

**INDIAN COUNCIL OF SOCIAL SCIENCE RESEARCH (ICSSR) AND
DEPARTMENT OF BIOTECHNOLOGY (DBT),
GOVERNMENT OF INDIA, NEW DELHI**



Sponsored



International Conference on

**CURRENT IMMUNOLOGICAL TOOLS FOR BIODIVERSITY AND
STATUS OF ENVIRONMENT HEALTH**

21 – 23, August, 2019

CONFERENCE PROCEEDINGS



Edited by

**Dr. B. DEIVASIGAMANI
Dr. A. SUNDARESAN
Ms. A.T. AJI JOVITHA
Mr. V. SATHISH**

ISBN: 978-3-659-29407-5



**CENTRE OF ADVANCED STUDY IN MARINE BIOLOGY
FACULTY OF MARINE SCIENCES
ANNAMALAI UNIVERSITY
PARANGIPETTAI, TAMILNADU, INDIA**



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सत्यमेव जयते
Department
of Biotechnology
Govt. of India

21 - 23, AUGUST, 2019



Indian Council of
Social Science Research

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Organized by



CENTRE OF ADVANCED STUDY IN MARINE BIOLOGY

FACULTY OF MARINE SCIENCES

ANNAMALAI UNIVERSITY

PARANGIPETTAI, TAMILNADU, INDIA



ORGANIZING COMMITTEE MEMBERS

- Patron** : **Prof. V. MURUGESAN**
Vice-Chancellor
Annamalai University
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- President** : **Prof. M. SRINIVASAN**
Director and Dean
Faculty of Marine Sciences
CAS in Marine Biology
- Co-ordinator&
Organizing Secretary** : **Dr. B. DEIVASIGAMANI**
Associate Professor &
UGC Research Awardee
CAS in Marine Biology
- Co-Organizing
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Associate Professor
Dr. B. AIYAMPERUMAL
Assistant Professor
Dr. S. KUMARESAN
Assistant Professo
Dr. H. ANN SUJI
Assistant Professor



அண்ணாமலைப்
ANNAMALAI



பல்கலைக்கழகம்
UNIVERSITY

(State University-Accredited with 'A' Grade by NAAC)
ANNAMALAINAGAR - 608 002, CHIDAMBARAM, TAMIL NADU, INDIA.

Prof. V. MURUGESAN, Ph.D.,
Vice-Chancellor

Message

It gives me great pleasure in wishing the CAS in Marine Biology, Faculty of Marine Sciences, for organizing ICSSR and DBT sponsored International Conference on “Current Immunological Tools for Biodiversity and Status of Environment Health” on 21 and 23 August 2019.

Immunological tools provide powerful methods to approach diverse research questions in Biological and Environmental Sciences. The mammalian immune system can produce endless variety of antibody molecules. Immunoassays can be developed for almost any molecule to identify enzymes inside whole cells; immunological methods have wide applicability and versatility, currently unrealized in Biological Oceanography and Marine Ecology. In the near future the world will undergo a sea of change in the field of Immunology and Biodiversity.

Considering the importance of immunological tools for biodiversity and environment health, the faculty members have taken praiseworthy efforts to organize an international conference on this rewarding research area. I congratulate the Organizing Secretary and his team for their earnest efforts in organizing the conference for the benefit of academicians, scientists and students, who are provided an opportunity to deliberate on all pertinent issues of immunological tools for biodiversity and environment health.

My best wishes for the success of the conference.

(V. MURUGESAN)



ANNAMALAI UNIVERSITY



(A State University – Accredited with ‘A’ Grade by NAAC)

ANNAMALAINAGAR – 608 002, CHIDAMBARAM, TAMIL NADU, INDIA

Date : 13-08-2019



Dr.N.KRISHNAMOHAN, M.E., Ph.D. (IITM)
Registrar i/c

MESSAGE

It is a matter of great pride that the Centre for Advanced studies in Marine Biology, Faculty of Marine sciences, Annamalai University is organizing **“International Conference on Current Immunological Tools for Biodiversity and Status of Environment Health”** jointly with ICSSR and DBT, Government of India.

In recent years, Immunology has had tremendous advances particularly in the field of marine Biology and Human Welfare.

I deeply appreciate the efforts taken by Co-Ordinator and Organizing Secretary from the Department of Marine sciences for their efforts in conducting the conference.

I am confident that this International Conference holds great promise to expand their knowledge on immunological tools to asses and analyze the environmental health and this might ignite the fire for studies to overcome the barriers in preserving the biodiversity and Environment.

I would like to convey my best wishes to the organizers and the delicates from all over the world for great learning and knowledge sharing.

(N.Krishnamohan)

Dr. V. SELVANARAYANAN
Professor of Entomology &
Controller of Examinations
Annamalai University
Annamalainagar - 608 002



MESSAGE

In the evolutionary perspective, marine ecosystem is considered as the cradle of all living organisms. Though this ecosystem was pristine earlier, with increasing human intervention, it has been the much polluted ecosystem now. Such catastrophic activities increased the incidence of diseases among marine organisms that threaten their very existence. Considering the pivotal role played by marine ecosystem in determining the earth's biodiversity, the losses to such fragile biodiversity are to be mitigated.

In the diagnosis and identification of diseases among marine organisms, latest techniques are being explored and promulgated. In that pursuit, novel immunological tools are handy and are highly useful. Considering the need for enhancing the expertise in this area of science, the Centre of Advanced Study in Marine Biology, Annamalai University is organizing an International Conference on "Current Immunological Tools for Biodiversity and Status of Environmental Health".

This centre, with its rich expertise and resources will enable very fruitful research deliberations during this conference. The outcome of this conference can form the basis for future line of research and also enable the policy makers and other stakeholders to plan the path of the needed impetus. I appreciate the strenuous efforts of the organizing committee in perceiving, planning and conducting such a needed scientific event.

At this juncture, I wish the conference a grand success.



(V. SELVANARAYANAN)

ANNAMALAI UNIVERSITY



Prof. Dr. M. SRINIVASAN,
M.Sc., B.Ed., M.Phil., Ph.D., PG Dip. in Yoga
Director and Dean
ENVIS Co-ordinator

Centre of Advanced Study in Marine Biology
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MESSAGE

It is with great pleasure, I extend my warm greetings to the participants of the ICSSR& DBT sponsored International Conference on “**Current Immunological Tools for Biodiversity and Status of Environment Health**” organized by the CAS in Marine Biology, Faculty of Marine Sciences on 21-23, August 2019.

I am confident that this international conference would be an exemplary platform for the young researchers and scholars in this field to gain an in depth knowledge through discussion with the experts, particularly in the research aspect of the subject.

My hearty appreciations are due to Dr. B. Deivasigamani, Organizing Secretary and Associate Professor and his co-organizers Dr. S. Bragadeeswaran, Associate Professor, Dr. B. Aiyamperumal, Dr. S. Kumaresan and Dr. H. Ann Suji, Assistant Professors of CAS in Marine Biology for all their efforts in organizing the international conference with great enthusiasm. I wish this conference a grand success.

I wish the participants from various colleges and universities for a pleasant stay and am sure that the conference will bring useful recommendations through meaningful deliberations.

M. 8/8.8.19.
(M. SRINIVASAN)



பாரதியார் பல்கலைக்கழகம்
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Dr. K. MURUGAN
Registrar i/c



MESSAGE

I am gratifying to know that the Centre of Advanced Study in Marine Biology, Faculty of Marine Sciences, Annamalai University, Parangipettai is organizing the **"INTERNATIONAL CONFERENCE ON CURRENT IMMUNOLOGICAL TOOLS FOR BIODIVERSITY AND STATUS OF ENVIRONMENT HEALTH"** to be held on 21st & 23rd August 2019.

I am very proud to spectate the exemplary efforts of the University in upgrading of various applications of Marine Biology in several fields and proving their excellence in all the dimensions.

I am sure that this conference will generate necessary professional enlightenment in the minds of the Members of Faculty, Research Scholars and Students to progress further. I hope the Scientific Presentations; Discussions and Other Activities that are going to be held in the Conference would be of great help and will definitely leave new milestones.

I wish to express my hearty wishes to the Co-Ordinator & Organizing Secretary and Co-Organizing Secretaries, all the Members of Faculty, Research Scholars, Administrative Staff and Students of the Department for their genuine interest, prolific efforts and dedicated contributions towards the success of this prestigious event.

May the Department flourish in all its endeavours and I profoundly wish the Conference for every success.

(Dr. K. MURUGAN)

ANNAMALAI UNIVERSITY

Dr.S.KABILAN
Dean, Faculty of Science

Mobile: +91-9443924629
E.mail: profdrskabilanau@gmail.com


MESSAGE



I am much charmed to escalate the efforts of the CAS in Marine Biology, Faculty of Marine sciences for organizing ICSSR and DBT sponsored International Conference on “Current Immunological Tools for Biodiversity and Status of Environment Health” on 21 to 23, August 2019. I know the coordinator invited eminent scientists from international and national level in the field to interact with the participants and also they have received a very good number of qualities of research paper to be presented in the international conference.

The present international conference will focus on Biodiversity and status of environment health will be useful for the present scientific company as well as to the research scholars. The conference will bring a great impact and result in solutions which help postgraduate students, young scientists and faculty members of the society.

I congratulate the Organizing Secretary and CAS in Marine Biology for organizing this international conference and wish grand success.


Dr. S. KABILAN
Dean, Faculty of Science

Date: 09.08.2019



Dr. SANTHA GOVIND
Dean, Faculty of Agriculture

MESSAGE

I am immensely happy that CAS in Marine Biology, Faculty of Marine sciences is organizing a three day International conference on "Current Immunological Tools for Biodiversity and Status of Environment Health" during 21st to 23rd, August 2019. My congratulations to the Dean, Organizing Secretary and the Faculty members of CAS in Marine Biology for their meticulous efforts in organizing the International conference.

I am pleased that the theme of the conference is focused to provide knowledge and exposure to the latest advances in Biodiversity and Environmental Status. The outcome of this scientific meeting will certainly provide an important breakthrough among the researchers in the advancement of the interdisciplinary research areas of Immunology and Biodiversity. I am sure plenary talks, discussions and presentations would create an impact to enhance research aptitude among the participants to promote global health issues and advanced technologies used to control and regulate the marine ecosystem and throw new light on various types of fish diseases, marine algae, microbial biotechnology, fishery science, human health and diseases, pollutions, human impact on the environment, pollution risk assessment, advanced immunological tools and control methods.

I congratulate all the participants and organizers of the conference and wish the conference a grand success.


(SANTHA GOVIND) 9/8/19



Dr.K.SIVAKUMARI, M.Sc., M.Phil., Ph.D., FAZ.,
Associate Professor and Head
Department of Zoology
Presidency College
Chennai – 600 005.
Tamil Nadu, INDIA.



To understand the diversity of marine ecosystem, there is a need for innovation of new methods and tools. Research is been carried out to develop and validate innovative tools, which relate theoretical and applied ecology in an integrative way to know about the changes caused in the marine ecosystem and its biodiversity. Developing new monitoring methods including remote sensing, meta-barcoding, acoustics and genomics software tools *etc.*, have also paved a way for assessing the environmental health status of marine ecosystem. In this context, I am happy that The Centre of Advanced Study in Marine Biology, Annamalai University is hosting an International Conference on Current immunological Tools for Biodiversity and Status of Environmental Health in August 2019. I am sure that this will be a forum to explore the issues of mutual concern about marine ecosystem as well as a platform for exchanging knowledge, sharing evidences and ideas, and generating solutions so as to promote global health issues and advanced technologies used to control and regulate the marine ecosystem.

I wish the Organizing Committee a great success.

Dr. K. SIVAKUMARI

Dr. B. DEIVASIGAMANI, M. Sc., M. Phil., Ph. D.,

Associate Professor & UGC-Research Awardee
Centre of Advanced Study in Marine Biology
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MESSAGE

It gives me an immense pleasure to extend my warm greetings and welcome you all for the ICSSR and DBT Sponsored International Conference on “Current Immunological Tools for Biodiversity and Status of Environment Health” from 21-23, August 2009 at Centre for Advanced study in Marine Biology, Faculty of Marine Sciences, Annamalai University, Parangipettai.

Worldwide experience has pointed to the central role of the immunologic defense systems of all animal species in resistance to and recovery from infectious diseases. Future improvements in the diagnosis and control of infectious diseases in wildlife populations will require an increased understanding of the immunology of threatened marine animal species, their associated pathogens, and the environmental factors that may undermine the immune system's ability to cope effectively with pathogens. Future research in this area will benefit from the networking of wildlife disease experts, immunologists, and biotechnology researchers to develop and utilize new tools and assays for management of diseases. Tools needed include up-to-date medical, genetic, and immunologic data bases, a wider variety of monoclonal antibodies to immune system components and pathogen-specific antigens, natural and recombinant pathogen-specific antigens for use in assays and as vaccines, and practical diagnostic immunoassays for measuring disease exposure and immune system function (immunologic competence).

The main prophylactic measures of marine animals are covered, including vaccination, probiotics and immunostimulation. A key element in the immunological control of fish diseases is the great variation in disease susceptibility and immune defence of different fish species, a reflection of the extended time the present day teleosts have been separated in evolution. Future research will probably make use of molecular and proteomic tools both to study important elements in immune defence and prophylactic measures and to assist with breeding programmes for disease resistance. Future research must address diseases in both vertebrate and invertebrate animals and must integrate immunologic, microbiologic, pathologic, physiologic, developmental, genetic, and environmental data unique to each species. It is in this context, our centre of Advanced Study in Marine Biology is organizing this international conference with the financial support of ICSSR&DBT, Government of India. We believe this conference will be promotes national and international academic exchanges and cooperation in the field of Immunology and Biodiversity.



(Dr.B.DEIVASIGAMANI)
Co-ordinator&Organizing Secretary





**INTERNATIONAL CONFERENCE ON
“CURRENT IMMUNOLOGICAL TOOLS FOR BIODIVERSITY AND STATUS OF
ENVIRONMENT HEALTH”**

Date : 21.08.2019
Registration : 08.30 - 9.00 am
Inaugural function : 09.00 - 10.45 am
Tea break : 10.45 - 11.00 am

TECHNICAL SESSION

Technical Session I: IMMUNOLOGY



Date: 21 st August, 2019	Time: 11.00 AM - 1.00 PM	Venue: Auditorium, CAS in Marine Biology
Chairpersons	Dr. Selvaraj Kandasamy, Ph.D., Department of Geological Oceanography & State Key Laboratory of Marine Environmental Science, Xiamen University, Xiamen, China	
	Dr. Ajit N. Kumar, Ph.D., PDF., Department of Molecular Biology and Microbiology, Tufts University school of Medicine, Boston USA	
	Dr. K. Amutha, Professor and Head, Department of Biotechnology, School of Life Sciences, Vels University, VISTAS, Chennai-117	
	Prof. N. Veerappan, CAS in Marine Biology, Annamalai University	
Session In-charge - Organizer	Dr. S. Bragadesswaran, Ph.D., CAS in Marine Biology, Annamalai University	
PLENARY TALK- (11.00 am to 11.45 am)		
IMMUNOLOGY, GENETICS & HUMAN DISEASES		
Prof. G. KUMARAMANICKAVEL, MD., Professor, Diagnostic & Interventional Imaging, & Orthopedics, University of Texas Medical School, Houston, USA		
Invited speaker-I (11.45 am – 12.00pm)	IMMUNOLOGICAL TOOLS FOR MONITORING AND ASSESSMENT OF THE IMPACT OF OCEAN ACIDIFICATION	
	Dr. M. ANAND, Ph.D., Department of Marine and Coastal Studies, Pudumadam Campus, Madurai Kamaraj University, Pudumadam- 623 524, Tamilnadu	



<p>Invited speaker-II (12.00 pm – 12.30 pm)</p>	<p>CURRENT IMMUNOLOGICAL ASSAY AND ITS ROLE IN BIOTECHNOLOGY</p> <p>Prof. ASITH RANJAN, Ph. D., Director (Centre for infectious Diseases and Control), Division of Medical Biotechnology, VIT University, Vellore, Tamilnadu</p>	
<p>Invited speaker-III (12.30 pm – 01.00pm)</p>	<p>MARINE MAMMAL CONSERVATION IN INDIA- OPPORTUNITIES AND CHALLENGES</p> <p>Dr. R.P. KUMARRAN, Ph. D., Consultant-Marine Conservation Policies, Chennai</p>	
<p>LUNCH BREAK (01.00 pm – 02.00pm)</p>		
<p>Invited speaker-IV (02.00 pm – 02.30pm)</p>	<p>COMPARATIVE STUDY ON IMMUNOMODULATORY EFFECT OF DIFFERENT BREEDS OF COW URINE THROUGH WATER ADDITIVE ROUTE ON <i>Labeo rohita</i></p> <p>Dr. S. VENKATALAKSHMI Head & Associate Professor Department of Zoology, Government College for Women(A), Kumbakonam</p>	
<p>Invited speaker-V (02.30 pm – 03.00pm) - Auditorium</p>	<p>MOLECULAR GENETICS AND BIODIVERSITY</p> <p>Prof. S. T. SOMASUNDARAM, Ph.D., CAS in Marine Biology, Annamalai University</p>	
<p>Oral presentation (2.30 pm to 5.00pm) - Display Hall</p>		
S.No	Author Name	Title of the Paper
1.	Chandravath and Devadason	Interaction between fish louse, <i>Lepeoptheirus salmonis</i> and the host atlantic salmon <i>Salmo salar</i> , L-an immunological study
2.	V. Sathish and B. Deivasigamani	Immunostimulants effects of chitosan on <i>Mugil cephalus</i> against <i>Aeromonas hydrophila</i>
3.	K. Rangesh, M. Anand and B. Rajeswari	Immunological and biomarker tools for assessing the impact of ocean acidification on sea urchin <i>Salmacis virgulata</i>
4.	R. Kumaran, Sumon Basu Choudhury, M. Thangaraj, T. Ramesh, and D. Annadurai	Immune status of <i>Litopenaeus vannamei</i> (Boone, 1931) in relation to the gut microfloral diversity
5.	M. Anand, K. Rangesh and B. Rajeswari	Immunological tools for monitoring and assessment of the impact of ocean acidification
6.	T. Suthin Raj, M. Charumathi and H. Ann Suji	Extract of <i>Sargassum teretifolium</i> as an immunostimulant in the management of <i>Colletotrichum capsisi</i> (Syd.) Butler and Bisby

7.	Prakash Sahaya Leon. J, Manivelu. D, Mariappan. M and Balakrishnan. K	Haemato-Immunological Responses to Deltamethrin Toxicity in Fresh Water Fish, <i>Oreochromis Mossambicus</i> (Tilapia)
8.	Senthil Elango, P. And M. Muthulingam	Histopathological impact of hexavalent chromium in liver and muscle of freshwater fish <i>Oreochromis mossambicus</i> (PETERS)
9.	S. Manivannan, Jayan. R. Krishnan and G. Valli	Immunological and chemical composition study of proteins from indigenous earthworm <i>P. ceylanensis</i>
10.	Dhivya R, Devadason C.G	Histopathological alterations in gills, liver, kidney and brain of <i>Oreochromis niloticus</i> , exposed to environmentally related heavy metal concentration of lead
11.	Elaya Bharathi, T, Vinoliya Josephine Mary, J, Mary Mettilda Bai, S	Cytotoxicity and antiproliferative effect of hemolymph lectin of <i>Atergatis integerrimus</i> on cervical carcinoma (Hela) cell line
12.	Sobana .V and O. Sivapriya	Effect of methanolic extract of <i>Costus pictus</i> (insulin plant) against breast cancer targeting oxidative stress and inflammation
13.	Dipak Kumar Kanaujia, Moumita Nandi, Sriraaman M, and Kannan Pakshirajan	Biodegradation dimethyl phthalate using <i>Arthrobacter</i> sp. in batch systems
14.	Ananda Raja R, Jithendran K.P, Joseph Sahaya Rajan J, Madhanagopal R, Poornima M, and Alavandi S.V	Mortality among farmed mud crab, <i>Scylla serrata</i> due to white spot syndrome virus (wssv) in Andhrapradesh, India
15.	K.K. Kalpana Devi and J. Prakash Sahaya Leon	Study on the effect of haematological parameters in <i>Oreochromis mossambicus</i> exposed to cypermethrin
16.	Revathy Jayaraman	Phytoremediation of heavy metals (Cd, Pb) in <i>Cucumber sativus</i> using EDTA as a chelating agent
17.	Suhathiya, K and M. Ravichandran	Effect of foliar application of nutrients and growth Retardents on the growth and yield of Rice fallow Black Gram
18.	Anitha Joice, J. Manju Bashini and P. Senthilkumaar	The p53 pathway in Human breast and Prostate Cancer Cell Lines Using <i>Curcuma longa</i>
19.	Dr.G. Priya, and Dr.S. Venkatalakshmi	Comparative study on immunomodulatory effect of different breeds of cow urine through water additive route on <i>Labeo rohita</i>
20.	K. Bhavani and Karuppasamy	Histopathological changes in the liver of <i>Danio rerio</i> exposed to arsenic(iii) oxide.
21.	S. Sumathi	Atrazine advances immunomodulation by altering melanomacrophage in spleen and vascular changes in the gills of <i>Cyprinus carpio</i>

22.	S. Saranya, V. Manoharan and S. Miltonprabu	Potential anti-haematotoxic and antioxidant effects of Pterostilbene against Fluoride: A biochemical, immunological and histomorphological changes in the erythrocytes of rats
23.	Vasuki Subramanian and G. Kokilam	Amino acid and fatty acid composition of some common marine brown algae from Mandapam region, South East Coast of India
24.	P. Rexi	Vitamin content in prawns collected from different niches in and around Thanjavur
25.	P. Sangeetha, S. Sivasuriyan and K. Rameshkumar	Screening of active component(s) present in the ethanolic extract of lemongrass (<i>Cymbopogon citratus</i>) using GC-MS





Technical Session II: BIODIVERSITY

Date: 21 st August, 2019		Time: 2.30 PM – 4.30 PM	Venue: Auditorium, CAS in Marine Biology
Chairpersons	Prof. Dr. G. Kumaramanickavel, MD., Professor, Diagnostic & Interventional Imaging, & Orthopedics , University of Texas Medical School, Houston, USA		
	Dr. P. Sampathkumar, Professor, CAS in Marine Biology, Annamalai University		
	Dr. S. Umavathi, Ph.D., HoD., PG and Research Department of Zoology, J.K.K. Nataraja College of Arts and Science, Komarapalayam-638 183, Namakkal (Dt), Tamil Nadu.		
	Dr. G. Archana, Ph.D., Department of Biotechnology, Karpagam Academy of Higher Education, Coimbatore-21, India		
Session In-charge Organizer	Dr. A. Ayyamperumal, Ph.D., CAS in Marine Biology, Annamalai University		
PLENARY TALK-II (02.30 pm to 03.00pm)			
GLOBAL WARMING: EARTH SYSTEM SCIENCE PERSPECTIVE WITH A SPECIAL FOCUS ON THE MARINE REALM			
Dr. SELVARAJ KANDASAMY, Ph.D., Department of Geological Oceanography & State Key Laboratory of Marine Environmental Science, Xiamen University, Xiamen, China			
Invited speaker-VI (03.00 pm – 03.30pm)	AGRICULTURAL BIO-DIVERSITY AND ITS EFFECTIVE ROLE TOWARDS AGRICULTURE		
	Dr. P. SHANMUGARAJA, Ph. D., Associate Professors, Faculty of Agriculture, Annamalai University		

<p>Invited speaker-VII (03.30 pm – 03.40pm)</p>	<p>ECOSYSTEM: A REVIEW</p> <p>Dr. K. PUGAZHENDY, Ph.D.,</p> <p>Department of Zoology, University of Madras, Guindy Campus, Chennai 600 025, Tamil Nadu, India</p> 	
<p>Invited speaker-VIII (03.40 pm – 03.50 pm)</p>	<p>BIODIVERSITY AND CLIMATE CHANGE</p> <p>Dr. A. SARAVANAKUMAR, Ph.D.,</p> <p>Associate Professors, CAS in Marine Biology, Annamalai University</p> 	
<p>Tea Break (03.50 pm to 04.00pm)</p>		
<p>Oral presentation (04.00 pm to 5.00pm) - Auditorium</p>		
S.No	Author Name	Title of the Paper
1.	Divya R, Thamizhselvi D, Priyadharshhni R, Senthamizh G and Soundarya E.	Biodiversity and Conservation
2.	S. Kathiresan and T. Raj Pravin	Climate change issues and biodiversity challenges in coastal Tamilnadu
3.	T. Raj Pravin	Exploring indigenous farm technologies for conservation of bio-diversity resources in coastal Tamilnadu
4.	V. Thirumal Kannan and T. Raj Pravin	MGNREGS towards conservation of Bio- diversity in rural India
5.	Priyadharshhni R, Thamizhselvi D, Divya R, Senthamizh G and Soundarya E.	Biodiversity and Environmental pollution
6.	Malleesh prabhu. S, Gowtham pradeep. T, Karthikeyan.V and Janarthanan. C	Coastal Biodiversity and its protection
7.	C. Praveen Sampath Kumar and Darling B. Suji	Role of breeders in biodiversity conservation
8.	V. Sumati	Effect of lab on human health and its diversity in milk and milk products
9.	P. Shanmugaraja, S. Palanivelraja, and V. Prabhudoss	Agricultural bio-diversity and its effective role towards agriculture
10.	S. Dineshkumar and R. Jeya	Agriculture and its effective role in bio-diversity conservation
11.	Shuchi Bhatt and M. Srinivasan	Diversity of family Trochidae at Gopnath Coast, Gujarat

12.	Kalidasan. T, Vengatesan. D and M. Kavaskar	Biodiversity Conservation Technologies in Fisheries
13.	V. Sakthivel and K. Kanagasabapathi	Biodiversity Conservation for Sustainable Livelihood
14.	Vengatesan, D, Kalidasan, T, & S. Ragunath	Need for Bio-Diversity for agro-ecosystem
15.	Ramesh P, D. Vengatesan and S. Mahalakshmi	Role of Indigenous Technical Knowledge (ITK) in agriculture based biodiversity conservation
16.	S. Suganya, M. Kavaskar and D. Vengatesan	Climate change and its impact on Biodiversity
17.	Dr. Haseena Rafath	Biodiversity and conservation of Extinct Marine Algae
18.	Sriraman M, Jaiseelan S, Vignesh D and Mullai P	On-site and off-site biosorption of pollutants in Uppanar estuary water
19.	T. Nalini and S. Ambika	Temporal variation of <i>Oecophylla smaragdina Fabricius</i> (Hymenoptera: Formicidae) nest density and nest longevity in different horticultural crops
20.	V. Seema, S and Bijoy Nandan	Mesozooplankton composition and community structure in Ashtamudi backwater
21.	Ahmed Arfath Ghani	Survey of Marine and Estuarine Oligochaetes (Annelida) in and around Chennai, Tamil Nadu, India
22.	A. R. Lenin	Study on morphological characteristics of different genotypes of Gladiolus flower
23.	Ramesh. P, D. Vengatesan and S. Mahalakshmi	Role of indigenous technical knowledge (ITK) in agriculture based biodiversity conservation
24.	R. Rajendran, R. Sivakumar, and R. Balamurugan	Role of information communication technology in disaster management & protection of Biodiversity
25.	Vaishnavi, P and P. Ramesh	Biodiversity conservation through sustainable agriculture
26.	S. Sivabalan	Biodiversity and Ecology of aquatic Oligochaeta from Neithavoyal Pond and Solavaram Lake, Thiruvallur district, Tamil Nadu.
27.	J.L.Joshi and Ajish Muralidharan	Biodiversity conservation and Plant Breeding for Harmony between Modern Agriculture Production and the Environment

Technical Session III: ENVIRONMENTAL


Date: 22 nd August, 2019	Time: 09.30 AM. – 1.30 PM	Venue: Auditorium, CAS in Marin Biology
Chairpersons	Dr. P. Sampathkumar, Professor, CAS in Marine Biology, Annamalai University	
	Dr. P. Santhanam, Ph.D., Marine Planktonology & Aquaculture Laboratory (MPAL), Department of Marine Science School of Marine Sciences, Bharathidasan University, Tiruchirappalli	
	Dr. M. Anand, Ph.D., Department of Marine and Coastal Studies, Pudumadam Campus, Madurai Kamaraj University, Pudumadam- 623 524, Ramnad District, Tamilnadu	
	Dr. A. Bharathi, Ph.D., P.G & Research Department of Zoology, Sir Theagaraya College, Chennai	
Session In-charge Organizer	Dr. S. Kumaresan, Ph.D., CAS in Marine Biology, Annamalai University	
PLENARY TALK-III (09.30 am to 10.20 am)		
MOLECULAR DIAGNOSTICS FOR DISEASES		
Dr. AJIT N. KUMAR, Ph.D., PDF., Department of Molecular Biology and Microbiology, Tufts University school of Medicine, Boston USA		
(10.20 am to 10.30am)		
CURRENT ENVIRONMENTAL STATUS AND BIODIVERSITY		
Dr. K. AMUTHA, Ph.D., Professor and Head, Department of Biotechnology, School of Life Sciences, Vels University, VISTAS, Pallavaram, Chennai-117		
Invited speaker-IX (10.30 am – 10.40 am)	ENVIRONMENTAL ISSUES OF FISH CULTURE PONDS Dr. B. MEENA, Ph.D., Associate Professor, Department of Zoology, Precedency College, Chennai-5	
Tea Break (10.50 am to 10.55am)		
Invited speaker-X (10.40 am – 11.15 am)	SHRIMP CULTURE IMPORTANT Dr. B. GUNALAN, Ph. D., Department of Zoology, Government Art's and Science College, Virudhachalam	
Poster presentation (11.25 am to 01.00 pm) Auditorium (Veranda -Hall)		



LUNCH BREAK (01.00 pm to 02.00 pm)		
Oral presentation (02.00 pm to 5.00 pm) Display Hall		
S.No	Author Name	Title of the Paper
1.	J. Hariharasudhan, S. Vimala, and T. Lalitha	A prosperous view on minimizing environmental impact through eco marketing
2.	A. Bharathi and Dr. M. Padmaja	Emission of air pollutants in world wide
3.	T. Rajeshwari, M. Dinesh, G. Thenmozhi and K. Surya	Acid rain and its environmental significances
4.	A. Bharathi	Plastics in the environment and its effects on living organisms
5.	G. Manimegala and G. Gunasekaran	Conversion of Municipal Solid Waste into Eco-Friendly Manure - A Study
6.	Dhanasekaran. S and Suganthi. M	Effective Technologies to Control Total Dissolved Solids in Dye Industry Effluent
7.	Manikandan P and Kalaiarasu S	Effect of location specific salt tolerant rhizobia (BBR-18) on the growth of blackgram (var. ADT 3) in the soil of high EC content (Kurinjipadi) of Cuddalore district
8.	D. Hemalatha	Influence of environmental microbial ecosystems on the microbiota and health of organisms
9.	Vengatesan D, Ramesh, P, and D. Balu	Magnitude of Environmental Biology for Sustainable Agriculture
10.	A. Bharathi and B. Deivasigamani	Climate change and environmental crisis
11.	E. Suriyapriya, M. Kavaskar, and D. Balu	Climate Change and its Impacts on food security
12.	D. Balu, Suriyapriya E Kavaskar, M and D. Vengatesan	Climate Smart Agriculture and Community Participation: Building towards Climate Change in India
13.	Sha.K, Gnanasekaran seerangan and Madhavan. S	Effect of organic amendments for environmental and sustainable production of Bhendi (<i>Abelmoschus esculentus.L</i>) cv .CO-4
14.	R. Bhuvaneswari K. Dhanasekaran, and S. Suganthi	Effective utilization of grey water and soil application of lignite humic acid on radish
15.	P. Senthilvalavan, V. Vinothkumar and R. Singaravel	Cadmium (cd) removal by plants: influence of soil amendments in an industrially polluted soil

16.	T. Ramesh Kumar, V. Manoharan, S. Ravichandran and G.Vidhya	Studies on multi-elemental composition and physical properties of honey samples from Tamilnadu - India
17.	D. Merin Emerald, S. Ravichandran, P. Sasikala and T. Ramesh Kumar	Studies on the heavy metal Zinc on the histological changes in the seminal vesicle of <i>Odontopus varicornis</i> (Heteroptera: pyrrhocoidae)
18.	Karthik Saravanan	Bioaccumulation of heavy metal chromium in <i>Cirrhinus mrigala</i>
19.	Junaid Hassan, A. Jebanesan and T. Ramesh Kumar	Toxic Effects of Malathion on some Metabolic Activities in Tilapia Fish <i>Oreochromis mossambicus</i> (Peters).
20.	Sudhagar Rao, G.B, R.Rex Immanuel, V. Balachandrakumar and T. Suthin Raj	Growth and yield of rice (<i>Oryza sativa</i> L.) as enhanced by the effect of zinc and iron fertilization
21.	S. Srinivasan, A. Angayarkanni, K. Dhanasekaran, N.J. Einthu pochine and T. Mathana	Effect of potassium and sea weed extract under INM on vigour of ambrette in terms of stem girth, flowering and pod yield
22.	Poongothai S, Anburathinam M, Aravindan M, Arulanandhi R and Ananthraman H	Impact of eutrophication on water bodies of Chidambaram, Tamilnadu, India
23.	Ajish Muraleedharan, K. Sha, S. Kumar and Ebenezer Babu Rajan	Effect of post-harvest treatment on gerbera var. Arka Krishika using different vase solutions
24.	M. Gayathiri	Effect of cushioning materials on storage life of Guava (<i>Psidium guajava</i> .L) cv. Lucknow 49
25.	A. Solaiappan, and J. Prakash Sahaya Leon	Monocrotophos effect on freshwater fish <i>Oreochromis mossambicus</i> (Tilapia) in biochemical analysis
26.	N. Dhamodharan, S. Madhavan and K. Sha	Floristic composition and biological spectrum: key factors of environmental health
27.	A. Gnanasekaran, J. Vigneshwari and P.K. Senthilkumar	Sustaining life of human health depends on the Environmental health
28.	Sudhagar Rao, G.B, R. Rex immanuel and T. Suthin Raj	Effective of organic and inorganic ammendements of wetland rice in coastal area
29.	P. Senthilvalavan, V. Vinothkumar and R. Singaravel	Cadmium (Cd) removal by plants: Influence of Soil Amendments in an Industrially Polluted Soil
30.	Anandhan. R Kavitha. V and Sumathi. R	Analyse of selected heavy metal contamination in the Mudikondan River, Nannilam, Thiruvavarur District, Tamil Nadu, India
31.	S.Gnanakumar, Dr.K. Karthikeyan,	Assessment of ground water quality in and around Sirkazhi town Nagapattinam District

32.	N. Pandeewari	Studies on the nodulation efficiency and growth parameters of groundnut- Rhizobium symbiosis
33.	S. Pandiammal, E. Rajalakshmi, J. Manju Bashini and P. Senthilkumaar	Biochemical analysis in hepatopancreas of Crab (<i>Portunus sanguinolentus</i>)
34.	J. Manju Bashini, Dilla Jose and P. Senthilkumaar	Impact of Herbicide Paraquat on the Indian major Carp, <i>Catla catla</i>
35.	G. Manikandana, H.A. Arjuna	A simple approach - grapheme oxide doped nickel oxide – and as supercapacitor.
36.	M. Ramanan	Anti-insect effect of <i>Ipomoea carnea</i> seed solvent extracts on <i>Spodoptera litura</i> Fab.
37.	Duong Ngoc Phuoc, Hoang Tran Duc Thinh, Nguyen Ngoc Truyen, Le Thi Thanh Thuy, Balaraman Deivasigamani, Truong Van Tuyen	Livelihood recovery of fishery related services providing households after marine environmental disaster in Vietnam in 2016: case study of Phu Vang district, Thua Thien hue province, Vietnam

Technical Session IV: BIOTECHNOLOGY

Date: 22 nd August, 2019		Time: 2.00 PM. – 5.00 PM	Venue: Auditorium, CAS in Marine Biology
Chairpersons	Prof. K. Vasudevan, Ph.D., Department of Zoology, Annamalai University, Annamalai Nagar		
	Dr. S.T. Somasundaram, Ph.D., Professor, CAS in Marine Biology, Annamalai University		
	Dr. V. Ravi, Ph.D., Department of Zoology, Government Arts College for Women (A), Kumbakonum		
	Dr.T. Suthin Raj, Ph. D., Department of Plant Pathology, Faculty of Agriculture, Annamalai Nagar, Chidambaram		
	Dr. G.B. Sudhagar Rao, Ph.D., Department of Agronomy, Faculty of Agriculture, Annamalai University, Annamalai Nagar		
Session In-charge Organizer	Dr. H. Ann Suji, Ph.D., CAS in Marine Biology, Annamalai University		
PLENARY TALK-IV (02.00 pm to 02.30 pm)			
INTERACTION BETWEEN FISH LOUSE, LEPEOPTHEIRUS SALMONIS AND THE HOST ATLANTIC SALMON SALMO SALAR, L - AN IMMUNOLOGICAL STUDY			
Dr. CHANDRAVATH DEVADASON, Ph.D., Department of Zoology, Eastern University, Chenkalady, 30350 Sri Lanka			

