consumer demand for tasty, nutritious, natural and easy-to-handle food products.



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Invited Abstracts

IRBEP/OP/79

## Role of Renewable Energy Resources for Green Electronics

**C. Ponmalathi<sup>1</sup>, M. Shenbagapriya<sup>2</sup> and M. Bharanidharan<sup>2</sup>**

<sup>1</sup>PG Scholar, Department of ECE, Knowledge Institute of Technology, Salem

<sup>2</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

### Abstract

Energy supply from renewables is an essential component of every nation's strategy, especially when there is responsibility for the environment and for sustainability. A wide range of renewable energy technologies are established commercially and recognized as growth industries by most governments. The influence of changing and new energy sources has been the driving function for the changes such as For electricity generation, wind-power and for photovoltaics which has a dramatic growth over the last two decades, both in terms of installed capacity and in sophistication of the industries. Electronic and microprocessor-based control may be used with benefits of low cost, reliability, and extremely fast and accurate operation. In all aspects of renewable energy, composite materials and microelectronic control have transformed traditional technologies, including hydro-power and the use of biomass. In particular we expect the great diversity of renewable energy supplies to be associated with a similar diversity in local economic and social characteristics. Green electronics is the application of environmentally considerate design and manufacture to electronic products. Green engineering requires environmental consideration at the design phase of a product. This consideration includes all material and energy requirements and their effects over the lifetime of the product. Regulations banning toxic materials in electronics manufacturing have received deserved attention; We ourselves see renewable energy as within human-inclusive ecology, both now and for a sustainable future.



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Invited Abstracts

IRBEP/OP/80

## Sustainable Development in an Urban Water Supply Network

**B. S. T. Ragu<sup>1</sup>, S. Maragatharaj<sup>2</sup> and T. Radhu<sup>2</sup>**

<sup>1</sup>PG Scholar, Department of ECE, Knowledge Institute of Technology, Salem

<sup>2</sup>Assistant Professor, Department of ECE, Knowledge Institute of Technology, Salem

### Abstract

A sustainable urban water supply network covers all the activities related to provision of potable water. Sustainable development is of increasing importance for the water supply to urban areas. The demand for urban water supply service is increasing rapidly as globalization accelerates economic development and brings improvements in living standards in India with the interactive effects of demographic growth and influx of migrants into cities due to push and pull factors. Provision of reliable and safe water supply to urban habitat is an essential input for overall economic and social advancement. However, urban local bodies mandated to perform this task in India have been experiencing constant budgetary bottlenecks in mobilizing resources to meet the water consumption targets of the present as well as future population. Urban water supply sector in India facing a number of challenges and constraints in meeting one of the important components of the United Nations' Millennium Development Goals (MDGs), i.e., to ensure supply of adequate potable water to half the number of people who are currently living without access to sustainable, safe drinking water sources by 2015. These problems and constraints include increasing scarcity of water, low pricing, high subsidy, poor cost recovery, high transmission and distribution (T & D) losses, due to poor maintenance, rising unaccounted for water (UFW) and non-revenue water (NRW). This work focuses on various urban water management schemes and proposes measures to enhance the sustainability in urban water management.



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Invited Abstracts

IRBEP/PP/01

## Green Technology

**R. Prakash<sup>1</sup>, J. Sagaya Metilda<sup>1</sup>, M. Senthil Kumaran<sup>1</sup>, N. Sumitha<sup>1</sup> and P. Deepan<sup>2</sup>**

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<sup>2</sup>Assistant Professor, Mahendra Engineering College (Autonomous), Namakkal

### Abstract

A green building, which is known as a sustainable building is designed to meet some objects such as occupant health; using energy, water, and other resources more efficiently; and reducing the overall impact to the environment. It is an opportunity to use the resources efficiently while creating healthier buildings that improve human health, building a better environment and provide cost savings. All the development projects lead to over-consumption of natural resources. This leads to serious environmental problems. Green building concept deals with the optimum use of natural resources for the development of infrastructure. The low cost eco-friendly house is the modern construction method which uses locally available materials and unskilled labor and also reduces the construction time. Similarly, use of recycled plastic, recycled aggregates and municipal wastes for the construction of pavement has considerable effect on the environment of earth. Another advanced method is the construction of low carbon building which uses sustainable materials like blended cement, compacted fly ash blocks, low energy intensity floor and roofing system, rammed earth walls and stabilized mud blocks etc. This ultimately results in reduction of greenhouse gases which will help to reduce greenhouse effect. This paper presents an overview of application of modern green infrastructure construction technology which makes a significant impact on conservation/proper utilization of resources like land, water, energy, air, material etc thereby reducing the overall cost of construction as well as adverse impacts of climate change.



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Invited Abstracts

IRBEP/PP/02

## Disaster Management

**C. Vignesh, P. Ravi and S. Mohan**

*Civil Department, Mahendra Engineering College (Autonomous), Namakkal*

### Abstract

The Indian coastline, spread over by 8041 kilo metres is exposed to tropical cyclones arising in the Bay of Bengal and Arabian Sea. The population on the bank of Bay of Bengal are horribly haunt by regular natural disasters like flood and cyclone round the year, leading to immeasurable loss of lives and properties. Even today, the people of the coastal areas are thunder stricken by remembering the terrible disaster they experienced during the recent past. Even now, the suffering and hardship, which broke down the backbone of socio-economic fabric of the affected people during the super-cyclone, has remained as a scar mark in their mind as well as others who were affected partially by this devastating natural calamity. All their aspirations for family welfare, personal comforts and community security in the future have created a question mark in their mind. They are in a state of panic stricken for the coming days. Insecurity, unwanted and apprehensiveness has captured the mind of people inhabiting in the coastal districts. Besides, natural calamities and man-made devastations have for shaken the mental tranquillity and financial stability of the people. If we analyse the socio-economic impact on these people, we find a state of frustration in personal life, selfish individualistic attitude, a materialistic, cultural atmosphere, increase of criminal habits and migration to urban pockets have taken place as a side effect of these natural calamity.



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Invited Abstracts

IRBEP/PP/03

## Optimized Biodiesel Production from *Calophyllum inophyllum* Oil Using Response Surface Methodology

**R. Prabhakar and T. Raja**

Department of Mechanical Engineering, V.M.K.V Engineering College, Salem 636 304

### Abstract

The production of a biodiesel from non-edible oil *Calophyllum inophyllum* is using transesterification process. The reaction parameters such as methanol to oil molar ratio, catalyst concentration, temperature and time have been optimized for the production of biodiesel. The yield of biodiesel from the *Calophyllum inophyllum* oil under the optimized conditions is found to be 89%. The central composite design (CCD) is used for experiments conducted. The statistics ANOVA tool is used. The Response surface methodology is used to optimize the production process.



*Invited Abstracts*

IRBEP/PP/04

## **Optimization of Bio-Diesel Preparation of Various Catalysts Using *Hevea brasiliensis* Seed Oil**

**T. Raja and R. Prabhakar**

*Department of Mechanical Engineering, V.M.K.V Engineering College, Salem 636 304*

### **Abstract**

The depletion of the world petroleum reserves coupled with the global environmental problems stimulated the search for the alternative source for petroleum fuel. Biodiesel is one such alternative for the diesel fuel. Biodiesel is a cleaner burning fuel than diesel, also a suitable replacement. It is obtained from renewable sources such as vegetable oil, animal fat's etc. In this paper *Hevea brasiliensis* seed non-edible oil is taken for conversion into bio-diesel. In the process of conversion by transesterification different catalysts are used. The catalysts identified were, Sodium hydroxide, Potassium hydroxide, Sodium methoxide, Sodium peroxide, Hydrochloric acid and Sulphuric acid. The physical and chemical characteristic of various catalysts were studied. An analysis on preparation cost of biodiesel was also carried out.



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Invited Abstracts

IRBEP/PP/05

## Preparation and Testing of Water Hyacinth Composites

**J. Sathees Babu<sup>1</sup> and Dr. K. Balamurugan<sup>2</sup>**

<sup>1</sup> Asst. Professor, Department of Mechanical Engineering, V.M.K.V Engineering College, Periya Seeragapadi, Salem, T.N.