<p>Invited speaker-XI (02.30 pm – 03.00 pm)</p>	<p>AQUAPONICS: A NEW AVENUE TO ENHANCE THE RURAL LIVELIHOOD THROUGH SUSTAINABLE AQUA-AGRICULTURE PRACTICES</p> <p>Dr. P. SANTHANAM, Ph.D., Marine Planktonology and Aquaculture Laboratory, Department of Marine Science, Bharathidasan University, Tiruchirappalli, Tamilnadu, India.</p>	
<p>Invited speaker-XII (03.00 pm – 03.30 pm)</p>	<p>CURRENT ISSUES IN ENVIRONMENTAL POLLUTION</p> <p>Dr. A. BHARATHI, Ph.D., P.G & Research Department of Zoology, Sir Theagaraya College, Chennai - 600 021 Tamilnadu</p>	
<p>Tea Break (03.00 pm to 03.40 pm)</p>		
<p>ADVENTURE SPORTS (SCUBA DIVING AND KAYAKING)</p> <p>Mr. T. VASANTHAN, Special officer CAS in Marine Biology, Annamalai University, Parangipettai</p>		
<p>Oral presentation (03.40 pm to 5.00 pm) - Auditorium</p>		
S.No	Author Name	Title of the Paper
1.	S.M. Naveen and G. Sathiya Narayanan	Molecular genetic diversity, phenotyping of Rice (<i>Oryza sativa</i> L.) Genotypes and varietal identification
2.	Aji Jovitha A.T and Deivasigamani Balaraman	Biosynthesis of gold nano particles from marine sponge (<i>Halliclona pigmentifera</i>)
3.	T. Uma Maheswari, Vidhu Valsan	Preservation of jackfruit bulbs in sugar syrup
4.	S. Usha and S. Karpagam	Optimization of callus biomass production and coumarin compound in the callus culture from the leaves of <i>Eupatorium Triplinerve</i> Vahl.
5.	N. Vignesh, A.C. Rathiesh and M. Srinivasan	Computational sequence investigation and in silico modeling of a stress response protein by <i>Oreochromis niloticus</i> fish gene
6.	Balasubramaniam Arul Prakasam and Mika Sillanpää	Synthesis and characterization of some gallium and indium chalcogenide nanostructures
7.	T. Uma Maheswari and Vidhu Valsan	Production and evaluation of jackfruit chips
8.	Beulah Bhakiya Sherlin, R, Kumaravadivel N, Salama, EA, Murali Sankar P, Natarajan N, Elaiyabharathi T and Selvi B .	Validation of QTLs for sorghum shoot fly resistance on F2 generation of sorghum (K8 × IS18551)






9.	G. Rajarajan, M. Arockia Doss, S. Amala and E. Dhineshkumar	Synthesis of 3t-Pentyl-2r,6c-di(4-chlorophenyl) piperidin-4-one semicarbazone and its spectral, biological evaluation and computational studies
10.	B. Sivaprakash	Kinetic Modelling of Competitive Interaction between Escherichia coli and Staphylococcus aureus at different temperatures
11.	M. Manivannan	Pesticide for food safety and quality management
12.	Gayathri. B and J. Sam Ruban	Effect of nano fertilizers on growth and yeild of capsicum
13.	T. Ramesh Kumar, V. Manoharan, S. Ravichandran and G. Vidhya	Studies on multi-elemental composition and physical properties of honey samples from Tamilnadu – India
14.	Kandathil Radhakrishnan Divya, Sivan Pillai Sureshkumar	Harvesting the microalgae Chlorella vulgaris with <i>Lactobacillus acidophilus</i> induced flocculation
15.	S. Madhavan and K. Sha	Effect of plant growth Hormones on rooting of golden dew drop (<i>Duranta repens</i> Goldoiii) Cuttings
16.	A. Isamma, K.R. Divya, S. Sureshkumar	Effects of microalgae incorporated diets on fatty acid profile, growth, and survival of Red Zebra, <i>Brachydanio</i>
17.	M. Ganga and K. R. Sankaran	Synthesis, spectral characterization of substituted 4,5-diphenyl-1-((tetrahydrofuran-2-yl)methyl)-1H-imidazole derivatives its applicable photophysical, molecular docking, cytotoxicity and computational studies
18.	Vinodhini A, Kiruthiga V and V. Rekha	Biosynthesis of silver nanoparticles using <i>Punica granatum</i> and its Antibacterial activity
19.	Kiruthiga. V, Vinodhini. A and V. Rekha	Green synthesis of gold nanoparticles using <i>Psidium guajava</i> and their effect on enhancing silk production in silkworm <i>Bombyx mori</i> . L
20.	V. Rekha, Vinodhini. A and V. Kiruthiga	DNA Barcoding – A promising tool for identification of Zooplankton
21.	Murali Sankar P, Vanitha, S, Kamalakannan, A, Jeyakumar, P, Ananth Raju, P and Shanmuga Packiam, S and Beulah Bhakiya Sherlin R	Diagnosis of two types Fusarium wilt in chickpea (<i>Cicer arietinum</i> L.) at field conditions
22.	S. Karuthamma, T. Ravi Mycin and K. Prakash	Phytotoxic effect of cadmium (cd) on green gram <i>Vigna radiata</i> (L.) Hepper
23.	Zakir Hussain Malik, Muzamil Ahmad Shah and K.C. Ravindran	Effect of heavy metals and salts on morphological, biochemical and antioxidant enzyme adaptations of a halophyte <i>Suaeda maritima</i> under paper mill effluent
24.	K. Ramakrishnan	Toxicity effect of cane sugar mill effluent on the seed germination and seedling growth of some crops

25.	Ramsenthil Ramadoss and Dhanasekaran Subramaniam	Studies on biosorption of cadmium using blue green algae and isotherm modelling
26.	Ipsita Chinara and N. Seetharaman	A comparative study of different solvents for phytochemical extraction & antioxidant properties from seeds of caraway plants
27.	T. Thamaraiselvi D. Geethanjali	Evaluation of antioxidant and hepatoprotective activity of <i>Setaria italica</i> in paracetamol induced in “Albino Wistar Rats”
28.	S. Sivapriya, S. Priyanka, D. Sivakumar, M. Gopalakrishnan, H.Manikandan	Synthesis and Characterization and biological activity of some novel 4-phenyl-3,4,5,6,7,8-hexahydroquinazoline-2(1H)-thione
29.	S. Priyanka, S. Sivapriya, D. Sivakumar, M. Gopalakrishnan, H. Manikandan	Synthesis and Characterization of Some 4-(3-Phenyl-1H-Pyrazol-4-yl) benzo [C] [1,2,5] oxadiazole
30.	C.S. Prya and B. Deivasigamani	Optimization of cultural conditions for production of Chitinase by hygrosopicus DSCH 2 isolated from soil sample
31.	G. Archana	Potential application of Marine seaweed <i>Kappaphycus alvarezii</i> extract for enhanced thermal oxidative stability of Cooking Oil in food bioengineering industry
32.	B. Deepa and K.C. Venkateshbabu	Evaluation of Cardioprotective Activity of Ethanol Extract Leaves of <i>Phyllanthus maderaspatensis</i> on Isoproterenol Induced Myocardial Infarction in Albino Rats
33.	Kiruthiga. V, Ajaz Haja Mohideen. R, Vinodhini. A and V. Rekha	Green synthesis of gold nanoparticles using <i>Psidium guajava</i> and their effect on enhancing silk production in silkworm <i>Bombyx mori</i> . L
34.	Vinodhini. A, Kiruthiga. V, Rekha V and R. Ajaz Haja Mohideen	Biosynthesis of silver nanoparticles using <i>Punica granatum</i> and its Antibacterial activity
35.	Ajaz Haja Mohideen. R, Kiruthiga. V and A. Vinodhini	Antibacterial efficacy of bacterialy synthesized silver nanoparticle.
36.	K. Sindhu Priya and Dr. K. Amutha (Poster presentation)	Nanoparticle synthesis and characterization of <i>Alternanthera sessilis</i>
37.	K. Muralikandhan	Production of Amylase enzyme with various nutritional supplements
38.	Isamma, A, Divya, and K.R, Sureshkumar, S	Effect of enriched <i>Artemia nauplii</i> with probiotic <i>Bacillus subtilis</i> on growth performance, intestinal microflora, and resistance to <i>Aeromonas hydrophila</i> of Ornamental fish <i>Brachydanio rerio</i>
39.	Ramanathan T	Biomedical potential of silver nanoparticles synthesized from ethanolic leaf extract of <i>Rhizophora apiculata</i> Blume.

40.	Mohamed Namees Mohamed Iqbal, Uma maheswari, Sathya Madhavan, Anandharaj Balaiyan and Ramanathan T	GC-MS Analysis of bioactive constituents from coastal sand dune plant <i>Ipomoea pes-caprae</i> (L.) R. Br. from Pudukuppam, Cuddalore District, Tamil Nadu
41.	E. Dhineshkumar, M. Iyappan and C. Anbuselvan	Synthesis, photophysical, molecular docking, cytotoxicity, and computational studies of 6,6'-((1E,1'E)-(1,2-phenylenebis(azanylylidene)) bis(methanylylidene)) bis (3-(difluoromethoxy)) phenol and their selective fluorescent chemosensor for Ni ²⁺ and Fe ³⁺
42.	N. Saradha Devi and A. Manimekalai	Nicotinohydrazides- synthesis, Characterisation, Antifungal, Antimicrobial and Anticancer studies- A Theoretical Approach
43.	Sivaraman, A, Rani, T, Kavnilavu, A and Poovizhi, R	Evaluation of leaf extrats of <i>Seaside clerodendrum</i> , <i>Volkameria inermis</i> (L.): Lamiacea against <i>Tobacco caterpillar</i> , <i>Spodoptera litura</i> (Fab.) (Noctuidae: Lepidoptera).
44.	Kavitha.V and Anandhan. R	Effect of carbaryl on the antioxidant activity of Indian earthworm <i>Lampito mauritii</i> (Kinberg)
45.	S. Kalaimani, and C. Kandeepan	Studies on molecular characterization and conservation status of freshwater fishes in Palani hills of Southern India
46.	S. Umavathi, S. Kowsalya, V. Sathish, V. Ramasamy and P. Sundaramurthy	Biopesticidal effect of <i>Ocimum tenuiflorum</i> L against the dengue vector <i>Aedes aegypti</i> L
47.	N. Vijayakumar and V.K. Bhuvaneshwari	Antioxidant, antibacterial activities of zinc oxide nanoparticles from <i>Anoectochilus elatus</i>

Technical Session V: MICROBIOLOGY

Date: 23 rd August, 2019		Time: 09.30 AM. – 1.00 PM	Venue: Auditorium, CAS in Marin Biology
Chairpersons	Prof. S. Jayalakshmi, Ph.D. , CAS in Marine Biology, Annamalai University		
	Dr. Gopal , Department of Zoology & Biotechnology-E-Millath Government college for women (A), Chennai-002.		
	Dr. B. Meena, Ph.D. , Associate Professor, Department of Zoology, Precedency College, Chennai-5		
	Dr. B. Gunalan, Ph. D. , Department of Zoology, Government Arts College, Vridhachalam		
	Dr. S. Rajakumar, Ph.D. , Associate Professor, Department of Manufacturing Engineering, Annamalai University		
Session In-charge Organizer	Dr. S. Bragadesswaran, Ph.D. , CAS in Marine Biology, Annamalai University		




PLENARY TALK-V (09.30 am to 10.00 am)		
IMMUNE-DIAGNOSTIC TECHNIQUES AND MICROBIAL INFECTIONS IN MARINE ORGANISMS		
Dr. KDEM RAMUDU, Ph.D., Associate Professor & HOD of Zoology, Department of Zoology, BGCW (Autonomous), Puducherry-605003		
Invited speaker-XIIII (10.00 am to 10.30 am)	ISOLATION OF HEAVY METAL TOLERANCE BACTERIA FROM FOUNDRY SOIL SAMPLES Dr. S. UMAVATHI, Ph.D., HoD, PG and Research Department of Zoology, J.K.K. Nataraja College of Arts and Science, Komarapalayam-638 183, Namakkal (Dt), Tamil Nadu.	
Invited speaker-XIV (10.30 am to 11.00 am)	SELECTION OF EXPERIMENTAL ANIMAL AND MANAGEMENT Prof. K. VASUDEVAN Department of Zoology, Annamalai University, Annamalai Nagar	
Invited speaker-XIIV (11.00 am to 11.30 am)	WSSV: A REVIEW Dr. A. GOPALAKRISHNAN CAS in Marine Biology, Annamalai University, Parangipettai	
Invited speaker-XIIIV (11.30 am to 11.50 am)	CRUSTACIAN REPRODUCTION: A REVIEW Dr. P. SOUNDERAPANDIAN CAS in Marine Biology, Annamalai University, Parangipettai	
Tea Break (11.50 am to 11.55 am)		
Poster presentation (11.45 am to 1.00 pm) - Auditorium (outside)		
Oral presentation (11.55 am to 1.00 pm) - Display Hall		
S.No	Author Name	Title of the Paper
1.	Latha, N., Sr. M.R. Basil Rose and Vargila, F.	Antimicrobial activity and phytochemical screening of the aqueous extracts of the leaf of <i>Crataeva magna</i>
2.	Annamalai. V, Gowtham Pradeep. T, Karthikeyan.V, Janarthanan. C	Antimicrobial activity of sea lettuce and its endophytes (<i>Ulva reticulata</i>)
3.	Vargila, F, Mary Mettilda Bai, S, Vinoliya Josephine Mary, J, Rathika, R.K. and Latha, N.	Antimicrobial activity of the lectin purified from the hepatopancreas of the freshwater crab, <i>Oziotelphusa</i> sps



4.	M. Maheshwari, Arun. VP and P. Vijayarengan	Antimicrobial activities of <i>Tylophora indica</i>
5.	R. Kowsalya and V. Swetha	Phytochemical analysis and antimicrobial activity of <i>Musa acuminata</i> in methanol extract
6.	Sathishwaran. R and T. Kalidasan	Industrial Food Microbiology and Technology
7.	D. Priyanka, D. Dhanavel, S. Kasthuri and R. Ramkumar	Phytochemicals in <i>Hibiscus sabdariffa</i> L.
8.	D. Shanmugapriya and D. Esther	Antimicrobial and anticancer activity of Pyocyanin and pyorubin pigments produced from <i>Pseudomonas aeruginosa</i>
9.	Prakash U and Elango R	Microbial degradation of coirpith compost
10.	D.Venkatakrisnan and M. Ravichandran	Influence of composts and Industrial by-products on yield attributes and yield of sugarcane in sandy loam
11.	Greeshma K, Krishnaswamy V K D, Phaniendra Alugoju, Latha Periyasamy	Screening of <i>Acacia mangium</i> Willd leaf and bark extracts for phytochemicals, antioxidant, antibacterial properties and Insilico candidate drug molecules for Alzheimer therapy
12.	Khursheed Ahmad Dar and S. Senthilmurugan	Production of beneficial micro-organisms in vermicompost by using earthworm <i>Eisenia fetida</i> .
13.	A. Kanagalakshmi and M. Amaravathi	In-vitro antimicrobial and antioxidant potential of methanolic flower extract of <i>Tridax procumbens</i> and their phytochemical constituents
14.	Ajaz Haja Mohideen. R, Kiruthiga. V, Vinodhini. A and V. Rekha	Antibacterial efficacy of bacterial synthesized silver nanoparticle
15.	R. Desingh	Antioxidant enzymes, osmolytes and aba in seedlings of <i>Casuarina junghuhniana</i> Miq. Under salt (NaCl) stress
16.	R. Ramkumar, D. Dhanavel, S. Kasthuri, and D. Priyanka	Chlorophyll and morphological mutants of little millet (<i>Panicum sumatrense</i> Roth .ex.Romers and Schultes.) variety Co4 (Samai)
17.	T. Nalini and S. Ambika	Nest composition of <i>Oecophylla smaragdina</i> fabricius (Hymenoptera: Formicidae) in <i>Mangifera indica</i> and <i>Manilkara zapota</i>
18.	Ehab, A. Salama, Kumaravadivel, N, Beulah Bhakiya Sherlin, R, Murali Sankar P, Ahamed, E. Khaled and Nader and R. Abdelsalam	Screening of salt tolerance cultivars in wheat (<i>Triticum aestivum</i> L.) through in vivo and in vitro conditions
19.	Shanthi Sivakumar	Determination of serum phenoloxidase activity in <i>Edible anomuran</i> crabs, <i>Albunea symmysta</i> (crustacea: decapod)

20.	Manivannan. R and M.V. Sriramachandrasekharan	Efficacy of organics and mineral nitrogen on growth and yield in rice in Typic ustifluvents soil
21.	N.G. Tamilselvi, G. Vidhya, P. Sasikala and A. Priyatharshini	Multi - Elemental Composition and Physical Properties of Honey Samples from Kanyakumari District, Tamilnadu, India
22.	M. Soundararajan, D. Marin Emerald, S. Ravichandran and G. Vidhya,	Fourier transforms infrared spectroscopy analysis of garlic (<i>Allium</i>)
23.	P. Kamalakannan	Effect of different levels of sulphur and zinc on rice yield and nutrient uptake
24.	R. Sheela, B. Asha and Dr. K. Ezhisai Vallabi	Microbiological Identification for Degradation of Organic Substances in an up flow Anaerobic Sludge Fixed film Reactor for Treating Sago Wastewater
25.	M. Vijayapriya and S. Mahalakshmi	Studies on the effect of certain carbon sources on bioflocculation of silicate solubilizing bacterial isolates
26.	S. Mahalakshmi and M. Vijayapriya	Studies on the effect of plant growth promoting rhizobacteria inoculation on the rhizosphere population of tomato (<i>Lycopersicon esculantum</i> . L).
27.	Sriraaman M, Vignesh D, Jaiseelan S and Gowthaman D	Biodegradation of endocrine disrupting compounds with various bacteria - A review
28.	Anandharaj Balaiyan, Sathya Madhavan, Mohamed Namees and Ramanathan T	Studies on phytochemical analysis and Antibacterial activity of ethanolic leaf extract of <i>Senna alata</i> (L) Roxb. (Leguminosae)
29.	Sathya Madhavan, Anandharaj Balaiyan, Mohamed Namees Mohamed Iqbal and Ramanathan T	Phytochemical and antibacterial studies of fruit extract of <i>Psydrax dicoccos</i> Gaertn. (Rubiaceae)
30.	Kumaresan. G and Rajan and L Fradlin Singh	Mass production of <i>Spirulina</i> in anaerobically digested brewery effluent medium
31.	Dr. T. Rani, J. Ramya and A. Sivaraman	Efficacy of certain botanicals against cotton mealy bug <i>Penococcus solenopsis</i> (Tinsley)
32.	Dr. T. Rani, J. Ramya and A. Sivaraman	Studies on the efficacy of certain botanicals against Cottonaphids, <i>Aphis gossypii</i> Glover (Aphididae: Hemiptera)
33.	S. Sudhasha, S. Sumatra, Dr. K. Sanjeevkumar, M. Charumathi, and J. Jayachitra	Evaluation of efficacy of certain Plant products against the Fusarium wilt pathogen on tomato caused by <i>Fusarium oxysporum</i> f.sp. lycopersici under in vitro condition
34.	V. Kiruthika, P. Vijayan and S. Senthimurugan	Vermicompost Preparation from Plant waste of <i>Crotalaria juncea</i> mixed with Cow dung Using Two Varieties of Earthworms <i>Eisenia fetida</i> , and <i>Eudrilus eugeniae</i>

35.	K.M. Syed Ali Fathima, T. Annalakshmi, S. Umamaheswari, P. Madhiyazhagan and Y. Thangam	Studies on the influence of biobac-n medium on the food utilization of the common carp (<i>Cyprinus carpio</i>)
36.	M. Ramanan	Evaluation of anti-insect properties of Ipomoea carnea against <i>Spodoptera litura</i> Fab [Lepidoptera: Noctuidae]
37.	S. Umavathi, N. Parimala and M. Jamuna	Isolation of heavy metal tolerance bacteria from foundry soil samples

Technical Session VI: AQUACULTURE and Miscellaneous

Date: 23 rd August, 2019		Time: 02.00 PM. – 3.00 PM	Venue: Auditorium, CAS in Marin Biology
Chairpersons	Dr. Kdem Ramudu , Associate Professor & HOD of Zoology, Department of Zoology, BGCW (Autonomous), Puducherry-605003		
	Dr. Muniyan , Department of Zoology, Periyar Art's and Science College, Cuddalore.		
	Dr. P. Soundarapandian, Ph.D. , Professor, CAS in Marine Biology, Annamalai University		
	Dr. J. Selvanathan, Ph.D., HoD , Department of Zoology, Pachaoyappas College for Men, Kanchipuram		
Session In-charge Organizer	Dr. S. Bragadesswaran, Ph.D. , CAS in Marine Biology, Annamalai University		
PLENARY TALK-VI (02.00 to 3.00 pm)			
LIVELIHOOD RECOVERY OF FISHERY RELATED SERVICES PROVIDING HOUSEHOLDS AFTER MARINE ENVIRONMENTAL DISASTER IN VIETNAM IN 2016: CASE STUDY OF PHU VANG DISTRICT, THUA THIEN HUE PROVINCE, VIETNAM.			
Dr. DUONG NGOC PHUOC, Ph.D. , Extension and Rural Development Faculty, Hue University of Agriculture and Forestry, Hue University			
COASTAL AND BRACKISH WATER AQUACULTURE STATUS OF INDIAN			
Dr. V.S. CHANDRASEKARAN, PRINCIPAL SCIENTIST (Rtd.) ICAR-Central Institute of Brackishwater Aquaculture, Chennai, Tamil Nadu-600 028, India			
Invited speaker-XX (02.30 pm to 03.00 pm)	MORTALITY AMONG FARMED MUD CRAB, <i>Scylla serrata</i> DUE TO WHITE SPOT SYNDROME VIRUS (WSSV) IN ANDHRA PRADESH, INDIA		
Dr. R. ANANDA RAJA ICAR-Central Institute of Brackishwater Aquaculture, Chennai,			

Invited speaker-XXI (03.00 pm to 03.30 pm)	AIR POLLUTANTS IN WORLD WIDE	
Display Hall	<p>Dr. S. RAJAKUMAR, Ph.D., Associate Professor, Department of Manufacturing Engineering, Annamalai University</p>	
Invited speaker-XXII (03.30 pm to 04.00 pm)	SYNTHESIS OF CHEMICAL COMPOUND AND ITS SPECTRAL, BIOLOGICAL EVALUATION AND COMPUTATIONAL STUDIES	
Display Hall	<p>Dr. G. RAJARAJAN, Ph.D., Associate Professor, Department of Chemistry, Annamalai University, Annamalainagar-608 002, India</p>	
Oral presentation (03.00 pm to 4.00 pm) - Auditorium (outside)		
Tea Break (03.40 pm to 03.50 pm)		
Oral presentation (03.00 pm to 4.00 pm) – Auditorium		
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1.	Senthamizh G, Divya R, Thamizhselvi D, Priyadharshhni R, Senthamizh G, Soundarya E	Aquaculture and induced breeding
2.	Soundarya E, Senthamizh G, Divya R, Thamizhselvi D, Priyadharshhni R, Senthamizh G	Aquaculture and prawn farming
3.	Balamurugan .V and T. BalaKrishnan	Study on Adoption Behaviour of Improved Technologies in Fish Curing
4.	Revathi and Lakshmanan S	Impact of Chlorpyrifos on Some Biochemical Constituents in Liver and Kidney of Fresh Water Fish <i>Channa Punctatus</i> (Bloch.)
5.	N.Ravisankar and S. Balakumar	Aquaculture and changing water quality in the Cauvery River Basin, Nagapattinam District, Tamilnadu State
6.	J. Rajaselvam and Sr. M.R. Basil Rose	Physicochemical characterization of a natural agglutinin from the hemolymph of a freshwater crab <i>Ozotetelphusa ravi</i>
7.	Habeeb Ashik Ahameda and Mohamed Jamal Mohameda	Impact of herbal supplemented diet on the sex steroid hormone levels and milt quality indices in the freshwater fish <i>Oreochromis mossambicus</i> (Peter's, 1852) – Update from email
8.	M.Kanagaraj,and D.Manivelu	The behavior changes of Euphorbia tirucalli latex powder on fresh water fish <i>Oreochromis mossambicus</i> (tilapia)

9.	Vaishnavi, P And P. Ramesh	Hematological study of spirulina on fresh water fish, <i>Oreochromis mossambicus</i> (Tilapia)
10.	T. Velayutham and S. Sivaprakasam	Isolation and characterization of polycyclic aromatic hydrocarbon degrading bacteria from marine soil sediments in Tamilnadu
11.	S. Priyadharsini and J. Manoharan	Studies on length-weight relationship of grow-out and loose-shell affected <i>Litopenaeus vannamei</i> low salinity water Tamil Nadu, India
12.	S. Sankaran and G. Karthikeyan	Effect of aquaculture on groundwater quality in the coastal regions of Vedaranyam block, Tamilnadu
13.	N.Nagarajan, P.Sivarajan, and N. Ashokkumar	Heavy Metal in Coastal Sediments of Uppanar Estuary in Cuddalore District, Tamilnadu
14.	J. Nelson Samuel Jebastin	3D structure modeling of protein disulfide isomerase (pdi) present in <i>Homo sapiens</i>
15.	Amitha Kuriana and Preetham Elumalaia	Comparative effects of chemical and biosynthesized (Leucas aspera and Oxy - Cyclodextrin complex) zinc oxide nanoparticles on Nile tilapia (<i>Oreochromis niloticus</i>)
16.	Abdul Salam Rubeena and Preetham Elumalai	Synthesis and antimicrobial characterization of lectin conjugated copper nanoparticles and its application in aquaculture
17.	J. Kuppuraj, K. Rajamohan, R. Udhayakumar, S. Sanjaygandhi and L.Vengadeshkumar	Studies on Cultivation Aspects of Milky Mushroom <i>Tricholoma giganteum</i> (Masse.)
18.	R. Udhayakumar, K. Rajamohan, S. Sanjaygandhi and L.Vengadeshkumar	Efficacy of amistar xtra 280 sc (azoxystrobin 18.2% + cyproconazole 7.3%) against maize downy mildew caused by <i>Peronosclerospora sorghi</i>
19.	M. Muthulingam M. Rajakani and R. Palaniappan	Impact of heavy metal, chromium on biochemical and histoarchitectural changes in liver of freshwater fish, <i>Channa striatus</i> (bloch)
20.	S. Sivaprakasam P. Ravichandran, K. Balaji and T. Ramesh	Bioaugmentation process for removing heavy metals from aqueous solution using fallen tree leaves of <i>Acanthophora spicifera</i>
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23.	Aboorva D., Sumitha D. and Joseph C. Daniel	<i>Lecithinase Production</i> and Cholesterol Degradation Potential of Gut Microbiota

24.	Suganya S., Sumitha D. and Joseph C. Daniel	Antibiotic Resistance among Bacterial Isolates from Human <i>Faecal Microbiota</i>
25.	M. Prakash	Antioxidant and antitumour activity of acid soluble collagen extracted from freshwater snakehead fish <i>Channa striatus</i>
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28.	Abjam Nadarajan	Nipah Virus and ahe Outbreak of the Disease, Transmission, The Symptoms and The Diagnosis Method
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33.	Muthuvelan Thambidurai, R. Velappan and M.L.Sundararajana	Optimization of Free Cooling Using PCM Filled Air Heat Exchanger for Energy Efficiency in Building
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35.	R. Lakshmanan	Concentration of Heavy Metals in Shrimp Pond (<i>litopenaeus vannamei</i>) Southeast Coast of India, Tamilnadu
36.	M.V.V. Thirumuruga Poiyamozi	Health Hazards Due to Characteristics of Groundwater Situation in Sipcot Industrial Area
37.	PL.Senthilkumar, S. SelvamuthuKumar	Utilizing Biodegradable Waste as A Plantation Media – A Novel Approach
38.	G. HemaPoojavalli, S. Bragadeeswaran, M. Selvam and J.Gopalsamy	Studies on bacterial association in skin epidermal mucus of fish (<i>Brachirus orientali</i>)
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40.	Selvam Murugan, S. Bragadeeswaran, K. Aparnadevi, R. Ranjithkumar	Studies on bloom forming microalgae from Tuticorin coast
41.	M. Barani, G. Chinnadurai S. Bragadeeswaran, K. Aparnadevi, G. Hemapoojavalli	Estimation of Carbohydrate and Protein in Lean Fish <i>Sardinella longiceps</i> and <i>Dussumieria acuta</i>
42.	S. Nightingale Sheeba, V.N. Ariharan, J. Vinoliya Josephine Mary, S. Mary Mettilda Bai, M. Arun Vijay	Characterization of a natural agglutinin from latex of the plant <i>Cnidoscolus aconitifolius</i> and its biomedical potential
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44.	J. Jayachitra, P. Sivasakthivelan, E. Babu	Role of Lactic Acid Bacteria in Fermentation of Beet Root Juice
45.	T. Selvam	Farming and Disease Management of The Pacific White Shrimp, <i>Litopenaeus vannamei</i>
46.	J. Chandraleka and V. Ravi	Food and Feeding Habits of The Silver Pomfret, <i>Pampus Argenteus</i> (Euphrasen 1788) from Nagapattinam Coast, Tamil Nadu
47.	Digi George, Preetham Elumalai	Effect of Alkoxy Glycerol with Nanoparticle as Immunostimulant in Nile Tilapia (<i>Oreochromis Niloticus</i>)

4.00 – 4.30 : PANEL DISCUSSION

4.30 – 4.40 : VALEDICTORY FUNCTION

5.00 : NATIONAL ANTHEM

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KEYNOTE ADDRESS

Immunology, Genetics & Human Diseases

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ABSTRACT

Immune system in humans keeps a close surveillance on threats from external or internal biological agents so that it protects all of us universally from microbial infection and cancer. Blood cells, T cells, B cells on a cooperative basis perform through both a swift response and memory recall mechanisms in the body. The genetics of our immune system is complex though interesting. Every nucleated cell in our body is guarded through a spectrum of sentinels - the human leucocyte antigens (HLA). These extracellular and intracellular immunoglobulin projections are of three distinctive classes of major histocompatibility complex (MHC) which has more than a million combinations that makes each individual biologically unique and transplantation-wise incompatible. HLA genes about 200 in number which govern the MHC, reside in the p arm of chromosome 6. Unless we have a precisely balanced immune system, we would not remain healthy. If the balance tilts to low due to psychological stress, smoking or alcohol, then we would be susceptible to infection or we may develop cancer. Lack of sleep suppresses the T cells and the inflammatory cytokines increase, making us susceptible to infections. Several studies time and again have proved that exercise boosts our immune system and makes us healthy. Nutritious diet has similar effects on boosting our immune system. Unfortunately, the universal protector of our body – the immune system could at times turn hyperactive and can cause allergies or target our own body cells causing what is called as autoimmune disorders (AD). In the process the surveillance system erroneously feels that our own body cells as foreign and moves on a destructive pathway. Examples of some of the AD are thyroid disease, Bechet's disease, psoriasis, systemic lupus erythematosus, type 1 diabetes mellitus, primary biliary cirrhosis, juvenile idiopathic arthritis, inflammatory bowel disease, juvenile hepatitis, some neurological diseases, celiac disease, etc. Immunomodulation is a tool that helps us to treat immune related disorders including cancer. Our immune system is a double-edged sword and hence a perfect balance is needed to keep us hale and healthy.

Global Warming: Earth System Science Perspective with a Special Focus on the Marine Realm

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ABSTRACT

Even though Earth and Oceans associated with it are far older than humans, human activities overwhelmingly impact Earth's climate compared to the nature climate forcing over the last a couple of centuries. When we look back the distant past, it is clear that impact of human released carbon to the Earth's atmosphere in recent decades on marine environment and its chemistry and biology is huge and fast enough to produce detrimental effects. In this talk, I'll introduce global warming in the perspective of Earth System Science by producing evidence from various natural proxy records. I'll then place the current warming in the geological context, specifically based on marine archives. Then I'll discuss some key ongoing threats to humans and marine ecosystem modifications, including the global carbon cycle and human health. Finally, I'll show a widespread effect of ocean acidification, future dangers and some alternate solutions and where the current policy stands on the issue of global warming.

SPECIAL TALK

Livelihood Recovery of Fishery Related Services Providing Households after Marine Environmental Disaster in Vietnam in 2016: Case Study of Phu Vang District, Thua Thien Hue Province, Vietnam

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ABSTRACT

This paper shows the status of livelihood recovery of fishery related services providing households after Formosa caused marine pollution crisis in 2016 in Thua Thien Hue province. Surveys at forty households in two communes of Phu Vang District unveil different ways local people react after thirty months post-disaster. Some households ceased fishing for about twenty to twenty one months, resulting in loss of income at more than 6.5 million VND/household/month. This is a significant reduction

in local income given the average GDP per capita of the commune was less than 4 million VND/household/month (Thua Thien Hue Statistic book, 2017). 80% of local reactions to the disaster are considered passive responses such as cutting expenses, borrowing from relatives, banks or living on savings. Very few households had changed to new livelihoods. However, over time, despite some challenges, households started recovering and have an average income equal to 87.11% compared with the level before the disaster. Keywords: marine pollution disaster, impacts on livelihoods, resilience, response and recovery

Species Diversity of Marine Algae along the Coast of Oman and Their Prospects

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ABSTRACT

The Sultanate of Oman is a country located at the eastern extremity of the Arabian Peninsula, between Yemen in the south, Saudi Arabia and the United Arab Emirates to the west. It has a long coastal line of around 1,700 km, characterized by a rich flora of marine algae including members of red, brown, green and blue-green algae which could also be categorized as micro (phytoplankton) and macro-algae (seaweeds). Hashim *et al*, reported 248 taxa of marine microalgae comprising of members from Bacillariophyceae, Dinophyceae, Dictyophyceae and Cyanophyceae. A total of 323 macroalgal taxa have been reported from Oman. (CBD, 2010) Being rich in proteins, vitamins, trace elements and many substances of medicinal importance Seaweeds are the only sources of agar, alginate and carrageenan. These phytochemicals are extensively used in various industries such as food, confectionary, textile, pharmaceutical, dairy and paper, mostly as gelling, stabilizing and thickening agents. This opens the way for several interesting possibilities for the commercial exploitation of Omani seaweeds for various applications. Attempts are being made to analyse the species diversity of each region and bioprospect fine biochemicals from some of them. Higher antioxidant and antibacterial activity are shown by the extracts of certain brown and green seaweeds. This opens the possibility of using these seaweeds to make different products that can have many biotechnological, nutraceutical and pharmaceutical applications. However, more investigations are required for separating, purifying and characterizing these compounds. An interesting diatom *Aphiprora sp* has been newly reported from the A'Sharqiyah coast of Oman.

Aquaponics: A New Avenue to Enhance the Rural Livelihood through Sustainable Aqua-Agriculture Practices

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ABSTRACT

The growing food insecurity, uncontrollable rising of food prices, water scarcity and poverty, especially in developing countries, coupled with concerns of climate pattern, have resulted significant global challenge. To overcome these issues, agriculture-based sustainable farming was suggested to produce food by conserving water and recycling nutrients, and converting wastes water into high-value resources. The global population has been growing rapidly, with a matching increase in global food demand, especially for high-quality protein, which has been driving the development of several agribusiness sectors such as aquaculture. However, large volumes of water are required to produce these animal proteins. Livestock farming uses approximately 12,000 L of water to produce 1 kg of beef meat, and conventional aquaculture uses until 3,75,000 L to produce 1 kg of fish in a flow through system. Consequently, the industrial scale practices of these activities and recent population growth have caused a serious water crisis. In order to avoid further crises related to the use of natural resources, new approaches and technologies are needed in agriculture aiming to achieve greater productivity with minimal environmental impact, when compared to conventional systems. In this context, aquaponics is emerging as an alternative method of food production. Aquaponics is an innovative smart and sustainable production system for integrating aquaculture (fish culture) with hydroponic (vegetable crops) that can play a crucial role in the future of environmental and socio-economic sustainability in rural and urban areas of India. The technique involves the integration of aquaculture recirculation systems with hydroponics. The environmental friendly approach of this cultivation method is due to the low use of water, minimal effluent discharge, nearly full utilization of aqua feeds, and the high productivity of fish and plants compared with conventional productions. In addition, the production of chemical and antibiotics-free food caters to an established consumer market that demanding high-quality fish and vegetables and is willing to pay for the added value ecological benefits of aquaponic products.

Current Issues in Environmental Pollution

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ABSTRACT

Certain man-made accidents threaten wildlife and the ecosystem. While these accidents are comparatively rare because of increased safety procedures, accidents still occur, sometimes with devastating effects. Example, such as oil spills, radioactive leaks, tanker spills, pipeline bursts and drilling accidents.

E-Wastes:

Various materials are used to make electronics and their components, including heavy metals, gases, plastics, chlorinated solvents and more. Common toxic materials found in electronic waste include:

- Mercury – Even little doses of mercury may cause kidney and brain damage.
- Lead – The effects of lead causes brain damage, particularly in children.
- Beryllium – Many connectors and motherboards include beryllium, which is considered a human carcinogen.
- Brominated Flame Retardants (BFRs) – BFRs are known to negatively affect hormonal functions that are essential for normal development.
- Cadmium - Cadmium has been shown to cause cancer, and when it accumulates within the body, it may result in kidney damage.