<sup>2</sup> Associate Professor, Department of Mechanical Engineering, IRTT, Erode, T.N.

### Abstract

Fiber reinforced polymer composites plays major role in large variety of applications for high specific strength and modulus. The fiber which serves as reinforcement in reinforced plastics may be synthetic or natural. Although glass and other synthetic fiber reinforced plastics possess high specific strength and their field of application are limited because of their high cost. But natural fibers are strong, light weight and very cheap. Coir, jute and water hyacinth fibers are easily available in India. The present work describes the development and characterization of a hybrid composite material reinforced with coir, jute and water hyacinth fibers in various compositions like 100% JC, 75% JC and 25% WH, 50% JC and 50% WH, 25% JC and 75% WH, 100% WH. The developed composite material was subjected to tensile test, flexural test, impact test and moisture absorption test to study the performance characteristics for selection of the best composition of fiber for automobile components. However inference has been made that 75%JC and 25% WH fiber reinforced composite material will be a suitable alternative material for automobile components.



*Invited Abstracts*

IRBEP/PP/o6

## Removal of Malachite Green Dye On Palm Tree Sawdust from Aqueous Solution

**Dr. N. Buvaneswari**

Associate Professor, Department of Chemistry, V.M.KV. Engineering College, Salem -636308, Tamil Nadu

### Abstract

Effluents releasing from dyeing industries directly affect the soil, water, plant and human life. In the present investigation, adsorption of malachite green dye on palm tree sawdust from aqueous solution was studied. The palm dust sawdust is a cellulose material (basic surface). The dye adsorption on the basic surface is correlated with experimental conditions. The experimental conditions like contact time, concentration of dye solution, temperature, dosage of adsorbent and particle size were optimized for maximum uptake and observed that the adsorption increases with increase of contact time (5h), temperature(30-70°C) and dosage of the adsorbent. The concentration effect was studied from 100 to 600ppm and observed that the percentage of adsorption decreases with increase of dye concentration. The adsorption increases with decrease of particle size (0.8–1.0mm). The adsorption mechanism of malachite green on palm tree sawdust proved that the palm tree sawdust acts as a very good adsorbent for the removal of malachite green dye.



*Invited Abstracts*

IRBEP/PP/07

## **Theoretical and Experimental Studies on Thermal Performance of Water-in-glass Evacuated Tube Solar Water Heaters**

**S. Sadhishkumar and Dr. T. Balusamy**

*Department of Mechanical Engineering, V.M.KV. Engineering College, Salem -636308, Tamil Nadu*

### **Abstract**

Renewable energy is considered as the key to a sustainable energy future. Solar energy is free, environmentally clean and it is recognized as the most suitable alternative energy options. A simple and efficient approach to utilize solar energy is the direct conversion to thermal energy for various applications such as water heating. Solar water heating systems (SWHS) are ranked among the most promising solar energy technologies. The world market for solar water heaters has significantly increased in the last decade. SWHS are often viable to replace electricity and fossil fuels used for many home applications. In general in a SWHS, solar collectors are used to transform solar energy into heat. Evacuated tube solar collectors have better performance than flat-plate solar collectors, in particular for high temperature operations. In this paper, the performance of a water-in-glass evacuated tube solar water heater is investigated for a range of locations. Factors influencing the operation of water-in-glass evacuated tube solar collector tubes are discussed and a numerical study of water circulation through the tubes is presented. The simulation results were then compared with that of experimental results.



## Kitchen Waste Recycling By Vermicomposting – An Eco friendly Approach

**T. Sivakami<sup>1</sup>, M. Kannan<sup>2</sup> and K. Sudha<sup>1</sup>**

<sup>1</sup>Department of Biochemistry, Directorate of Distance Education, Vinayaka Missions University, Salem, TN

<sup>2</sup>Research Scholar, Department of Plant Science, Bharathidasan University, Tiruchirappalli - 620 024, Tamil Nadu

### Abstract

Composting is the most economical and sustainable option for onsite organic waste management and it is easy to operate. Though, thermo composting has been adopted as a basic tool for on-site waste decomposition, there are some disadvantages in the methods such as long duration of the process, frequent aeration requirement, loss of nutrients and heterogeneous end product. Organic waste recycling is an efficient and eco-friendly technology to convert wastes in to various value added products. The products of recycling are eco-friendly fertilizers and they reduce the loss of nutrients from fertilizers. Vermicomposting of leaf litters, municipal solid waste, paper waste, silkworm litter, beverage industry sludge are successfully demonstrated by various authors across India. Hence, the study is proposed to apply vermicomposting technology to process the house hold wastes in Salem, Tamil Nadu, India, employing earthworm. The present investigation is carried out in kitchen wastes of two localities of Salem district namely Peramanur and Ammapet. Kitchen waste are collected from the selected localities and separated for dry and wet wastes. Kitchen wastes are allowed for decomposition for a period of 15 days. In the parallel time cow dung also collected from the nearby localities and it is also allowed for stabilization for 15 days. Composting beds were prepared in layers using kitchen wastes and cow dung in 1:3 ratio. *Eisenia fetida*, an earthworm species used for vermicomposting. Moisture was maintained at 30%. Vermicompost is analysed for the nutrient status of the compost, physio-chemical and microbiological characteristics by comparison with standard vermicompost. Parameters of vermin-compost such as organic matter, bulk density, water holding capacity, pH, electrical conductivity, micro and macro nutrient contents are also analysed. The investigation revealed that the predigestion of kitchen waste had a better correlation on the yield of vermin-compost compared to raw kitchen waste and it is a nutrient rich organic fertilizer and soil conditioner.



## **Impact of Human Activities in the Forest Ecosystem of Kalrayan Hills, Salem District, Tamil Nadu, India**

**M. Kannan<sup>1</sup>, T. Senthil Kumar<sup>2</sup> and M.V. Rao<sup>1</sup>**

<sup>1</sup>Department of Plant Science, Bharathidasan University, Tiruchirappalli - 620 024, Tamil Nadu

<sup>2</sup>Department of Industry University Collaboration, Bharathidasan University, Tiruchirappalli -620 024, Tamil Nadu

### **Abstract**

In this study, a preliminary attempt was made to trace out the causes and consequences of activities of tribes on forest ecosystems of Kalrayan hills, Salem district, Tamil Nadu, India. The study area Kalrayan hills, lies between 11° 30' and 12° 01' N latitude and 70° 29' and 78° 54' E longitude and covers an area of 1095 km<sup>2</sup>. The Kalrayans belongs to Salem district is divided into two sections - the Northern section, referred to as Chinna ("little") Kalrayans (2700 feet) and the Southern section, called Periya ("big") Kalrayans (3000 feet) and they comprise 58 and 44 tribal hamlets respectively. Vegetation of Kalrayans is semi deciduous to scrub forests where sandal wood grows naturally along with other dominant species like teak and bamboo. Data for the impact of human activities in the forest environment were collected through field visits in and around the various hamlets of the tribal communities of the study area from December 2009 to December 2014. During the study period it was observed that the forest ecosystem in Kalrayan hills is very much exploited by the local people for the agricultural purposes such as landscaping, monoculturing, manufacture of bricks, granite stones etc., The plants from wild are used for edible purposes, construction purposes, grassing, various medicinal and non-medicinal purposes, etc., The study revealed the fact that biodiversity plays an important role in the functions of forest ecosystem and there is an urgent need to study on the conservation strategy of biodiversity in and around the tribal settlements of the study area.