Hazardous Waste

The improper handling of hazardous waste materials poses immediate and long-term risks to plants, animals, humans and the environment. Hazardous waste is any liquid or solid that contains carcinogenic or teratogenic compounds, including pesticides, paint strippers, solvents, paint, gasoline, bleach, ammonia, industrial cleaning agents and drain cleaners. Individuals and businesses should make sure that hazardous-waste disposal experts handle all hazardous waste, and should never dump hazardous waste with regular trash or into rivers or ditches.

Ozone Depletion

Based on the study of Environmental Protection Agency, there are several airborne materials that can lead to ozone pollution. Ground-level ozone, particulate matter, lead, sulfur dioxide, nitrogen oxide and carbon monoxide are all dangerous when released into the air. These contaminants may cause human health problems and damage to plants and animals. The EPA enforces laws controlling the release of these substances

into the atmosphere. Measured air quality leads to less stress on the outer ozone layer of the planet that supports protect us from the sun.

Soil Contamination

Damage of underground storage tanks, acid rain, leaching of hazardous waste from a landfill, pesticides and herbicides, and discharge from industrial chemical wastes all can contaminate the soil in which farmers cultivate crops or graze livestock that people eventually eat. Laws against such pollution need to be stringent, and the correct agencies have to be tough in the enforcement of those laws to help retain soil safer for humans and animals.

Current Environmental Status and Biodiversity

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ABSTRACT

Climatic change global warming is the major environmental problem we have seen before release of CO₂ has exceeded 400 times per million. Report from UN office for the coordination of humanitarian affairs, in 2012 there were 905 natural catastrophes worldwide and 93 percent of these events were weather related disasters. In the last decade 2.4 billion people affected by climate related disaster compared to 1.7 billion in the previous decade. The climatic changes which lead to destructive sudden rain in intense tropical storms repeated flooding and droughts are likely to increase unless we can reduce the amount of CO₂, 340 parts per million we will cause huge and irreversible damage to earth. Not only CO₂, SO₂ emissions also increased in years 15.23 million tons. In 1985 increased to 17.95 in 1993 by china other major reason is high population and social capital in coastal areas countries with many islands, it is also a focus of concern about the prospects of sea level rise. In islands, the sea level rises about only a few meters will worsen soil degradation and corresponding decline in agriculture productivity. In 2013, the total population of Asia pacific region stood at 4.3 billion which is 16 percent of world population. World most populous countries china next to that India current environmental issues that require urgent attention are release of CO₂ ozone destruction by chloroform, carbons, water pollution, air pollution, soil waste management deforestation to control these over whelming changes. We must inculcate certain changes like the famous three RRR; RESUSE, RECYCLE, REDUCE, Along with creating clean energy afforestation, defending endangered animals and foresting sustainable communities. Biodiversity ensures natural sustainability for all life on earth more than 3 million people depend on marine and coastal biodiversity. 1.6 million People rely on forest further livelihoods the loss of biodiversity affects the life of more

than 1 billion people living in dry lands. Climate is a major factor in the distribution of species across the globe, climate change focus them to adjust but many are not able to cope causing them to die, over hunting, over fishing and over harvesting contribute greatly to the loss of biodiversity killing off numerous species over the past several 100 years.

Immune-Diagnostic Techniques and Microbial Infections in Marine Organisms

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ABSTRACT

The Marine Biology with reference to Biodiversity Conservation, the Institutions such as ICAR, ICMR, CIFE, CMFRI are established all over the country. The Institutions are putting up lot of research activities with reference to Marine Biodiversity Conservation such as Fin Fish, Shell Fish, Prawn, Oysters', and Mussels. The Infections with reference to viral, bacterial and fungal infections are prone to cause mass mortality. The infection with reference to viral infection in Prawn (*Peneau's monodon* and *Peneau's indicus*) causes mass mortality and Economic loss in the Aquaculture industry. The Aquaculture industry is putting lot of efforts to overtake the viral infection to the Prawn industry cum Prawn farming. The seed collected from various sources such as 1. Natural seed collection during High tide in the Sea coast, 2. Seed collected from Mangrove Roots and 3. Seed collected from Hatchery production are three different sources available to the Aquaculture Industry. However, the Former is still in puzzle with viral infection called SEMBV (Systemic Ectodermal Mesodermal and Bacculo viral infection) infection. The white spot disease is also known as SEMBV infection caused by *Monodon Bacculo Virus*. The white spots on carapace appeared indicative of viral infection and causes mass mortality to the Industry. The increase in seed called PL 20 introduction in Hectare area cause suffocation and stress results change in the water quality i. pH, ii. BOD, iii. COD, Total alkalinity, iv. Dissolved O₂, CO₂ levels as a result suffocation and viral infection. It is indeed essential to understand the Immunological parameters i. PCR (Polymerase Chain Reaction) during PL20 stage from various sources. The possible Immunodiagnostic techniques i.) ELISA (Enzyme Linked Immunosorbent Assay), ii.) PCR iii) .DNA amplification is currently available to understand the viral infection before introducing the seed into the form. One must understand the consequences such as immunological concepts to overtake the viral infection using Feed mixed with i. Antioxidants (Vitamin C) and ii. Disease Resistant (Vitamin E) which will overtake the infection by developing immunity to the pathogen.

Interaction between fish louse, *Lepeophtheirus salmonis* and the host Atlantic salmon *Salmo salar*, L-an immunological study

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ABSTRACT

The salmon louse, *Lepeophtheirus salmonis*, is a crustacean ectoparasite of salmonids and causes significant economical losses in Atlantic salmon farms. This study demonstrates the cellular inflammatory response, in respect of macrophage migration, mounted by the host, Atlantic salmon (*Salmo salar* L) to the salmon louse while it is attached to the host's epidermis. During the inflammatory response, macrophage infiltration is common at the infected place in the host and also macrophage possesses phagocytic activity. The aim of the study was immunological response of macrophages of host to excretory and secretory product (E/S) of parasite. The E/S product of the parasite collected from the explant and *in vitro* culture of the parasite and macrophages isolated from the blood of fish were used in this study. Macrophage migration assay and an assay for phagocytosis were used to study the inflammatory response. Inhibition of macrophage migratory response ($p < 0.05$) and significantly low level of phagocytosis ($p < 0.05$) were observed. It can be concluded from the result that anti-inflammatory response seems to be subjected in the host during the louse infection.

Keywords: Inflammation, macrophages, migration, parasite, phagocytosis

ORAL PRESENTATION - IMMUNOLOGY

Immunostimulants Effects of Chitosan on *Mugil cephalus* against *Aeromonas Hydrophila*

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ABSTRACT

The purpose of this study was to determine the effect of chitosan scheduled the nonspecific immune mechanisms and disease resistance in *Mugil cephalus*. After chitosan it was mix with feed 40% fish meal, 30% rice bran, 20% Soybean meal, 15% wheat flour at different concentration. Fishes were feed with different doses of 1%, 2% and 3% chitosan. The nonspecific immune mechanisms were assessed in terms of

Counting of white blood cells (WBC), Lysozyme assay and Respiratory burst activity. The functional immunity in terms of percentage mortality and Relative Percent Survival (RPS) was assessed by a challenge with live *Aeromonas hydrophila*. In our present study 1% chitosan shows a significantly increased WBC, higher lysozyme activities and respiratory burst activities when compare with other diet 1%, 2% chitosan diet & control feed. Cumulative survival rate after 1 days of challenge test, experiment group showed 60% survival and control 80% survival was observed. After 7 days of experimental studies 70%, 80%, 65 %, and 30% survival was observed in T1, T2, T3 and Control group respectively. This preliminary study indicates that Chitosan could be used to promote the health status of fish in intensive finfish aquaculture.

Immunological and Biomarker Tools for Assessing the Impact of Ocean Acidification on Sea Urchin *Salmacis Virgulata*

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ABSTRACT

The present investigation deals with the immunological and biomarker tools to assess the impact of ocean acidification on sea urchin. As per IPCC 2011 report, ocean acidification is the on-going decrease in seawater pH due to high level CO₂ enters into ocean which continuously changes the seawater carbonate chemistry. Echinoderms have the water vascular system through which they can perform their feeding and metabolism. Seawater chemistry changes in surrounding environment could possibly first impact on echinoderms which will leads to the cascade effects on entire marine communities due to its keystone role. Therefore, the hypothesis was made on the basis of any small changes in seawater carbonate system leads to the impact of echinoderm metabolism. The experiment was carried out at microcosm level to mimic the natural ocean acidification on sea urchin. Sea urchin was exposed to 4 different pH levels viz., pH 8.2 (ambient), pH 8.0, pH 7.5 and pH 7.0. The changes in different biomarkers viz., acetylcholine esterase, catalase, glutathione S-transferase, lipid peroxidase and reduced glutathione was assessed during experiment. The enzymatic response of *S. virgulata* in control and pH treated conditions showed the highly significant ($p < 0.01$) variation and their activity of enzymes ascertained that the animals were being stressed. The hemagglutination assay of sea urchin hemolymph against sheep red blood cell was carried out. But it did not seem antigenicity in both control and pH perturbed conditions.

Immune Status of *Litopenaeus vannamei* (Boone, 1931) in Relation to the Gut Microfloral Diversity

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ABSTRACT

In this study, *Litopenaeus vannamei* samples were collected from CAA approved CAS marine Biology demonstration pond, Parangipettai (Station 1) and JJ Aquafarm, Natarajapuram (Station 2). The relationship between the immune status of *L. vannamei* and the gut bacterial diversity was assessed by lysozyme bioassay. In station 1, totally 103 colony morphology were observed. Among that *Aeromonas* sp, *Pseudomonas* sp, *Bacillus* and *Vibrio* sp were enumerated in high density as the major gut bacteria of *L. vannamei*. Here the probiotic bacterial species was more than pathogenic counterpart it may be due to the station is near to the non polluted mangrove vegetation. Whereas, in station 2 the commercial culture pond, about 400 different colony morphology were detected. Among that *Vibrio* sp, *Salmonella* sp, and *Staphylococcus* sp were noticed as dominant pathogenic bacterial species. In lysozyme bioassay, the activity was significantly more in station 1 *L. vannamei* samples. On the other hand, the lysozyme activity was very less in station 2. The result shows that, the probiotic gut microflora in station 1 reflect a good immune status in *L. vannamei*. Further these isolated probiotic bacteria may characterize and can be used in commercial aquaculture ponds to improve the health status.

Immunological Tools for Monitoring and Assessment of the Impact of Ocean Acidification

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ABSTRACT

The ocean plays an important role in controlling global warming and climate change by absorbing one third of human generated carbon dioxide (CO₂). The exchange of CO₂ in ocean waters, alters the partial pressure of CO₂ result in reducing carbonate ion concentration and in consequence decrease the ocean pH is termed as ocean acidification. The impact of ocean acidification on marine ecosystems is likely to have major consequences for climate processes, food production, biodiversity and sectors reliant on these services, such as fisheries and aquaculture. Immense work has been

carried out to evidence the negative impact of ocean acidification (OA) on marine organisms with particular focus on marine calcifying organism's calcification and development process. Recent findings has revealed that various marine organisms acclimatize to the event of changing climate and OA at the cost of physiological processes such as reproduction, immune function and ecological role at appropriate time scale. The interaction between stress hormones and immune functions is still a young field of research with limited findings on various neurotransmitters, hormones, neuropeptides, and cytokines as signal messengers or effectors to regulate humoral and cellular immunity, energy metabolism, shell formation, and larval development. The aim of this lecture is to review the current status of innate immune response of marine organisms to the event of OA and to identify the research gap and challenges involved in using immune modulation as a tool for monitoring and assessment of the impact of OA in marine organism.

Extract of *Sargassum teretifolium* as an Immunostimulant in the Management of *Colletotrichum capsici* (Syd.) Butler and Bisby

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ABSTRACT

Chilli (*Capsicum annum* L.) is one of the important commercial vegetable crops which are grown extensively almost throughout the world. Cultivation of chilli has been limited by a variety of biotic (fungal, bacterial, viral, nematodes diseases) and abiotic (environmental factors) deteriorating factors. *Colletotrichum capsici* the most common ascomycetous fungus is notorious for causing fruit rot in chillies. Several management strategies are used for the control of the disease such as cultural control, use of resistant cultivars, biological control and use of fungicide. Under intensive chilli cultivation, there is an urgent need to develop disease control measures alternative to chemicals because the use of fungicides lead to toxic residues on chilli products and also cause environmental pollution. Organic method is an alternative and ecofriendly approach for the chilli fruit rot disease management. Macro algae are an attractive and natural source of bioactive molecules. Such natural products may have potential for the management of fungal diseases in sustainable agriculture such as organic farming. The present study was, therefore, accomplished to investigate the simultaneous influence of various brown seaweed extracts viz. *Dictyota dichotoma*, *Padina gymospora*, *Hydroclathrus clathratus*, *Sargassum teretifolium* and *Chnoospora implexa* were selected and evaluated for their antifungal activity by two methods such as Agar well method and Paper disc assay. Among them, the extracts of *Sargassum teretifolium* at a highest concentration (20%) maximally reduced the mycelial growth in both the methods recording 17.3 and 14.8 per cent inhibition respectively.

Haemato-Immunological Responses to Deltamethrin Toxicity in Fresh Water Fish, *Oreochromis Mossambicus* (Tilapia)

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ABSTRACT

Environmental pollution, especially water pollution has been increasing at an alarming rate due to rapid industrialization, civilization and green revolution. Domestic sewages are run off from agriculture fields loaded with pesticides and fertilizers, pollute the water bodies. The aquatic environment is continuously affected by toxins and pollutants, which could alter the haemato-immunological response of fishes. Fishes are extremely sensitive to aquatic pollution. The present study is to assess the haematological and immunological response of the fresh water fish *Oreochromis mossambicus* exposed to sublethal concentration of deltamethrin 1/10th, 1/20th of the 96 hour LC-550 value for the period of 21 days. Blood samples were taken after 21 days of exposure to deltamethrin. Haemato-immunological parameters including RBC, WBC, Hb, PCV and Immunological indices were determined. Fish exposed to deltamethrin showed, decreased level of RBC, WBC, Hb, Hematocrite and Immunological indices significantly in almost all exposure, compared with control group. These changes may be potentially disruptive and immunosuppressive for the survivability of *Oreochromis mossambicus* in wild environments and aquaculture farms. Therefore, strict biosecurity should be taken into consideration when this pesticide is used in agriculture fields surrounding freshwater sources of fish cultivation.

Histopathological Alterations in Gills, Liver, Kidney and Brain of *Oreochromis Niloticus*, Exposed to Environmentally Related Heavy Metal Concentration of Lead

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ABSTRACT

Heavy metals are the most dangerous hazardous of all environmental pollution. They are moderately or completely solvable in water and bioaccumulates in internal organs of aquatic organisms and causes toxicity. The examination was analyzed the toxicity of Lead to freshwater *Oreochromis niloticus* to observe the histopathological alternations in gills, liver, kidney, and brain. Females and males fish of *Oreochromis niloticus* were reared in freshwater culture tanks and matured fish exposed to concentrations of Lead (Pb²⁺) 0.5, 2.5 and 5 mg/L for a period of 30 days. The histopathological variations were compared with control experiment fish which were

reared in separate culture tank. The lesions, epithelial lifting, lamellar swelling, hypertrophy and hyperplasia of pavement and chloride cells included curling in secondary lamellae, and shorter gill lamellae, complete devastation of gill lamellae, and aneurysm in gill filaments were observed in the gills. The alterations of liver were observed as cytoplasmic vacuolation, nuclear pyknosis, degenerative nuclei, disarrangement of hepatic cords, and moderate melano-macrophages aggregation. In the kidney, majority of tubules were showed focal tubular necrosis and the unclear lumen, rupture of Bowman's capsule, glomerular tuft, hypertrophies of glomeruli, hemorrhage between renal tubules, degeneration of the epithelial cells lining, necrotic cells, proliferation of renal tubules and some renal tubules were dilated. Alterations of the brain were vacuolation, degradation of Purkinje nuclear cells, and lesions and hemorrhage observed in granular layer. The control group was shown the normal histopathological constructions. The resulting point toward increased water concentrations of Lead directly above the maximum tolerable limit and their bioaccumulation in the gill, liver, kidney, and brain of *Oreochromis niloticus* fish undergoes pathological alterations and inhibition of metabolic processes.

Immunological and Chemical Composition Study of Proteins from Indigenous Earthworm *P. ceylanensis*

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ABSTRACT

The present work has been done to obtain composition of proteins from non-conventional sources that could be used in various food products for human consumption and that meet the following circumstances: nutritionally balanced and toxicologically harmless, interesting to the senses and economically feasible. From this study proteins from *P. ceylanensis* in order to determine chemical composition i. e. protein, fat and heavy metal and electrophoretic profile, generation of humoral immune response in mice and toxicity in a human cell line. Results of our study revealed 58 ± 4 and 9 ± 1 (g%) of proteins and fat respectively. Moreover, levels of heavy metals were low and similar to tunny fish (Soorai) and fifteen bands were observed by SDS-PAGE with a molecular weight range of 6.2–202 kDa while twenty spots were observed following 2D gel electrophoresis. After immunizations with *P. ceylanensis* lysate, high titer antibodies were produced without causing immediate hypersensitivity reactions and excellent cell viability was observed when *P. ceylanensis* proteins were added to a human cell line. Therefore, our results suggest that earthworm *P. ceylanensis* proteins are safe for feeding animals intended for human utilization.

Histopathological Impact of Hexavalent Chromium in Liver and Muscle of Freshwater Fish *Oreochromis mossambicus* (PETERS)

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ABSTRACT

In the present study the histopathological study was observed in liver and muscle of freshwater fish *Oreochromis mossambicus*. The fish exposed to hexavalent chromium (3 ppm) for 10 days, 20 days and 40 days. The present study in the liver, splitting of hepatocytes and damage of hepatocytes were observed. In the muscle breakage and neurons of cells were observed the present study it is concluded that the increasing duration of exposure of heavy metal hexavalent chromium caused more damages in liver and muscle tissues of *Oreochromis mossambicus*.

Cytotoxicity and Antiproliferative Effect of Hemolymph Lectin of *Atergatis Integerrimus* on Cervical Carcinoma (HeLa) Cell Line

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ABSTRACT

In the present work, an N-acetyl neuraminic acid (NeuAc) Specific lectin was purified from the hemolymph of the marine crab, *A. integerrimus*. The purification was performed using affinity chromatography and SDS-PAGE. The lectin, on non - denaturing PAGE showed a single band of 216 k Da and when subjected to SDS-PAGE, the lectin showed three fractions of molecular weight, 70, 72 and 74 kDa. Physico-chemical characterization revealed the lectin as pH and temperature sensitive, calcium dependent and sensitive to calcium chelators. Based on the calcium dependency of the lectin, AiL could be classified as a C-type lectin. Cytotoxic and antiproliferative effect of the hemolymph lectin (AiL) of marine crab, *A. integerrimus* against four human cancer cell lines cervical carcinoma (HeLa), colorectal adenocarcinoma (HT-29), hepatocellular carcinoma (HepG2) and lung adenocarcinoma (A549) and normal fibroblast cell line (L929) was assessed. Among the four cell lines tested AiL exhibited significant antiproliferative effect against HeLa cell line with an IC₅₀ value of 65.028 µg/ml. Fluorescence microscopy analysis showed significant increase in apoptotic cell death in dose dependent manner which was further confirmed through the DNA fragmentation assay. The growth inhibitory effect of AiL on HeLa cell line was shown to be a consequence of AiL triggering G₀/G₁ phase arrest and the apoptotic signal amplified by the activation of caspase-9 executing cell death. Reverse transcriptase PCR revealed an increased expression of p53 gene which could be a major reason for anticancer potential.

Effect of methanolic extract of *Costus pictus* (insulin plant) against breast cancer targeting oxidative stress and inflammation

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ABSTRACT

Breast cancer has the highest incidence of all cancers in women worldwide and is a combination of distinct malignancies that damages the mammary glands. Cancer cells are usually associated with higher ROS levels inducing malignancy leading to proliferation, death evasion, angiogenesis, and metastasis and the role of ROS on breast cancer etiology and progression is being progressively elucidated. Recently, intensive research efforts are made to identify novel breast cancer therapeutics to potential clinical application. The cytotoxic drugs induce adverse effects resulting from interference with structures or processes essential for cell survival, proliferation, or function. Plant based compounds are considered safe and are in demand for the treatment of cancer due to their lesser side-effects. Therefore, the present study is focused on the effect of *Costus pictus* (Insulin plant) on the breast cancer targeting oxidative stress and inflammatory pathways. Human breast cancer (MCF-7) cell lines were treated with methanolic extract of *C.pictus* and cytotoxic studies were performed. MTT assay and apoptosis analysis was carried out. The ROS production was determined and the anti-oxidant enzyme assays were performed. The inflammatory genes TNF- α and TGF- β were analyzed. The results showed that *C. pictus* treatment induced apoptosis in breast cancer cell lines. Increased number of dead cells was observed. The oxidative stress was reduced on induction with *C.pictus*. Further, the gene expression of TGF- β 1 and TNF- α were also down-regulated in *C.pictus* supplementation when compared to control MCF-7 cell lines. Together, the results showed that *C.pictus* showed effective anti-cancer activity in breast cancer.

Biodegradation Dimethyl Phthalate using *arthrobacter* sp. In Batch Systems

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ABSTARCT

Dimethyl Phthalate (DMP) is one of the Endocrine disrupting compounds (EDCs) that are exogenous agents that eliminate natural hormones in the body. Major

source DMP is waste water from various industries. In the list of identified EDCs published by United Nations on July 2018, phthalates stands first. Out of 45 compounds, 10 are phthalates. Thus experiments were carried out with Dimethyl Phthalate (DMP). Biological removal methods are cheap and efficient than other methods. Thus, biodegradation is carried out in engineered environments with pure culture microorganisms. Mostly aerobic microorganisms are capable of degrading EDCs. Thus batch biodegradations were initially carried out with *arthrobacter sp.*, *rhodococcus opacus sp.* and *ochrobacter sp.*. All three microorganisms are inoculated in different Mineral Salt Media (MSM) containing 250 mg/l of DMP as carbon source. The flasks are kept in shaker incubator at 32°C and 160 RPM. Samples were collected for each 48 hours and the optical density (OD) was determined using Ultra Violet Visible spectrophotometer. At the end of 240th hour *arthrobacter sp.* shown good results. Now, *arthrobacter sp.* is inoculated in Louis Broth Media (LB Media). Samples were taken in 4 hours interval for 36 hours and their OD value is determined. Also 10 ml of samples are centrifuged and the pellets were lyophilized to determine the Dead Cell Weight (DCW). DCW vs OD calibration graph was drawn to generate the slope equation. Then the microbes are inoculated in MSM media with various concentrations of DMP (i.e. 100 mg/l, 250 mg/l, 500 mg/l, 750 mg/l and 1000 mg/l). Samples were taken for 24 hours in 2 hours interval and OD value was found. Using slope equation generated from the calibration graph, the corresponding DCW were found with OD value. Along with standard samples, all the samples collected were analyzed with High Performance Liquid Chromatography. Then the standard sample's area vs concentration calibration chart was drawn and the slope equation was generated. Using slope equation the concentration of the compound present after degradation can be found out. Hence the initial concentration is known removal efficiency can also be calculated. In 100 mg/l concentration the resultant degradation percentage was 99.33% at the end of 24th hour.

Mortality among Farmed Mud crab, *Scylla Serrata* Due to White Spot Syndrome Virus (WSSV) in Andhra Pradesh, India

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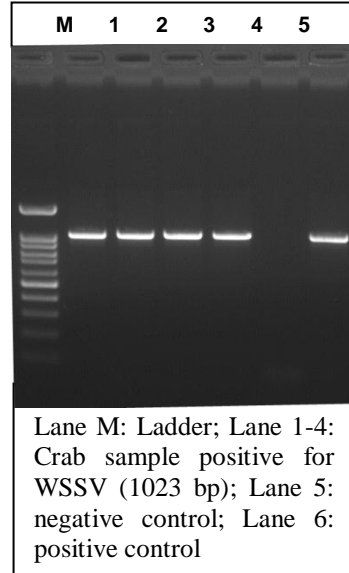
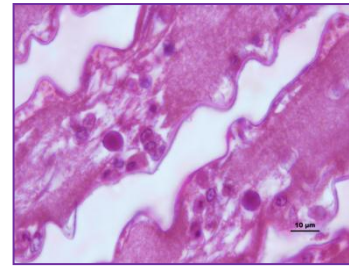
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ABSTRACT

Mud crab, *Scylla serrata* farming had been initiated in the abandoned vannaimei ponds in Andhra Pradesh, India since 2016. Total area under mud crab culture in Andhra Pradesh was 7363.81 hectares during 2017-18. The crab farming in earthen ponds was done using the green local (GL) crabs (100-200g) from export portals (Odisha, Tamil

Nadu, Puducherry, Kerala, Karnataka, Maharashtra and Goa) with the stocking density of 0.1 per sq. mt. Crab mass mortality was observed in Nagayalanka, Krishna district with clinical signs such as white spots on the carapace, lethargy, fungal growth over the skeleton, chitinolytic spot on the abdominal flap, fouling, broken claw, loss of chelate legs, and light greenish to yellowish or pinkish discoloration followed by death. Mortality was observed during 65th day of culture (DOC) and progressed up to 75% in a period of 10 days. Hence, emergency harvest was done on 75th DOC. Water and pond sediment samples were collected from diseased and healthy farms (four farms with 21 ponds). Water salinity, pH, dissolved oxygen and temperature were 16.67 ± 0.18 ppt, 8.16 ± 0.01 , $3.75 \pm 0.06\%$ and $26.68 \pm 0.06^\circ\text{C}$, respectively. Moribund and healthy crabs were collected with an average size of $781.25 \pm 33.56\text{g}$. On spot post-mortem examination was done and the samples were collected in suitable preservatives. Post mortem examination revealed that the gills were heavily infested (left gill- 74.8 ± 11.81 ; right gill- 72.3 ± 11.95) with metazoan crustacean parasite, stalked barnacle, *Octolasmis* spp. Abdominal cavity contained about 30-40mL serosanguinous fluid. Microbial load estimation in pond sediment, water and haemolymph of infected pond were significantly higher than that of healthy ponds. Haematological investigation revealed that the healthy mud crab had higher total haemocyte count (THC) of $17.28 \pm 0.46 \times 10^6$ cells mL^{-1} while the diseased crabs had THC of $6.90 \pm 0.48 \times 10^6$ cells mL^{-1} . The differential haemocyte population was characterized based on the presence of the cytoplasmic granules and cell sizes. Small non-granular (SNGH) and large non-granular (LNGH) haemocytes populations were found significantly increased while semi-granular or small-granular (SGH) and large granular (LGH) haemocytes were drastically reduced in diseased crabs compared to that of healthy crabs. Polymerase chain reaction (PCR) screening for white spot syndrome virus (WSSV) revealed that the diseased samples were positive. Histopathology showed that there was degeneration of gill tissue and were characterized by hypertrophied nuclei with marginated chromatin and eosinophilic to basophilic intranuclear inclusions. It is advisable to stock disease free crablets and follow strict better management practices to avoid disease outbreaks in future.



Study on the Effect of Haematological Parameters in *Oreochromis Mossambicus* Exposed to Cypermethrin

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ABSTRACT

Toxic chemicals reach the aquatic environment either directly or indirectly. Among insecticides pyrethroids is considered to be the most harmful one. Pyrethroids insecticide inhabits the aquatic environment and within two weeks they are absorbed by the aquatic organisms with some toxic effect. Hematological parameters determine fish health and are considered as an easy tool to manifest relationship between fish and environment. Pyrethroids used to control pest in agriculture. Sublethal effect of Cypermethrin (25% EC) on some Haematological parameters such as RBC, WBC count, Hb content and hematocrit values were studied in *Oreochromis mossambicus*. The fishes were exposed to 1/10th, 1/20th, 1/30th concentration of Cypermethrin for a period of 30 days. The blood samples were analysed every 10th, 20th, 30th, day of Exposure period. A decrease value in RBC, WBC, Hb and Haematocrit was observed in 1/10th concentration at 30th day duration, although mild reduced percentage in all the four Haematological parameters was observed in 1/20th and 1/30th concentration while compared with control group.

Phytoremediation of Heavy Metals (Cd, Pb) in *Cucumber Sativus* Using EDTA as A Chelating Agent

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ABSTRACT

Heavy metals are present in soil as a consequence of human activity. Metal rich mine tailing, metal smelting, electroplating, battery recycling, wood treating, fuel burning and fuel production, downwash from power lines; intensive agriculture and sludge dumping are the most important human activities that contaminate soils with large quantities of metals. The present study was carried out to examine the effect of chelating agent EDTA on phytoremediation potential of *Cucumber sativus*. Heavy metals contaminated soil was prepared artificially by adding cadmium chloride and lead acetate in the concentration of 100 ppm/3kg of soil and *Cucumber sativus* plant was grown on the soil for 30 days. The chelating agent of EDTA was applied on different interval days (8th, 16th, 24th days). EDTA used to enhance the metal uptake in to the plant root and shoot. The accumulated metals were analyzed by using atomic absorption spectroscopy. On 30th day biochemical parameters and heavy metals accumulation capacity were analyzed by measuring the amount of cadmium and lead in root and shoot of *Cucumber sativus*. The overall results obtained in this study indicate that there exists a non-linear positive relationship between the heavy metals concentration in the soil and that accumulated in plant roots and shoots.

Effect of Foliar Application of Nutrients and Growth Retardants on the Growth and Yield of Rice Fallow Black Gram

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ABSTRACT

To find out the effect of foliar application of nutrients and growth retardants on the growth and yield of rice fallow blackgram, a field experiment was carried out in the experimental farm of Annamalai University, during January – April 2013. The treatments were T1- BTEX 111-1 + MC 120 ppm, T2 BTEX 111-1 + Triacantanol 0.2%, T3 - BTEX 111-1 + CCC 250 ppm, T4 - BTE X 111-2 + MC 120 ppm, T5 - BTEX 111-2 + Triacantanol 0.2%, T6 - BTEX 111-2 + CCC 250 ppm, T7 - BTEX 111-3 + MC 120 ppm, T8 - BTEX 111-3 + Triacantanol 0.2%, T9 - BTEX 111-3 + CCC 250 ppm. The experiments were studied in randomized block design with three replications. Black gram var ADT3 was grown as test crop. The results of the study indicated that the foliar application of the nutrients viz. DAP, KCl and micronutrients viz. Zn, Fe, B and growth regulators significantly increased the growth and yield. Among all the treatments the combined application of nutrients T8 - BTEX III - 3 + Triacontonal 0.2% recorded significantly higher growth of black gram by way of increased plant height 55.46 cm at harvest and DMP on 45 DAS 1709 Kg ha⁻¹ of black gram besides improving the yield. The grain yield recorded with this treatment was 1032 Kg ha⁻¹ and haulm yield was 2088 Kg ha⁻¹.

The p53 pathway in Human Breast and Prostate Cancer Cell Lines Using Curcuma Longa

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ABSTRACT

p53 mutation remains the most common genetic change identified in human neoplasia. p53 expression is an indicator of cells ability of aberrant cancer cells to stop in the cell cycle and repair the DNA. More p53 expression betters the DNA damage repair capacity of the cells. Treatment of cancer cells by curcumin resulted in increased expression of p53 protein. Increased p53 protein may help slow the proliferation of cancer cells. Treatment of all 5 cancer cell lines increased induction of p53 gene expression.

ORAL PRESENTATION - BIODIVERSITY

Biodiversity and Conservation

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ABSTRACT

Biodiversity Conservation is an ethic of resource use, allocation and protection. Its primary focus is upon maintaining the health of the Natural world, its Fisheries, Habitats, and Biological diversity. Secondary focus is on material conservation including non-renewable resources such as metals, minerals and Fossil fuels and energy conservation which is important to protect the natural world. Those who follow the conservation ethic and especially, those who advocate or work toward conservation goals are termed conservationists. To conserve habitat in terrestrial eco regions and to stop deforestation is a goal widely shared by many groups with a wide variety of motivations. To protect sea life from extinction due to overfishing or climate change is another commonly stated goal of conservation ensuring that “some will be available for future generations” to continue a way of life. The term conservation itself may cover the concepts such as cultural diversity, genetic diversity and the concept of movement’s environmental conservation, seed bank (preservation of seeds). These are often summarized as the priority to respect diversity especially by greens. The International Union for Conservation of Nature (IUCN) is a membership Union unique composed of both government and civil society organisations. It provides public, private, and nongovernmental organisations with the knowledge and tools that enable human progress, economic development and nature conservation to take place together.

Key words: Biodiversity; Conservation; Deforestation; Overfishing; Seed bank.

Climate Change Issues and Bio- Diversity Challenges in Coastal Tamilnadu

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ABSTRACT

The climate change issues are affecting the livelihoods of millions of our coastal farmers. Being small and marginal farmers, agricultural labourers and farm women they remain as a prey to changing climate related issues and resultant natural vagaries. With fresh water and other natural resources becoming shrinking resources in coastal habitats, farming and rearing livestock in coastal villages face innumerable difficulties to survive and sustain. The rise in global temperature and water levels are also displacing a large quantum of coastal communities to nearby rural or urban centres. The earlier indigenous

technology knowledge systems and the Biodiversity resources with the coastal communities which protected them against all natural calamities are also seen on a declining trend. So to solve this problems of climate change we need to educate coastal communities on climate change related issues, develop innovative farm technologies suited to the needs of coastal farmers taking into account the existing bio- diversity resources of the coastal habitats and the financial resources of the farming community into consideration. Farm scientists, Extension workers, Development professionals and Policy planners need to work together in conserving our bio- diversity resources against rising climate change related issues in coastal areas of Tamil Nadu.

Exploring Indigenous Farm Technologies for Conservation of Bio-Diversity Resources in Coastal Tamilnadu

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ABSTRACT

Our Indian farming in coastal areas still rely on traditional and indigenous farm technologies. Tamilnadu blessed with a long sea coast spanning thirteen coastal district is blessed with abundant fauna and flora. It is also home to twenty five percent of our Tamilnadu population mostly belonging to the marginalized and disadvantaged sections of the society. With climate change playing a crucial role in our coastal farming, there is a need to effectively combat these issues using the available indigenous farm technologies found viable at the grass root level and also tap the existing germplasm resources for achieving greater production and productivity related gains. With horticulture production increasing more than agricultural production across the nation and with the average income of farmer at reduced level as by NSSO reports, there emerges a need to create a new farming system taking into account the resources at disposal with the farming community towards demand driven and market oriented farm activities. This will effectively pave way for conservation of bio-diversity resources effectively using the available germplasm resources to their fullest potential and over a period of time will assist us in creation of climate resilient farm technologies suited to the needs of our coastal farm communities.

MGNREGS towards conservation of Biodiversity in rural India

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ABSTRACT

The Mahatma Gandhi National Rural Employment guarantee Scheme (MGNREGS) under implementation across our nation in rural areas is the largest social security

scheme in the world. Employing small and marginal farmers, agricultural laborers, farm women and unemployed farm youth in rural areas, this scheme has created employment opportunities for millions of our disadvantaged population in their respective rural habitats. Creation of rural public utilities and common infrastructure deploying the rural labour force has resulted in it been designated as “Green Jobs”. Many Afforestation projects, building of community based irrigation structure for water conservation and water harvesting (Eg. Farm ponds, percolation tanks), flood control and protection (Eg. Check dams, culverts etc), Irrigation canals (Macro and micro irrigation works etc), Renovation of traditional water bodies (Eg. Desalting of tanks ect) are undertaken as a part of this exercise which are safeguarding our farming ecosystems in rural habitats. The water conservation and water related works like land development (Eg. Contour bunds, field bunds etc), works on lands of SC/ST/ BPL/ IAY beneficiaries and the establishing of rural connectivity (Eg. Village roads) had also assisted us in carrying out conservation works at the micro level thereby paving way for sustainable use of our resources. So the need of the hour is to strengthen this welfare initiative in the best interest of our nation and to conserve our bio-diversity resources and utilize it effectively for the benefit of present and future generations.

Biodiversity and Environmental Pollution

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ABSTRACT

Environmental pollution occurs in different forms air, water, soil, radioactive, noise, heat, thermal and light. Pollution includes i). Air pollution, ii). Water pollution, iii). Soil Pollution, iv) Noise pollution, v) Radioactive pollution and vi) Light pollution. The presence of substances introduced into the environment which has harmful or poisonous effects. The introduction of contaminants into the natural environment cause adverse change. Pollution is something that brings harm to our environment and in turn to the people who exit based on the environment. Environmental pollution occurs when pollutants contaminate the surroundings which bring about changes that affect our normal lifestyles adversely. Pollutants are the key elements or components of pollution which are generally waste materials of different forms. Pollution disturbs our ecosystem and the balance in the environment. With modernization and development in our lives pollution has reached its peak, giving rise to global warming and human illness. Sources and causes of Environmental pollution includes i) Industrial activities ii) Dumping solid waste, iii) vehicles, iv) Rapid urbanization and industrialization, v) population overgrowth. Pollution control include i) refuse disposal systems ii) sanitary landfills, iii) emission control systems for automobiles, iv) sedimentation tanks in sewage systems v) the electrostatic precipitation of impurities from industrial gas, or the practice of recycling.

Coastal Biodiversity and Its Protection

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ABSTRACT

Marine source form an essential component of the Earth's ecosystem and are critical to sustainable development. International law, as reflected in UNCLOS, provides the legal framework for the conservational use of the oceans and their resources. This integrates the three pillars of sustainable development. It can contribute to: food security, energy, disaster risk reduction, sustainable agriculture, land desertification, forests, ecosystems and biodiversity, women's empowerment, and sustainable tourism. Focus area for: Reducing marine pollution and debris including from land-based activities. Halting the destruction of marine resources especially through acidification. Encouraging sustainable small-scale fisheries. The importance of biodiversity is undoubted and it should be reflected in the catalogue of SDGs with its inter linkages. In mining mostly diamonds are found in marine, the first diamond company (Tidal Diamond Company) were established in 1950 .The sustainability of our biosphere significantly relies on the goods and services provided by deep-sea ecosystems.

Role of Breeders in Biodiversity Conservation

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ABSTRACT

Biodiversity refers to the variety and variability of life on Earth. Biodiversity is typically a measure of variation at the genetic, species, and ecosystem level. The aim of the conservation is to save species and plants from extinction and their habitats from destruction. The developed countries are looking for a sustainable supply of biological resources from the developing countries and easy access to them as well. Conservation of Biodiversity in India. India is signatory to several major international conventions relating to conservation and management of wildlife. Captive breeding programs are increasingly being initiated to prevent the imminent extinction of endangered species and/or populations. Most programs can maintain genetic diversity within populations over several generations, but available research suggests the loss of fitness in captivity can be rapid, its magnitude probably increasing with the duration in captivity. Over the long-term, there is likely tremendous variation between (i) programs in their capacity to maintain genetic diversity and fitness, and (ii) species or even intra specific life-history types in both the severity and manner of fitness-costs accrued. Encouragingly, many new theoretical and methodological approaches now exist for current and future programs to

potentially reduce these effects. Nevertheless, an unavoidable trade-off exists between conserving genetic diversity and fitness in certain instances, such as when captive-bred individuals are temporarily released into the wild. Owing to several confounding factors, there is also currently little evidence that captive-bred lines of salmonids can or cannot be reintroduced as self-sustaining populations

Effect of Lab on Human Health and Its Diversity in Milk and Milk Products

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ABSTRACT

Milk and milk products are an important part of human diet. These dairy products can contain diverse microbiota. Especially LAB is the main players of food fermentation. The most common LAB in milk and milk products includes *Lactobacillus spp.*, *Lactococcus spp.*, *Pediococcus spp.*, *Streptococcus spp.*, *Leuconostoc spp.*, *Enterococcus spp.*, etc. LAB impacts the organoleptic and physico chemical characteristics of foods as well as human health. Acid production is carried out by starter culture of lactic acid bacteria (LAB) whereas other lactic acid producing microbes viz., moulds, and yeasts become dominant during ripening and contribute to the development of aroma and texture in food products. Probiotics are part of the nonstarter microbiota and their use has been extended in recent years. But some microorganisms can also produce toxic compounds, especially biogenic amines and aflatoxins. In rare cases fermented milk products can be contaminated by some pathogens. If pathogens multiply during food manufacture or storage, they can cause sporadic cases or outbreaks of disease. The current state of different aspects of the research on LAB presents in milk and milk products in their positive or negative impact on human health.

Agricultural Bio-Diversity and Its Effective Role towards Agriculture

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ABSTRACT

Agriculture depends to a large extent on the services provided by ecosystems. Biodiversity conservation requires that intervention strategies are integrated and adaptable to the conditions of each specific condition. Biodiversity conservation is critical for economic development and poverty alleviation. The agriculture sector is highly dependent on the services generated by biodiversity and neighboring natural ecosystems that provide key services such as pollination, pest control, genetic diversity, soil retention, structure and fertility, water supply, etc. Although there is certainly an

increased adoption of good agricultural practices, there are still abundant unsustainable practices in agriculture that cause substantial environmental degradation, biodiversity loss and a progressive loss of agricultural productivity at the same time. Agricultural biodiversity provides humans with food and raw materials for goods - such as cotton for clothing, wood for shelter and fuel, plants and roots for medicines, and materials for biofuels - and with incomes and livelihoods, including those derived from subsistence farming. Agricultural biodiversity also performs ecosystem services such as soil and water conservation, maintenance of soil fertility and biota, and pollination, all of which are essential to human survival. In addition, genetic diversity of agricultural biodiversity provides species with the ability to adapt to changing environment and evolve, by increasing their tolerance to frost, high temperature, drought and water-logging, as well as their resistance to particular diseases, pests and parasites for example. This is particularly important regarding climate change. The evolution of biodiversity, and therefore both its and our survival, mainly depends on this genetic diversity. The importance of agricultural biodiversity encompasses socio-cultural, economic and environmental elements. All domesticated crops and animals result from human management of biodiversity, which is constantly responding to new challenges to maintain and increase productivity under constantly varying conditions.

Agriculture and Its Effective Role in Biodiversity Conservation

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ABSTRACT

Agriculture comprises all aspects of crop and livestock farming, fisheries, aquaculture and forestry. Agricultural biodiversity includes all the components of biological diversity of relevance to food and agriculture together with the components of biological diversity that constitute the agro-ecosystem: the variety and variability of animals, plants and micro-organisms, at the genetic, species and ecosystem levels, that sustain the functions, structure and processes of the agro ecosystem. This diversity has been shaped by farmers and communities for millennia and remains a key element of the livelihood strategies of poor, small-scale farmers throughout the world. Agricultural biodiversity, including wild relatives of genetic resources, is a fundamental resource for the continued improvement of varieties and breeds, and needed to cope with changes. Biodiversity and ecosystem services are essential in supporting agriculture in multiples ways and at all levels. These inter linkages are increasingly seen as key for livelihoods, welfare, production and development. While biodiversity and ecosystem services are essential to agricultural sectors, these sectors are also major drivers of environmental change with significant impacts on biodiversity and ecosystem services. One main

impact on biodiversity loss derives from the conversion of natural or semi natural land into agricultural land uses, followed by the introduction of invasive alien species, including pests and diseases. Reducing the ecological footprint of agriculture through sustainable practices can contribute to the conservation of biodiversity, habitats and ecosystem services provision. Agricultural landscapes can be designed and managed to host wild biodiversity of many types, with neutral or even positive effects on agricultural production and livelihoods. Innovative practitioners, scientists and indigenous land managers are adapting, designing and managing diverse types of 'eco agriculture' landscapes to generate positive co-benefits for production, biodiversity and local people.

Diversity of Family Trochidae at Gopnath Coast, Gujarat

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ABSTRACT

Gujarat has the longest coastal line in India. Length of a coastal line is 1600km long. The Gopnath is situated on the coast of Bhavnagar district. It is away to 75-80 km away to Bhavnagar district. The Gopnath is a pilgrimage site so yearly thousands of visitors are visiting. It has a muddy shore line .this study shown the result of mollusc family *Trochidae*. The name suggests that the shells of *Trochidae* are top shape. Generally, occur in the intertidal area and subtidally at a few meters depth. On the study site, three species of family *Trochidae* were found viz. *Tectus niloticus* (Linnaeus, 1767), *Trochus radiates* Gmelin, 1791, *Trochus maculates* Linnaeus, 1758.

Biodiversity Conservation Technologies in Fisheries

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ABSTRACT

Overfishing and irresponsible fishing practices have long been recognised as leading causes that have reduced aquatic biodiversity, along with other causes such as pollution, habitat destruction and fragmentation, non-native species invasions and climate change. The FAO code of conduct for responsible fisheries and the international instruments pertaining to fisheries and biodiversity conservation stress the need for developing selective and eco-friendly fishing gears in order to conserve resources protect non-targeted resources and endangered species like sea turtles and minimise environmental impacts of fishing. Various types of bycatch reduction technologies have been developed in the fishing industry around the world, in order to minimise the impact

of fishing on non-target resources. These devices have been developed taking into consideration variation in the size and differential behavior pattern of shrimp and other animals inside the net. Semi-pelagic trawl system has been developed as an alternative to shrimp trawling in the small-scale mechanised trawlers operating in the tropical waters. Sources of pollution from fishing operations which affect fisheries environment include emissions of greenhouse gases (GHGs) and plastic debris originating from abandoned, lost and abandoned fishing gears. Enforcement of bycatch reduction technologies, promotion of low impact and fuel efficient fishing systems and smart trawling techniques, along with regulation on total fishing effort at sustainable levels and maintenance of Marine Protected Areas will facilitate protection and restoration of biodiversity and enhance the resilience of the fish stocks to fishing pressure. In this paper, various approaches to minimise the impact of fishing operations on bio-diversity in fisheries environment are discussed.

Biodiversity Conservation for Sustainable Livelihood

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ABSTRACT

Biodiversity refers to the wide variety of ecosystems and living organisms like animals, plants, their habitats and their genes. Biodiversity is the link between all organisms on earth, binding each into an interdependent ecosystem, in which all species have their role. Biodiversity found on earth today consists of many millions of distinct biological species, which is the product of nearly 3.5 billion years of evolution. Many different species are living in this world and each one is connected uniquely in some form of relationship with another. It is the web of life. It is widely accepted that biodiversity loss and poverty are linked problems and that conservation and poverty reduction should be tackled together. A suite of diverse issues is examined, including threats to biodiversity, such as those from habitat transformation, alien invasive species, overexploitation and genetic engineering; the difficulties of 'mainstreaming' biodiversity at all levels of planning and decision-making; and strategies for conservation and development such as protected area management, community-based management. Rural communities depend on key components of biodiversity and ecosystem services that are found in non-domestic habitats. It is high time to conserve bio-diversity to sustain our livelihood. Efforts should be intensified to maintain bio-diversity for sustainable environment. Suggestions are made for efficiently conserving and maintaining the bio-diversity.

Need for Bio-Diversity for Agro-Ecosystem

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ABSTRACT

Biodiversity is the sum of all terrestrial, marine and other aquatic ecosystems, species and genetic diversity. It includes the variability within and among living organisms and the ecological complexes of which they are part. Agriculture' comprises all aspects of crop and livestock farming, fisheries, aquaculture and forestry. Agricultural biodiversity includes all the components of biological diversity of relevance to food and agriculture together with the components of biological diversity that constitute the agro-ecosystem: the variety and variability of animals, plants and micro-organisms, at the genetic, species and ecosystem levels, that sustain the functions, structure and processes of the agro ecosystem.. The agricultural sectors together manage the largest terrestrial, freshwater and marine areas on Earth. If managed sustainably, agricultural sectors can contribute to important ecosystem functions. These include maintenance of water quality, nutrient cycling, soil formation and rehabilitation, erosion control, carbon sequestration, resilience, habitat provision for wild species, biological pest control and pollination. Well maintained agricultural and forest lands reduce risks and damage from floods, storms, tsunamis, avalanches, landslides and droughts. Agriculture and other ecosystems are also important for the non-material benefits they provide to people. These "cultural services" include aesthetic inspiration, cultural identity, sense of home, and spiritual experience related.

Role of Indigenous Technical Knowledge (ITK) in Agriculture Based Biodiversity Conservation

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ABSTRACT

Indian farmers, over centuries, have learned to grow food and to survive in difficult environments, where the rich tradition of ITK has been interwoven with the agricultural practices followed by them. Indigenous Technical Knowledge (ITK) has been developed by the people based on their experiences and continuous improvement through informal experimentation. ITK systems are adaptive skills of local people usually derived from many years of experience that have often been communicated through oral traditions and learned through family members over generations. It is vital

role to the food security and health of millions of people and is developed and passed on from generation in the form of accounts, cultural values, customs and agricultural practices. It closely interlinks cultural and biological diversity, forming an essential basis for the conservation and sustainable use of global biodiversity. Biodiversity provides the fundamental building blocks for the many goods and services a healthy environment provides. Other important services provided by our biodiversity include recreational, cultural and spiritual nourishment that maintain our personal and wellbeing. ITK act many important roles on biodiversity especially in Agricultural ecosystem and following some practices like, protecting and preserving the wealth and variety of species, habitats, ecosystems and genetic diversity on the planet. With the above view an attempt is made with this paper to discuss about the role of ITK in agricultural biodiversity conservation.

Climate Change and Its Impact on Biodiversity

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ABSTRACT

Climate change refers to a statistically significant change in either the mean state of the climate or in its variability persisting for decades or longer. Biodiversity is the variability among living organisms, including genetic and structural difference between the individual and the species. The world bio-diversity has a total of 1,263,500 species of plants and animals while India has only 51,828 species. It provides us with all the necessities of life and sustains and nourishes us. Biodiversity plays a direct role in climate regulation. It is also important in following ways: Soil formation and maintenance of soil quality, maintain air quality, maintain water quality, detoxification and decomposition of wastes, pollination and crop production, climate stabilization, prevention and mitigation of natural disasters and provision of food security. About one-third of the world's area is under cultivation. Climate change leads to variability in rainfall patterns, heat stress, spread of pests and diseases and shortening of the crop cycle and affecting plant growth and production. Climate change results in the impact on the biodiversity like change in their distribution pattern, migration of species, invasion of invasive species, change in the phenological behaviour, increase in the forest fires and pest attacks. Climate change and biodiversity loss are two of the greatest global threats to human well-being. To maintain the balance of ecosystem, interaction between the plants and animals biodiversity needs to be understood, hence promoting its conservation and protection by designating the hotspots as biosphere reserves, increasing afforestation, reforestation and agro forestry practices. Biodiversity based adaption and mitigation strategies will enhance the resilience of ecosystems and prevent damage to human and natural ecosystems.

Biodiversity and conservation of Extinct Marine Algae

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ABSTRACT

Sea weeds or algae are by and large simple plants which display a spectrum of photosynthetic pigments and evolve oxygen during the process of photosynthesis. Marine algae are assemblage of chlorophyll bearing autotrophic thallophytes. Algae are popular as food and well known for their medicinal effects due to presence of active phenolic constituents. Marine algae have gained much importance in cosmetics and pharmaceutical industries due to their rich bioactive compounds (phlorotannins, sulphated polysaccharides and tyrosinase inhibitors, etc). So due to over exploitation of marine algae by such industries, some of the algae are diminishing and getting extinct. The present study reviews the proper conservation of such marine algae.

On-site and off-site biosorption of pollutants in uppnar estuary water

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ABSTRACT

Vellar River is originating from Shevaroy hills and draining in Bay of Bengal. Uppanar is the estuary of Vellar. Many industries are located in this region. Effluents of these industries cause heavy metal contamination. Literature says mangrove plants adsorb heavy metals. In this context, biosorption of heavy metals present in Uppanar estuary water was carried out both in on-site and off-site and the efficiencies were compared. Initially *Rhizophora Mucranata sp.* and *Avicennia Marina sp.* plants were collected from Pichavaram mangrove forests. The leaves, stems and roots of both mature and young plants were dried, powdered and used to adsorb the heavy metals in the contaminated water sample. The experiment was carried out under stirred condition. After analysis of adsorbent, efficiency calculations were done. Then the leaves, stems and roots of matured and young plants were collected from the mangrove plantation site located in Uppanar estuary (11°41'23.4"N and 79°46'02.8"E). This site was established by the Pollution Control Research Laboratory, Department of Chemical Engineering, Annamalai University-FEAT under the aegis of Ministry of Environment, Forests and Climate change, Government of India in 2014. The collected samples were dried, powdered and analyzed with Atomic Absorption Spectroscopy. Finally efficiency calculations were done and compared with off-site efficiency.

Mesozooplankton Composition and Community Structure in Ashtamudi Backwater

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ABSTRACT

The Ashtamudi backwater forming a major part of the Ashtamudi wetland ecosystem have been under severe environmental stress due to plethora of anthropogenic activities which drastically destroyed the health of the precious wetland ecosystem. Ashtamudi backwater is the second largest backwater system and one of the Ramsar site in Kerala is planimetric in shape with eight creeks covering an area of 5598 ha and lying between lat. 8^o53' and 9^o 02' and long.76^o31'and76^o41'. Four stations representing different environmental conditions such as Neendakara (marine zone), Chavara (industrial zone), Ashtamudi (brackish water zone) and Ashramam (mangrove zone) were selected for regular monthly monitoring of mesozooplankton. Mesozooplankton composition and community structure describes the composition, distribution, abundance and diversity of mesozooplankton in the Ashtamudi backwater. Qualitatively and quantitatively the mesozooplankton population was comparatively poor in the polluted stations like Chavara and Ashramam. The mesozooplankton in the Ashtamudi backwater belonged to six functional group such as Hydromedusa, Rotifera, Ostracoda, Cladocera, Copepoda and Copepod nauplii. Eighteen species of mesozooplankton were identified from Ashtamudi backwater where the copepods expressed as the major mesozooplankton functional group with maximum abundance in all the study stations including thirteen species. In the Ashtamudi backwater the population density of mesozooplankton was maximum during the post monsoon period. The comparatively low diversity index at Chavara and Ashramam (polluted stations) compared to Neendakara and Ashtamudi (non polluted stations) coincided with the poor abundance and incidence of mesozooplankton communities arising from stress condition due to pollution in the region.

Temporal variation of *Oecophylla smaragdina fabricius* (Hymenoptera: Formicidae) nest density and nest longevity in different horticultural crops

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ABSTRACT

Oecophylla smaragdina is a successful predator in the tropical environment and plays a very crucial role in managing pests of horticultural crops. A study was conducted to assess temporal variation of *Oecophylla smaragdina* nest density and nest longevity in

the orchard and fields of Faculty of Agriculture, Annamalai University, Annamalainagar, Tamil Nadu. Nest densities were monitored in nine horticultural crops for the period of one year (March 2017- February 2018) at fortnightly intervals. Nest density was measured as the number of large ($\geq 175.3 \text{ cm}^3$) and small ($\leq 175.3 \text{ cm}^3$) nests per tree, for trees with ant nests. Nest longevities were examined in nine horticultural crops on a relatively opportunistic basis whenever a nest observed in the density trial was known to be constructed very recently at Annamalainagar. The nests were marked and inspected every week on March 2017- February 2018 until abandoned and their nest longevity was recorded as number of days they present. Highest number of large nests was found during March, September, October and small nests during March, September, April, July and October. Highest number of large nests was recorded in *Manikara zapota* and *Mangifera indica*. Highest number of small nests was found in *Manikara zapota* followed by *Prunus dulcis*, *Morinda citrifolia* and *Mangifera indica*. Nest longevity of *Oecophylla smaragdina* in *Prunus dulcis* and *Mangifera indica* were recorded for the highest as 47.14 and 45.68 days respectively. In *Azadiracta indica*, *Oecophylla smaragdina* nests were recorded for least duration as 25.66 days.

Study on Morphological Characteristics of Different Genotypes of Gladiolus Flower

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ABSTRACT

The experiment was carried out during the period from November'2017 to October, 2018 to compare the morphology of five gladiolus flowers genotypes with respect to plant height, length and breadth of leaf, number of leaves per plant, length of flowers, breadth of flower, weight of flower, weight of single stick, length of spike, length of rachis, flowers per plant, days to reach 50% spike initiation, number of corm and cormel per plant, breadth of corm and weight of cormel per plant. The results indicated the significant variation amongst the gladiolus genotypes with respect to studied morphological characteristics as well as with yield, yield attributes and plant height. The plant height was higher (58.6cm) and lower (46.52cm) in yellow and orange/red respectively due to genotype. The lengths of leaves were almost same but higher with yellow and violet (42.25/42.05 cm) than the white and orange ones where the smallest length was recorded for red (33.36cm) one. Almost same trends were recorded for breadth of leaves with the exception of few. The average number of leaves was highest for white (12.25) followed by red, violet, orange and yellow respectively. Most of the parameters of flower characteristics did not maintain regular trend and correlation when considered in terms of sequences starting from white to red. The recorded results clearly indicate that the white genotype has the best planting materials which may be planted for luxuriant growth of plants and production of excellent flowers.

Role of Indigenous Technical Knowledge (ITK) In Agriculture Based Biodiversity Conservation

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ABSTRACT

Indian farmers, over centuries, have learned to grow food and to survive in difficult environments, where the rich tradition of ITK has been interwoven with the agricultural practices followed by them. Indigenous Technical Knowledge (ITK) has been developed by the people based on their experiences and continuous improvement through informal experimentation. ITK systems are adaptive skills of local people usually derived from many years of experience that have often been communicated through oral traditions and learned through family members over generations. It is vital role to the food security and health of millions of people and is developed and passed on from generation in the form of accounts, cultural values, customs and agricultural practices. It closely interlinks cultural and biological diversity, forming an essential basis for the conservation and sustainable use of global biodiversity. Biodiversity provides the fundamental building blocks for the many goods and services a healthy environment provides. Other important services provided by our biodiversity include recreational, cultural and spiritual nourishment that maintain our personal and well-being. ITK act many important roles on biodiversity especially in Agricultural ecosystem and following some practices like, protecting and preserving the wealth and variety of species, habitats, ecosystems and genetic diversity on the planet. With the above view an attempt is made with this paper to discuss about the role of ITK in agricultural biodiversity conservation.

Role of Information Communication Technology in Disaster Management & Protection of Biodiversity

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ABSTRACT

The present study aims to know the role of ICT in disaster management. Natural disasters include those unplanned events that occur as a result of natural processes such as earthquakes, tornadoes, tsunamis, freezes, blizzards, extreme heat or cold, drought, or insect infestation. Since times immemorial disasters have been occurring in various forms and places and posing threat to people, structure or economic assets. The objective of the study used to examine the respondent's level of knowledge about the role of ICT

in disaster management based on gender and occupation. To collect the necessary data, random sampling technique will be adopted. 100 samples were selected based on stratified random sampling method. The statistical tool such as t-test and F-test were used. Result shows that respondents differ in their level of awareness about disaster management based on age. Hence, the middle age groups have high level of knowledge about disaster management. Also the college levels have high level of knowledge about disaster management. Further the female groups have high level of knowledge regarding role of ICT in disaster management. Therefore it is concluded that the professional group have high level knowledge about ICT disaster management then compare to government employee.

Biodiversity Conservation through Sustainable Agriculture

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ABSTRACT

Conservation agriculture is based on the integrated management of soil, water and biological resources, and external inputs. It attempts to achieve 'resource-efficient' crop production by utilizing three farming principles: (1) minimum soil disturbance, (2) organic soil cover and (3) diversified crop rotations. Agriculture extension personnel need to be trained on this field is the need of hour. We can conserve our biodiversity through planting more plants or by conserving the existing plant through, community seed bank, educating women about the importance of biodiversity conservation, strict enforcement of various laws related to biodiversity. Conservation of existing biodiversity in agricultural landscapes and the adoption of biodiversity-based practices have been proposed as ways to increase the sustainability of agricultural production. Increases in agricultural production have traditionally involved increased dependence on pesticides and fertilizers and overuse of water that can degrade soils and water resources. Farming practices, however, are undergoing a shift to move from dependency on traditional inputs and from chemical-based intensification to forms of biological intensification that draws on the richness of biodiversity and natural resources to provide ecosystem services. Promoting the healthy functioning of ecosystem services and doing so through ecosystem-based approaches, can increase the options available for optimizing agricultural production sustainably. With the above view an attempt is made with this paper to discuss about the role of biodiversity conservation.

Survey of Marine and *Estuarine Oligochaetes* (Annelida) in and around Chennai, Tamil Nadu, India

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ABSTRACT

A survey of marine and estuarine oligochaetes was conducted between April 2018 and April 2019 at Chennai. Samples were collected from Marina Beach, Besant Nagar Beach, Kasimedu fish landing centre and Adayar Estuary. About 480 oligochaetes were observed in the samples collected from Kasimedu fish landing centre, Adayar Estuary and Marina Beach and were identified upto Family level. Four taxa (Tubificidae sp 1, Tubificidae sp 2, Tubificidae sp. 3 and Tubificidae sp. 4) belonging to family Tubificidae and four taxa (*Enchytraeidae* sp. 1, *Enchytraeidae* sp. 2, *Enchytraeidae* sp. 3 and *Enchytraeidae* sp. 4) belonging to family *Enchytraeidae* were observed.

Analyse of Selected Heavy Metal Contamination in the Mudikondan River, Nannilam, Thiruvarur District, Tamil Nadu, India

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ABSTRACT

The present short-review briefly summarizes the status of heavy metal in Cauvery River and its sources and the status and effect of heavy metals in the river sediments and water. The difference in the heavy metals in different parts of the pathways of the river Cauvery is provided in addition to the pollution level and the effect of polluted water or enriched heavy metals on living systems. The pollution status and heavy metal contaminants level varies in water and in sediments with reference to different locations. The rapid population growth along the Mudikondan River has necessitated proper conservation and efficient utilization of freshwater bodies for sustainable development. This is necessary because there has been accelerated deterioration of water quality and also because of increased domestic, municipal and agricultural activities. Effluent discharge, urbanization and deforestation are the main causes of environmental degradation within the catchment.

Biodiversity and Ecology of Aquatic Oligochaeta from Neithavoyal Pond and Solavaram Lake, Thiruvallur District, Tamil Nadu

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ABSTRACT

Aquatic Oligochaeta were collected from Neithavoyal Pond and Solavaram Lake both located at Thiruvallur district of Tamil Nadu. Monthly quantitative samples were collected from Neithavoyal Pond designated as location A and Solavaram Lake designated as Location B from January 2017 to December 2017. *Dero dorsalis*, *Dero digitata*, *Dero*

indica and *Dero zeylanica* were identified at Location A. *Branchiodrilus semperi*, *Dero dorsalis*, *Pristina breviseta* and *Limnodrilus hoffmeisteri* were identified at location B. All the seven oligochaetes identified during the present study constitute the first report for Thiruvallur district. Ecological parameters like temperature, DO, pH, salinity, depth of water and Ecological indices like index of dominance, Index of diversity and Index of evenness were calculated at both the locations. Temperature was found to be inversely correlated with the population density of oligochaetes. At both the locations index of dominance was found to be inversely proportion to the index of diversity and evenness, i.e. higher value of index of dominance correspond to the low value of index of diversity and index of evenness and vice versa during the period of study.

ORAL PRESENTATION – ENVIRONMENTAL STATUS

A Prosperous View on Minimizing Environmental Impact through Eco Marketing

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ABSTRACT:

Humans understood that their activities are dangerous threat to the environment which explores various uncontrollable issues in future. The people look into the environmental issues in each and every product that they are ready to use. So the business initiates new strategy to address this sincere issue such as modifying their products or creating the product with concern in reduction waste to the environment. The paper deals with importance of green marketing, its marketing strategy and philosophy, problems associated with this green marketing.

Emission of Air Pollutants in World Wide

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ABSTRACT

Air pollution seems as a modern-day curse: a by-product of increasing urbanization and industrialization. It does, however, have a long and growing history with interesting transitions in line with economic, technological and political conversion. This entry presents a global-level overview of air pollution: trends in emissions from historical through to the present day, the health and death burden and risk from air pollution, and discussion of some of the key correlations and factors of the severity of

pollution and its impacts. The emission of the polluted air and harmful substances to the atmosphere and a number of pollutants, including the sulphur dioxide (SO₂), particulate matter (small suspended particles of varying sizes), ozone (O₃), nitrogen oxides (NO_x), carbon monoxide (CO), particulate matter (small suspended particles of varying sizes), carbon monoxide (CO) and Volatile organic compounds (VOCs). Carbon dioxide (CO₂) and other greenhouse gases are not typically considered within this group and are treated separately. Isolating the specific air pollutants and clearly attributing them to a specific health or environmental outcome can be complex since some pollutants act as ancestors to others. For example, NO_x and SO₂ can respond in the atmosphere to form particulate matter compounds. The bases of every pollutant differ, however, most are usually connected to fuel combustion and industrial activities; pollutants are released as by-products of these processes. Air pollution has a range of negative impacts, including the human health, damage to ecosystems, food crops and the built environment. The WHO focuses the air pollution as the greatest environmental risk to human health.

Acid Rain and Its Environmental Significances

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ABSTRACT

Acidification of rain-water is identified as one of the most severe ecological problems of transboundary nature. Acid rain is mainly a combination of sulphuric and nitric acids depending upon the relative quantities of oxides of sulphur and nitrogen emissions. Due to the interaction of these acids with other components of the atmosphere, protons are released causing rise in the soil acidity Lowering of soil pH mobilizes and leaches away nutrient cations and rises availability of toxic heavy metals. Such changes in the soil chemical characteristics decrease the soil fertility which ultimately causes the negative impact on growth and productivity of forest trees and crop plants. Acidification of water bodies causes large scale negative impact on aquatic organisms including fishes. Acidification has some indirect effects on human health also. Acid rain affects each and every components of ecosystem. Acid rain also damages man-made materials and structures. By reducing the emission of the precursors of acid rain and to some extent by liming, the problem of acidification of terrestrial and aquatic ecosystem has been reduced during last two decades.

Conversion of Municipal Solid Waste into Eco-Friendly Manure – A Study

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ABSTRACT

A rapidly increasing population and high rate of industrialization have resulted in a quantum increase of Municipal Solid Waste (MSW) generation. Although large numbers of technologies are available for managing MSW, their applications are limited because of their high costs, infrastructure and energy requirements. Management of MSW in an environmentally compatible manner, such as vermicomposts have merged as feasible options for converting MSW into nutrient rich composts with the help of epepic earthworm *Perionyx excavatus*. Vermicompost seems to provide a good quality end product and ecofriendly manner.

Effective Technologies to Control Total Dissolved Solids in Dye Industry Effluent

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ABSTRACT:

Process industries promote the employment opportunity and economy of the country, the pollution caused by them has to be controlled in order to save the environment from degradation. Dying industries is one of the most promising industrial sectors that provide huge employment opportunity to skilled, semi-skilled and unskilled peoples in the developing countries. Various chemicals and large amounts of water are used for the dying purpose, consequently it generates a substantial quantity of waste water, which cause serious environmental issues, if it is disposed without proper treatment. BOD, COD, TDS, TSS, pH, Colour/Turbidity, Odour, Dispersants, acids, Base, Salts (Total Salt Concentration), Detergents, Humectants, Oxidants, Electrical Conductivity (EC), Hardness, Sediments, Sodium Adsorption Ratio, Toxic Ions, Trace Elements and Heavy Metals are the parameters to characterize the quality of effluent. The Total Dissolved Solids (TDS) is amongst one which is still tough to control even advanced technologies were developed except multiple effect evaporation process. Since the evaporation process is non-economical one, this research paper intends to find the suitable and sustainable method to eliminate the TDS in effluent emanating from dying process. Also, the applicability of natural coagulants is reviewed in digestion of TDS.

Effect of location specific salt tolerant rhizobia (BBR- 18) on the growth of blackgram (var. ADT 3) in the soil of high EC content (Kurinjipadi) of cuddalore district

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ABSTRACT

Nodulation of blackgram in different soil types of Cuddalore and villupuram districts were studied. The nodulation was found to be good (18.2 to 23.4 plant⁻¹) in plants collected at Panruti, Kattumannarkoil and Mangalur. The nodulation was found to be poor recording 10.4 nodules plants⁻¹ at Kurinjipadi of Cuddalore district. The eighteen soil samples collected from different locations of the above districts were analysed for pH, electrical conductivity, organic content and for NPK. The soil test revealed the problems of high pH of 8.50 and high EC of about 1.15 dSm⁻¹ Kurinjipadi. This soil was chosen to test the salt tolerance efficiency of Bradyrhizobium BBR-18 isolate (obtained from the soils of Annamalai nagar) was studied on the blackgram Bradyrhizobium symbiosis. The isolate BBR-18 showed greater tolerance upto 1.8 per cent salt concentration. The trail was laid out to assess the efficiency of BBR-18 on growth and yield of Blackgram under stress condition. The nodulation, nitrogen content and dry weight of plants recorded. Plants raised from uninoculated seeds were maintained for comparison. Interestingly, inoculation with salt tolerance BBR-18 strain increased the root dry weight of Blackgram plants. The increase in root and shoot dry weight was from 0.188 and 0.315 respectively. The increase in the total nitrogen content of the root and shoot was from 1.35 to 1.88 per cent and 1.67 to 2.27 per cent respectively. The nodule number increased from 10.5 nodules plant⁻¹ to 18.0 nodules plant⁻¹. The BBR-18 isolate developed as location specific salt tolerant rhizobia for the soil of high EC content of Blackgram soils of cuddalore district and has got potential to increase BNF in the rhizosphere of Blackgram under salt stress condition.

Influence of environmental microbial ecosystems on the microbiota and health of organisms

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ABSTRACT

The present study aims to find out the influence of environmental microbial ecosystems on the micro biota and health of organisms. Plants, animals and humans, are colonized by microorganisms (microbiota) and transiently exposed to countless others.

The microbiota affects the development and function of essentially all organ systems, and contributes to adaptation and evolution, while protecting against pathogenic microorganisms and toxins. Genetics and lifestyle factors, including diet, antibiotics and other drugs, and exposure to the natural environment, affect the composition of the micro biota, which influences host health through modulation of interrelated physiological systems. These include immune system development and regulation, metabolic and endocrine pathways, brain function and epigenetic modification of the genome. Importantly, parental micro biotas have trans generational impacts on the health of progeny. Humans, animals and plants share similar relationships with microbes. Research paradigms from humans and other mammals, amphibians, insects, planktonic crustaceans and plants demonstrate the influence of environmental microbial ecosystems on the micro biota and health of organisms, and indicate links between environmental and internal microbial diversity and good health. Therefore, overlapping compositions and interconnected roles of microbes in human, animal and plant health should be considered within the broader context of terrestrial and aquatic microbial ecosystems that are challenged by the human lifestyle and by agricultural and industrial activities. Here, we propose research priorities and organizational, educational and administrative measures that will help to identify safe microbe-associated health-promoting modalities and practices. In the spirit of an expanding version of “One health” that includes environmental health and its relation to human cultures and habits (Eco Health), we urge that the lifestyle-micro biota-human health nexus be taken into account in societal decision making.

Magnitude of Environmental Biology for Sustainable Agriculture

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ABSTRACT

Environments consist of many components including both physical features, such as climate and soil type, and biological features, such as predators and prey. The term environmental biology has wider connotations than ecology because it includes the study of humans in the environment, so you will find such subjects as agriculture, pollution and the unnatural surroundings. Ecology is in many ways the most complicated of all the biological sciences. Ecologists have to know something about the structure, physiology and behavior of organisms before they can begin to understand how such organisms interact with one another and with the physical environment. However, whole ecosystems are often far too complex to understand all in one go. It is easier to begin by

choosing one or two species, or a small area of habitat, to study in detail. Practical ecology involves making observations, taking measurements and sometimes testing ideas by experimentation. Because there is so much to study in the environment and because the environment may change considerably in the next few decades (due to global warming and pollution) anyone can do valuable research.

Climate Change and Environmental Crisis

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ABSTARCT

CO₂ in the Atmosphere absorbs and release the infrared-wavelength radiation, resulting warmer air, soils, and ocean surface waters, without this the planet would be frozen solid. But now there is too much carbon in the air. Now the burning of fossil fuels, deforestation for agriculture, and industrial activities has increased the concentration of atmospheric CO₂ from 280 ppm (200 years ago) to about 400 ppm. That is an unprecedented increase in both size and speed that results the climate disruption. **Big smog and climate change:** Burning coal, oil, gas and wood caused the carbon overloading is only one form of air pollution. Recently the World Health Organization (WHO) estimated that 1/9th of deaths in the year 2012 was attributable to cause diseases as carcinogens and other poisons in polluted air. **Good and Bad:** One good thing is that clean energy is rich - it just needs to be harvested. It was 100% renewable-energy future is feasible with existing technology now. But the bad thing is that even though renewable energy substructure such as solar panels, wind turbines, energy storage and distribution systems are already widespread, and getting inexpensive and more effective all the time and not applying them quickly enough to avoid catastrophic climate disruption. Barriers in policy and also the finance persist to be overcome. **Deforestation:** In the tropics, species rich wild forests are being destroyed, often to make way for ranching of cattle, plantations of soybean or palm oil, or other agricultural monocultures. Today, about 30% of the land area of the planet is covered by a forest that is about half as much as before agriculture got started around 11,000 years ago. Each year approximately 7.3 million hectares (18 million acres) of forest are destroyed, maximum in the tropics. About 15% of the planet's land area covers the tropical forests; now down to 6 or 7%. By logging or burning ample of this remainder has been degraded. Natural forests, carbon sinks, keeping carbon out of the atmosphere and oceans act as biodiversity reserves. **Species Extinction:** In terrestrial ecosystem, the wild animals are being hunted to extinction for bush meat, ivory and for medicinal products. In marine ecosystem enormous industrial fishing boats equipped with bottom-trawling or purse-seine nets clean out full fish populations. **Soil Degradation:** Soils are being damaged by

soil erosion, soil compaction, over grazing, monoculture planting, over contact to pollutants, land-use alteration. According to UN estimates approximately 12 million hectares of farmland a year get completely degraded. **Conclusion:** Water scarcity in all over the world is becoming an increasing problem. It is the only going to get worse. The United Nation's World Water Development Report 2016 released this week (WWDR).