## A Preliminary Study on the Production and Purification of Bacteriocins from Lactic Acid Bacteria

**K. Sudha<sup>1</sup>, T. Sivakami<sup>1</sup> and M. Kannan<sup>2</sup>**

<sup>1</sup>Department of Biochemistry, Directorate of Distance Education, Vinayaka Missions University, Salem, Tamil Nadu

<sup>2</sup>Research Scholar, Department of Plant Science, Bharathidasan University, Tiruchirappalli - 620 024, Tamil Nadu

### Abstract

Bacteriocins are antagonistic proteins or peptides that show bactericidal activity against closely related species. They are also called as antimicrobial peptides, which were considered to be narrow antibiotics and are produced by many gram positive and gram negative bacteria. Of all the bacteria, lactic acid bacteria had received much attention, due to their potential application in food industry as natural preservatives. Hence this preliminary study is initiated for isolation and purification of bacteriocins from lactic acid bacteria and the study is in progress. For the present study, *Lactobacillus sp.* was isolated from the milk products available in the market. Isolated colonies of *Lactobacillus* were identified with colony morphology and microscopic observations. The organisms were further confirmed with regular and standard biochemical tests. Further work is on progress for the optimization of Bacteriocin production through different chemical and environmental factors like temperature, pH, nitrogen sources, inoculums size and incubation.



## Bioaccumulation of Heavy Metals in Six Commercial Fish Species of Ennore Mangrove Ecosystem, North Chennai, East Coast India

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### Abstract

The accumulation of six heavy metals; mercury (Hg), chromium (Cr), cadmium (Cd), lead (Pb), copper (Cu) and zinc (Zn) in six commercial species of fishes (*Liza melanoptera*, *Channos channos*, *Mugil cephalus*, *Oreochromis mossambica*, *Siganus javus* and *Arius sp.*), water and sediment collected from six stations along the Ennore mangrove ecosystem course was studied. Ennore creek receives lot of treated and untreated effluents discharges from heavily industrialized and sub urban settlements. The water, sediments and fish samples (liver, muscles and gills) were processed and analyzed for heavy metals and the result showed that the. The heavy metals concentrations were detected almost all the samples and the highest concentration was detected in the following sequential order, In liver samples Zn > Hg > Cr > Cd > Cu > Pb/ *Channos channos* > *Arius Sp* > *Channos channos* > *Liza melanoptera* > *Oreochromis mossambica* > *Siganus javus*. In muscles Cu > Cr > Zn > Pb > Hg > Cd / *Siganus javus* > *Channos channos* > *Arius sp.* > *Siganus javus* > *Arius sp.* > *Siganus javus*. In gills Cr > Zn and Hg > Cd > Pb > Cu / *Liza melanoptera* > *Arius Sp.* > *Oreochromis mossambica* > *Siganus javus* > *Arius sp.* > *Arius sp.*



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Invited Abstracts

IRBEP/PP/12

## Production of Soap from Food Waste

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### Abstract

In India every year more than Rs. 58,000 Crore valued for more than 40% amount of food goes waste. 300 tons of oil barrels are used for the production of the total amount of food around the world. This amount of oil also gets dumped with the food waste. Raw fruit and vegetable peels, fish parts, animal residues constitute the part of the total food waste. The increasing population is giving rise to the high amount of food waste that is dumped in the landfills. They create health disorders to the mankind *and also* harm climate, water, land and biodiversity. Hence the reuse of the food waste within the human food chain, finding secondary markets represents the best option. The project aims in the development of the soap from the food waste. Fat is extracted from the food waste and are subjected to alkali in order to produce soap. This production of soap in the proposed way is to consider the recycle of waste in the society. The use of chemicals in the manufacture of soap has created a sensation of segregating the quality of soap. The recycled production of soap from the domestic food waste shall increase the market potential of soap.



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Invited Abstracts

IRBEP/PP/13

## Geomatics Based Site Selection of Municipal Solid Waste Disposal

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### Abstract

The solid waste materials in cities are the natural outcome of human activities. In most of the cities and municipalities in India, there is a major concern due to the health problems associated with improper disposal of waste. Several factors have to be considered in site selection for waste disposal. Due to the involvement of different parameters, deciding upon a suitable location for waste disposal is very complicated, costly and time consuming. Geographic Information System (GIS) allows users to view, understand, question, interpret and visualize spatial and non-spatial data in many ways that reveals relationships, patterns and trends in the form of maps, reports and charts. The present study details about locating a suitable waste disposal site for our study area. Selecting a suitable disposal site should adhere to the government safety norms and ensure there is no risk involved to the people or the environment. Factor considered for site selections include natural physical characteristics as well as socioeconomic, ecological and land-use factors. Multi-criteria overlay analysis has been done for solid waste disposal site selection in this study. Geographical Information System (GIS) integrates geographical, Geomorphological and other parameters with population and other relevant data in selection of suitable disposal.



## Site Suitability Evaluation for Textile Sewage Water Treatment Plant Using Remote Sensing Techniques in Jalaknadapuram, Salem District, Tamilnadu

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### Abstract

Textile processing units in Jalakandapuram Salem district of Tamilnadu, India generates chemically toxic waste water there by polluting sub-soil and surface water of water bodies in particular Sarabanga minor basins which comes under the Cauvery basin. Jalakandapuram ( Latitudes 11° 35'30''N to 11°46'25''N and Longitudes 77°48'30'' E to 78°2'E) Sub- basin is one among the four sub- basins of the Sarabanga minor basins which comes under the Cauvery basin. Waste water from textile processing units contains a complex mixture of dyes, which are highly resistant to conventional treatment technology. As the characteristics of wash water effluent and dye bath effluent are variable, various physical, chemical and biological treatment methods are adopted for the treatment. Most of the perennial rivers in Tamilnadu have less surface flow water and dried during summer season. The area lies in arid zone of Salem, Tamil Nadu having very scanty rains and very low ground water reserves. Some of the other problems that are faced by the area are disposal of industrial effluent posing threat to its sustainability of water resource. Textiles industries, various mechanical process and chemical/synthetic dyes are used and considerable wastewater discharged from these textile units contains about high amount of the dyes into the adjoining drainages. Geographic Information System (GIS) can be used as a decision support tool for planning waste management. The manual methods adopted for the analysis of many factors would be a tedious and lengthy work. Also the possibilities of errors increase when merging the spatial and non-spatial data. But in case of GIS, as the work is carried out in layers, the chances of error will be less and the system is capable to coordinate between spatial and non-spatial data. Remote sensing analysis has been carried out using Resource sat -1 multispectral satellite data along with DEM derived from IRS P5 stereo pair. GIS database generated of various thematic layers viz. base layer - inventorying all water bodies in the vicinity, transport network and village layer, drainage, geomorphology, structure, land use. Analysis of spatial distribution of the features and change detection in land use/cover carried out. GIS maps have been used to help factor in spatial location of source and hydro-geomorphological settings. In our project analyze the chemical content of the water and Site suitability evaluation for waste management is becoming a major criteria for defending the environmental degradation. If proper location for the treatment plant is not selected then it may lead to soil degradation and ground water pollution. The study area is situated in the southern portion of Tamil Nadu, India that is currently experiencing high rates of population growth and economic development. Potential sites for the treatment plant are evaluated using suitability score based on planning and design constraints, including ground slope, land use pattern, and distance to river and roads. Spatial analyst tool of ArcGIS software is used for selection of suitable reclamation plant site. Finally based on weightage value, suitable site for treatment plant have been selected and classified into good, moderate and poorly suitable areas respectively.



*Invited Abstracts*

IRBEP/PP/15

## **Comparative Study on the Black and White *Sesamum indicum* Seeds (Raw and Roasted)- *In Vitro***

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### **Abstract**

Sesame (*Sesamum indicum* L.) is one of the world's most important oil seed crops. Apart from being an important oilseed source, sesame seed is a potential source of proteins. Sesame seeds were proceeding from the local market. First portion of the seeds were soaked in water overnight at room temperature. Then it was shade dried and milled into flour. For roasting, the second portion of the sesame seed were heated in a preheated oven at 90°C for 10 mins on a glass tray, cooled and milled into flour. Proximate composition, mineral contents and antioxidant activity of raw and roasted sesame seeds were studied in this study. The results revealed that white sesame seeds showed an increased percentage concentration of moisture, ash, crude protein, total amino acids, crude fibre but crude lipid were here high in both seeds. The mineral calcium, phosphorous, iron contents and magnesium were increased in raw seeds while reduced in roasted sesame seeds. Vitamin is an essential nutrient for all species. The Vitamin A level was high in raw and roasted black sesame seeds than vitamin E level, which was higher in white sesame seeds. In this study, white sesame seeds have higher nutrient value, mineral content and antioxidant activity followed by the black sesame seeds. Finally, when compared with raw and roasted, raw sesame seeds shown to be a promising food material for improving the nutrient value for the human, mineral content and antioxidant activity when compared with roasted one.