Climate Change and Its Impacts on Food Security

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ABSTRACT

The world population continuous to increase and is projected to reach 9.1 billion by 2050. This increase is expected to come from developing countries. In many developing countries like India, food security of the poor will be at risk, as they would face more severe resource and economic constraints due to the above world average population growth and limited arable land. In certain regions of India, like Bihar and Odisha, low agricultural productivity and output, and high poverty rates leave millions, especially those in rural areas, undernourished. The situation is further complicated by decreasing per capita availability of arable land and slow climate change adaption, which will lower food supply, compounding the challenge of meeting food demand. Low-input subsistent agriculture is generally inappropriate tillage increase soil degradation and erosion, reducing soil productivity and soil organic carbon. Thus, agricultural intensification is needed without further degradation the natural resources base. Furthermore, in the Indian context, average farm size is very small and average household member size is large, with poverty and food insecurity prevalent among small land-holders. Therefore, introduction and implementation of a new agricultural production system should be viewed in the context of enhancing farm productivity, environmental quality and profitability of agriculture while also improving household food and nutritional security.

Climate Smart Agriculture and Community Participation: Building towards Climate Change in India

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ABSTRACT

Climate change is emerging as a major threat on agriculture, food security livelihood of millions of people in many places of the world. The monsoon is the lifeline

for India's farm- dependent 2 trillion economy, as at least half the farmlands are rain-fed. The country gets about 70% of annual rainfall in the June-September monsoon season, making it crucial for an estimated 263 million farmers. About 800 million people live in village and depend on agriculture, which accounts for about for about 15% of India's gross domestic product (GDP) and a failed monsoon can have a rippling effect on the country's growth and economy. The climate change events like monsoon failure, unexpected drought and depletion of natural resources are the prime factors that drive our farmers out of the farming occupation. New approaches like climate smart agriculture are the need of the hour which warrants community participation. Climate smart agriculture (CSA) is an approach to developing the technical, policy and investment conditions to achieve sustainable agriculture development for food security under climate change. Climate change directly affects agricultural production as the sector is inherently sensitive to climatic conditions and is one of the most vulnerable sectors to risk. Climatic change could affect agriculture in several ways in terms of quantity and quality of crops, agricultural practices, through changes of irrigation and agricultural inputs etc.

Effect of organic amendments for environmental and sustainable production of Bhendi (*Abelmoschus esculentus*.L) cv.CO-4

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ABSTRACT

The investigation on "Studies on effect of organic nutrients and bio stimulants on growth and yield of bhendi (*Abelmoschus esculentus* (L.) Moench) cv.CO-4" was carried out in the Department of Horticulture, Faculty of Agriculture, Annamalai University, Annamalainagar, Tamil Nadu during 2018-2019. The study on effect of organic nutrients was carried out by the application of three different organic manures such as FYM (12.5 t ha⁻¹), vermicompost (2.5 t ha⁻¹ and 5 t ha⁻¹) and pressmud (12.5 t ha⁻¹ and 25 t ha⁻¹) along with foliar spray of panchagavya @ 3%, humic acid @ 2% and effective microorganisms @ 2% on 30, 60 and 90 days after sowing with 12 treatment combination in RBD with three replications. The biometric observations on growth attributes viz., plant height, stem girth, number of branches plant⁻¹, internodal length, number of leaves plant⁻¹ and crop dry matter production, yield characters viz., days taken for first flowering, days taken for 50% flowering, number of fruits plant⁻¹, fruit length, fruit girth, single fruit weight, yield plant⁻¹, yield plot⁻¹, yield ha⁻¹ and biochemical characters viz., ascorbic acid content and crude fiber content along with plant nutrient uptake and post-harvest soil nutrient status. All the treatments significantly influenced the biometric characters of bhendi and the results revealed that the treatment combination of FYM @ 12.5 t ha⁻¹ + vermicompost @ 2.5 t ha⁻¹ + panchagavya @ 3%

as foliar spray on 30, 60 and 90 DAS was found to be the best with the bhendi fruit yield of 20.83 t ha⁻¹ along with the highest plant nutrient uptake N, P₂O₅ and K₂O kg ha⁻¹ and post-harvest soil available nutrient status of N, P₂O₅ and K₂O kg ha⁻¹. From the experiment, it was concluded that the application of FYM @ 12.5 t ha⁻¹ + vermicompost @ 2.5 t ha⁻¹ + panchagavya @ 3% as foliar spray on 30, 60 and 90 DAS were identified as the best to increase yield for bhendi cv.CO-4.

Studies on Bloom Forming Microalgae from Tuticorin Coast

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ABSTRACT

Phytoplankton forms the vital source of energy in the marine environment. They initiate the marine food chain, by serving as food to primary consumers, which include zooplankton, shellfish, finfish and others. Algal blooms in the sea have occurred throughout recorded history and are a recurring phenomenon. The phytoplankton samples were collected from Tuticorin coastal area (Lat -8.7642° N Long -78.1348° E) between April, 2018 and June, 2018 (summer season). During the study, the following species such as *Asterionellopsis* sp., *Bacteriastrum* sp., *Odontella mobiliensis*, *Chaetoceros curvisetus*, *Cosinodiscus thorii*, *Ditylum sol*, *Pleurosigma elongatum*, *Rhizosolenia alata*, *Thalasiothrix longissima*, *Triceratium favus*, *Ceratium fusus*, *Fragillaria* sp., *Leptocylindrus danicus*, *Odontella mobiliensis*, *Odontella heteroceros* and *Ceratium furca* were recorded. The very common bloom form species of Dinoflagellate *Triceratium foveus* are collected in all locations.

Estimation of Carbohydrate and Protein in Lean Fish *Sardinella longiceps* and *Dussumieria acuta*

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ABSTRACT

Fish is considered to be an excellent food item by a great majority of people due to its special culinary and nutritional properties. Fish is not only a source of proteins and healthy fats, but also a unique source of essential nutrients, including long-chain omega-3 fatty acids, iodine, vitamin B₁₂, and calcium. Small fish taken in whole containing nutrients in the skin and bones is very much useful for growing children. Carbohydrates constitute in a minor percentage to the total biochemical composition. Carbohydrates

play an important role as energy reserve in animals. Samples were collected from Ayyampettai coast (Lat- 11.74 80° N Long- 79.77 14° E). Carbohydrate and protein were estimated in two lean fish, *Sardinella longiceps* (length-6.8 cm, weight- 47g) found to be 0.13 % and 0.08% and in *Dussiemia acuta* (length- 7 cm, weight- 51.2 g) 0.19% and 0.1% respectively.

Effective Utilization of Grey Water and Soil Application of Lignite Humic Acid on Radish

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ABSTRACT

In the era of industrialization, human settlement in the urban area is increasing year after year, which has led to increased waste water generation. This waste water must be properly recycled or utilized for crop production. In the present study, a pot experiment was conducted to establish the effect of grey water irrigation and humic acid application on the yield and nutrient uptake by radish. The experimental soil analyzed sandy loam texture, pH 7.2, EC 0.19 dS m⁻¹, CEC 15.6 [cmol(p+) kg⁻¹], low in organic matter 4.9 g kg⁻¹, available N(123.0 mg kg⁻¹), available P (4.5 mg kg⁻¹) and medium in available K (90 mg kg⁻¹). The exchangeable Ca, Mg, and available S status of the experimental soil was 5.2 (cmol (p+) kg⁻¹), 2.5 (cmol (p+) kg⁻¹) and 2.5mg kg⁻¹ respectively. The DTPA extractable Fe, Mn, Zn and Cu status of the initial soil was 11.5, 33.4, 3.2 and 0.6 mg kg⁻¹ respectively. Calculated quantities of NPK were supplied through urea, superphosphate and muriate potash so as to supply a uniform N: P: K dose of 50:30:50 kg ha⁻¹. The treatments consisted of two types of irrigation water viz, bore well water and grey water and four levels of lignite humic acid (0, 15, 30, 45 mg kg⁻¹). The LHA extracted from Neyveli lignite was used for this experiment. The LHA was applied as K-humate by dissolving calculated quantity of LHA in 0.1N KOH to the respective pots. Each treatment was replicated three times. Radish var. Pusa Chetki was grown as test crop. Four plants in each pot were maintained and harvested at 45DAS. The Plant samples collected at harvest were analyzed for total N, P, K, Ca, Mg, S, Fe, Mn, Zn and Cu as well as heavy metals namely Cr, Pb, Ni and Cd. The results of the pot experiment clearly showed that soil application of LHA @45mg kg⁻¹ to grey water irrigated plants increased the tuber and leaf yield to the tune of 123.89 and 180.28 per cent. The crop nutrient uptake is also favoured by LHA application. Soil application of LHA to grey water irrigated plants recorded higher uptake of N, P, K, Ca, Mg, S, Fe, Mn, Zn, and Cu as compared to bore well water irrigated plants. However, the uptake of Cr, Pb, Ni and Cd by radish and faecal coliform population on the root surface was discouraged by LHA application. Hence, the study is simple and cost-effective approach that can be adopted for the treatment and reused grey water for domestic and agriculture and also for recharging the aquifers to prevent saltwater intrusion along the coastal aquifers.

Cadmium (cd) Removal by Plants: Influence of Soil Amendments in an Industrially Polluted Soil

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ABSTRACT

An experiment was conducted to assess the transfer coefficient of hyper accumulator (sunflower) in an industrially polluted soil using various organic and inorganic amendments along with recommended dose of NPK fertilizers. Cadmium removal was determined by DTPA extract method and analyzed under ICP-OES. From the experimental results, it was observed that, higher bio-concentration and remediation efficiency were found in EDTA amended plants and it was followed by potassium humate applied treatments in both (45 DAS and harvest) stages of the experiment. Whereas, higher transfer factor was noticed in FYM amended plants and it was followed by press mud amended plants. Results concluded that soil inorganic amendments EDTA or potassium humate enhanced the cadmium removal by sunflower but FYM amended plants realized reduced cadmium uptake through immobilizing cadmium (Cd) in soil.

Studies on Multi-Elemental Composition and Physical Properties of Honey Samples from Tamilnadu – India

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ABSTRACT

The aim of the present study was to investigate the multi-elemental composition of honey from Tamilnadu. The elemental profiles of ten honey samples from Tamilnadu had been constructed using the data obtained from both ICP – AES and ICP – MS. Potassium and sodium were the most abundant minerals covering from 63.9-87% and 147.29% respectively. The ratio of potassium to sodium has more than one. Eventhough the minerals and base elements composition varied dependent on the types of honey samples, there was no satisfactory significant difference between the analyzed honey samples. The total element content of honey samples were strongly correlated with the electrical conductivity but only have moderate correlation with the ash content and honey color on the available regression analysis.

Studies on the heavy metal Zinc on the histological changes in the seminal vesicle of *Odontopus varicornis* (Heteroptera: pyrrhocoidae)

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ABSTRACT

The seminal vesicle of adult *Odontopus varicornis* appears as white oval shaped body which was richly supplied with tracheoles. The posterior region of seminal vesicle was connected with vas deferens. The seminal vesicle has dual function that is secretory and storage of sperms. The seminal vesicle of the insect been with an outer thin, delicate membrane and internally it has folded epithelium with numerous nuclei. The lumen is surrounded by a layer of folded epithelium with rich secretory substances and sperm mass. Due to the heavy metal impact of zinc which exhibits marked histological changes in its architecture such as highly disintegrated folded epithelium with deeply stained cytoplasm and nuclei. The lumen has negligible amount of secretory substance and weakly stained with eosin. Due to the heavy metal zinc toxicity the seminal vesicle has lost its secretory nature, therefore, no nourishment to the developing sperms in *Odontopus varicornis*.

Bioaccumulation of Heavy Metal Chromium in *Cirrhinus Mrigala*

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ABSTRACT

Heavy metal chromium is a common pollutant from tannery industries. Chromium apart from being an important metal presents a substantial threat to aquatic life. It destabilizes the ecosystem due to their toxic impact on biota and bioaccumulation in certain organisms. Occurrence of chromium varies in fishes, depending upon their age, development as well as other physiological variables. It also produced cytotoxicity and detrimental impact on behavior of fish such as hypertrophy and paraplegia at gill epithelium, uneven swimming and suspended feeding. Chromium in the effluent is a major concern for the tanning industry and it is directed in to water bodies which in turn taken part in biological magnification through food chain. The present study is undertaken to gauge the accumulation of chromium in the organs of *Cirrhinus mrigala*, when the finger lings of fish is subjected to sub lethal dose of chromium for a period of 10, 20 and 30 days in controlled environment. The tissues from gill, liver and kidney where subjected to Atomic Absorption Spectroscopy for end of 10, 20 and 30 days.

Maximum accumulation of chromium was found in the liver and kidney while minimum accumulation was seen in gill. *Cirrhinus mrigala* is used to us bioindicators because it tends to accumulate heavy metals and so their effects. As the fish is extensively used for human consumption, this finding urges greater regulation for industrial effluent discharge.

Key words: Bioaccumulation, heavy metal, chromium, *Cirrhinus mrigala*,

Toxic Effects of Malathion on some Metabolic Activities in Tilapia Fish *Oreochromis mossambicus* (Peters).

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ABSTRACT

Organophosphorus pesticides are used in the agricultural field due to their rapid biodegradability and non-persistent nature to control the pest but their broad spectrum of harmful effects extends far beyond the pest. Main objective of this paper is to carry out some biochemical characteristics (total protein, carbohydrate and cholesterol in liver, kidney and gills), oxygen consumption and blood parameters of the freshwater tilapia fish (*Oreochromis mossambicus*) The data shows that all biochemical's parameters were found to be decreased in all tissues (liver, kidney, and gills) also gradual decrease in the blood parameters (Hb, RBC's, WBC's, etc) were also observed in the experimental fish in comparison with control. The results indicated the toxic nature of the insecticide Malathion.

Growth and Yield of Rice (*Oryza sativa* L.) as Enhanced by the Effect of Zinc and Iron Fertilization

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ABSTRACT

Field experiment was conducted during Kuruvai and Navarai seasons of 2018 at agronomic research area, Faculty of Agriculture, Annamalai University to assess the Growth and yield of rice (*Oryza sativa* L.) as enhanced by the effect of zinc and iron fertilization. The experiment was laid out in Randomized block design replicated thrice with thirteen treatments which combination with zinc and iron forms of fertilizers. The results were showed that combined soil application of ZnSO₄, FeSO₄ and foliar application of Zn-EDTA, Fe-EDTA (T13) expressed the highest growth and yield attributing characters.

Effect of Potassium and Sea Weed Extract under INM on Vigour of Ambrette In Terms of Stem Girth, Flowering and Pod Yield

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ABSTRACT

Ambrette (*Abelmoschus moschatus* Medic.) is an aromatic and medicinal plant belongs to the family Malvaceae. It allay thirst, check vomiting and cure diseases due to kapha and vatha are useful in treating intestinal disorders, dyspepsia, urinary discharge, nervous debility, hysteria and skin diseases like itch and leucoderma. A field experiment was conducted at Farmer's Field Sivapuri Village, Chidambaram. The field trial was laid out in Randomized Block Design (RBD) with eight treatments and three replications. The treatments were T1- Absolute control, T2- 100% RDF, T3-75% RDF -N (NCU), T4- 75% RDF-P (EPMC), T5 -75% RDF -N (NCU) + P (EPMC), T6 - T3+SWE, T7- T4 + SWE, T8- T5 + SWE. The recommended dose of N:P₂O₅:K₂O for ambrette was 120:30:40 kg ha⁻¹ supplied in the form of urea, SSP and MOP, respectively. Potassium produces strong stiffness and thereby reduces lodging. It also imparts vigour and disease resistance to plant. Potassium activates more than 60 enzymes that involved in much important plant physiological process. Potassium deficiencies greatly reduces quality and crop yield. Seaweed liquid extract is a marine alga at lower concentration was found to have significantly enhanced biochemical parameters such as photosynthetic pigments, protein content, sugars, ascorbic acid and nitrate reductase activity. The results revealed that at harvest, application of 75% RDF-N (NCU) + P (EMPC) + SWE (T8) recorded the highest stem girth of 8.22 cm compared to control (5.89 cm). The same treatment registered pod girth was maximum in T8 (9.87cm) and highest pod yield ha⁻¹ of 2361.32 kg compared to control.

Impact of Eutrophication on Water Bodies of Chidambaram, Tamilnadu, India

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ABSTRACT

Growing of algal blooms and other plants are one of the major problems faced by water bodies caused due to number of activities done by human. The growing of plant is nothing but eutrophication one of the major problems such as due to which water quality is getting deteriorated and ecosystem is getting destroyed. The excessive enrichment of

water with anthropogenic source of nutrients especially nitrogen and phosphorous is the main cause of Eutrophication. The indicating parameters of eutrophication are total solids, total nitrogen, total phosphorous, nitrates, pH, BOD and COD. The reasons for eutrophication are addition of some chemicals near the water bodies (phosphates), mixing municipal sewage in pond ecosystem excessive usage of fertilizers etc. In 2007, for instance, more than 2 million residents of Wuxi, China could not access piped drinking water for more than a week due to severe attack by algal blooms on Lake Taihu. Water bodies are affected by eutrophication which causes toxicity in human being when used for drinking purpose. Water samples are collected and tested for their quality parameters. From the results the water bodies can be classified as affected or not affected by Eutrophication. This analysis is useful to conserve the water bodies of the study area for sustainable water resources management.

Effect of Post Harvest Treatment on Gerbera var. Arka Krishika using Different Vase Solutions

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ABSTRACT

Gerbera (Gerbera jamesonii) is one of 10 most important cut flowers in the world. *Gerbera* is very popular and widely used as a decorative garden plant and as cut flower. It is one of the popular cut flower having short vase life and is mostly used freshly, so the improvement of vase life is the required quality to the customers. But the most important problem faced by the flowers is the short-life after harvest and stem neck bending. It is very much important to improve and to increase longevity and quality of these flowers by using chemical solutions. In this study, effects of various postharvest treatments on postharvest quality and quantity parameters of *Gerbera* were evaluated. To increase the postharvest shelf life of gerbera flowers experiments were conducted by using Preservative solutions viz. Citric Acid and Silver nitrate in 4 different concentrations viz. 10, 20, 30 and 40 ppm and control treatment with distilled water were used. The experiment was conducted with total nine treatments. The application of silver nitrate declined the rates of relative fresh weight reduction. The solution uptake and soluble solid contents in silver nitrate treated cut flowers were significantly higher than other treatment during the experimental days. The application of silver nitrate led to the promoted longevity of gerbera cut flowers and positive effects on the vase life of gerbera cut flowers. Stem bending and petal shriveling were also found to be delay in the treatment with Silver nitrate 40 ppm. Treatment with Silver nitrate 40-ppm can extend the vase life of harvested gerbera flowers by reducing the fungal infection, increase the solution uptake and by supplementing carbohydrate for harvested flowers.

Effect of cushioning materials on storage life of Guava (*Psidium guajava* .L) cv. Lucknow 49

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ABSTRACT

Guava is one of the richest sources of vitamin C, containing two to five times more than that in oranges. It is a good source of calcium and iron. It has great demand as a table fruit and as a raw material for processing industries, leads to earn good foreign exchange and marketing. Cushioning materials are extending the storage life of vegetables, so there is a need to develop cheap and commonly available technology for extending the shelf life of these produce at least to manage the movement in the market chain to control the losses. With this background the present study was carried out in the Department of Horticulture, Faculty of Agriculture, Annamalai University to study the effect of cushioning materials on storage life of guava. The experiment was laid out in Randomized Block Design with six treatments and three replications. The treatment consists of storage of guava with cushioning materials in cardboard boxes. The cushioning materials used were paddy straw, paper shreds, newspaper, polythene bags and sponge. Observations on physiological loss in weight and days taken for storage life were recorded. The results revealed that guava packed in cardboard box with polythene bag recorded minimum physiological loss in weight and maximum storage life of eleven days in guava cv. Lucknow 49.

Monocrotophos effect on freshwater fish *Oreochromis mossambicus* (Tilapia) in biochemical analysis

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ABSTRACT

Chemical pesticides are well recognized as an economic approach for controlling pests in agricultur. The fishes are exposed to physical and chemical stressors, such as monocrotophos Fishes are extremely sensitive to aquatic pollution. The pesticides affect both lethal and sub lethal, changes in biochemistry. Monocrotophos is extremely toxic and it acts primarily on the nervous system. Proteins are important organic substances by organisms and play an important role in energy metabolism of animal. Biochemical changes in the fishes and freshwater fauna by influences the activities of several enzymes and metabolites The present study is to assess the protein content in liver of the fresh water fish *Oreochromis mossambicus* exposed to sub lethal concentration of monocrotophos $1/10^{\text{th}}$ of the 96 hour LC50 value for the period of 30 days. End of the exposure period, fishes were sacrificed and the effect of monocrotophos on the

biochemical constituents like protein under sub lethal toxicity were analysed in the tissues liver. The total protein concentration was estimated. The fish exposed to monocrotophos showed, gradual decreases in protein level for 30th days in the liver tissue. The depletion of protein content in liver tissue of *Oreochromis mossambicus* was due to the utilization of protein to counteract the toxicant stress caused by pesticide.

Floristic Composition and Biological Spectrum: Key Factors of Environmental Health

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ABSTRACT

Life form in a community is generally defined as the sum of adaptation of plant to climate. Generally, a complete list of plants is called "Floristic composition" and their life form cause appearance of a plant community. The structure and rate of change in composition are sensitive indicators of a whole environment. Therefore, it is important to study the Floristic composition and life forms of different plants (Biological spectrum) to find out phytoclimatic zones of the area. In India, several workers have studied Floristic composition and Biological spectrum of different regions. Besides, No work on life forms has so far been carried out in southern central region of Tamil Nadu in India. The biological spectrum of this region indicator denotes "Therophytes" phyto climatic region prevails in that area which is found to be more adaptive and survive in adverse season in the form of seeds are predominantly found in extreme hot (or) cold rainy condition. Dominance of Therophytes in this region to biotic interference includes Deforestation, Intensive utilization of land for cultivation, over grazing increase in human habitations abundance is fact an expression of monsoonic climate. The main immunological remedies to conserve bio-diversity in that region are reducing high population rate and reduce pollution rate in the natural environment due to reason of Deforestation. Laying out a plan to conserve the endangered wild species and reduce the pouching of exotic organisms is the ideal solution to increase the bio-diversity status of environment health in that particular region.

Sustaining life of human health depends on the Environmental health

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ABSTRACT

Biological diversity or biodiversity for short is the variety of life on Earth - its genes, species, populations, and ecosystems. Soils are vital role to humans because of the

soil biodiversity, with its inherent complexity, not only provide disease control but also influences the quantity and quality of the food, air, water. Rapidly declining the biodiversity may be a contributing factor to another global megatrend to increasing the prevalence of allergies and other chronic inflammatory diseases among urban populations worldwide. Our immune system needs to be exposed to possible pathogens residing in soils in order to develop tolerance. Soil biodiversity acts to enhance the structure of soils. Soil organisms can also degrade harmful pollutants and reduce the impact of poor sanitation. Some species may be uniquely sensitive to specific environmental changes and thereby be our “canaries” or “indicator species” warning us of potential future harm.

Effective of Organic and Inorganic ammendements of Wetland Rice in Coastal Area

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ABSTRACT

Rice (*Oryza sativa* L.) is one of the world’s most important food crops which is being extensively cultivated in India. Rice is the staple food for half of population, especially the poor. Currently, more than one third of human population relies on rice for their daily subsistence. Rice is the main staple diet in the Asia and the Pacific region, providing almost 39% of calories. Almost 90% of the total rice is produced and consumed in Asia. Rice plays an important role in Indian agriculture and is staple food for more than 60% of the population. The slogan ‘Rice is Life’ is most appropriate for India as this crop plays a vital role in our national food security and is a means of livelihood for millions of rural households. In Tamilnadu, rice is cultivated in an area of 18.30 lakh hectares with a production of 79.49 lakh tonnes and an average productivity of 4.4 tonnes ha⁻¹ (Department of Economics and Statistics). Might be due to the combined beneficial effect of inorganic and organic in terms of improving the soil physical, chemical and biological properties, presence of hormones and availability of optimum quantity of nutrients at critical stages favourably the growth parameters of the rice directly and yield parameters indirectly. Further, organic and inorganic application might have improved the chlorophyll content, increased the CO₂ assimilation in plants and increased the uptake of nutrients by plants. It was observed that the growth and yield components of rice crop were markedly influenced by integrated nutrient management practices. Sustainable production could be achieved only when factors leading to continued maintenance of soil health are taken care of. Hence, the complimentary role of organics as supplements to chemical fertilizers is important for

keeping the soil health in order to harness the potential yield in rice (Lency, 2001). Under these circumstances, more emphasis is now being given on integration of inorganic and organics including agro - based industrial wastes and by-products to improve the soil productivity (Kaleeswari et al., 2012). Besides improving nutrient status of soils, it also helps in improving physical, chemical, biological properties of soil and increases fertilizer use efficiency (Siddaram et al., 2010). Nutrient management is considered as an essential input in crop production. Further, integrated use of chemical fertilizer along with other organic manures and microorganism can help in maintaining yield levels in most of the crops under different agro-ecological regions (Suresh kumar kakraliya et al ., 2017). To explore the potentiality of integrated use of organic and inorganic nutrient sources, the urgent need is to test easily available alternative sources of energy such as vermicompost, pressmud and poultry manure for increasing rice production and soil health as well. Integrated nutrient management practices through complementary use of available and renewable sources of plant nutrients along with chemical fertilizers has a number of agronomic and environment benefits. This approach is not only a reliable way of obtaining higher yields of crops without any adverse effects on soil health. With the above facts under consideration, it was carried out to formulate an efficient, economic and viable integrated nutrient management practice for rice. It can be concluded that application of organic and inorganic fertilizer was highly impressive and appears to be more promising as an efficient integrated nutrient management system for not only enhancing crop yields in rice but also maintaining soil fertility and eco system, a felt need of present day agriculture. Hence, this nutrient management practice can be recommended for adoption by the farmers in the coastal area.

Studies on the nodulation efficiency and growth parameters of groundnut-Rhizobium symbiosis

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ABSTRACT

Groundnut is an important subsistence food crop. It is mainly grown for the kernels and the edible oil. Groundnut kernels contains 47-53 % oil and 25-36 % protein, they are contain about 10-15 % carbohydrate and are rich in P. They are also a good source of Vitamins B and E. The genus *Arachis* belong to family Fabaceae, subfamily Papilionaceae. The genus is morphologically well defined and distinguished from other genera by having a peg and geocarpic reproductive growth. The genus *Arachis* as more than 70 % wild species, of which only *Arachis hypogaea* L. is domesticated and commonly cultivated. Groundnuts are used in various forms, which include groundnut oil, roasted and salted groundnut, boiled or raw groundnut or as paste popularly known as groundnut (or peanut) butter. In this study we focused the rhizobial isolates for

nodulation efficiency, total nitrogen content and growth parameters. In the strain of GR-3 recorded the highest nodulation efficiency and nitrogen content. In the variety VRI-2 recorded the highest growth parameters such as Germination percentage, Root length, Shoot length and Vigour index than uninoculated plant.

Biochemical analysis in hepatopancreas of Crab (*Portunus sanguinolentus*)

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ABSTRACT

Cypermethrin commonly used in agriculture field to control the insecticidal activity in aquatic species throughout the world. Fungicides are also used to protect field crops, cereals, fruits, vegetables etc., from the fungus. The purpose of the present study was to examine the biochemical activates of toxicants in hepatopancreas of crab (*Portunus sanguinolentus*). The crabs were introduced in these two toxicants for 24 hrs in laboratory conditions to analyze the biochemical activities of protein, lipid and carbohydrates in the hepatopancreas of crab. Protein, lipid and carbohydrates declined in cypermethrin shows mean values (55.40 ± 0.42 mg/g, 59.42 ± 0.73 mg/g and 11.41 ± 0.33 mg/g) than the fungicides (50.12 ± 0.53 mg/g, 57.10 ± 1.10 mg/g and 10.11 ± 1.01 mg/g) than control (60.51 ± 0.21 mg/g, 68.38 ± 0.65 mg/g and 14.10 ± 0.41 mg/g) therefore cypermethrin showed maximum impact on crab hepatopancreas than Hexaconazole.

Impact of Herbicide Paraquat on the Indian major Carp, *Catla catla*

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ABSTRACT

The fingerlings of the Indian major carp, *Catla catla* were exposed to the herbicide, Paraquat for 24 hrs LC50 and were analyzed for the variations in their nutritional and enzymatic parameters. After exposure, tissues like brain, muscle, liver and kidney were dissected and subjected to experimentation. Total protein and carbohydrate and lipid contents of fingerlings of *Catla catla* showed that Paraquat had more effect in liver. The liver and muscle showed very high SDH activity and the brain and kidney showed very less LDH activity. When compared to control, ACP activity increased in all tissues and ALP activity decreased in all tissues.

ORAL PRESENTATION - BIOTECHNOLOGY

Biosynthesis of gold nano particles from marine sponge (*Halliclona pigmentifera*)

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ABSTRACT

Biotic factors mediated synthesis of nanoparticles is considered as an eco-friendly approach compared to chemical and physical methods. This work reports the biosynthesis of gold nanoparticles using the extract of marine sponge *Halliclona pigmentifera*, water soluble organisms present in marine sponge extract were mainly responsible for the reduction of gold ions. UV-Visible Spectrum of the aqueous medium containing gold nanoparticles showed peak at around 533nm. The FT-IR was done to identify the biomolecules responsible for the bio reduction of gold ions and capping of the bioreduced gold nanoparticles. After 72 hours of treatment revealed to have size of 33.5-50nm in diameter and a spherical shaped Polydispersal of the particles. It is an eco-favorable method in development of nanoparticles for further applications.

**Molecular genetic diversity, phenotyping of Rice (*Oryza sativa* L.)
Genotypes and varietal identification**

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ABSTRACT

The present enquiry on studies on “Classical and Molecular Genetic Diversity and Varietal Identification in Rice (*Oryza sativa* L.)” was made with 20 rice genotypes. Data were recorded on eleven morphological traits. The data were subjected to classical genetic diversity analysis as suggested by Mahalanobis’ (1936). Molecular genetic diversity was assessed based on the DNA polymorphism brought out by RAPD and ISSR markers. The 20 genotypes were grouped in to as many as five clusters, through classical D2 analyses; eight clusters through RAPD and eight cluster through ISSR analyses. Ten primer were used for RAPD and eight were used for ISSR markers. The PCR amplification of template DNA produced a total 422 bands among 20 genotypes with 10 RAPD primers. The Polymorphic Information Content (PIC) for the primer ranged from

0.792899 (Rpi-6) to 0.62222 (Rpi-9) and the PCR amplification of template DNA produced a total 356 bands among 20 genotypes with 8 ISSR primers. The Polymorphic Information Content (PIC) for the primer ranged from 0.828277 (UBC-808) to 0.78238 (UBC-823). A simultaneous consideration on the classical genetic diversity and molecular genetic diversity brought out the superiority of the genotypes viz., TKM-1 and TKM-12 as well as CB-05031 and RNR-2448 as they were grouped in the same cluster in all the three diversity analyses. Hence these genotypes may be crossed with other genotypes of interest to evolve high yielding heterotic lines and/or novel segregates. It was also found out that there is no parallelism between genetic diversity and geographical origin.

Preservation of jackfruit bulbs in sugar syrup

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ABSTRACT

Jackfruit (*Artocarpus heterophyllus* Lam.) belongs to the family Moraceae, has been named as the national fruit of Bangladesh and can be considered as the largest fruit among the edible fruits. The fruit is perishable and in every year, a considerable amount of jackfruit specially obtained in the glut season (June-July) goes waste due to lack of proper postharvest knowledge during harvesting, transporting and storing both in quality and quantity. Proper postharvest technology for prolonging shelf -life is therefore necessary. The experiment was conducted in a Completely Randomized Design with jackfruit bulbs preserved in four formulations with variations in sugar concentration and five replications (T1- 89 %, T2-76 %, T3- 63 %, T4-50 %). The effect of the processing on the nutritional quality and sensory quality, storage life and cost economics was also calculated in this study. The sensory evaluation was carried out monthly for a period of six months during storage. Results revealed that, in the present study the bulbs preserved in sugar syrup, T1 (89% of sugar) was considered as the best treatment when compared to others with an ascorbic acid content of 3.64 mg/100g, carotenoids of 4.23 mg/100g and fat content of 2.32 g. T1 observed as a sample with maximum shelf life period of five months. The average sensory scores for taste (8.6), colour (8.4), flavour (8.4) and overall acceptability (8.6) of jackfruit bulbs preserved in sugar syrup was initially maximum in T1 formulated with 89% of sugar concentration. The same trend was maintained in all months of evaluation with gradual reduction in scores. Cost of production of bulbs preserved in sugar syrup was estimated with the benefit cost ratio of 1.49.

Optimization of callus biomass production and coumarin compound in the callus culture from the leaves of *Eupatorium Triplinerve* Vahl

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ABSTRACT

The objective of the present study was to evaluate the optimization of callus biomass culture yield and high-performance liquid chromatography (HPLC) analysis of coumarin compound in the callus culture from the leaves of *Eupatorium triplinerve* vahl. The maximum growth of callus was obtained from leaf and nodal segments at various individual concentration of 2,4-D, NAA and BA. Particularly maximum growth of callus from leaf explants developed at 4.52 μ M of 2,4-D (60.33 \pm 5.01%) and maximum growth of callus was obtained from nodal segments developed at 4.52 μ M of 2,4-D(25.30 \pm 5.00%), and very low callus initiation from leaf explants response was obtained at 9.04 μ M of 2,4-D (20.43 \pm 5.03). Among three plant growth regulators for callus production, in leaf and nodal explants, 2, 4-D has maximum initiation of callus.

Computational sequence investigation and in silico modeling of a stress response protein by *Oreochromis niloticus* fish gene

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ABSTRACT

HSP90 gene of *O.niloticussp* is an associate of the heat shock protein family and plays a significant role in stress-related and defense responses educed by contagion with activator of hsp90 ATPase activity. Hence, understanding molecular structure and function of the protein coded by this gene is of paramount importance for fish biologists working on ATPase. The present study was aimed at sequence and in silico structural analysis of Hsp90 protein coded by this gene, through validation of the overall folds and structure analysis 36%, Alpha helix, 17% beta strand, 38% in normal mode. One major domain was detected belonging to hsp90 family while neural network analysis is related protein to be highly phosphorylated at threonine residues. Stero chemical analysis shows 80.5% of most favoured region.16.4% additional allowed region 2.4% in generously allowed regions.

Synthesis and Characterization of some Gallium and Indium Chalcogenide Nanostructures

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ABSTRACT

Some gallium and indium chalcogenide nanostructures were synthesized from gallium nitrate and indium nitrate respectively by hydrothermal and calcination route. The morphology, composition and particle size of the synthesized compounds were characterized by SEM, EDX and TEM respectively. The phase and purity of the hydrothermal and calcination products were characterized by powder XRD. The nanostructures are of interesting shape and the effect of reaction parameters on the morphology and the size is studied. The mechanism of hierarchical structure formation is found to be Ostwald ripening followed by dehydration and it has been discussed in detail. Results of optimization studies and the plausible applications of the synthesized nano materials will be presented.

Production and Evaluation of Jackfruit Chips

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ABSTRACT

The experiment was conducted in a Completely Randomized Design with four formulations (T1- 3.2 %, T2- 2.8 %, T3- 2.4 %, T4- 2 % of salt concentration) of jackfruit chips and five replications. The effect of the processing on the nutritional quality and sensory quality of the chips made out of jackfruit were determined. Storage life and cost economics were also calculated in this study. The sensory evaluation was carried out monthly for a period of six months during storage. Among the formulations, T4 formulated with 2.0 % of salt concentration was analysed as the best formulation with maximum period of shelf life (4 months) over other formulations and the least values for oil content and carotenoids (33.89% and 0.32 mg/100g respectively) and the moisture content of 4.75%. Sensory scores for taste (8.7) and overall acceptability (8.8) were also maximum in T4 during initial sensory evaluation. The other sensory parameters like colour (8.8), flavour (8.0), and crispness (8.0) were maximum in T2 formulated with 2.8% of salt concentration and this was followed by T4 which secured the next best scores. Cost of production of 1kg of chips was also estimated with the benefit cost ratio of 2.00

Validation of QTLs for sorghum shoot fly resistance on F2 generation of sorghum (K8 × IS18551)

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ABSTRACT

Sorghum (*S. bicolor* L. Monch) is a fifth important millet crop in the wide. In India, it is mostly cultivated in arid and semi-arid regions for grain and fodder. Last few decades, sorghum production and yield were drastically reduced due to shoot fly infestation during seedling stage. The present study was designed to validate shoot fly resistance QTLs in the F2 generation of K8 × IS18551. Sowing was taken up on February-May, 2018. A total of 50 plants (Ear head harvested) were screened. The F2 plants were genotyped using SSR markers flanking the 4 QTLs. Among them resistance QTLs viz., (4, 3, 2 and 1 QTLs) had localized in 12, 16, 8 and 7 sorghum plants. Based on resistance analysis, the plants with maximum no. of QTLs (4 and 3) recorded as higher resistant compared to the plants with least no. of QTLs (2 and 1). The plants with QTLs having shoot fly resistance compare to the recurrent parent. These QTLs might be used for further development of resistant varieties in sorghum.

Synthesis of 3t-Pentyl-2r,6c-di(4-chlorophenyl) piperidin-4-one semicarbazone and its spectral, biological evaluation and computational studies

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ABSTRACT

Pentyl-2r,6c-di(4-chlorophenyl) piperidin-4-one semicarbazone was synthesized. The compound has been characterized by elemental analysis, FT-IR, 1H and 13C spectra. Natural bond orbital (NBO), Mulliken charges, Molecular Electrostatic Potential (MEP), frontier molecular orbitals (FMO), NLO were also carried out by DFT (B3LYP/6-31++G (d,p)). The lowering of HOMO and LUMO energy gap clearly indicates that the charge transfer taking place within the molecule. Antimicrobial activity and the compound was tested against bacterial strains viz., *Escherichia coli*, *Bacillus subtilis*, *Staphylococcus aureus*, and *Vibrio cholera* and the fungal strains viz., *Aspergillus niger*, *Candida albicans*, *Aspergillus flavus* and *Trichophyton mentagrophytes*

were used for this study. Ciprofloxacin and Cetramazole are used as a standard drug for the bacterial strain and fungal strains respectively. The compound was docked into Topoisomerase II protein to understand the binding interactions.

Kinetic Modelling of Competitive Interaction between Escherichia coli and Staphylococcus aureus at different temperatures

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ABSTRACT

Most of the biochemical operations involve mixed culture operations on industrial scale. The performance of the processes depends on the interaction pattern. Interactions can be classified as positive and negative type. Competition is a negative type of interaction among mixed microbial systems and is more common in industrial applications. To attain coexistence of the various species growing together in a batch or continuous processes, the mechanism of interaction and appropriate models to define the mechanism is essential for the design and control of the biochemical reactions. In the present study an attempt has been made to model the competitive interaction mechanism of Escherichia coli and Staphylococcus aureus at various temperature conditions. The pure culture growths followed logistic model and the interaction effect for the coli species is found to be second order and the aureus species follows third order. The growth parameters and interaction coefficients were computed using MATLAB 7.1 software and presented. The simulation study for continuous process in a chemostat model revealed that coexistence is not possible.

Pesticide for Food Safety and Quality Management

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ABSTRACT

The agrochemical plays a major role in the production and quality of crop and its use in one of the increase day by day. Development of the profit-oriented food enterprises, growing consumers expectation and concerns as regards food quality and safety, forced many companies to improve safety and quality of their products through implementation of the quality and safety assurance and management system. The pesticides used in producing food and feed may remain in small amount in or on the agricultural produce and processed foods. Some production units use both HACCP and

ISO-9000 in an integrated food quality and safety management system. In order to ensure safety of food, the government regulates the maximum value of each permitted pesticide residue. Now concerns about pesticide residues in and on food and their impact on environment are rising. The most of the environmental contaminants includes persistent organic pollutants, endocrine disrupting chemicals and biocides. To secure food safety and preserve the environment nationwide survey of pesticide residues is needed to monitor the presence of toxic substances in and on food items.

Effect of Nano Fertilizers on Growth and Yield of Capsicum

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ABSTRACT

The growth and yield depends on certain factors, among these proper and balanced nutrition plays a significant role. World agricultural cropping systems intensively using large amount of fertilizers to achieve more production per unit area but using more doses than optimum of these chemicals and fertilizers leads to several problems like environment pollution, low input use efficiency, decrease quality of food material, develop resistance in different weeds, diseases, insects, less income from the production, soil degradation, deficiency of micro nutrient in soil, toxicity to different beneficial living organism present above and below the soil surface etc. Thus in concern to the problem an experiment was carried out at orchard, Department of Horticulture, Faculty of Agriculture, Annamalai university, Chidambaram during the year 2018-2019. The experiment was conducted in nine treatments viz., T1- Nano cleated NPK(1g), T2- Nano cleated NPK(0.75g), T3- Nano cleated NPK(1g) + 1% Zn, T4 -Nano cleated NPK (0.75g) + 1% Zn, T5 -Nano cleated NPK (0.75g) +0.5% B, T6 – Nano cleated NPK (1g) + 0.5% B, T7 - NPK + 1% Zn, T8 – NPK + 1% B, T9 – Control. The treatment T4 (Nano cleated NPK (0.75g) + 1% Zn) and T3 (Nano cleated NPK (1g) + 1% Zn) recorded that the Nano cleated fertilizers along with micro nutrient have significant effect on growth and yield parameters.

Studies on multi-elemental composition and physical properties of honey samples from Tamilnadu – India

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ABSTRACT

The aim of the present study was to investigate the multi-elemental composition of honey from Tamilnadu. The elemental profiles of ten honey samples from Tamilnadu

had been constructed using the data obtained from both ICP – AES and ICP – MS. Potassium and sodium were the most abundant minerals covering from 63.9-87% and 147.29% respectively. The ratio of potassium to sodium has more than one. Even though the minerals and base elements composition varied dependent on the types of honey samples, there was no satisfactory significant difference between the analyzed honey samples. The total element content of honey samples were strongly correlated with the electrical conductivity but only have moderate correlation with the ash content and honey color on the available regression analysis.

Harvesting the microalgae *Chlorella vulgaris* with *Lactobacillus acidophilus* induced flocculation

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ABSTRACT

Cost effective harvesting of biomass is a major challenge in microalgal industries as it is limited by the high-energy inputs. Chemical flocculation is being extensively used as a harvesting technique of the algae, but leads to high operation cost, metal contamination of the harvested biomass, decrease in cell viability, inability to use of cell biomass for subculture. In view of these constraints, bio-flocculation is an alternative technological approach for harvesting of algae in mass culture system. Thus the present work evaluated the effect of potential of a bacteria *Lactobacillus acidophilus* (10307 MTCC) to flocculate the freshwater microalgae *Chlorella vulgaris*. Algae cells at exponential phase (6×10^6 cells ml⁻¹) were treated with *Lactobacillus acidophilus* (10307 MTCC) (1×10^8 CFU ml⁻¹), in the laboratory under controlled conditions of temperature and light. The viability and integrity of the flocculated cells were assessed using staining method and scanning electron microscopy. The microscopic pictures show that significant built up of flocs volume was observed for microalgae with optimized concentration of bacteria. The results of SEM images of the harvested microalgae showed that highly concentrated and thick biomass was formed. Highest flocculation efficiency and recovery percentage of microalgae was at increasing time interval was achieved with 2% bacterial concentration in 22hrs. Based on observed flocculation efficiency, cell viability and cell integrity the selected bacteria is be an efficient flocculants for biomass harvesting of *Chlorella vulgaris*. The flocculated biomass of nutritionally rich microalga can be further explored for feed applications in aquaculture after accomplishing studies under laboratory and field conditions.

Effect of plant growth Hormones on rooting of golden dew drop (*Duranta repens Goldoiii*) Cuttings

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ABSTRACT

Golden dew drop is scientifically called as *Duranta repens* belongs to the family verbanaceae It's a tall, much branched, bushy shrub with axillary spine. Leaves opposite (or) whorled, ovate, upper part toothed, glabrous. Flowers blue, in loose terminate panicle, corolla tube white and curved, longitudinal line of deeper colour in the middle of each lobe. Fruits yellow berries. In this species spines are often absent in type with larger leaves. The Plant is indigenous to the west indies, mexico and brazil. The variegated forms *Duranta repens* are widely grown in tropical gardens. The small, green leaved type with spines is often grown as hedge and forms an impenetrable barrier. The varieties with variegated leaves are grown in shrubbery and in pots and they are very showy shrubs. It has bright lemon coloured leaves. The color of the leaves gives a feel of freshness. The plant has outstanding ornamental features. Golden dew drop is generally propagated through seeds have very short span of seed viability and very long juvenile phase of seed propagated plants are major constrains in seed propagation. Thus there is a need to standardize vegetative method of propagation. The present investigation was conducted at Department of Horticulture, Faculty of Agriculture, Annamalai University, Annamalai Nagar. The experiment was laid out in completely randomized design, at different IAA, IBA and NAA concentrations (100,200 and 300 ppm, and control) replicated thrice. The results revealed that *Duranta* cuttings are treated with T5 IBA 200 ppm recorded maximum sprouting percentage (92.3%), No. of sprouts per cuttings (7.86), No. of leaves per Cuttings (41.0), No. of roots per cutting (24.7) and root length (11.4 cm).

Effects of microalgae incorporated diets on fatty acid profile, growth, and survival of *Red Zebra, Brachydanio rerio*

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ABSTARCT

A 40 day experiment was conducted to investigate the effects of two microalgae as feed ingredients on growth performance, fatty acid profiles of Red Zebra (*Brachydanio rerio*). Three diets (control, *Spirulina platensis* incorporated diet, *Chlorella Vulgaris* incorporated diet) were formulated. In the control diet, no microalgal meal was

added, the *S.platensis* and *C.vulgaris* diets were added 20g/kg *S. platensis* meal and 20g/kg *C. vulgaris* meal, respectively. Compared to the control, the addition of *S.platensis* and *C.vulgaris* had significant effects on fatty acid profiles, proximate composition, of zebrafish. The addition of *S. platensis* and *C. vulgaris* significantly increased the EPA, DHA profiles and polyunsaturated fatty acids (PUFA) in fish muscles. Moreover, the addition of *S.platensis* to the diet significantly increased linolenic acid polyunsaturated content of EPA + DHA. These results demonstrate that *S.platensis* and *C. vulgaris* can be used as feed ingredients to improve the growth performance and survival percentage of Red Zebra (*Brachydanio rerio*).

Synthesis, spectral characterization of substituted 4,5-diphenyl-1-((tetrahydrofuran-2-yl)methyl)-1H-imidazole derivatives its applicable photophysical, molecular docking, cytotoxicity and computational studies

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ABSTRACT

In the present study, seven novel imidazoles derivative of 4,5-triphenyl-1-((tetrahydrofuran-2-yl)methyl)1H of one pot four components reaction were 1-7 have been synthesized. The structures of the compounds were confirmed by FT-IR, 1H & 13C NMR, LC-Mass, UV-Vis, and Fluorescent spectral data. The imidazole derivatives were designated to be different conformer are made in using the basis set at Gaussian-03W B3LYP/6-31G(d,p) and determined by NLO, MEP and Mulliken atomic charge. The theoretical IR frequencies are found to be in good agreement compared to experimental values. The natural bond orbital analysis has been determined by stability and charge delocalization of the bonding to antibonding orbital interaction within the molecule. The frontier molecular atomic orbital analyzed were also assumed to be predicting energy is explained on the basis of HOMO-LUMO energy gap calculations. Molecular docking was also performed in order to explain the estrogen receptor (ER) is over-expressed in 70% of breast cancers. The ER was one isoforms, ER α . The ER ligand binding domain (LBD) has been the target for hormone-responsive breast cancer. Due to tissue-specific effects currently available drugs for hormone, positive breast cancer presents serious limitation. The dynamic and plastic nature of ER LBD plays a crucial role in ligand design that discriminates between the ER subtypes. Agents that selectively target ER isoform are a formidable challenge to researchers. The imidazole scaffold is a privileged scaffold for exploration of anticancer agents in order to investigate their probable cytotoxicity (MTT) assays were applied to determine anticancer activity of the compounds against breast (MCF-7) cell lines. Most of the compounds showed greater activity against MCF-7 cells. Some of them indicated considerable cytotoxicity against the MCF-7 cell lines. However, anticancer activity screening results revealed that 6, 5, 2, 3 and 7 were the most active compounds in the series.

Biosynthesis of silver nanoparticles using Punica granatum and its Antibacterial activity

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ABSTRACT

The increasing tendency of microbial infections, rapid emergence of drug-resistance to recent antibiotics and quick evolution through mutation necessitate development or modification of antimicrobial compounds and alternative treatments. Currently, biosynthesized silver nanoparticles have been considered as the potent candidate in medical science due to its antibacterial properties. So the aim of this study was green synthesis of silver nanoparticles using Punica granatum leaf extract and its antibacterial activity. Silver nanoparticle formation was confirmed by surface plasmon resonance at 420 nm. Furthermore, XRD analysis confirmed the crystalline nature of the particles. FTIR analysis was carried out to identify possible biomolecules responsible in bioreduction of silver ions. TEM analysis revealed the poly dispersed spherical nanoparticles. The biogenic nanoparticles revealed the antibacterial efficacy against both gram-positive bacteria and gram-negative bacteria, suggesting its prospective applicability as an effective antibacterial agent.

Green synthesis of gold nanoparticles using Psidium guajava and their effect on enhancing silk production in silkworm *Bombyx mori*. L

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ABSTRACT

In this study, rapid, easy and simple method was used for the synthesis of gold nanoparticles using Psidium guajava aqueous leaf extract. The plant extract acts both as reducing agent as well as capping agent. To identify the compounds responsible for reduction of gold ions, the functional groups present in plant extract were investigated by FTIR. Various techniques used to characterize synthesized nanoparticles are XRD, TEM and UV-Visible spectrophotometer. UV-Visible spectrophotometer showed absorbance peak in range of 530 nm. TEM analysis reveals that gold nanoparticles are spherical in shape with the diameter of 5 to 20 nm. The newly synthesized gold nanoparticles were supplemented to the larvae of silkworm *Bombyx mori*. L. In this present investigation, the supplementation of biosynthesized gold nanoparticles confirms its influence on silk production indices by exhibiting higher values in the assessed economic parameters and

biochemical parameters such as larval weight, silk gland weight, cocoon weight, pupal weight, Shell weight, filament length denier, protein, carbohydrate, lipid, DNA and RNA. Results of this investigation will open up a new greener platform to the silkworm farmers to produce the high quality silk at lower cost.

DNA Barcoding – A promising tool for identification of Zooplankton

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ABSTRACT

Microscopic crustaceans such as Copepods, Cladocera, Rotifers and Ostracods are the major zooplankton components in terms of biomass in freshwater bodies. These organisms play an important ecological role by linking primary producers to planktivorous fish. Because the strength of predation upon zooplankton is reflected in their community structure examining zooplankton community structure is critical to understand ecosystem conditions in lakes and ponds. Zooplankton monitoring programs have been established in many parts of the world. Workers in the various zooplankton monitoring programs must avoid misidentification of species by morphological characteristics which could result in future confusion. To overcome these issues DNA based identification technology such as DNA barcoding is one of the potential methods of identifying organism using short standardized fragments of genomic DNA. This present paper reviews the DNA barcoding survey of different zooplankton community.

Diagnosis of two types Fusarium wilt in chickpea (*Cicer arietinum* L.) at field conditions

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ABSTRACT

Chickpea (*Cicer arietinum* L.) is one of the most important legume crop in India and cultivated on during November (Rabi) season. It's a cool winter pulse crop and their yield was drastically reduced due to soil borne disease of Fusarium wilt. In the present study, an extensive survey was conducted in major chickpea growing areas of Tamil Nadu during Rabi, 2015-17. In that period, especially two types of wilt viz., early and late wilt was occurred severely in cv. JAKI-9218 and CO₃. Early wilt occurred within

18-21 days after sowing in the ramification stage. Wilt infected plants showed yellowish foliage and collar portion of root without discolouration and roots are not shrunked and rotten and plant growth has been arrested. In late wilt occurred during pre-flowering to podding stage from 35 days after sowing. Infected plants root collar region was showed brown discolouration with shrunked and rotten. Leaves were drooping and yellowish finally died within 35-55 days after sowing without pod formation and yield.

Phytotoxic Effect of Cadmium (Cd) on Green Gram *Vigna radiata* (L.) Hepper

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ABSTRACT

The present study deals with the effect of different concentration of cadmium (Cd) on the growth, biochemical, antioxidant enzymatic activities and nutrient content of green gram plant. The green gram plants were raised in pots containing the soil (2kg) with different concentrations of cadmium (Cd) (control, 5, 10, 15, 20, 25 and 50 mg kg⁻¹ soil). Three replicates were maintained for each level. The plant samples were collected at 30, 60 and 90th DAS for the measurement of different growth parameters. The selection of morphological parameters such as root length, shoot length, number of leaves, number of nodules, total leaf area, fresh and dry weights of green gram were determined for all the sampling days. The enzyme activities like viz., catalase, peroxidase and polyphenol oxidase were calculated by Chandlee and Scandalios method (1984). All the parameters increased in control treatments, but 50 mg kg⁻¹ cadmium (Cd) treatment decreased among the growth. The enzyme activities like viz., catalase, peroxidase and polyphenol oxidase were increased in 50 mg kg⁻¹ cadmium (Cd) treatments, decreased in control treatments. The nutrient content such as micro and macro nutrient were analyzed in 30, 60 and 90th DAS.

Effect of heavy metals and salts on morphological, biochemical and antioxidant enzyme adaptations of a halophyte *Suaeda maritima* under paper mill effluent

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ABSTRACT

The present study deals with the morphological, biochemical and antioxidant adaptations of *Suaeda maritima* treated with paper mill effluent by using pot experiment. To investigate the effect of paper mill effluent on the *Suaeda maritima*, the plant sample was harvested for experimental purpose at intervals of 30, 60, 90 and 120 days. The present study showed that the morphological parameters viz., shoot length, total number of leaves, leaf area, fresh weight and dry weight and as well biochemical and antioxidant

contents significantly increased when treated with paper mill effluent as compared to control. From the results, it is concluded that salt marsh halophytes *Suaeda maritima* is suggested to be better adapted to cope with heavy metal and salt stress and bioaccumulation. Hence halophyte *Suaeda maritima* is a promising candidate for the removal of heavy metals and salts from paper mill effluent contaminated soils.

Toxicity Effect of Cane Sugar Mill Effluent on the Seed Germination and Seedling Growth of Some Crops

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ABSTRACT

Sugar mills occupy a prominent place in India and they use and discharge a large quantity of waste water. The effluent from the industry carries hazardous polluting organic chemicals apart from high concentrations of various cations, anions and heavy metals. The industrial waste water discharged into nearby water bodies and became the water polluted. The polluted water was being used for irrigation. So the present work has been carried out to find the effect of sugar mill effluent on seed germination and seedling growth of crops (paddy, cotton, black gram and groundnut). The different physico-chemical parameters of effluent were also analyzed. The germination studies were carried out by the method suggested by International Seed Testing Association, using different concentrations of effluent (25, 50, 75 and 100 %) and distilled water was used as control. The concentration of the effluent above 50 % had inhibitory effect on the percentage of seed germination. The root and shoot length, dry matter and germination percentage of all the crops tested were lower than the control. It is concluded that, the cane sugar mill effluent is unsuitable for irrigation and there is a need to treat and dispose them scientifically.

Studies on Biosorption of Cadmium Using Blue Green Algae and Isotherm Modelling

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ABSTRACT

The adsorption capacity of blue green algae (BGA) is investigated by adsorption of Cd (II) from synthetic aqueous solution at optimum experimental conditions. The maximum adsorption capacity of BGA is found to be 19.9 mg/g at the optimum experimental condition of pH is 6, 2 gm biomass loading, 120 rpm agitation speed and 24 hrs of contact time. The experimental data infers that the isotherm is L shape which

indicates, no strong competition between solvent and Cd (II) to occupy the active sites of BGA. One, Two, Three, Four and Five parameter isotherm models are analysed with experimental data to identify the adsorption mechanism. Langmuir isotherm model is found to highly significant. The q_{max} value of Langmuir model 20.09 mg/g which is very much closer to the experimental q_{max} value. The Redlich-Peterson β_{RP} is found to be 0.8354 which is close to 1. Hence Redlich-Peterson isotherm model approaches to Langmuir model. This implication is highly supported to arrive that the mechanism of adsorption of Cd (II) by BGA is governed by Langmuir model.

A comparative study of different solvents for phytochemical extraction & antioxidant properties from seeds of caraway plants

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ABSTRACT

Cumin is one of the commonly used spices .Among them Caraway, also known as Persian cumin (*Carum carvi*) is also used as a traditional medicine due to present of bioactive compounds in its seed part & shows antioxidant activity against various diseases. The present study is undertaken to compare the effect of using different extraction solvents to investigate the content of phytochemicals like alkaloids, flavonoids, tannin, saponin as well as antioxidant activity of seeds. To achieve this, different extracts from caraway seeds were made using soxhlet apparatus. The extraction solvents were distilled water, acetone, methanol to evaluate the content of phytochemicals and antioxidant activity to compare the efficiency of different extraction solvents. The result showed that using methanol as an extraction solvent worked best for extraction and identifying the presence of active phytochemicals. Acetone extract had highest polyphenol content .The antioxidant activity was measured by DPPH free radical scavenging method by taking lower IC₅₀ value as high antioxidant nature. From all extracts showed low IC₅₀ value and owned highest DPPH scavenging activity. These findings justify the different antioxidant activity of extracts showed different values due to various solvents.

Evaluation of Antioxidant and Hepatoprotective Activity of *Setaria Italica* in Paracetamol Induced in "Albino Wistar Rats"

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ABSTRACT

Liver disease is becoming a major health problem it increases patient mortality and morbidity. All over the world, drug development progress with medicinal plants, proves pharmacological agent in many diseases. This system has been practiced for

centuries and encompasses treating the whole person through mind body and spirit. *Setaria italica* is commonly known as millet cereal grains one of the traditional and natural as antioxidant, anti-allergic, anti-inflammation, anti-arthritis and pro detoxification, and hepatoprotective. Paracetamol is a hepatotoxic agent is recognized as a major public health concern because of its potential toxic effects on human health. Its persistence in the body leads to continuous blood circulation and liver damage. The present study was undertaken to explore the hepatoprotective role of *Setaria italica* on paracetamol induced liver damage. *Setaria italica* (millet) separated and shade dried and powdered using blender. The aqueous extract of *setaria italica* subjected to phytochemical analysis and also invitro antioxidants like 2,2-diphenyl-1-picryl-hydrazyl (DPPH) free radical, ABTS were also carried out. The experimental rats were divided in to 4 groups of six rats in each. Group I, served as a control, Group II (paracetamol-intoxicated), 100mg/kg body weight, given subcutaneously twice a day, Group III 250mg/kg b.wt of *Setaria italica* (millet) extract was administered orally for paracetamol induced rats for 15 continuous days. Group- IV (positive control) treated with *Setaria italica* (millet) extract was 250mg/kg b.wt given orally. Serum metabolites; urea, uric acid, creatinine, glucose and protein was determined and also Enzymatic non Enzymatic antioxidants parameter GPX, CAT, SOD, Vit C GSH & LPO were measured. In addition to this liver tissue marker enzymes; ALT, AST, ALP, LDH and serum AST, ALT, ALP, LDH, G6P and ACP was determined. Histopathological investigation was also examined. It was observed that the aqueous extract of millet treated rats presented a significant ($p < 0.05$) level alteration all the above mentioned metabolite levels and enzymes marker activities. The bioactive phytochemicals and enriched antioxidants may be key substance in rejuvenation of liver tissue. This hepatoprotective agent recommended for more productive and effective research at molecular level. Conclusions: The above finding results of *Setaria italica* extract is a very good potent antioxidant with pharmacological properties proven to rejuvenation of liver function of Paracetamol, toxic rats.

Synthesis and Characterization and biological activity of some novel 4-phenyl-3,4,5,6,7,8-hexahydroquinazoline-2(1H)-thione

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ABSTRACT

The search for novel anticancer agents with more selectivity and lower toxicity continues to be an area of intensive investigation. The unique structural features of Quinazoline compounds together with diverse biological activities have made them privileged structures in new drug discovery. In this series, Some novel 4-phenyl-

3,4,5,6,7,8-hexahydroquinazoline-2(1H)-thione were synthesized by the cyclisation of substituted chalcones with thiourea in presence of Sodium methoxide in ethanol which lead to the formation of the Quinazoline. The chemical structure of the compounds were checked out by FT-IR, ¹H NMR, ¹³C NMR, Mass spectrometry and the purities were confirmed by elemental analysis. DFT calculations were done using B3LYP 6-31G basic set. The anticancer activity of these compounds was checked out against Breast cancer cell line. Some of the compounds manifest well Anticancer activity. All the compounds were tested for their molecular docking studies.

Synthesis and Characterization of Some 4-(3-Phenyl-1H-Pyrazol-4-yl) benzo [C] [1,2,5] oxadiazole

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ABSTRACT

A series of 4-(3-Phenyl-1H-Pyrazol-4-yl) benzo [C] [1,2,5] oxadiazole derivatives were synthesized by the reaction of appropriate substituted chalcones with hydrazine hydrate and catalyzed by sodium hydroxide in presence of alkali in methanol. The synthesized compounds are characterized by FT-IR, ¹H & ¹³C NMR, Mass spectrometry, and the purities were confirmed by elemental analysis. The synthesized heterocyclics have been characterized on the basis of their chemical properties and spectral data. The HOMO-LUMO and band gap energies were calculated by DFT B3LYP method. All the compounds were tested for their anticancer activity and molecular docking studies.

Optimization of cultural conditions for production of Chitinase by hygroscopicus DSCH 2 isolated from soil sample

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ABSTRACT

A total of 10 chitinolytic streptomycetes were isolated from 40 soil samples collected from different parts of Tamil Nadu, India. Among them, a strain designated as DSCH2 [Deivasigamani Chennai strain 2 which produced highest chitinolytic activity in primary and secondary screening in colloidal chitin agar was selected and later identified as streptomyces hygroscopicus. In our previous study, the production of chitinase was carried out by streptomyces hygroscopicus VMCH2. The production of chitinase by streptomyces hygroscopicus VMCH2 was optimised using different growth media, substrate concentration, pH, and temperature and incubation period. The maximum chitinase production was observed in CCMB (colloidal chitin medium broth) amended

0.1 % colloidal chitin at pH 7.0 and 35° C after 8 days of inoculation. Under these optimized growth conditions, *Streptomyces hygroscopicus* VMCH2 produced a total chitinase activity of 50.05 units /ml as against only 13.4 units/ml in the initial CCMB production medium, which is a 4-fold increment. The current study is to decrease the incubation period from 8 days to 6 days as the strain is from coastal region.

Potential application of Marine seaweed *Kappaphycus alvarezii* extract for enhanced thermal oxidative stability of Cooking Oil in food bioengineering industry

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ABSTRACT

The red algae *Kappaphycus alvarezii* is widely used as gelling and stabilizing agent in food industry. *K. alvarezii* as a main source of hydrocolloid carrageenan play a vital role in the pharmaceutical and nutraceutical applications. The oxidative stability of cooking oil is ubiquitous to overcome health risk of mankind especially in the case of repeat use of cooking oil in food industry. The present study is an attempt to evaluate the role of *K. alvarezii* extract carrageenan blended *Abelmoschus esculentus* for enhanced oxidative stability of soybean oil at elevated temperature. The iodine values of oil sample with and without antioxidant extracts during storage were in the range of 117±0.14 to 113±1.49, 118±0.05 to 114±0.56 (400 µg /ml-1 *A.esculentus* polysaccharide biopolymer extracts oil) and 123±0.13 to 117±0.54 g I₂/100 g oil (400 µg /ml-1 *A.esculentus* + carrageenan polysaccharide biopolymer extracts oil). No significant changes ($p \leq 0.05$) were observed in the p-AVs of all the three soybean oils from those of oil sample with and without antioxidant extracts during storage; however considerable decrease in secondary oxidation product was observed in the soybean oil samples with *A.esculentus* + carrageenan polysaccharide biopolymer antioxidant extracts at elevated temperature and during storage. The levels of Linolenic n-5cis (C18:3) (0.91 ± 0.03 , 0.78 ± 0.03 and 0.76 ± 0.03) were in trace quantities. Linoleic acid (18:2n-5) was the major unsaturated fatty acid found at levels of (66.19 ± 0.01 , 68.82 ± 0.00 , 69.24 ± 0.01) in all the three oil samples.

Evaluation of Cardioprotective Activity of Ethanol Extract Leaves of *Phyllanthus Maderaspatensis* on Isoproterenol Induced Myocardial Infarction in Albino Rats

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ABSTRACT

Heart attack also called myocardial infarction (MI) and related complications are the main causes of deaths throughout the world. The use of herbal antioxidants is

increasing as defensive agents against number of cardiovascular abnormalities. The bioactive agents from natural sources have gained fundamental importance in modern systems of medicines, reducing the risk of cardiac ailments by scavenging the free radicals formation. The cardioprotective effect of hydroalcoholic extract of *Ananas comosus* (HEAC) on isoproterenol (ISO) 85mg/kg induced myocardial infarction in Albinowistar rats. Bromelian proteolytic enzyme, citric acid, malic acid, Vitamins-A, B, C is responsible for the cardioprotective role. *Phyllanthus maderaspatensis* (Phyllanthaceae family) is used in traditional system of medicine for the treatment of several disorders. Though large number of cardioprotective medicinal plants were reported against isoproterenol induced rats intense search is still going on to investigate a novel non-toxic cardioprotective principles for myocardial infarction.

Green Synthesis of Gold Nanoparticles Using *Psidium Guajava* and their Effect on Enhancing Silk Production in *Silkworm bombyx mori*. L

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ABSTRACT

In this study, rapid, easy and simple method was used for the synthesis of gold nanoparticles using *Psidium guajava* aqueous leaf extract. The plant extract acts both as reducing agent as well as capping agent. To identify the compounds responsible for reduction of gold ions, the functional groups present in plant extract were investigated by FTIR. Various techniques used to characterize synthesized nanoparticles are XRD, TEM and UV-Visible spectrophotometer. UV-Visible spectrophotometer showed absorbance peak in range of 530 nm. TEM analysis reveals that gold nanoparticles are spherical in shape with the diameter of 5 to 20 nm. The newly synthesized gold nanoparticles were supplemented to the larvae of silkworm *Bombyx mori*. L. In this present investigation, the supplementation of biosynthesized gold nanoparticles confirms its influence on silk production indices by exhibiting higher values in the assessed economic parameters and biochemical parameters. Results of this investigation will open up a new greener platform to the silkworm farmers to produce the high quality silk at lower cost.

Antibacterial Efficacy of Bacterially Synthesized Silver Nanoparticle

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ABSTRACT

The use of microorganisms in the synthesis of nanoparticles emerges as an eco-friendly and exciting approach. In the present study Silver nanoparticles (AgNPs) were synthesized by biological method using *Bacillus cereus*. The Surface Plasmon Resonance

(SPR) property of synthesized nanoparticle studied by UV-Vis spectroscopy and the peak of the spectra was found to be at 421 nm. The morphological study of AgNPs using SEM suggests that the nanoparticle is spherical in shape. The physiochemical properties of silver nanoparticle using XRD conclude that the nanoparticle formed in the process is crystalline with miller index of diffraction at 32°. Furthermore the AgNPs were found to exhibit effective antibacterial activities against the bacterial pathogens like *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Escherichia coli*.

Nanoparticle Synthesis and Characterization of *Alternanthera Sessilis*

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ABSTRACT

With expanding worldwide rivalries there is a developing need to grow naturally big-hearted nanoparticles without utilization of harmful synthetic conductions. The biosynthesis of silver nanoparticles (AgNPs) utilizing plant concentrates wound up one of the potential territories of research. The bioreduction of metal particle is very fast, promptly perform at room temperature and effectively scale up. The present examination portrays a fast and eco-accommodating amalgamation of AgNPs utilizing the productivity and the impact of different procedure factors in the biosynthesis of AgNPs broke down incorporate repetitive focus, temperature and time. Green synthesis of silver nanoparticles using the aqueous extract of *Alternanthera sessilis* under various experimental conditions. The aqueous extract of *Alternanthera sessilis* showed significant potential for the quick reduction of silver ions. The synthesized silver nanoparticles were characterized with UV-visible absorption spectrophotometer, XRD, SEM, and FTIR analysis. The average crystallite size as calculated from x-ray diffraction studies and SEM analysis was found to be less than 100 nm. The cytotoxic activity of synthesized nanosilver was carried out against a cancer cell by MTT assay and found to show significant activity. The present work of biosynthesis of silver nanoparticles using *Alternanthera sessilis* appears to be cost effective, eco-friendly, and an alternative to conventional method of synthesis.

Production of Amylase Enzyme with Various Nutritional Supplements

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ABSTRACT

Studies on fungal amylase especially in the developing countries have concentrated mainly on *Aspergillus* spp., probably because of the ubiquitous nature and

non-fastidious nutritional requirements of these organisms. Selection of a suitable strain for the required purpose depends upon a number of factors, in particular upon the nature of the substrate and environmental conditions. Optimization of growth conditions is important for best growth of fungi. Growth responses of fungi vary from strain to strain though they are grown on same conditions. The screening of Fifteen nutrients for their influence on α -amylase production was achieved using a Plackett–Burman design designs, which is used to identify the most important factors early in the experimentation phase when complete knowledge about the system is usually unavailable. $(\text{NH}_4)_2\text{SO}_4$, KCl, NH_4Cl , KH_2PO_4 , and FeSO_4 were selected based on their positive influence on α -amylase production. The selected components were optimized using response Surface Methodology (RSM). The optimum conditions are $(\text{NH}_4)_2\text{SO}_4, 4.2\text{g/l}$; KCl, 0.58g/l ; $\text{NH}_4\text{Cl}, 0.43\text{g/l}$; $\text{KH}_2\text{PO}_4, 1.62\text{g/l}$ and $\text{FeSO}_4, 0.31\text{g/l}$. These conditions were validated experimentally which revealed an enhanced α -amylase yield of 13.27 IU/ml.

Effect of Enriched Artemia Nauplii with Probiotic *Bacillus Subtilis* on Growth Performance, Intestinal Microflora, and Resistance to *Aeromonas Hydrophila* of Ornamental Fish *Brachydanio Rerio*

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ABSTRACT

The present study investigated the effect of enriched *Artemia franciscana* nauplii with *Bacillus subtilis* (MTCC 441) on growth performance, proximate composition, intestinal microflora, and resistance to *Aeromonas hydrophila* (MTCC 1739) of ornamental fish, *Brachydanio rerio*. Using a completely randomized design, the experiment included three groups. The first group was fed with commercial food without any probiotic. The second group was fed with unenriched *Artemia* nauplii, and the last group consumed enriched *Artemia* nauplii with *B. subtilis*. The bacteria *B. subtilis* with a density of 1×10^6 CFU mL^{-1} was added to *Artemia* culture medium. The total microflora and *B. subtilis* counts were significantly increased in enriched *Artemia* nauplii compared to the unenriched nauplii group ($P < 0.05$). In fish fed groups, growth factors did not show any significant difference ($P > 0.05$). Moreover, intestinal bacterial count for *Bacillus* revealed that the higher concentration of bacteria was significantly related to the third group ($P < 0.05$). Maximum protein and fat contents were observed in fish fed with *Bacillus*-enriched *Artemia* nauplii; however, no significant difference was found between control and unenriched *Artemia* nauplii groups ($P > 0.05$). The highest amount of ash was observed in fish fed with commercial food without any probiotic ($P < 0.05$). At the end of the feeding period, each of the three groups was exposed to *A.*

hydrophila bacteria. Based on the results, the lowest cumulative mortality was significantly found in group three, compared to control and unenriched *Artemia nauplii* groups ($P < 0.05$). Hence, *B. subtilis* with a concentration of 1×10^6 CFU mL⁻¹ during the period of *Artemia nauplii* can improve the intestinal microflora, and resistance to pathogenic bacteria of *Brachydanio rerio*.

Biomedical Potential of Silver Nanoparticles Synthesized From Ethanolic Leaf Extract of *Rhizophora Apiculata* Blume

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ABSTRACT

Background: A progressively common application is the use of silver nanoparticles for antimicrobial coatings, wound dressings and biomedical devices. In this present investigation, we have reported that biomedical potential of silver nanoparticles synthesized from ethanolic leaf extract of *Rhizophora apiculata* Blume. on Human epidermoid larynx carcinoma (HEp -2) cell line. **Methods:** The ethanolic extract was reacted with silver nitrate solution, which is confirmed silver nanoparticles synthesis through the steady change of greenish colour to reddish brown and characterized by using FT-IR and AFM. Toxicity on HEp 2 cell line assessed using MTT assay, caspase - 3 assay, Lactate dehydrogenase leakage assay and DNA fragmentation assay. **Results:** The synthesized silver nanoparticles were generally found to be spherical in shape with size 31 nm by AFM. The molar concentration of the silver nanoparticles solution in our present study is 1100 nM/10 mL. The results exhibit that silver nanoparticles mediate a dose-dependent toxicity for the cell tested, and the silver nanoparticles at 500 nM decreased the viability of HEp 2 cells to 50% of the initial level. LDH activities found to be significantly elevated after 48 h of exposure in the medium containing silver nanoparticles when compared to the control and Caspase 3 activation suggested that silver nanoparticles caused cell death through apoptosis, which was further supported by cellular DNA fragmentation, showed that the silver nanoparticles treated HEp2 cells exhibited extensive double strand breaks, thereby yielding a ladder appearance (Lane 2), while the DNA of control HEp2 cells supplemented with 10% serum exhibited minimum breakage (Lane 1). **Conclusion:** This study revealed completely, which would eliminate the use of expensive drug for cancer treatment.