## ***In Vitro* Study of *Rosa indica* and *Rosa centifolia* on Antioxidant Activity and a Comparative Study of the Aqueous, Methanol and Petroleum Ether Extracts**

**A. Sheela**

Assistant Professor, Department of Biochemistry, Valliammal College for Women, Chennai-600 102

### **Abstract**

Rose is a shrub known for its broad range of pharmacological properties. It is rich in antioxidant phytochemicals, which are responsible for most of its medicinal properties. Different formulations of rose were in use since ancient times, which vary in their phytochemistry and clinical importance, depending on the plant parts, extraction solvents, method of extraction used. The present study is a comparison between three different preparations of rose: the aqueous extract, the petroleum ether extract, and the methanol extract from rose petal. The qualitative analysis proved that *Rosaindica* is having more amounts of total phenolics when compared to *Rosa centifolia*. Aqueous extract contains more amounts of total phenolics when compared to petroleum ether and methanol extract. Reducing Power Assay, enzymatic antioxidant assays and non- enzymic antioxidant assays confirm that Aqueous extract of *Rosa indica* is having higher free radical scavenging activity than aqueous *Rosa centifolia* and even in the other two extracts of (PE and M) *Rosa centifolia* seems to be lesser than *Rosa indica* (PE and M extract). Thus it can be concluded from this *in-vitro* study that, the aqueousextract, petroleum ether extract and methanol extract of *Rosa indica* and *Rosa centifolia* have enhanced antioxidative activity. The comparative study proves that *Rosa indica* having high free radical scavenging activity than *Rosa centifolia*.



*Invited Abstracts*

IRBEP/PP/17

## **Gastroprotective Potentials of the Ethanolic Extract of *Mukia maderaspatana* against Indomethacin-induced Gastric Ulcer in Rats**

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### **Abstract**

This study investigated the protective effects of ethanolic extract of *Mukia Maderaspatana* against indomethacin-induced gastric ulcer in rats. Gastric ulceration was induced by single intraperitoneal injection of indomethacin (30 mg/kg b.wt.). *Mukia Maderaspatana* extract produced significant reduction in gastric mucosal lesions, malondialdehyde (MDA), and serum tumour necrosis factor (TNF $\alpha$ ) associated with a significant increase in gastric juice mucin content and gastric mucosal catalase (CAT), nitric oxide (NO), and prostaglandin E2 (PGE2) levels. The volume and acidity of the gastric juice decreased in pretreated rats. The plant extract was elevated in the gastric juice of rats untreated has showed near normal levels in pre-treated rats. The *Mukia Maderaspatana* was able to decrease acidity and increase the mucosal defense in the gastric area, therefore justifying its use as an antiulcerogenic agent. Ranitidine significantly increased pH value and decreased pepsin activity and gastric juice free and total acidity. The anti-ulcer effect was further confirmed histologically.



## Effect of Ursolic Acid and Rosiglitazone Combination on Hepatic Lipid Accumulation in High Fat Diet-fed C57BL/6J Mice

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### Abstract

This study investigated the combined effect of ursolic acid (UA) and rosiglitazone (RSG) on lipid regulatory genes in high fat diet (HFD)-fed mice. Male C57BL/6J mice were fed either normal diet or HFD for 10 weeks, after which animals in each dietary group were divided into following six groups, (normal diet, normal diet plus UA and RSG, HFD alone, HFD plus UA, HFD plus RSG, and HFD plus UA and RSG), for the next 5 weeks. UA (5 mg/kg BW) and RSG (4 mg/kg BW) were administered as suspensions directly into the stomach using a gastric tube. At the end of the study (106th day), their liver was analyzed for lipid content. RT-PCR and western blotting methods were used to analyze lipid regulatory genes. HFD-fed mice showed increased activities of hepatic marker enzymes (aspartate aminotransferase and alanine aminotransferase) in plasma and an increased concentration of total cholesterol, triglyceride and free fatty acid in liver. These results were confirmed by upregulated mRNA expression of lipogenic genes such as sterol-regulatory-element-binding protein-1c, fatty acid synthase and acetyl-CoA carboxylase and downregulated mRNA expression of fatty acid oxidative genes such as carnitine palmitoyltransferase-1, acetyl-CoA carboxylase and peroxisome proliferator-activated receptor- $\alpha$  in HFD-fed mice. Combined treatment (UA/RSG) significantly reduced the hepatic marker enzyme activities and decreased the lipid accumulation in liver. Further, combination treatment (UA/RSG) down regulated lipogenic genes and upregulated fatty acid oxidative genes in HFD-fed mice. This study suggests that UA in combination with RSG reduced lipid accumulation in liver.



## Antibacterial Activity and Physicochemical Activity of the Methanol Extract of *Gloriosa superba*

**K. Revathi<sup>1</sup>, A. M. Saranya<sup>1</sup> and V.K. Evanjelene<sup>2</sup>**

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<sup>2</sup>Alpha Omega Hi-Tech Bio Research Centre, Salem

### Abstract

Medicinal plants are nature's gift to humans to make disease free healthy life. Medicinal plants represent a rich source of antimicrobial agents. Plants are used medicinally in different countries and are a source of many potent and powerful drugs. In the present study, the plant *Gloriosa superba* was evaluated for various parameters. Phytochemical screening showed that the important phytochemicals like alkaloids, steroids and phenols were present in the methanol extract. *Bacillus cereus* was found to be most susceptible organism. *Enterococcus faecalis* was found to be next susceptible organism. All the organisms studied were susceptible in the highest concentration of methanol extract. The methanol and hexane extracts of *Gloriosa superba* were studied for their organoleptic characters. Physicochemical parameters were also studied for the methanol and hexane extracts of *Gloriosa superba*. Thus, the above results proved that methanol extract of *Gloriosa superba* had potent antibacterial activity which could be attributed to the presence of phytochemicals.



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Invited Abstracts

IRBEP/PP/20

## Anticancer and Antioxidant Activities of Algae *Caulerpa racemosa*

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### Abstract

Various bioactive compounds from marine organisms have been experimentally tested to comprehensively study the biological effects of recently developed drugs. The versatility of the functions of algae may derive from their abundant bioactive metabolites. *Caulerpa racemosa* is a species of green alga, a seaweed in the family Caulerpaceae. It is commonly known as sea grapes and is found in many areas of shallow sea around the world. The phytochemical screening was done and it was seen that alkaloids, flavonoids and terpenoids were present in the methanol extract of *Caulerpa racemosa*. The antioxidant activity was seen to be directly proportional to the concentration of the *Caulerpa racemosa* methanol extract. Florescence analysis of the sample was done using different tests. Cytotoxic activity of the methanol extract of *Caulerpa racemosa* was found to be significant against the studied cancer cell line. These results suggest that *Caulerpa racemosa* can be considered as promising resource of the future forming one of the important marine living resources of high medicinal value.



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Invited Abstracts

IRBEP/PP/21

## A Study on the Antidiabetic and Antifungal Activity of *Colocasia esculenta*

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### Abstract

Plants are the richest resource of drugs of traditional systems of medicine, modern medicines, nutraceuticals, food supplements, folk medicines, pharmaceutical intermediates and chemical entities for synthetic drugs. Extract of *Colocasia esculenta* leaves has been traditionally used for the treatment of various ailments in Ayurveda and Unani medicine. *Colocasia esculenta* is traditionally used in various diseases such as high BP, hepatic disorder, rheumatic pain, pulmonary congestion, ulcer etc. It was found that the phytochemicals of medicinal significance were present only in the ethanol extract of *Colocasia esculenta*. *Aspergillus niger* was the least susceptible species and *Trichophyton simii* was highly susceptible. Higher activity was seen against *Candida albicans* at the highest concentration of the extract. It was found that the  $\alpha$ -amylase inhibiting activity was directly proportional to the concentration of the *Colocasia esculenta* extract. From the study, it can be concluded that *Colocasia esculenta* has potent activity and can be used to treat many diseases and as an antifungal agent.