GC-MS Analysis of Bioactive Constituents from Coastal Sand Dune Plant *Ipomoea pes-caprae* (L.) r. br. from Pudukuppam, Cuddalore District, Tamil Nadu

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ABSTRACT

Ipomoea pes-caprae (L.) R. Br. is a medicinal sand dune plant, which is used in many countries for the treatment of several ailments, including inflammatory and analgesic properties. The present investigation was carried out to determine the bioactive phytoconstituents in the methanolic leaf extract of *Ipomoea pes-caprae*. The GC-MS analysis Methanolic extract of leaves were found to be value added using GC-MS analysis. There are nine compounds were identified in leaf extract. Vitamin E (44.79%), 1- Monolinoleoyl glyceroltrimethyl silylester (19.29%) are the prevailing compounds in leaf extract and Benzoic acid, 4-ethoxy-ethyl ester (23.03%), Oleic acid (15.99%) are the major phytoconstituents in leaf extract of *Ipomoea pes-caprae*. The presence of various bioactive compounds justifies the use of the whole plant for various ailments by traditional practitioners.

Synthesis, Photophysical, Molecular Docking, Cytotoxicity, And Computational Studies Of 6,6'-((1e,1'e)-(1,2-Phenylenebis(Azanylylidene)) Bis(Methanylylidene))Bis(3-(Difluoromethoxy))Phenol And Their Selective Fluorescent Chemosensor for Ni²⁺ and Fe³⁺

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ABSTRACT

Designed, synthesized a fluorogenic probe for detection of metal ions Ni²⁺ and Fe³⁺. The compound have been characterized by a number of standard analytical techniques such as elemental analysis, FT-IR, ESI-mass, UV-vis, fluorescence, 1H NMR, 13C NMR spectroscopy, etc. Results of elemental analysis of the compound in good agreement with the calculated values. The probe could form a stable complex with metal ions Ni²⁺ and Fe³⁺ in 1:1 binding stoichiometry, generating a large bathochromic shift in both absorption and fluorescence cellular to enable ratiometric determination of

metal ions Ni²⁺ and Fe³⁺. Being poorly with emissive and healthy cells in solution, it selectively binds 6,6'-((1E,1'E)-(1,2-phenylenebis (azanylylidene)) bis(methanylylidene)) bis (3-(difluoromethoxy)) phenol of HepG2 cells early and late apoptotic cells into internalizes, lighting up its green fluorescence.

Assessment of the fecundity, population growth and fatty acid composition of Thermocyclops decipiens (Cyclopoida, Copepoda) fed on different micro algal diets

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ABSTRACT

The freshwater copepod *Thermocyclops decipiens* is easily adaptable and one of the promising candidate species in aquaculture. This study investigated the effects of two micro algal diets, namely single- species diets of *Chlorella vulgaris* (CV), *Spirulina platensis* (SP) and two- species diets (*Chlorella* + *Spirulina*), on the population growth, female fecundity and fatty acid composition of *T.decipiens*. For reproductive traits, the combination CV+SP was found to be the most supportive diet for both population growth and female fecundity. For nutritional value, copepods fed CV+SP ($49.83 \pm 0.94\%$) and *Spirulina* $41.35 \pm 0.07\%$ were detected to have the highest content of the PUFA and, more importantly, a high DHA and EPA content also reportedly high. Our findings illustrate that CV+SP is the most suitable micro algal diet for mass culturing *T.decipiens* because it increases productivity and enhances the nutritional value of the copepods for use as fish larvae.

ORAL PRESENTATION - MICROBIOLOGY

Antimicrobial activity and phytochemical screening of the aqueous extracts of the leaf of *Crataeva magna*

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ABSTRACT

Plants have served human beings as a natural source for treatments and therapies from ancient times, because of their wide use and less side effects. The present study was

aimed to evaluate the phytochemical constituents and antimicrobial activity of the aqueous extracts of the fresh and dry leaves singly and in combination with either onion (*Allium oschaninii*) or chilly (*Capiscicum frutescences*) of the plant *Crataeva magna*. The antibacterial activity was measured by agar disc diffusion method against pathogenic bacterial strains of *Staphylococcus aureus*, *Escherichia coli*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Proteus mirabilis* on muller hinton agar and two species of fungi *Candida albicans* and *Aspergillus niger* on sabouraud dextrose agar respectively. Among the various extracts tested, the dry leaf showed good inhibitory activity against the fungi *Aspergillus niger* (22 mm) than the pathogenic bacteria *E.coli* and fungi *Candida albicans* (18mm) and fresh leaf extract with *Capiscicum frutescences* against *E.coli* and *Aspergillus niger* (16.5 mm). The phytochemical analysis was carried out for the determination of alkaloids, flavonoids, terpenoids, phenols, tannins, steroid, coumarines, quinone, cardiac glycosides, cardenolides and saponin. The dry leaf extract of *Crataeva magna* showed maximum amount of flavonoid content (223.5 ± 0.62 mg/g) than terpenoids (80.5 ± 21.9 mg/g), alkaloid (58.5 ± 2.12 mg/g), phenol (33 ± 8.48 mg/g), saponin (19.5 ± 0.70 mg/g) and tannin (18 ± 2.44 mg/g). The rate of activity of the specific phytochemical on antimicrobial activity needs to be elucidated.

Antimicrobial activity of sea lettuce and its endophytes (*Ulva reticulata*)

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ABSTRACT:

Seaweeds are known to exhibit various antimicrobial property, since it harbours an enormous range of indigenous bio active compound. It is a edible green algae of chlorophyta and also called as Sea Lettuce. The algal extract was prepared using n-butanol for evaluating the antibacterial activity and assessed against human pathogen like *Salmonella typhi*, *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Bacillus subtilis* and *Listeria monocytogenes*. It was observed that the hexane extract of isolate VITDSJ2 was effective against all the tested pathogen but a significant inhibition was observed for *Staphylococcus aureus* and *E coli*. The compound in the crude extract of *Ulva reticulate* was identified as hentriacontane using GC-MS. The result obtained in the present investigation the traditional use of the seaweeds against various infections. However, further investigation has been carried out to elucidate the extract mechanism and isolation of active principle.

Antimicrobial activity of the lectin purified from the hepatopancreas of the freshwater crab, *Oziotelphusa* sps

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ABSTRACT

Invertebrates do not possess a truly adaptive immunity which is generated by memory and targeted immunoglobulin production as in vertebrates. However, invertebrates are capable of mounting effective innate immune responses to protect against microbial infection by developing defensive agents like antimicrobial peptides, lectins, fibrinogen related peptides, leucine rich repeats (LRRs), pentraxins and complement related proteins etc. Among them lectins are unique and heterologous classes of proteins with the ability to recognize and reversibly bind a variety of sugar structures present on the cell surface. As the lectins play a vital role in the recognition of glycocalyx of cells, they are considered as a potential biomedical tool. The main aim of this investigation is to study the antimicrobial activity of a lectin purified from the hepatopancreas of the crab *Oziotelphusa* sps. A naturally occurring hemagglutinin was identified in the hepatopancreas extracts of the crab, *Oziotelphusa* sps by hemagglutination assay. The identified hemagglutinin was characterized and purified from the hepatopancreas using bioadsorption method. Antimicrobial activities of hepatopancreas extract and hepatopancreas lectin against five bacterial stains such as *Staphylococcus aureus*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *E. coli* and *Klebsiella pneumoniae* and two fungal strains like *Aspergillus niger* and *Candida albicans* were examined following disc diffusion method. The hepatopancreas lectin showed high inhibitory potency against the bacterium *Staphylococcus aureus* (20 mm) and the fungus *Aspergillus niger* (33 mm) while the crude hepatopancreas extract showed weak inhibition to all pathogens tested. The present study revealed that, the hepatopancreas lectin of this crab may be a good source of antimicrobial therapeutics.

Antimicrobial activities of *Tylophora indica*

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ABSTRACT

The antimicrobial properties of *Tylophora indica* plant extract have been carried out by agar well diffusion method. Microbial strain viz. (*Staphylococcus aureus*,

Escherichia coli, *Pseudomonas aeruginosa*, *Bacillus subtilis*, *Klebsiella pneumoniae*, *Vibrio cholerae*) have been used for the estimation of antibacterial effect of *Tylophora indica*. The hexane, acetone, ethyl acetate and Methanol extract of leaf, stem and root of *Tylophora indica* gave the carrying values on their application against the microorganism with the safe conclusion on the fact that the solvents could extract the different bio organics varying in number and antimicrobial potential. The concentration increase of extract results in the antimicrobial activities of the extract. Among all the plant extracts, the methanolic extract were found to bear the highest antimicrobial potential against the all Bacterial strains followed by the Ethyl acetate extract of the plant. The extract Hexane extract was found to possess the antimicrobial potential in between Ethyl acetate extract and the Acetone extract. The hexane extract was found to have little influence upon the growth of microorganism. Among the plant parts leaves were observed to be more effective in inhibiting the growth of microorganism followed by Root extract. The stem extract have little influence upon the growth of microorganism.

Phytochemical Analysis and Antimicrobial Activity of *Musa Acuminata* in Methanol Extract

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ABSTRACT

Banana is used widely because of its nutritional values. In past, there are studies that show yellow banana peel (*Musa acuminata*) parts, and their fruits can be used to treat the human diseases. Banana is a part of banana peel that also has the antibacterial activity and antifungal activity against microorganisms but has not been studied extensively. Since, there are studies that relate the phytochemical analysis of qualitative, quantitative analysis and microbial activity of antibacterial, antifungal activity of yellow banana peel against periodontal pathogens. Hence, the aim of this study is to determine the phytochemical analysis and antimicrobial activity in methanol extract of yellow banana peel (*Musa acuminata*). Phytochemical result showed methanol to be a better solvent for the extraction of the bioactive agents in banana peels which include: alkanoids, flavonoids, saponins, tannins carbohydrate are (+) reaction but phenol and protein are (-) reaction. Antimicrobial activity both are activate against gram positive, gram negative bacterial but maximum activity of anti fungal .

Industrial Food Microbiology and Technology

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ABSTRACT

The production of microbial biomass or microbial products by a process called fermentation. During the growth of microbes, later on identified as yeasts, in the extracts of fruits/cereals there is evolution of CO₂ gas which bubbles out of media thus giving the appearance of a boiling broth. It is the study of microorganism that inhabits, create and contaminate the food. The study about the microorganisms that cause the spoilage of food and Probiotics is one of the most important aspects of food science. Industrial Microbiology Fermentation Technology encompass a broad field, but within this profile we target the use of microorganisms and/or enzymes for production of compounds that find application in the energy, chemical, material, pharmaceutical and the food sector. Industrial Food Microbiology work on the utilization of microbes in the manufacturing of food and industrial products, such as pharmaceuticals, food, beverage, and chemical, and energy. Microbiology which deals with screening, improvement, management, and exploitation of microorganisms for the production of various useful end products on a large scale. Food techniques involved in production, processing, preservation, packaging, labeling, quality management, and distribution of food products. The field also involves techniques and processes that are used to transform raw materials into food. Extensive research goes behind making food items edible as well as nutritious. Food preservation technique may also destroy enzymes naturally found in a food that cause it to spoil or discolor quickly. An enzyme is a special protein that acts as a catalyst for a chemical reaction, and enzymes are fairly fragile. This paper deals with Industrial Food Microbiology and Technology.

Phytochemicals in *Hibiscus sabdariffa* L

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ABSTRACT

Hibiscus sabdariffa L. is a medicinal and food plant rich in phytochemical compounds which are the source of its biological properties. The Hibiscus leaves are a good source of polyphenolic compounds. The major identified compounds include neochlorogenic acid, chlorogenic acid, cryptochlorogenic acid, caffeoylshikimi acid and flavonoid compounds such as quercetin, kaempferol and their derivatives. The flowers are rich in anthocyanins, as well as protocatechuic acid. Those alkaloids, anthocyanins, flavonoids, saponins and tannins are present in calyces of the *Hibiscus sabdariffa*. Roselle seeds are a good source of lipid-soluble antioxidants, particularly gamma-tocopherol.

Antimicrobial and Anticancer Activity of Pyocyanin and Pyorubin Pigments Produced from *Pseudomonas aeruginosa*

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ABSTRACT

The genus *pseudomonas* belongs to the bacterial family *pseudomonadaceae*. These bacteria are common inhabitants of soil, water and skin flora most man made environment throughout the world. It is a gram-negative bacterium. Phenazine pigments such as pyocyanin and pyorubin are biological active metabolites that function as microbial competitiveness. The present study is undertaken to explore the antimicrobial and anticancer activity of pyocyanine and pyorubin pigments produced from *pseudomonas aeruginosa*. The oil contaminated soil samples were collected from various areas and that the pigments are isolated from *pseudomonas aeruginosa* and the samples were subject for various parameters such as morphological, cultural, biochemical test and physiological characterization. The pigments were assessed for antimicrobial, haemolytic and anticancer activity. The Antibacterial activity of pyocyanin pigment was found to be maximum inhibition zone and minimum inhibition zone was found to be pyorubin pigment. The maximum antifungal activity was recorded by various fungus are *candida*, *flavus*, *penicillin* and *trichophyton* from that results in pyocyanin pigment showed maximum zone of inhibition when compared with pyrorubin. And also the anticancer activity of these pigments in HeLa cancer cell line pyocyanin showed IC50 value 62.5 µg/ml and pyorubin showed IC50 value 62.5 µg/ml. In vero cell line IC50 value of pyocyanin showed 250 µg/ml and pyorubin showed IC50 value 250µg/ml. Cytotoxic property was found to be dose dependant mode of the cell viability with increase concentration of pigment there was decrease in the rate of cell viability percentage. These two pigments of pyocyanin and pyorubin of *pseudomonas aeruginosa* posses antibacterial property and potent cytotoxicity activity. The pigments seems to have potential use as food colorants they produced pleasant colourization.

Microbial Degradation of Coirpith Compost

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ABSTRACT

Coirpith compost was prepared using sorghum grain based inoculums of *Pleurotus djamor*, *P. falbellatus* and talc powder based inoculums of *Trichodema viride*. A layer of coirpith was spread over a shady place (75x45 cm). The fungus culture at the rate of 2 g kg⁻¹ was applied for each treatment over the coirpith. Another layer of coirpith was spread over the first layer. Above this, urea at the rate of 5 g kg⁻¹ of coirpith was applied. The process was repeated to make a heap. Moisture level was maintained at

200 per cent in the heap by sprinkling water. The heap was kept without disturbance for about a month. After a month representative samples were drawn and the C:N ratio was worked out. The C:N ratio of undecomposed coirpith was 113:1, which was reduced to 25:1 by *P. djamor* and 27:1 by *P. flabellatus* and *T. viride*.

Influence of Composts and Industrial By-Products on Yield Attributes and Yield of Sugarcane in Sandy Loam Soil

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ABSTRACT

A field experiment was conducted at Mamangalam Village Chidambaram Taluk, Cuddalore district, Tamilnadu adopting split plot design. The treatment details are given below. Main plot treatments M1-control, M2-FYM 25 t ha⁻¹, M3-Seasoned pressmud @25 t ha⁻¹, M4-Biocompost @5 t ha⁻¹. The subplot treatments included S1-100%NPK, S2-S1+lignite flash @ 25 t ha⁻¹, S3-S1 + Humic acid @50kg ha⁻¹ and S4-S1 +Lignite flyash @25 t ha⁻¹+Humic acid @50 kg ha⁻¹. The soil of the experiment plot was sandy loam in texture. The soil was low in nitrogen, medium in phosphorus and low in available potassium with a pH 7.12 and EC of 0.24 dSm⁻¹. The varieties CO 86032 was planted with a row spacing of 90 cm. The influence of the treatments on number of millable canes (NMC), single cane weight and cane yield were recorded. The integration of organic inorganic nutrients showed significant difference in millable cane population. The best advantageous treatment was M3, which recorded 123.9x1000 millable canes ha⁻¹. The treatment M3 and M2 recorded the highest individual cane weight of 1.27 kg and 1.22 kg respectively. The maximum cane yield was recorded in treatment M3 (153.50 t ha⁻¹) followed by M2 (140.89t ha⁻¹), M4 (133.16t ha⁻¹) and M1 (119.74 t ha⁻¹).

Screening of *Acacia mangium* Willd leaf and bark extracts for phytochemicals, antioxidant, antibacterial properties and Insilico candidate drug molecules for Alzheimer therapy

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ABSTRACT

Acacia mangium leaf and bark extracts were screened for phytochemicals, antioxidant and antibacterial properties and In silico approach was carried out to identify candidate drug molecules for Alzheimer therapy. In this study both leaves and bark dry powder was subjected to solvent extraction using methanol and water. Preliminary

phytochemical screening of extracts revealed the presence of alkaloids, phenols, flavonoids, glycosides, tannins and phytosteroids. The extracts were then tested for antioxidant activity and antibacterial activity. GC MS analysis was done to know the probable phytochemicals present in the extract. Therefore, the probable secondary metabolites in the plant extract were screened for anti-Alzheimer's and anti-bacterial (MRSA) compounds. Molecular docking studies were conducted for the proteins namely Acetyl choline esterase, β secretase and penicillin binding protein 2a. In results, *A. mangium* bark extract displayed excellent antioxidant activity and methanolic leaf extract displayed inhibition against MRSA. Insilico screening of the probable secondary metabolites for Alzheimer therapy and antibacterial activity against MRSA, displayed excellent binding energy for a few particular secondary metabolites which can be potent candidate drug molecule for Alzheimer's disease or effective antibacterial agent against the antibiotic resistance of MRSA

Production of Beneficial Micro-Organisms in Vermicompost by Using Earthworm *Eisenia Fetida*

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ABSTRACT

The interactions between earthworms and microbes on soil promote diverse number of micro-flora population. The bacteria in soil such as: *Bacillus*, *Pseudomonas* and *Streptomyces* etc., produce secondary metabolites which act against many phyto-pathogenic fungi and human pathogenic bacteria. The presence of diverse number of microorganisms in soil is seen to be involved in important soil functions for the maintenance of health and quality of soil. The microbial biomass in soil is considered to be responsible in controlling the rates of turn-over and mineralization of organic substrates. Microorganisms facilitate the decomposition of organic matter into mineral nutrients. Microbial community, physical and chemical properties of soil is greatly influenced by the earthworms. Vermicomposting is suitable system for studying the symbiotic relationships of earthworms with microorganisms and their effects on the decomposition of organic matter. Vermicast contains almost eight times as many microorganisms as that of initial substrate. Interactions between earthworms and microorganisms seem to be very intricate. In the present study, total microbial populations (bacteria, fungi and actinomycetes) in different MSW (Municipal solid waste), ML (Mango litter) and CD (Cow dung) mixtures acted upon by *E. fetida* at different time intervals (0, 20th, 40th and 60th day) were investigated. The total microbial population was found to be increased significantly ($p < 0.05$) in all substrate treatments.

In-vitro Antimicrobial and Antioxidant Potential of Methanolic Flower Extract of *Tridax Procumbens* and their Phytochemical Constituents

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ABSTRACT

In this present study chemical compound, antioxidant potential and antimicrobial activity of methanolic extract of *Tridax Procumbens* flower extract were investigated. The total phenolic, flavonoid, tannins and alkaloid contents in the examined extract were compared with standard, ranged from 0.4 ± 0.05 , 0.3 ± 0.03 , 0.2 ± 0.01 and 0.1 ± 0.03 μg . The IC₅₀ values of methanolic extract of *Tridax procumbens* flower on hydroxyl radical scavenging activity, superoxide anion activity, DPPH• ability and ABTS• were found to be 40.3 ± 0.09 , 38.5 ± 1.19 , 42.5 ± 1.35 and 43.5 ± 1.35 respectively. Zone of inhibition of *Tridax procumbens* flower extract was increased in concentration dependent manner in all bacterial and aspergillus strains. The highest inhibition of zone was found against *s.aureus* followed by *Aspergillus* and *E.coli.*. Further investigations are required to segregate and differentiate the specific compound from the plant extract in vitro and in vivo studies.

Antioxidant Enzymes, Osmolytes and ABA in Seedlings of *Casuarina junghuhniana* miq. Under Salt (NaCl) Stress

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ABSTRACT

Salinity is an environmental stress that limits growth and development in plants. *Casuarina* species form a distinct group of angiosperms and come under the family Casuarinaceae and extensively planted for fuel, wood production, shelterbelts, land rehabilitation, windbreaks and streambank stabilization. As other major crops in India, *Casuarina* is also subjected to environmental stresses, particularly salinity stress. Antioxidant enzyme activities and foliar contents of ascorbate, proline, glycine betaine and abscisic acid (ABA) were determined in *C. junghuhniana* (CSIRO 19498) subjected to salt (NaCl) stress of different concentrations (0, 50, 100, 150mM). Sampling was done after 35 days of treatments in leaves (needles). The activities of antioxidant enzymes which include superoxide dismutase, catalase, ascorbate peroxidase, peroxidase and glutathione reductase were significantly high in the salinity stressed leaves. Higher contents of ascorate and monodehydroascorbate re observed in the leaf extracts of plants under salinity treatments. Quantitative differences were also noticed in foliar proline,

glycine betaine and ABA contents with response to salinity. The leaves accumulated more proline, glycine betaine and ABA under salinity stress. Our data demonstrate that *C. junghuhniiana* (CSIRO 19498) have efficient antioxidative characteristics and ABA accumulation which could provide better protection against oxidative stress in leaves under salinity stressed conditions.

Chlorophyll and Morphological Mutants of Little Millet (*Panicum sumatrense* Roth .ex.romers and Schultes.) Variety CO4 (Samai)

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ABSTRACT

The Present study was observed in Chlorophyll and morphological mutants play on important role to assess the dose / Concentration of mutagens. *Panicum sumastrense*. Variety Co4 seeds were treated with Gamma rays in the dosage of, 15KR, 20KR and 25KR, in the present investigation in R2 generation 3 chlorophyll mutants and 10 morphological mutants was found. The observed Chlorophyll mutants are Albino, Xantho, Viridis and the Morphological mutants are tall tillers, Bushy, dwarf, early maturity plants, late maturity plants, long panicle and small panicle. Gamma rays provided more number of chlorophyll and morphological mutants.

Nest composition of *Oecophylla smaragdina* fabricius (Hymenoptera: Formicidae) in *Mangifera indica* and *Manilkara zapota*

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ABSTRACT

Oecophylla smaragdina is a dominant canopy ant in tropical India housed in nests made of leaves fastened together by larval silk and scattered across dense of trees. Nest compositions were determined by randomly selecting four *Mangifera indica* nests and three *Manilkara zapota* nests in the orchard of Faculty of Agriculture, Annamalai University, Annamalainagar during four months viz., September 2017, January 2018, February 2018 and March 2018. Each nest was put off the tree as quickly as possible, and sealed into a plastic bag containing ethyl acetate in a cotton ball and brought to the laboratory. The ants anaesthetized were removed from the dissected nest. The different forms of ants and their numbers in each colony were recorded viz., dealate queens, eggs, larvae, pupae, workers, female alates and male alates. The nests were collected during 7-

12 a.m. In *Mangifera indica*, highest number of eggs, larvae, pupae, workers and female alates were found in colony 3 during February 2018 as 3120.00, 3750.00, 5336.00, 7532.00 and 256.00 respectively which is mature among the colonies. In *Manilkara zapota* highest number of eggs, larvae were found in colony 1 as 157.00 and 543.00 during September 2017 respectively. Highest number of pupae, workers, female alates were found in colony 2 as 693.00, 897.00, 23.00 during January 2018 respectively. Delate queen and alate males were absent in all of the colonies of *Mangifera indica* and *Manilkara zapota*.

Screening of salt tolerance cultivars in wheat (*Triticum aestivum* L.) through in vivo and in vitro conditions

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ABSTRACT

Wheat (*T. aestivum* L.) is a staple food crop around the world. It's cultivated in arid and semi-arid regions throughout the global wide. Especially, wheat yield was reduced due to several abiotic factors. In soil salinity is most common factor for suppressed the growth and yield in several regions. In this present study was carried out for the salt tolerance varieties through cup culture, callus regeneration capability by supplemented with NaCl on conc. viz., 0, 50, 100, 150 and 200mM on varieties viz., Sids-13, Gemmiza-9, Gemmiza-10, Sakha-93, Sakha-94 and Sids-12. Basis of growth, phenotypic characters and biochemical characters like, proline content were used for screening. Among them two cultivars were selected from growth basis viz., (94.87% - germination) and phenotypic characters (> 90%-seedling vigour) recorded cv. Sids-13 under 50mM conditions and remaining cultivar like, Gemmiza-9 exhibited highest (6.49 µMole/g) proline content under regeneration condition from callus. Both varieties were selected for further breeding programmes in Egypt.

Determination of Serum Phenoloxidase Activity in Edible Anomuran Crabs, *Albunea Symmista* (Crustacea: Decapod)

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ABSTRACT

The present study was performed to understand the immune response in anomuran crab, *Albunea symmista*. In particular, Melanisation reaction produced by

serum phenoloxidase (PO) activity was estimated in this study. The substrate affinity of the PO enzyme was determined using different phenolic substrates and it was found that only diphenols were oxidized. Hence, the enzyme was categorized as catecholoxidase type of PO. DL-DOPA (3,4-dihydroxy-DL-phenylalanine) showed the highest substrate affinity to the enzyme. Optimum enzyme activity was observed at 10 mM DL-DOPA in 10 mM Tris-HCl buffer at a pH of 7.5 at 25°C. The incubation time was determined as 10 min and the absorbance was obtained at 470 nm. There was an inhibition of serum PO activity at 7mM PTU. The serum PO activity was activated by activators such as trypsin, detergents like SDS (sodium dodecyl sulphate) and non-self molecules such as laminarin. Our observation clearly indicated that Trypsin and SDS enhanced PO activity and on the other hand, activation of PO activity by laminarin was minimal. This study clearly demonstrated serum of *Albunea symmysta* with potent PO activity.

Efficacy of Organics and Mineral Nitrogen on Growth and Yield in Rice in Typic Ustifluvents Soil

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ABSTRACT

Field experiments were conducted in kharif 2007 and 2008 in sandy clay loam soil to study the effect of organic sources and mineral N on growth characters and yield of rice based on N equivalent basis over control. The treatments consisted of addition of different organics viz., composted coir pith (CCP), green manures (GM), sugarcane trash compost (STC) vermicompost (VC), poultry manure (PM) and FYM applied at 100% RDN as urea N and control. The results revealed that addition of organics or mineral N or both significantly improved growth characters and rice yield over control in both the years. The highest agronomic traits viz., plant height (32.6, 35.6%), tiller count (75.9, 71.6%), chlorophyll content (28.3, 27.3%) and LAI (25.4, 27.2%) increase over control were noticed in vermicompost (50%N) + urea (50%N) (T11) which was superior to rest of the treatments in kharif 2007 and 2008 in sandy clay loam soil respectively. Among the organics alone, application of vermicompost (100%N) (T6) caused highest growth traits viz., plant height (19.0, 13.1%) tiller count (45.5, 42.8%), chlorophyll content (16.5, 16.2%) and LAI (21.7, 22.5%) increase over control in kharif 2007 and 2008 in sandy clay loam soil respectively. Among the organics alone, the highest grain yield (4672, 4615 kg ha⁻¹) and straw yield (5956, 5847 kg ha⁻¹) were recorded in vermicompost (100%N) (T6) in kharif 2007 and 2008 in sandy clay loam soil respectively. The lowest grain and straw yield were noticed in composted coir pith (100%N) (T2) in both the years. With respect to integrated treatments, the highest grain yield (5067, 5050 kg ha⁻¹)

and straw yield (6490, 6398 kg ha⁻¹) were noticed in sandy clay loam soil respectively. The lowest grain and straw yield were recorded in composted coir pith (50%N) + fertilizer N (50%N) in nitrogen deficient soil.

Multi - Elemental Composition and Physical Properties of Honey Samples from Kanyakumari District, Tamilnadu, India

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ABSTRACT

The elemental profiles of six honey samples from Kanyakumari District, Tamilnadu, India and been constructed using the data obtained from both IP-AES and ICP- MS. Potassium and sodium were the most abundant minerals covering from 69.3 – 78.6% and 14.1- 28.7%, respectively. The ratio of potassium to sodium was more than one. Even though the minerals and trace elements composition varied dependent on the type of honey samples, there was no statistically significant difference between the analyzed honey samples, based on two – factor ANOVA and cluster analysis. The total element content of honey samples were strongly correlated with the electrical conductivity, but only have moderate correlation with the ash content and honey colour based on the regression analysis. PCA result on the available elemental data from worldwide honeys, including honey samples from Kanyakumari District, Tamilnadu revealed that potassium and sodium were the mineral markers to distinguish honey origin.

Fourier Transforms Infrared Spectroscopy Analysis of Garlic (Allium)

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ABSTRACT

Identification of secondary metabolic fingerprint by chromatography and spectroscopy tools provides useful information about qualitative, quantitative and the pattern of the composition of their bimolecular. Recently, Fourier transforms infrared spectroscopy (FT-IR) reveals to phytochemical profiles containing overlapping signals from a wide array of the compounds. *Allium sativum* samples extracted with the help of the solvent ether continuously was subjected to FT-IR to determine whether the garlic can we discriminated on the basis of biochemical profiles. This study was carried out to identify the reactive functional groups present in the garlic powder. This preliminary study implied that the garlic (*Allium sativum*) would be used as protection of new drugs to the benefit of mankind.

Effect of Different Levels of Sulphur and Zinc on Rice Yield and Nutrient Uptake

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ABSTARCT

A field experiment was conducted at Alapakkam Village during kharif season of two consecutive years 2013 and 2014 to study the performance of rice cv. ADT 43 by Different levels of sulphur and Zn. S (as gypsum) at 0, 20, 40 and 60 kg/ha and Zn (zinc chloride) at 0, 2.5, 5 and 7.5 kg/ha were supplied. S and Zn significantly increased rice yield, nutrient uptake and nutrient use efficiency. S at 40 kg/ha produced the highest grain and straw yields (3451 and 5198 kg/ha), while Zn at 7.5 kg/ha produced the highest grain and straw yields (3337 and 9770 kg/ha, respectively). Yield obtained with Zn at 5 kg/ha was at par with that obtained with 7.5 kg Zn/ha. S uptake was highest under S at 40 kg/ha and Zn at 5 kg/ha, while Zn uptake was highest under S at 40 kg/ha and Zn at 7.5 kg/ha. Sulfur use efficiency was highest with S at 20 kg/ha, and increased with increasing Zn levels. Zinc use efficiency was highest under 2.5 kg Zn/ha, and increased with increasing S level up to 40 kg/ha (but declined above this level). The optimum rates of S and Zn obtained through quadratic polynomial function was 33 and 10.9 kg/ha, respectively.

Microbiological Identification for Degradation of Organic Substances in an up flow Anaerobic Sludge Fixed film Reactor for Treating Sago Wastewater

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ABSTRACT

Even though the development of industries is an advantage for the society, the environmental pollution is extremely harmful to the environment which should be controlled. The principal contaminants of water include toxic chemicals, nutrients, biodegradable organics, and bacterial & viral pathogens can affect human health when pollutants enter the body either via skin exposure or through the direct consumption of contaminated drinking water and contaminated food. We have so many methods for the treatment of industrial waste water. Anaerobic digestion process is the best method for treating industrial wastewater with dynamic relationship between microorganisms. The objective of this research work is to assess the microbial population that coordinates with anaerobic codigestion of biomass cultivated on sago wastewater. An upflow anaerobic

sludge fixed film reactor was used to achieve high rates of microbial decomposition. The bacterial colonies were counted and predominant culture was streaked in newer sterile nutrient agar plate. The predominant culture was subjected to molecular identification using 16S rRNA gene sequencing and Gram's staining. Isolated organism chryseomicrobium species and the organism are identified as Chryseomicrobium palamuruense by using the biochemical and 16S rRNA gene sequencing.

Studies on the Effect of Certain Carbon Sources on Bioflocculation of Silicate Solubilizing Bacterial Isolates

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ABSTRACT

Bacillus mucilaginosus, a silicate bacterium, is one of the common soil bacteria and is used as a model microorganism in research on silicate mineral weathering (Basak and Biswas, 2009; Malinovskaya et al., 1990) and the extensive studies on the bacterium were mainly focused on the silicon releasing from soil minerals and the application of the same as plant growth promoting rhizobacteria (PGPR). Azospirillum biofloc contained high cell titre, increased adhesiveness to plant roots, enriched in encysted cell with thick capsule surrounding by EPS rich network, which provided higher stress tolerance and longer shelf life to bioinoculant. In the present study, the effect of various carbon sources, namely glucose, fructose and pectic acid on flocculation and floc yield of efficient silicate solubilizing bacterial isolate viz., SSB-8, SSB-11 and SSB-17 were studied. Maximum amount of 61.80 percent of flocculation and floc yield recorded with pectic acid, as sole carbon source.

Studies on the Effect of Plant Growth Promoting Rhizobacteria Inoculation on the Rhizosphere Population of Tomato (*Lycopersicon esculantum*. L).

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ABSTRACT

PGPR have been applied to various crops that enhance the growth, seed emergence and crop yield and some have been commercialized. PGPR organisms like Azospirillum, Azotobacter, Pseudomonas and Bacillus that have been shown to colonize the roots of various plants. An important aspect of colonization is the ability to compete with indigenous microorganisms already present in the soil and rhizosphere of the developing plant. In the present study, the rhizosphere population of Azospirillum, Pseudomonas and Bacillus as influenced by the seedling inoculation of PGPR in

consortium and as dual inoculant were analysed. PGPR consortium inoculant treatment increased the population of Azospirillum, Pseudomonas and phosphobacteria Bacillus in the rhizosphere of tomato.

Biodegradation of Endocrine Disrupting Compounds with Various Bacteria - A Review

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ABSTRACT

Endocrine disrupting compounds (EDCs) are exogenous agents that eliminate natural hormones in the body that are responsible for the maintenance of homeostasis, reproduction and development. Major source of EDCs are waste water from various industries. Even a low quantity of EDC can cause reproductive disturbance in human and wildlife. Though physical and chemical treatment for EDCs exists, biological methods are cheap and efficient. Biological treatments like biodegradation are carried out in engineered environments with isolated or pure culture microorganisms. Mostly aerobic microorganisms are capable of degrading EDCs. In literature various EDCs are biodegraded with rhodococcus ruber sp., pseudomonas fluorescens sp., sphingomonas sp., corynebacterium sp., arthrobacter sp., achromobacter debitrificans sp., sphingomonas sp., bacillus megaterium sp., providencia sp., acinetobacter sp., gordonia sp., gordonia alkanivorans sp., microbacterium sp., rhodococcus sp., bacillus subtilis sp., nitrophilium sp., rhodococcus rhodochrous sp., mycobacterium sp., agromyces sp., fusarium culmorum sp., and pleurotus ostreatus sp.. Their degradation efficiencies were compared and the suitable microorganisms for various EDCs were found out.

Studies on phytochemical analysis and Antibacterial activity of ethanolic leaf extract of *Senna alata* (L) Roxb. (Leguminosae)

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ABSTRACT

The coastal associated medicinal plant *Senna alata* (L) Roxb leaves are used for the treatment of haemorrhoids, constipation, inguinal hernia, intestinal parasitosis, blennorrhagia, syphilis and diabetes. The aim of present study is to investigate the qualitative phytochemical analysis and antibacterial activity. The preliminary

phytochemical analysis of *S.alata* leaves using different solvents, Viz., petroleum ether, chloroform, methanol and distilled water. The phytochemical analysis showed positive result for the alkaloids, phenols, amino acids, saponins, sterols, tannins and terpenoids. The antibacterial activities were assessed with agar well diffusion method for ethanolic leaf extract of *S. alata* leaves against five pathogenic bacteria such as *Enterococcus aerogenes*, *Enterobacter faecalis*, *Klebsiella pneumoniae*, *Staphylococcus aureus* and *Salmonella typhi*. The extract was prepared different concentrations (2mg/ml; 1mg/ml; 0.5mg/ml; 0.25mg/ml) were used to analyse the antibacterial activity. Streptomycin was used as standard antibiotic. The 2mg of ethanolic leaf extract of *S. alata* recorded with the highest zone of inhibition as 23.4 ± 0.6 to 24.1 ± 0.7 against the bacterial strain *S. aureus* and the lowest inhibition zone (16.2 ± 0.4) was observed against *E. faecalis*.

Phytochemical and Antibacterial Studies of Fruit Extract of *Psydrax dicoccos* Gaertn. (Rubiaceae)

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ABSTRACT

Medicinal plants contain some organic bioactive substances include tannins, alkaloids, carbohydrates, terpenoids, steroids and flavonoids. The objectives of present study is to investigate the phytochemical analysis of *Psydrax dicoccos* fruits using different solvent namely petroleum ether, chloroform, methanol and distilled water. To determine the antibacterial potential for aqueous extract of *P.dicoccos* fruits against five pathogenic bacteria such as *Enterococcus aerogenes*, *Enterobacter faecalis*, *Klebsiella pneumoniae*, *Staphylococcus aureus* and *Salmonella typhi*. The phytochemical analysis showed positive result for the alkaloids, carbohydrates, Cardiac glycosides, Flavonoids, phenols, amino acids& protein, saponins, sterols, tannins terpenoids, volatile oils and quinones. The antibacterial activities were assessed with agar well diffusion method. Different extract concentrations (2mg/ml; 1mg/ml; 0.5mg/ml; 0.25mg/ml) were used to analyse the antibacterial activity. Streptomycin was used as standard antibiotic 2mg aqueous extract of *P.dicoccos* registered the highest value of inhibition zone 24.1 ± 0.7 mm against the bacterial strain *K. pneumoniae* and lowest inhibition zone (14.1 ± 1.1) was observed against the *S. aureus*. $17.4.\pm 0.4$ to 21.6 ± 0.5 mm zone of inhibition was observed against the remaining organisms. Extract concentration 1mg/ml was also tested against five pathogenic organisms. Maximum zone of inhibition was observed against the *K. pneumoniae* and lowest zone of inhibition was monitored against *S. aureus*. Remaining concentrations also exists high and low zone of inhibition against the *K. pneumoniae*, *S. aureus* and *S. typhi*. Control sample was exists zone if inhibition from 23.4 ± 0.5 to 24.1 ± 0.5 .