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Invited Abstracts

IRBEP/PP/22

## Medicinal Properties of *Euphorbia hirta*

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### Abstract

Plants are used in traditional medicine for the treatment of several ailments in different parts of the world. *Euphorbia hirta*, an important medicinal herb, belongs to genus *Euphorbia*, family *Euphorbiaceae* and is widely used in local and traditional Chinese medicine in clinical practice, the whole plant is commonly applied to cure various diseases. In the present study, the phytochemical analysis revealed that alkaloids, steroids and phenols were present in the methanol extract of *Euphorbia hirta*. It was seen that the antioxidant activity increased with the increase in concentration of the extract. *Staphylococcus epidermidis* was the most susceptible organism and the inhibition seen in the highest concentration of extract was higher than that of the control. GC-MS and TLC analysis were also done to identify the compounds. These results suggest that *Euphorbia hirta* can be considered as promising resource of the future forming one of the important marine living resources of high medicinal value.



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Invited Abstracts

IRBEP/PP/23

## Green Synthesis of Zinc Oxide Nanoparticles from *Sargassum fluitans*

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### Abstract

*Sargassum* (Phaeophyceae family) is a genus of brown algae, well-known as macroalgae or seaweeds, distributed throughout the temperate and tropical oceans in the world. The current study aimed to study *Sargassum fluitans* collected from the Rameshwaram coastal waters. Phytochemical analysis of the methanol extract of *Sargassum fluitans* seaweed showed the presence of Alkaloids, steroids, carbohydrates high quantity of alkaloids and steroids were quantitatively estimated in the methanol extracts of *Sargassum fluitans*. The antibacterial activity results of methanol extract of *Sargassum fluitans* seaweed showed excellent effect against the three gram positive and one gram negative bacteria. In the result of seaweed extract, the maximum zone of inhibition was observed on *Klebsiella pneumoniae* (17 mm) and in methanol 60  $\mu$ l *Bacillus subtilis* (17 mm) concentration and minimum zone of inhibition observed for *Enterococcus faecalis* (15 mm) and *Bacillus cereus* (15 mm). From the Methanol extracts Zn-nano particles were synthesized. The synthesized Zn-Nps were characterized by UV, FT-IR and SEM analysis.



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Invited Abstracts

IRBEP/PP/24

## Medicinal Activities of *Polyalthia longifolia*

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### Abstract

Medicinal plants have bioactive compounds which are used for curing of various human diseases and also play an important role in healing. The present study was carried out in *Polyalthia longifolia*. *Polyalthia longifolia* is commonly found in India. Two extracts derived from different solvents, qualitative and quantitative phytochemical analysis were reported. The antimicrobial activity results of Ethanol extract of *Polyalthialongifolia*leaves showed excellent activity. The organisms tested were *Aspergillus niger*, *Klebsiella pneumonia* and *Bacillus cereus*. The activity seen in the higher concentrations of ethanol extract was much higher than that observed for the control. *K.pneumoniae* was least susceptible when compared to the other two organisms. The ethanol extract of *Polyalthia longifolia* has significant antimicrobial activity. Anti-oxidant activity (reducing power assay) was of ethanol extract of *Polyalthia longifolia* was found to increase with increasing concentration. The cytotoxicity was also significant in the extract.



## Synthesis of Aluminium Nanoparticles from *Rivina humilis* and their Antifungal Activity

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### Abstract

*Rivina humilis* is a species of flowering plant in the pokeweed family, Phytolaccaceae. The phytochemical analysis of *Rivina humilis* revealed that alkaloids, flavonoids, terpenoids were present only in the aqueous extract and absent in the chloroform extract. The quantitative analysis of alkaloids and flavonoids in the aqueous extract of *Rivina humilis* was performed. It was seen that flavonoids were higher than alkaloids. The aluminium nanoparticles were synthesized from the aqueous extract. The antifungal activity was also studied the maximum zone of inhibition was observed on *Candida albicans* (17 mm), *Aspergillus niger* (16mm) in Aqueous extract 60 µl concentration and minimum zone of inhibition observed on *Trichophyton simii* (14 mm) and *Curvularia lunata* (11 mm). The nanoparticles were characterized by UV, FTIR and SEM. It was concluded from the study that *Rivina humilisi* s an important medicinal plant.



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Invited Abstracts

IRBEP/PP/26

## Silver Nanoparticles from *Durvillaea antarctica* Extract

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### Abstract

Seaweeds are considered to produce a great variety of secondary metabolites characterized by a broad spectrum of biological activities. In this study, *Durvillaea antarctica* was evaluated. Qualitative phytochemical analysis of *Durvillaea antarctica* revealed that high activity was seen in the methanol extract. Alkaloids and steroids were present in the methanol extract. The antioxidant activity was observed to increase proportional with the increase in the concentration of the methanol extract of *Durvillaea antarctica*. Silver nanoparticles were synthesized from methanol extract of *Durvillaea antarctica* and characterized by UV, FTIR and SEM. Antimicrobial activity of *Durvillaea antarctica* was tested against the bacterial organisms *Pseudomonas aeruginosa* and *S.aureus* and the fungal organisms *Candida albicans* and *Curvularia lunata*. The methanol extract of *Durvillaea antarctica* possessed significant antimicrobial activity. Finally it was concluded that the *Durvillaea antarctica* is a source of bioactive compounds with potential applications, revealing activity to control pathogens and antioxidant activity.



## Evaluating the Effect of Background Water Chemistry on the Aquatic Toxicity of Major Ion Salts

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### Abstract

Increased concentrations of major ions (Na, K, Ca, Mg, Cl, SO<sub>4</sub>, HCO<sub>3</sub>) in surface waters are a consequence of many land uses, including extraction of oil, gas, and several other minerals. Several existing studies have indicated that the toxicity of excess concentrations of these ions can depend on characteristics of the underlying water chemistry. As an example, literature data have indicated that the toxicity of sodium chloride increases as water hardness decreases. As such, toxicity of waters enriched with major ions can depend not only on what ions are elevated, but also on which ions are present in low concentrations. The current study was focused on surveying a full range of major ion salts, and identifying the degree to which the toxicity of these salts varied with differences in the underlying water chemistry. This was accomplished by conducting many series of exposures in which dilution water chemistry was manipulated in different ways. For example, in some series, concentrations of all the ions in the dilution water might be raised or lowered simultaneously, such that all ions remain in the same ratios as concentrations change. In others, only certain ions were manipulated and others held constant; an example of the latter would be comparing waters with the same hardness (i.e., Ca + Mg is constant), but with varying ratios of Ca to Mg. By interpreting results of multiple experiments together, one can infer which water quality parameters most influence toxicity of major ions. The most extensive testing was completed with *Ceriodaphnia dubia*, with more limited testing using *Daphnia magna* and fathead minnows. The data show that effects of water hardness on the toxicity of NaCl and Na<sub>2</sub>SO<sub>4</sub> are driven primarily by Ca specifically, not by overall water hardness. An even greater influence of Ca was found for MgSO<sub>4</sub> and MgCl<sub>2</sub>. Toxicity of potassium salts was also sensitive to background water chemistry, but these effects were associated with variation in Na concentration rather than Ca. Chloride:sulfate ratios and alkalinity/pH seemed to have comparatively little influence on toxicity of major ion salts when tested over ranges common to natural waters.



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Invited Abstracts

IRBEP/PP/28

## Production of Bio-fertilizer from Fruit and Vegetable Waste

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### Abstract

India is the second largest country in the world for the production of fruits and vegetables. But still India wastes lots of fruits and vegetables, the estimated amount of wasted vegetables and fruits in India is about 13-15 crore rupees. This huge amount of wastes are dumped in waste bins, drainages etc which causes loss and even unclean city. When these waste fruits and vegetables are mixed with water bodies like rivers, ponds, lakes, etc they increase the amount of Chemical Oxygen Demand and Biological Oxygen Demand in those water bodies. Thus lots of nutrients are wasted daily by wasting the waste. The organic wastes are utilized to some extent in agriculture but most of them are either burnt or remained unutilized, especially in developing countries. Organic waste materials are available in huge amounts in the form of farm waste, poultry waste and industrial wastes (rice industry). The continuous accumulation of these wastes is becoming a potential source of land, water and air pollution. The proposed idea is based on the production of bio-fertilizers from the wasted fruits and vegetables and will reduce the wastage of wastes and will be environmentally and economically good.



*Invited Abstracts*

IRBEP/PP/29

## Vibrational Spectral Analysis of Ortho, Meta and Para – Amino Benzoic Acids

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<sup>2</sup>Department of Physics, Annamalai University, Annamalai Nagar

### Abstract

In this paper, we consider amino benzoic acids, which are pharmaceutically active. Structural patterns of various substituted amino benzoic acids were identified by FTIR and FT-Raman spectra. We have investigated the vibrational analysis of the compounds and tentative assignment of the frequencies in the respective infrared and Raman spectra of the compounds. The functional groups present in the compounds and their absorption position in the region 4000-400  $\text{cm}^{-1}$  are identified referring the absorption frequencies reported in the literature. The activity of the drug molecules are based on the structural patterns of the substitutions. We have found that p-aminobenzoic acid shows better activity than others.



## Quadrilinearization of (2+1) Dimensional Breaking Soliton Equation

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### Abstract

Solitons are solitary waves, which do not undergo change in amplitude due to collision, except for a phase shift. Solitons are the solutions of nonlinear dispersive partial differential equations. Mathematical models are being developed in neuroscience that signals are conducted within neurons in the form of solitons. In this paper, we investigate the (2+1) dimensional Breaking Soliton equation. The (2+1) D breaking soliton equation describes the interaction of a Riemann wave propagating along the y-axis with a long wave along x-axis. Using Painleve truncation approach, we have quadrilinearized the breaking soliton equation. We have also obtained the solutions in terms of arbitrary function. Using the arbitrary function, we have constructed periodic solutions and line solitons.



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*Invited Abstracts*

IRBEP/PP/31

## **Social Impact and Healthy Diet Plan on Obesity**

**D. Dhanasree**

*Department of Biotechnology, V.M.K.V engineering College, Salem*

### **Abstract**

Obesity means excess accumulation of fat in body. It is concern that India has the third place in which males has 12.1% and female 16% based on NFHS data. There are several associated risk of diseases like diabetes and heart diseases this is due to the genetic tendency of Indians. Obesity also causes illness hormonal problems and some rare diseases of brain that can lead to over eating. The healthier plan of food choices and proper workouts will be the good remedy for obesity mainly in children. Various researches say that a minimum of thirty minutes atleast five days a week period of activity are as beneficial to your overall fitness. It also improves blood circulation, reduces the risk of heart diseases, keep weight under control.



*Invited Abstracts*

IRBEP/PP/32

## Review on Genetically Modified Mosquitoes

**G. Dhanush, P. Hindrajith, B. Naveen Raj and Saurabh Kumar**

*Department of Biotechnology, V.M.K.V engineering College, Salem*

### Abstract

In light of the above, the need to develop new tools for controlling the dengue vector has become a key element in current regional strategies. For some years, oxford insect technology (Oxitec) has been engineer a genetically modified Rockefeller strand of *Aedes aegypti*, OX513A, as one more potential tool for combating the vector. This strain has a transgene that promotes *Ae. aegypti* mortality in the larval stage, where the promoters responsible for the transgenes expressions are found. The strain has a genetic marker expressed by a fluorescence protein and a conditional lethality system. The fluorescence makes it possible to identify larvae and adult males in the laboratory. The conditional lethality system is meditated by the presence or absence of tetracycline. In the absence of this antibiotic, a protein lethal to these insects in produced, so that when males with the gene are released and fertilized with females, the *Ae. aegypti* populations decline, since their pregnancy lie in the larval stage.



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Invited Abstracts

IRBEP/PP/33

## Biotechnology and the Utilization of Solid Wastes as a Resource for Product Development

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Department of Civil Engineering, Mahendra Engineering College (Autonomous), Namakkal-637 503

### Abstract

Life is associated with waste production and the exploitation of these materials as a renewable resource for bio product development could be a major challenge for bio technology. Environmental pollution is the major problem associated with rapid industrialization, urbanization & rise in living standards of people. For developing countries, industrialization was must & still this activity very much demands to build self reliant and in uplifting nations economy. However, industrialization on the other hand has also caused serious problems relating to environmental pollution. Therefore, waste seem to be a by product of growth. The country like India can ill afford to lose them as sheer waste, on the other hand with increasing demand for raw materials for various beneficial uses. Management of ISW is not the responsibility of local bodies. Industries generating solid waste have to manage such waste themselves and are required to seek authorizations from respective state pollution control boards under relevant rules. However, through joint efforts of SPCBs, local bodies and the industries, biotechnology methods, a mechanism could be evolved for better management.



## Effect of Naringin on UVB Induced Antioxidant Status and DNA Damage in NIH 3T3 Cells

**N. Roopa<sup>1</sup> and Dr. M. Sridevi<sup>2</sup>**

<sup>1</sup>Research Scholar, Department of Biochemistry, Periyar University, Salem, TN

<sup>2</sup>Professor & Head of Department of Biotechnology, VMKV Engineering College, Salem, TN

### Abstract

Exposure to UVB radiation induces the formation of ROS in living beings. Naringin widely recognized as naturally occurring dietary phytochemicals, found in grape fruit and gives bitter taste. In this study, we examined the protective effect of naringin on UVB induced antioxidant status with reference to cellular DNA damage in mouse embryonic fibroblast (NIH 3T3 cells). NIH 3T3 cells is one of the most standard cell lines in world wide. The cells were treated with varying concentration of naringin (20 $\mu$ M, 40 $\mu$ M, 60 $\mu$ M) and also it is exposed to UVB radiation. 60 $\mu$ M shows the effective dose. After the treatment, series of *in vitro* tests such as the levels of cytotoxicity, hydroxyl radical, superoxide, nitric oxide, DPPH, ABTS radical scavenging activity, intracellular ROS, oxidative DNA damage, apoptotic morphological changes and enzymatic (superoxide dismutase, catalase and glutathione peroxidase) and non – enzymatic (Glutathione) antioxidant status were carried out. NIH 3T3 cells with naringin (60 $\mu$ M) alone showed some significant changes in antioxidant status, tail DNA, %tail length, tail moment when compared with UVB treated cells. Based on our results, we conclude that antioxidant depletion and the DNA damage was inhibited by naringin against UVB induced in NIH 3T3 cells. The future work is on progress.



*Invited Abstracts*

IRBEP/PP/35

## Handle Bar Cardiac Heart Rate Meter

**P. K. Shanly**

*Department of Biomedical Engineering, VMKV Engineering College, Salem*

### Abstract

Today with an increased interest in maintaining good health through physical exercise, a need exists for a quick and easy way to detect the heart rate after exercise to ensure that the desired aerobic state has been reached. The primary objective of the handlebar heart rate meter is to provide a portable, yet affordable device that quickly displays a person's average heart rate when they simply grip the set of device handlebars. The handlebar cardiac heart rate meter detects the electrocardiogram (ECG) waveform through the handlebars. This waveform is converted to a pulse waveform whose frequency corresponds to the heart rate. This frequency is converted to a voltage level that is proportion to the person's average heart rate and then displayed on the Liquid Crystal Display. In addition, a buzzer and flashing LED provide audio and visual indication of the heartbeat. The handlebar cardiac heart rate meter is battery operated and has a response time of less than 5 seconds.



## Doppler Ultrasound Fetal Heart Rate Monitor

**R. Vinusha**

*Department of Biomedical Engineering, VMKV Engineering College, Salem*

### Abstract

Physicians frequently use a portable Doppler ultrasound device for monitoring fetal heart rates. One such device used by a physician in the region is the Imex Pocket Dop II Doppler ultrasound fetal heart rate monitor. The commercial unit provides only a Doppler audio tone of heart activity, played over a small speaker. The physician must correctly position the unit on the mother, count the fetal heart sounds in a given time interval, and manually compute the heart rate. The purpose of this project is to design an electronic add-on feature that converts the fetal heart sounds into average fetal heart rate, which is indicated on a Liquid Crystal Display (LCD). A small battery powered detection unit was designed, packaged and added to the unit, providing an accurate digital reading of fetal heart rate (+/- 1 Beat/Minute). A small red LED was added to blink for each detected fetal heart beat, providing positive heart beat information for a possibly hearing-impaired mother.



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*Invited Abstracts*

IRBEP/PP/37

## Handicap Access to a Four-Wheeler

**Tissa Mary**

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### Abstract

The use of 4-wheelers has gained significant popularity for chore type activities on farms and ranches and for use in other industries. Individuals with certain types of physical handicaps either have difficulty or are unable to get onto and/or operate 4-wheelers. Students developed a safe and efficient system that allows physically handicapped individuals to get onto and operate 4-wheelers. Emphasis was placed on access and operating system design that accommodates individuals with a wide range of physical disabilities. Affordability was another area of emphasis.



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*Invited Abstracts*

IRBEP/PP/38

## Medication Reminder Bottle Cap

**Ancy Babu**

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### Abstract

There is a need for a product that utilizes a user-programmable clock and timing system to remind patients to take prescription medications. Physicians and pharmacists have expressed concern over patient compliance with prescription medications. Often this is not because of the willful disobedience of the patient, but due to forgetfulness and the busy schedules many people lead. Many of the current products on the market are costly and supply more features, such as locking and password protection, than many users need. The objective of this design project is to design an inexpensive alternative that provides audio and visual alarms to assist the user in prescription compliance. In fulfillment of this objective the Medication Bottle Cap is a small electronic device that replaces the cap on commonly used prescription bottles. The product snaps onto a 75 ml bottle and is approximately 2 inches in diameter. It features a clock display to show current time and three user programmable alarms. This allows the patient to be reminded of a medication three times daily.



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*Invited Abstracts*

IRBEP/PP/39

## Hearing Aid Systems for Impaired People

**S. Vaishnodevi**

*Assistant Professor, Department of Biomedical Engineering, VMKV Engineering College, Salem*

### Abstract

The term DIGITAL is used so often today, it can be confusing. When the term "digital" is used when referring to hearing aids, it generally means the hearing aid is 100% digital. In other words, the hearing aid is indeed a "complete computer". Digital technology is tremendous and it allows the audiologist maximal control over the sound quality and loudness of the hearing aid. Importantly, digital technology allows the audiologist to tailor or customize the sound of your hearing aids to what you need and want to hear. In this paper, we developed noise reduction filters (Adaptive LMS) for a configurable digital hearing aid (DHA). Our digital hearing aid overcomes the shortcomings of the traditional analog model.



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Invited Abstracts

IRBEP/PP/40

## Collagen as a Bio-Material

**K. Natarajan**

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### Abstract

Collagen, the most abundant protein found in the body forms the major component of fascia, cartilage, ligament, tendon, bone and teeth. Since they do not contain all the essential amino acids they are not completely considered as proteins. They mainly act as connective tissue in animals. The radical 'Triple helical structure' of collagen consists of five tropocollagen molecules assembled along the corners of a regular pentagon. This structure was proposed by Dr. G.N. Ramchandran and is known as the 'Madras helix'. Collagen exhibiting the key properties such as Controlled drug release, Bio-degradability, Energy absorption, Piezo-electric effect has earned its title as a smart Bio-material. The industrial applications of collagen are in pharmaceuticals, photography and as a flavoring ingredient in foods. Recent research has proven collagen to be inevitable, to the Bio-medical field. Collagen sheets have found its use in cosmetic surgery, healing aid for burn patients and as reconstruction of bone and wide variety of dental and orthopedic surgeries. This medical collagen is obtained from young beef cattle (bovine), pig tissue (porcine). This paper is intended to shine light on collagen which wasn't considered to be of any importance and inspire this generation of young minds to explore and discover the untapped potentials of collagen and other Bio-materials.



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Invited Abstracts

IRBEP/PP/41

## Adsorption of Cationic Malachite Green and Anionic Methyl Orange Dyes on Silica

**Dr. N.B uvaneswari<sup>1</sup>, R. Razim Meeran<sup>2</sup> and P. Saisantosh<sup>3</sup>**

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<sup>2</sup>Department of Automobile Engineering, V.M.K.V Engineering College, Salem-636308, Tamil Nadu

<sup>3</sup>Department of Aeronautical Engineering, V.M.K.V Engineering College, Salem-636308, Tamil Nadu

### Abstract

Water pollution due to effluents from textile dyeing industry is a cause of serious concern. In which, the soil polluting and non-soil polluting dyes are identified through adsorption mechanism by using cationic malachite green (MG) and anionic methyl orange (MO) dyes on silica. The positive  $\Delta H^\circ$  of MG higher than the 40KJ/mole confirmed the adsorption of MG on silica is chemisorption and the negative  $\Delta H^\circ$  less than 40KJ/mole is proved that the adsorption of MO on silica is physisorption. The recovery of both the dyes has been studied by using dyes adsorbed silica in water at 90°C. Very poor recovery (15%) and high adsorption of MG (89%) is due to the strong adsorption to silica surface proved its soil polluting nature. The high recovery of MO (92%) and poor adsorption (33%) of MO on silica surface is proved that MO is not polluting the soil.



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Invited Abstracts

IRBEP/PP/42

## Nanorobots for Laparoscopy

**G. Sureshkumar**

Assistant Professor, Department of Electronic & Communication Engineering, VMKV Engineering College, Salem

### Abstract

This paper presents an innovative hardware architecture for medical nanorobots, using nanobioelectronics, clinical data, and wireless technologies, as embedded integrated system devices for molecular machine data transmission and control upload, and show how to use it in cancer surgery. The integration of medical nanorobotics and surgical teleoperation has the use of robotic laparoscopy concepts. To illustrate the proposed approach, we applied advanced 3D simulation techniques as a practical choice on methodology for molecular machine integrated system analyses and biomedical instrumentation prototyping. Keywords: Architecture, cancer, hardware, integrated circuit, medical nanorobotics, nanobioelectronics, nanomechatronics, nanomedicine, surgical instrumentation, VLSI.



## Synthesis of Aluminium Nanoparticles from *Tagetes erecta* and their Antimicrobial Activity

**Azhaguraja**

Department of Chemistry, AVS College of Arts and Science, Salem

### Abstract

Medicinal plants are of great importance to the health of individuals and communities in general. The medicinal value of plant lies in the bioactive phytochemical constituents of the plant and which shows various physiological effects on human body. Nanotechnology is an important field of modern research dealing with synthesis, strategy and manipulation of particle's structure ranging from approximately 1 to 100 nm in size. In the current study the phytochemical analysis, antimicrobial activity synthesis and characterization of aluminium nanoparticles from the extract of *Tagetes erecta* was done. Alkaloids, phenols and steroids were present only in the methanol extract. The antimicrobial activity of aluminium nanoparticles from *Tagetes erecta* were tested against two organisms. The nanoparticles synthesized were characterized using UV-VIS, FTIR and SEM. It was concluded that the aluminium nanoparticles synthesized from the extract of *Tagetes erecta* have the ability to be used as antimicrobial agent against antibiotic resistant strains and also the plant extract of *Tagetes erecta* can be used to cure various diseases.



## Degradation of Feather Waste by Bacteria Isolated from Poultry Farm Soils

**B. Vennila**

*Department of Biotechnology, Shri Shakthikailash Women's College, Salem*

### **Abstract**

Feathers represent approximately 5-7% of the total weight of poultry animals, form the exo-skeleton of birds. Disposal of feather waste is quite challenging. The traditional methods for disposal of feather wastes have extensive operating costs, consume energy, result in loss of natural resources and have extreme environmental implications. Keratinolytic enzymes from bacteria are used to treat keratin containing wastes from poultry and leather industries, through the development of non-polluting processes. In this study, an attempt was made to degrade feather samples with the help of bacterial strains. The bacterial species were isolated from poultry farm soil and characterized. The 16S rRNA sequencing was also done. The degrading potential of the five isolated strains were studied. It was concluded that *Bacillus subtilis* was a potential keratinolytic strain and can potentially be used for treatment of feather waste thus bringing about effective waste management of feather waste using an eco-friendly approach.



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*Invited Abstracts*

IRBEP/PP/45

## Recent Trends in Food Preservation

**R. Subbaiya and R. Karamchand**

*Department of Biotechnology, K S R College of Technology, Tiruchengode*

### Abstract

The increasing consumer demand for 'fresh like' foods have led to much research effort in the last decade or so. This food preservation technology protects the food from deterioration and spoilage due to certain microbes and some enzymatic reactions by chemical, physical and microbiological means. It helps in reducing the wastage of food and prevents the loss of nutritional values by inactivation of certain enzymes and microbes. It increases the shelf life of the food products. In this paper the aim, goals and emerging techniques of food preservation / processing are discussed. Above are the points discussed in number of articles which have been reviewed and some recent trends of doing it in a better manner is what our motive of doing this presentation is.



*Invited Abstracts*

IRBEP/PP/46

## Design and Implementation of Safer Cards Via RFID Security

**S. Surya and T. M. Tamil Selvi**

*M.Kumarasamy College of Engineering, Thalvapalyam, Karur, Tamil Nadu 639113*

### Abstract

We report on a new approach for enhancing security and privacy in certain RFID applications whereby location or location-related information (such as speed) can serve as a legitimate access context. Examples of these applications include access cards, toll cards, credit cards, and other payment tokens. We show that location awareness can be used by both tags and back-end servers for defending against unauthorized reading and relay attacks on RFID systems. On the tag side, we design a location-aware selective unlocking mechanism using which tags can selectively respond to reader interrogations rather than doing so promiscuously. On the server side, we design a location-aware secure transaction verification scheme that allows a bank server to decide whether to approve or deny a payment transaction and detect a specific type of relay attack involving malicious readers. The premise of our work is a current technological advancement that can enable RFID tags with low-cost location (GPS) sensing capabilities. Unlike prior research on this subject, our defenses do not rely on auxiliary devices (or) any explicit user environment.



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Invited Abstracts

IRBEP/PP/47

## Waste Management

**Lekshmi**

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### Abstract

There are many factors that contribute to the Public Health issues in India. Irresponsible disposal of waste from homes, industries, etc is one of the major problems to public health. A few weeks back, a report from Trivanthapuram, Kerala, said that illegal dumping of domestic waste in private lands have been on a steady increase. The residents of the neighbouring locality reported that the neighbourhood had become impossible to live in due to the unbearable stench of the rotten waste. Left with no choice, the residents complained to the concerned authorities and it was later found that the waste was being dumped illegally in private land areas without proper permission and paperwork. Such activities are not only in Kerala but also in many parts of India. Waste management in certain parts of India has not yet been attended to with proper seriousness. Thus polluting the air, land, and water of the environment and leading to some serious public health issues. Waste can be disposed without being harmful to human beings when done with care. For example, domestic waste can be disposed through sanitary landfills and proper incineration. Another one is Hazardous waste, which can be treated by chemical, biological, thermal, and physical methods. Following a safe and efficient pattern for waste disposal can reduce the harmful effects on public health thus creating a disease-free, stronger and healthier community.



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Invited Abstracts

IRBEP/PP/48

## Alternate Fuel-Jatropha Oil (Performance Analysis Using Kirloskar Engine)

**A. Ahamed Masood and V. Bala Krishnan**

### Abstract

The depletion of fossil fuels and the increase in the emission levels has caused a concern globally. An eco-friendly alternate was required to fulfill the growing demand. This paper highlights our work on alternate fuels and the importance of choosing jatropha. It reduces pollution drastically in terms of sulphates and carbon monoxide. To start with, we reduced the viscosity problem faced to a large extent by carrying out the transesterification process in our chemistry laboratory. We also studied the cost factor involved in the usage of jatropha. Performance test was conducted on an electrical loaded diesel engine and a study on the emissions was made using MAESTER 2000 Exhaust Gas Analyser in our thermal laboratory. The pollution levels came down drastically and performance was better with various blends of Jatropha and diesel.



## **Association between Bone Mineral Density and Lean Body Mass among Adolescent and Effect of Intervention**

**P. Karthika<sup>1</sup> and Dr. L. Uthira<sup>2</sup>**

<sup>1</sup>PhD Scholar, Department of Food Science and Nutrition, Periyar University, Salem

<sup>2</sup>Department of Food Science and Nutrition, PSG College of Arts and Science, Coimbatore

### **Abstract**

Childhood and adolescence are the most important periods for maximum bone mass acquisition, which is defined as the maximum bone density achieved through normal growth, being associated with and influenced by environmental factors (calcium-rich diet and physical exercise), hormonal and also genetic factors. The present study was aimed to determine the relation between Bone Mineral Density (BMD), Body Mass Index (BMI) and the effect of exercise program for the period of four months. Five hundred samples were collected who belongs to 18-24 years adolescence from five private girls hostels, Coimbatore and obtained information regarding Socio, Nutritional Status, Clinical and Medical History, Dietary and Lifestyle pattern. Bone Mineral Density was determined using Quantitative ultrasound monitor for before and after the intervention study. The result revealed that total five hundred population, 193 of them were having osteopenic and 51 were osteoporotic along with low Body Mass Index respectively as compared with the normal reference value of T-Score. The physical activity and dietary pattern of the normal bone mineral density group was much better than the vulnerable group and the impact of intervention was significantly ( $p < 0.05$ ) higher than between pre and post exercise group. In conclusion, low body mass are more prone to low bone density thus revealed as strong relationship between them. Diet modification and physical activity can be used as an effective strategy for maximizing the bone mass.



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Invited Abstracts

IRBEP/PP/50

## Study of Air Pollution Due to Magnesite in Salem Town

**Dr. T. Subramani**

Professor and Dean, Department of Civil Engineering, VMKV Engineering College, Salem, Tamil Nadu

### Abstract

Opencast mining dominates metals, ores and building stones production in India. A survey was conducted to evaluate its local atmospheric impact. Modern opencast mining involves a high degree of mechanisation of the operations. Deep hole drilling, blasting of formations and sizing by crushing of the mineral are essential activities in most large open castmines. Heavy Earth Moving Machines (HEMM) are the essential features of all large open mines. Operation of HEMM, crushers and blasting causes environmental degradation from dust, noise and ground vibration Emissions data were utilized to compute dust generation due to different mining activities. Work zone air quality, ambient air quality and seasonal variations are described revealing high pollution potential due to suspended particulate matter (SPM) and consequent impact on human health. Air pollution control measures involve planning and implementing a series of preventive and suppressive measures in addition to dust extraction systems. Different abatement measures are enumerated. Pollution control by trees, the tolerance of trees to different air pollutants and plant species useful for controlling pollution are also discussed. There is a need for wider application of dust control chemicals on haul roads. Sustainable management of pollution can be achieved by the proper implementation of suggested abatement measures. Our study is in Salem district magnesite mine which is 10 km from city. The Ambient Air Quality has been monitored around the surrounding areas of the site. At all location, the PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>x</sub>, NO<sub>x</sub> and CO values are found to be well within the limit. As the existing air quality measured during the season reveals the air quality is well within the limit and no new source will be added due to the proposed activity.