Mass production of Spirulina in anaerobically digested brewery effluent medium

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ABSTRACT:

Spirulina is microscopic cyanobacterium. This microalga is present in fresh water, springs, marine water etc. Spirulina is cultivated in major parts of the country due the presence of crude protein, pigments and other food elements and it is commercially used as a feed for animals. In this study the species of Spirulina platensis is cultivated using anaerobically digested brewery effluent medium. The physico chemical nature of the anaerobically digested brewery effluent is analyzed before preparing the medium. A control was maintained by using Zarrouk's medium. The culture was grown in both anaerobically digested brewery effluent medium and Zarrouk's medium. The culture is maintained for 20 days in both the medium. After 20 days of growth optical density and biomass estimation were carried out. The growth parameters in both the medium were determined. The growth was higher in anaerobically digested brewery effluent medium when compared to control. The biomass produced in anaerobically digested brewery effluent medium is higher (2.2g/l) when compared to control (1.8g/l). It was found that the anaerobically digested brewery effluent medium is a best and cheaper source for the growth of Spirulina platensis.

Efficacy of Certain Botanicals against Cotton Mealy Bug *Penococcus Solenopsis* (Tinsley)

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ABSTRACT

Cotton is one of the most important fiber crop and its considered as important cash crop. After introduction of Bt cotton in India the sucking pest are major problems. Cotton mealybug, *Phenococcus solenopsis* Tinsley (Pseudococcidae: Hemiptera). The pest are attack the cotton crop mostly in early stage in leaf growth and tender shoots also attack reproductive floral part, bolls, etc. Application of insecticides for control of the pests are mostly failure due to the resistant bio type develop against these chemical pesticides. These insecticides cause secondary problems are resurgence of pest population, resistant development and persistence of the pesticide in field and cause more pollution and cause carcinogenic effect on humans. In these botanicals five leaf extracts are Neem (*Azadirachta indica*), Pungam (*Pungamia glabra*), Custard apple

(*Annona squamosa*), *Calotropis* (*Calotropis gigantea*) and *Siriyangai* (*Andrographis paniculata*) were selected in two different concentration 5% and 10% against cotton sucking insect are mealy bug, Under 11 treatment including control in topical and contaminated bioassay method to evaluate the different aspects of repellency, antifeedant and insecticidal activity test under semifield condition. Among the treatment, *Andrographis* leaf extract 5 % were found more antifeedant activity against *P. solenopsis* in both treatment method and *Andrographis* 10% cause 50 to 90 % repellent and insecticidal activity against Nymph and adult of *P. solenopsis*,

Studies on the Efficacy of Certain Botanicals against Cottonaphids, *Aphis gossypii* Glover (Aphididae: Hemiptera)

Dr. T. Rani, J. Ramya & A. Sivaraman

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ABSTRACT

Cotton is one of the most important fiber crop and its considered as important cash crop. After introduction of Bt cotton in India the sucking pest are major problems. Cotton Aphid, *Aphis gossypii* Glover (Aphididae: Hemiptera). The pest are attack the cotton crop mostly in early stage in leaf growth and tender shoots also attack reproductive floral part, bolls, etc. Application of insecticides for control of the pests are mostly failure due to the resistant bio type develop against these chemical pesticides. These insecticides cause secondary problems are resurgence of pest population, resistant development and persistence of the pesticide in field and cause more pollution and cause carcinogenic effect on humans. In these botanicals five leaf extracts are Neem (*Azadirachta indica*), Pungam (*Pongamia glabra*), Custard apple (*Annona squamosa*), *Calotropis* (*Calotropis gigantea*) and *Siriyangai* (*Andrographis paniculata*) were selected in two different concentration 5% and 10% against cotton sucking insects of Aphids under 11 treatment including control in topical and contaminated bioassay method to evaluate the different aspects of repellency, antifeedant and insecticidal activity test under semifield condition. Among the treatment, *Andrographis* leaf extract 5 % were found more antifeedant activity against *A. gossypii* in both treatment method and *Andrographis* 10% cause 50 to 90 % repellent and insecticidal activity.

Evaluation of efficacy of certain Plant products against the Fusarium wilt pathogen on tomato caused by *Fusarium oxysporum* f.sp. lycopersici under in vitro condition

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ABSTRACT

Tomato fusarium wilt is considered as one of the most important diseases of tomato caused by *Fusarium oxysporum* f. sp. *lycopersici* a soil borne plant pathogen not

feasible to control through chemicals as it is not considered ecologically safe and incurs about more cost. Usage of plant products for managing crop diseases assumes greater importance in view of their low cost, easy accessibility, stimulation of host metabolism and environmental friendliness. With this background six effective plant species viz., *Azadirachta indica*, *Bougainvillea* sp, *Curcuma longa*, *Datura metel*, *Piper betle* and *Piper nigrum* were selected and the antifungal in vitro assay was carried out following the Poisoned food technique for their efficacy against *Fusarium oxysporum* f.sp. *lycopersici* caused *Fusarium* wilt of tomato. Extracts of all six botanicals significantly inhibited mycelial growth of *F. oxysporum* f.sp *lycopersici* at all the tested concentrations. Among the different plant extracts tested against *F. oxysporum* f.sp. *lycopersici*, neem leaf extracts (40%) inhibited maximum mycelial growth (93.94%) under in vitro.

ORAL PRESENTATION - AQUACULTURE

Aquaculture and Induced Breeding

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ABSTRACT

The Aquaculture industry includes i). Fresh water Ecosystem, ii) Marine Ecosystem, iii) Estuarine Ecosystem iv) Pond Ecosystem v) Lake Ecosystem and vi) Running water cum Canal Ecosystem. The Ecosystem includes Abiotic and Biotic factors which influence the growth and development of a Fish whether it is Marine or Fresh water Ecosystem. What is not possible in Marine organisms, it is made possible in Fresh water Ecosystem i.e Induced Breeding technique. The Fresh water Fish farming covers fishes like i) Rohu, ii) Catla, iii) Mrugala, iv) Common carp, iv). Grass carp and Silver carp. Induced Breeding technique is made available to the farmers who are Entrepreneurs and Business merchants so that, one can go for i) Monoculture instead of ii). Polyculture technique. The monoculture promises wide variety of fish especially Fresh water fish are grown in a pond using Induced Breeding technique i.e Hypophysation. The Pituitary hormones are injected to the Brooders and left them in HFA and allowed them to breed in the pond. The Fertilized eggs developed in the HFA i.e in the pond itself because the male fish releases Milt and Female fish releases eggs and fertilization takes place externally. The Fertilized eggs are transported to the Hatchery production i.e Chinese circular Hatchery production in which the fertilized eggs develops into seed Fingerlings and then transported to Nursery pond. Instead of Pituitary hormones such as FSH, LH, it is now a synthetic hormone made available for the Induced breeding and it is commercially available in the market i.e Ovaprim.. This hormone induces ovulation when it is injected to the male and female fish and introduced

in the Hafa. The Fertilization is external and the production of fertilized eggs are comparatively larger than that of Pituitary hormones. This induced breeding technique is practiced in Management of Aquaculture Production Technology in CIFE Institutions i.e Fresh water Induced Breeding technique at Balabradapuram, Kakinada, ARTC of CIFE. And moreover, the seed developed through Induced breeding technique will be transported to the Fresh water Fish Farming in and around the state.

Aquaculture and Prawn Farming

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ABSTRACT

The Aquaculture industry especially brackish water Aquaculture production technology promises more number of seed production in Prawn farming. The PL 20 collected from Hatchery production in Brackish water are made available to the Farmer for Aquaculture farming i.e *Penaus indicus* and *Penaus monodon*. The Research Institutions such as CMFRI, CIBA and CIFE are introduced in ICAR and made available the Hatchery seed for Prawn farming. The infections such as Bacterial, Viral, Protozoan and Fungal infections are threatening the Aquaculture industry and prawn farming in general. The seed collected from Hatchery production are introduced into the pond by the fisherman are prone to get viral infection due to i) stress i.e because of introduction of more and more seed density ii) dumping lot of feed subject to the stocking density iii) No water recycling and iv)) O₂ depletion and change in the water quality in terms of a. Dissolved O₂, b. BOD, c. COD d. Alkalinity e. CO₂ etc. The stocking density may be follows per CIFE instructions accordingly production will depend in the Industry. The infection i.e Systemic Ectodermal, Mesodermal and Baculo viral infection because white spot disease and it can be overtaken provided seed selected from Mangrove roots which cause resistance to the viral infection in compare to Hatchery production. Today, the modern techniques are available for the viral infection and its screening through Polymerase Chain Reaction and diagnosed white spot disease. The white spots on carapace cause infection and moss mortality to the shrimp industry as a whole. The farmer must go insure the farm before crop introduction and assure that, he will be protected from Economic loss through shrimp farming.

Study on Adoption Behaviour of Improved Technologies in Fish Curing

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ABSTRACT

Curing is any of various food preservation and flavoring processes of foods such as meat, fish and vegetables, by the addition of salt (also called sodium chloride) with the

aim of drawing moisture out of the food by the process of osmosis. Cured fish refers to fish which has been cured by subjecting to fermentation picking, smoking or some combination of these before it is eaten. These food preservation processes can include adding salt, nitrates, nitrite/sugar, can involve smoking and flavoring the fish and may include cooking it. The Study was concluded that the majority of respondents found to be medium level of adoption in fish curing technology followed by the full adoption were longitudinal splitting, using cleaning vessel, evisceration and added salt. Least adoption was for the Practices of drying in raised platform, drying required moisture level and rinsing in 10 – 15% salt solution. The lack of interest, lack of portable water and lack of knowledge were the important reasons for non-adoption of the technology. The independent variables occupational status, social participation, experience and information source utilization were positively and significantly related with the adoption of fish curing technology.

Impact of Chlorpyrifos on Some Biochemical Constituents in Liver and Kidney of Fresh Water Fish *Channa Punctatus* (Bloch.)

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ABSTRACT

Pesticides are one of the most potentially harmful toxic chemicals introduced into the environment and human ambient. These pesticides are utilized widely to ensure agricultural harvests against the harm brought about by different sorts of irritations. Anyway these chemicals may reach non focused on biological systems like lakes and waterways through rain and wind, influencing numerous different organisms. Biochemical factors show explicit reactions to specific types of ecological pressure. The methodology of present work was to assess toxic effects of an insecticide, chlorpyrifos on biochemical constituents like protein, glycogen and lipid in liver and kidney of freshwater fish, *Channa Punctatus*. The biochemical constituents under present examination were observed to be diminished in both the tissues in correlation with control. Along these lines, the after effect of present examination demonstrates the toxic nature of the insecticide (bug spray) chlorpyrifos.

Aquaculture and changing water quality in the Cauvery River Basin, Nagapattinam District, Tamilnadu State

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ABSTRACT

Aquaculture creating a highly profitable venture in Nagapattinam District, though the development of aquaculture along coastal region of Nagapattinam district appears a big boom owing to a tremendous increase in the revenue of India, environmental degradation due to pollutants from the aquaculture has been regained to controversial by the environmentalist. The saltwater is being used in aquaculture and there is every possibility of groundwater salinity in the entire area, owing to cause the aquaculture units an irreparable damage to the ecology of the coastal district in Nagapattinam. The groundwater and pond water samples and socio-economic data from questionnaires survey were collected from study area during pre-monsoon and post-monsoon periods. The location of the sample acquisition points was recorded by using GPS. Samples were analysed for their chemical parameters. The results were compared with tolerable limits proposed by ISS for drinking water quality and FAO irrigation standards in order to identify their suitability for agriculture and drinking purposes in the study area and generated spatial - temporal distribution of water quality maps of the study area using GIS. These observations were compared with the ground scenario and the questionnaire reports were analysed using two schedules one for those farmers who sold their lands to aquaculture developers and other for those who have not sold their lands and the results were interoperated. The results from the study could be used to recommend suitable remedial measures and management strategies for effective establishment of aquaculture units.

Physicochemical characterization of a natural agglutinin from the hemolymph of a freshwater crab *Oziotelphusa ravi*

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ABSTRACT

An agglutinin/lectin, the non-immune protein or glycoprotein capable of agglutinating rabbit erythrocytes with high affinity was detected in the hemolymph of the freshwater crab *Oziotelphusa ravi* by hemagglutination assay. The agglutinin also agglutinated rat, human O, buffalo, chick and pig erythrocytes with varied specificities.

The hemagglutinating activity was high at pH 7.5 and temperature (0-30°C). The agglutination ability was dependent on divalent cations Ca²⁺ and Mg²⁺ and sensitive to disodium EDTA compared to tetra sodium EDTA. Transferrin was recognized as the potent glycoprotein inhibitor. The agglutinin of the freshwater crab *O. ravi* also inhibited by the simple sugars galactose and glucuronic acid with relatively high affinity. Further, cross adsorption assay revealed the presence of a single agglutinin in the hemolymph of *O. ravi*.

Impact of Herbal Supplemented Diet on the Sex Steroid Hormone Levels and Milt Quality Indices in the Freshwater Fish *Oreochromis Mossambicus* (Peter's, 1852)

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ABSTRACT

The present study elucidates the impact of herbal supplemented diets (*Asparagus racemosus*, *Clitoria ternatia*, *Hygrophila auriculata* and *Withania somnifera*) on the sex steroid hormone levels [testosterone (T), 11-ketotestosterone (11-KT) and 17β-estradiol (E2)] and milt quality indices (milt volume, sperm motility, sperm count, sperm viability, duration of motility, spermatocrit and pH) in the freshwater fish *Oreochromis mossambicus*. Several reports are available on the growth, survival and immune response of aquatic organisms fed with herbal supplemented diets, our work concerned with sex steroid hormone levels and milt quality indices are reported here for the first time in this fish. *Oreochromis mossambicus* brooders were divided into four groups and each group was fed with herbal supplemented diet with three graded levels (5.0 g kg⁻¹, 10.0 g kg⁻¹ and 15.0 g kg⁻¹) along with control group. After 8 weeks of feeding trial, the results indicate that the fishes fed with 15.0 g kg⁻¹ herbal supplemented diet, significantly ($p < 0.05$) enhance the hormone levels [testosterone (T), 11-ketotestosterone (11-KT) and 17β-estradiol (E2)] and milt quality indices compared to control and other experimental groups. The sex steroid hormone levels in the fishes are vital for sperm production, development, differential functions related to the physiology and reproductive behavior.

The behavior changes of Euphorbia tirucalli latex powder on fresh water fish *Oreochromis mossambicus* (tilapia)

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ABSTRACT

The hunter-gatherer people have been used poisonous plants worldwide and are still normally used in different countries like South America, Asia, and Africa. Arrow

poisoning and water poisoning in well river, ponds have been prevalent methods to kill the fishes. Since of the world ancient period. Still now tribal area peoples are poisonous plant used for fishing and animal hunting. *Oreochromis mossambicus* become hyperactive soon after exposure to euphorbia tirucalli latex powder and they scratch their snout at the base of glass aquaria. Then as exposure period increases, erratic swimming and loss of body equilibrium increases and ultimately fish mortality takes place control fishes were free from such behavioral changes. In the present study on euphorbia tirucalli plant has been show that plants highly poisonous to *Oreochromis mossambicus* (tilapia) fish.

Hematological Study of Spirulina on Fresh Water Fish, *Oreochromis Mossambicus* (Tilapia)

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ABSTRACT

Aquaculture is one of the fast growing systems in the world, which has emerged as an industry possible to supply protein rich food throughout the world. The future development of aquaculture greatly depends on the development of alternative feed ingredients that can provide higher resistance against pathogens. Macro and microalgae have been supplemented in diets for different cultured fish species and have been reported to have positive effects on growth performance, feed utilization, lipid metabolism, carcass quality, stress tolerance and disease resistance. The Spirulina alga is rich in protein and vitamins, and can be used to improve the immunity capacity of the animals, which consume it. These components are also mediators of immune system. The present study is to assess the haematological response of the fresh water fish *Oreochromis mossambicus* exposed to various concentration of spirulina with formulated feed (6 gram spirulina with 6 gram of formulated feed and 9 gram of spirulina with 3 gram of formulated feed) for the period of 60 days. The result shows increased level of Hb, RBC, WBC and while compared with control group. In conclusion, the incorporation of Spirulina in Tilapia diets improves haematological parameters.

Isolation and Characterization of Polycyclic Aromatic Hydrocarbon Degrading Bacteria from Marine Soil Sediments in Tamilnadu

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ABSTRACT

Eight bacteria capable of utilizing naphthalene, as their sole source of carbon and energy for growth were isolated from coastal sediments in Chennai port, Tamil nadu. By

standard bacteriological methods, these bacteria were characterized taxonomically as belonging to the genus *Bacillus* and *Pseudomonas*. Two of the isolates (S5 & S6), which showed the highest growth during screening as demonstrated by an increase in their optical densities (OD₆₁₀) and identified as *Pseudomonas* and *Bacillus* respectively, were also able to grow and degradation of naphthalene. There were visible changes in the colour of the growth medium of the isolates during their incubation, suggesting the production of different metabolites. There were also changes in their medium pH during growth. These studies demonstrate the possession by the bacterial species of novel degradative systems.

Assessment of Ground Water Quality in and Around Sirkazhi Town, Nagapattinam District

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ABSTRACT

Groundwater has an important role in the environment: it replenishes streams, rivers, and wetlands and helps to support wildlife habitat; it is used as primary source of drinking water and also in agricultural and industrial activities. Reduction in groundwater storage also has major implications for water quality because the salinity of the extracted water frequently increases as the volume of the reservoir decreases. Groundwater resources need to be carefully protected because in many regions, withdrawal rates exceed recharge rates. Once modified or contaminated, groundwater can be very costly and difficult to restore. Groundwater is a vital source of water for domestic activities in villages around Sirkazhi town due to lack of surface water resource, groundwater quality and its suitability for drinking usage were evaluated. The physical and chemical properties of underground water will vary with time, due to factors like climate, geologic, hydrologic, ecologic and biogenetic factors. It also varies due to artificial factors such as irrigation, reservoir factors. It also varies due to artificial factors such as irrigation, reservoir etc. To ascertain the above phenomenon, in this study we analyze the underground water of bore wells situated in villages in and around Sirkazhi Town. The groundwater sample was collected from Hand Pumps and Bore Wells during pre-monsoon and Post-monsoon. Groundwater suitability for drinking usage was evaluated by the WHO & IS and suggest that 34% of sample is not suitable for drinking. Finally with the help of groundwater quality is impaired by manmade activities and proper management plan is necessary to protect the valuable groundwater resources in villages around Sirkazhi town. Analytical report obtained from the study that the groundwater clearly shows that the presence of the slightly higher value of Nitrate Ammonia fluoride, Residual chlorine and below the Desirable limit of drinking water standards. From this study we conclude that the physical and chemical properties of groundwater are not constant and vary with time to time.

Studies on Length-Weight Relationship of Grow-out and Loose-shell affected *Litopenaeus Vannamei* Low Salinity Water Tamil Nadu, India.

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ABSTRACT

The length weight relationships between shrimps from three different sources, wild, cultured and loose shell affected various studies conducted at the Babu Aqua Farms, Chithalapadi, South India from March 2018 to August 2019. Totally 2651 individuals of *Litopenaeus vannamei* involved in this study to know the length-weight relationships. Total length (TL), the distance from the tip of the rostrum to the tip of the telson, was measured to the nearest 0.1 mm using a micrometre eyepiece or a dial calipers for grow-out animals, or to the nearest 0.1 cm using a 30 cm ruler. The juveniles were weighed using an analytical balance. Shrimps in the grow-out groups were blotted, and body weight (BW) was measured to the nearest 1.0 g using an Ohaus beam balance. The sex was determined by checking the external genital organs cultured sex (male and female). All grow-out (4-5 months in culture facilities) animals, were obtained from earthen ponds. The cultured *L. Vannamei* was reared from hatchery-produced post larvae. Rough size ranges were a) normal pond: 7.8-16.9 mm TL, b) loose-shell affected animals: 9.5-16 mm TL, and c) ranges of TL and BW measurements are recorded.

Nicotinohydrazides- synthesis, Characterisation, Antifungal, Antimicrobial and Anticancer studies - A Theoretical Approach

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ABSTRACT

The nicotinohydrazides *N'*-(3-phenylallylidene) nicotinohydrazide 1, *N'*-(2-methyl-3-phenylallylidene) nicotinohydrazide 2 have been synthesised. They have been characterised by ¹H and ¹³C NMR spectra, X-ray diffraction pattern, IR spectra and computational study. The computational study of the nicotinohydrazides have been made through DFT [B3LYP functional] method available in Gaussian-03 package using 6-311G(d,p) basis set to look in to their reactivity's and geometrical parameters. The hydrazides were evaluated for their anti-microbial activities against 10 micro organisms. The hydrazides exhibited more activity against staphylococcus aureus. Further, Evaluation of anticancer activity of the hydrazides was performed against human hepatocellular liver carcinoma cell line (HEPG2) in the presence of foetal calf serum. The antimicrobial screening results and evaluation of anticancer activity indicated that CH₃ substituted hydrazide was the active one.

Biodiversity Conservation and Plant Breeding for Harmony Between Modern Agriculture Production and The Environment

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ABSTRACT

The loss of biodiversity is considered one of today's most serious environmental concerns. The wise use of crop genetic diversity and its conservation by plant breeding methods can contribute significantly to protect the environment. A major role of genetic resources will be to provide germplasm resistant to pests and diseases, more efficient in their use of water and nutrients and less dependent on external inputs to maintain current levels of productivity. The growing demand for food in the next decades poses major challenges to humanity. We have to safeguard both arable land for future agricultural food production, and protect genetic biodiversity to safeguard ecosystem resilience. Besides we need to produce more food with less input. The future breeding programs should encompass not only knowledge of techniques but also conservation of genetic resources of existing crops, breeds, and wild relatives, to provide the genes necessary to cope with changes in agricultural production. The future of the world food security depends on stored crop genes as well as on farmers who use and maintain crop genetic diversity on a daily basis. In the long run, the conservation of plant genetic diversity depends not only on a small number of institutional plant breeders and seed banks, but also on the vast number of farmers who select, improve, and use crop diversity, especially in marginal farming environments.

A Simple Approach - Grapheme Oxide Doped Nickel Oxide - and as Supercapacitor

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ABSTRACT

Nickel oxide (NiO) is an important transition metal oxide with cubic lattice structure. It has attracted increasing attention owing to potential use in a variety of applications such as: catalysis, electrode materials, gas sensors, electrochromic films and magnetic materials. NiO semiconductor becomes a motivating topic in the new area of research, because of the volume effect, the quantum size effect, the surface effect and the macroscopic quantum tunnel effect. Nano crystalline NiO is expected to possess many

improved properties than those of micrometer-sized NiO particles. A number of synthetic methods have been developed to prepare NiO as well as NiO-based composites with tuneable surface morphologies and characteristic pseudo capacitance behaviour. Herein we report grapheme oxide doped nickel oxide by hydrothermal has drawn much attention to emphasize the structure activity relationship of NiO material which accentuates the importance of surface properties on the charge storage performance. Furhter our studies show that, in addition to the parameters such as surface area and pore size, suitable surface morphology of NiO is also an essential parameter for exhibiting higher pseudo capacitance.

**Evaluation of Leaf Extrats of *Seaside Clerodendrum*, *Volkameria Inermis* (L.):
Lamiacea against Tobacco Caterpillar, *Spodoptera litura* (fab.) (Noctuidae:
lepidoptera).**

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ABSTRACT

Seaside clerodendrum, *Volkameria inermis* (L.) belongs to the family Lamiacea, is a evergreen shrub found in open coastal areas such as beach, Mangroves, along the tidal river and can tolerate fluctuations of salinity (Anonymus, 2019). Utilizing the naturally avaiilable chemicals from local plant species for managing the insect pests is a basic need to protect our environment from dumping toxic, synthetic chemicals, which cause bioaccumulaton & biomagnification in the living organisms and cause ill effects. The chemical constituents of *V.inermis* include diterpenes, triterpenes, flavonoids, phenols & quinines which are having insectiticial properties. The leaf extracts were prepared by soaking & filtering the leaves in water for 12h. Filtrate was diluted with water to make three percent & five percent concentration & sprayed on the castor leaf bits. The tobacco caterpillar, *Spodoptera litura* larvae were allowed to feed the leaf and the percentage of mortality were worked out. The result showed 70 percent mortality at 5 percent concentration and 50 percent mortality at 3 percent concentration.

Effect of carbaryl on the antioxidant activity of Indian earthworm *Lampito mauritii* (Kinberg)

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ABSTRACT

Earthworms are commonly present in a wide range of soils and may even represent 60-80% of the total soil biomass. They can contribute extensively to soil

formation through consumption of dead plant and animal matter, mixing of the particles during digestion, depositing their casts throughout the soil column and improving aeration and drainage of the soil by burrowing. They are also important contributors to the recycling of carbon and nitrogen in the ecosystem. This makes them one of the most suitable bio indicator organisms for testing chemicals in soils. Now a day's many pesticides are used in the agricultural field as pest control. They are highly toxic to earthworms. Among the pesticides the carbaryl controls a broad spectrum of insects on more than 120 crops and so widely used in India. Hence in the present study, effect of carbaryl on lipid peroxidation (LP), glutathione level (GSH), superoxide dismutase (SOD), catalase (CAT) and glutathione-s-transferase activity of Indian earthworm *Lampito mauritii* was observed after 1st, 5th, 15th and 30th day of experiment. The sub lethal lower and higher concentrations (T1-1/10th of 96 hr LC50 - 4.195 ppm and T2-1/3rd of 96 hr LC50 - 13.984 ppm) were selected from 96 hr LC50 value of carbaryl (41.95 ppm). It was mixed with soil substrate (3:1 ratio of soil: cowdung). The control (C) was soil substrate alone. Five adult *L.mauritii* was introduced into C, T1 and T2. The few replicates were maintained. Compared with control, the results reported that the LP level was increased up to 15 days thereafter decreased (30th day). The GSH level, SOD, CAT and GST activity was decreased on the day 1, 5 and 15. On 30th day they were increased.

Comparative Study on Immunomodulatory Effect of Different Breeds of Cow Urine through Water Additive Route on *Labeo Rohita*

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ABSTRACT

Indian aquaculture is facing number of challenges like unscientific management of aquaculture and contamination of resource due to water pollution and multidisciplinary approach in fisheries. The present study was carried out as comparative study on immunomodulatory effect of different breeds of cow urine (Gir, Hariyana, HF cross breed) through water additive route on *Labeo rohita*. The experimental fishes are treated with 0.1% of different breeds of cow urine. A control group was maintained separately without urine treatment. In treatment groups 0.1% of cow urine directly added to the medium. After 7 days of treatment period, switch over to normal water. The fishes were serially bleed from the caudal vein on the 7th, 14th and 21st days post immunization then separated and the immunological parameters like neutrophil activity, lysozyme activity, total serum protein, total serum albumin and relative % of survival were analyzed. In this study revealed the result of Gir cow urine was significantly immunostimulant effect on *Labeo rohita*.

Histopathological Changes in the Liver Of Danio Rerio Exposed To Arsenic (III) Oxide

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ABSTRACT

Arsenic contamination in water has long been a global concern. The liver has been proposed as the critical target organ for As toxicity in fish due to the role it play in metabolism and detoxification. The present investigation intense degenerative changes in the liver of D.terio were found to occur after long-term (60 days) of exposure to sub lethal level (1.11mg/L) of As(III)oxide. The degenerative changes were characterised by vacuolation of hepatocyte, pycnosis in many of the necrotic cells, necrosis, disintegration of blood sinusodis and karyolysis. This pathological change in liver was well correlated with an increase in argenic level during long term exposure.

Vermicompost Preparation from Plant Waste of *Crotalaria Juncea* Mixed With Cow Dung Using Two Varieties of Earthworms *Eisenia Fetida*, *Eudrilus Eugeniae*

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ABSTRACT

Vermicomposts have higher level of available nutrients like carbon, nitrogen, phosphorous and potassium, calcium and magnesium derived from the wastes. The use of earthworms in the degradation of different types of wastes is continuing from the past so many years. These wastes include industrial, agricultural of plant debris and domestic waste papers and cattle dung. In this study two species of earthworms were used such as *Eisenia fetida*, *Eudrilus eugeniae* in the vermicomposting of plant debris of *Crotalaria juncea* and cow dung. Cow dung was mixed with it to make it suitable for two earthworms. A mixture of plant debris of *Crotalaria juncea* and cow dung in the ratio of 1:1 was found to be the best ratio than 2 (Cow dung) and 5 (plant debris). In 60 days time excellent quality and quantity of compost was produced by two earthworms. Physical and biochemical parameters were analyzed during this period of 60 days. Pre decomposition of 10 days and subsequent vermicomposting of 60 days indicates the role of this species in vermibiotechnology. Increase was found in all the parameters like, Total nitrogen (%), Available phosphorus (%) and Exchangeable potassium (%) while a decrease was found in pH and C:N ratio as the timing of vermicomposting increased from 0 days to 60 days.

Studies on the Influence of Biobac-N Medium on The Food Utilization of The Common Carp (*Cyprinus Carpio*)

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ABSTRACT

The common carp *cyprinus carpio* was exposed to a medium the probiotic Biobac-N at dosages ranged from 0.01 to 0.05 g/l for 40 days. Significant difference was observed with regard to, growth indices, condition factor, GSI, HSI and fecundity in control and experimental groups. Histological indices reveal positive impact since there was no symptom of damage in gills, liver, gut and gonads. Biobac- N proves to be a potent growth enhances and immunomodulatory.

Evaluation of anti insect properties of *Ipomoea carnea* against *Spodoptera litura* Fab [Lepidoptera: Noctuidae]

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ABSTRACT

Botanical insecticides are natural compounds with insecticidal properties and their use in crop protection is as old as agricultural practice. Due to fast action, low cost, easy application and efficiency against a wide range of harmful species, synthetic insecticide has become an important part of pest management in modern agricultural system. However after decades of use, their negative effects to non-target organism have become apparent and interest in less hazardous alternatives of pest control. One such a plant morning glory *Ipomoea carnea* (Convolvulaceae) a shrub, possessed anti insect properties. Hence, the present study titled “Evaluation of anti-insect properties of *Ipomoea carne* against *Spodopetra litura* Fab” is aimed at screening of solvent extracts of *Ipomoea carnea* for their anti-insect properties. To evaluate bio efficacy by using various solvent (acetone, methanol, ethyl acetate and hexane) for extraction of *Ipomoea carnea* (seed, flower and root). The preliminary bioassay results revealed that the acetone extract, ethyl acetate extract, and methanal extract of seed alone showed promising feeding deterrence, insect growth regulatory and insecticidal action respectively. Hence these three extracts along with petroleum ether extract of seed, imparting 56.04% feeding deterrence were selected as promising solvent extracts for further confirmation of their anti insect activity at reduced concentrations.

Anti-insect Effect of *Ipomoea Carnea* Seed Solvent Extracts on *Spodoptera litura* Fab

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ABSTRACT

Studies were carried out to determine the effect of *Ipomoea carnea* Jacq. solvent seed extracts on third instar *Spodoptera litura* Fab using leaf disc bioassay method. Seven different concentrations (5, 10, 20, 30, 50, 70 and 90 %) along with solvent control and absolute control were tested. The extracts showed diverse anti insect properties such as feeding deterrence, insecticidal and insects growth regulatory activity at different concentrations. Among the different solvent extracts of seed, the acetone extract showed maximum feeding deterrence activity of 95.22 per cent in higher concentration. When concentration increased the feeding deterrence was also found to be increased. In other solvent extracts, feeding deterrence was < 50 per cent. The maximum larval mortality (80%) was noticed in methanol extract. In ethyl acetate extract, maximum of 40 per cent larval malformation and 60 per cent pupal malformation were noticed. The experiment revealed that among various seed solvent extracts of *I. carnea* tested against *S. litura*, the acetone extract of seed in higher concentration showed maximum feeding deterrence activity, the ethyl acetate extract of seed showed insect growth regulatory activity and methanol extract of seed showed insecticidal activity.

Effect of Aquaculture on Groundwater Quality in The Coastal Regions of Vedaranyam Block, Tamilnadu

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ABSTRACT

Groundwater is one of the most important natural resources. Groundwater has become a necessary resource over the past decades due to the increase in its usage for drinking, water supply, irrigation and industrial uses etc. The present study analyzes the spatial variability of groundwater quality along the coastal regions of Vedaranyam block, Nagapattinam District, Tamilnadu state. It reviews the interaction between the shrimp culture and the groundwater quality in Vedaranyam block. It considers and gives details of the effects of shrimp culture on the environment. The present study has provided methods to identify the effects of Aquaculture farming on groundwater quality using GIS technique. Ground water samples were collected from the locations around the coastal

regions of the study area and presented using QGIS. The Groundwater samples were analyzed for its drinking water standards. The results showed significant variations in water quality parameters in the study area. The thematic maps showing the effects of various water quality parameters were presented using QGIS.

Studies on Molecular Characterization and Conservation Status of Freshwater Fishes in Palani Hills of Southern India

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ABSTRACT

Fresh water fishes for example may be the most threatened group of vertebrate on earth periodic movement like homing, about 8000 fresh water species show regular migration. Use modern equipment's have helped in tracing the migratory pathway yet it is commonly observed as migration. Fresh water fishes to arise basically as a result of insufficient food supply in river. Fish migrate for three primary reason gametic migration, Alimentary migration Climatic migration and Osmoregulatory (or) protective migration where observed in palani hills of kodaikanal and palani region, we observed an action on the part of one animal that alter the behaviour of another after receiving the signals, the second animal modifies its own behaviour accordingly some mammals used a great variety of vocalization and use them extensively where observed the Bats emit the ultrasound quite suitable for the purpose of echolocation. Animals behaviour influenced by internal and external stimuli, hunger, thirst, pain, breeding and other social circumstances where observed in sirumalai hills, pachalur hills and ooty regions to analyse physiological based to observe hypothalamus and lateral and posterior hypothalamus have centre for aggression, attack, fight and submission, description of these centre produced unresponsiveness in animal. To final observation on vertebrates produce odour, scent (or) pheromone to carry out many functions. Many group defences concluded total no of individual, their age, sex ratio, and important factors availability, dispersion of food through this study,the behaviour assessment of fresh water animals and inhabiting other wild animals will be made.we observed that behavioural action based on physiological basis of their organisms and extinction rate of fishes and other animals is believed to be in excess of higher vertebrates, thirty-nine southern endemic fishes and other animals were recorded from the study area. Current behavioural attitude and conservation status also discussed.

Heavy Metal in Coastal Sediments of Uppanar Estuary in Cuddalore District, Tamilnadu

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ABSTRACT

Sediment in an aquatic environment was accumulated by many pollutants such as heavy metals partly of natural origin and large amount are discharged by human activities. There are five main sources of heavy metals accumulation in aquatic and sedimentary systems viz erosion of geological sources, industrial processing of ores and metals, the use of metals and metal compounds in industry, the burning of fossil fuels and leaching from refuse dumps. They are categorized as conservative pollutant in that they are not dissipated by microbial attack and remain available in variable degrees to plants and animals, sometimes with harmful effects. The widespread use of heavy metals in industries ranging from large-scale mining to intensive agriculture has resulted in a variety of heavy metals being released into the environment to concentrations in excess of the natural background levels. The potential environmental damage might be comparatively small if these metals are ultimately fixed in sediments and pore-water concentrations. The aim of the present study is to determine the concentrations of various pollutants (heavy metals, oil and grease, total hydrocarbons) in Uppanar and its bay using chemical and organic analysis in sediment. The bay was the most polluted due to domestic sewage and industrial inputs.

Modern Day – Toxicological Study

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ABSTRACT

Medical toxicology is a subspecialty of medicine focusing on toxicology and providing the diagnosis, management, and prevention of poisoning and other adverse effect due to medications, occupational and environmental toxicants, and biological agents. Toxicity testing of new compounds is essential for drug development process. The preclinical toxicity testing on various biological systems reveals the species-, organ- and dose- specific toxic effects of an investigational product. The toxicity of substances can be observed by (a) studying the accidental exposures to a substance (b) in vitro studies using cells/ cell lines (c) in vivo exposure on experimental animals. Now a day's

research mainly focuses on the various experimental animal models and methods used for toxicity testing of substances. The pre-clinical toxicity testing helps to calculate “No Observed Adverse Effect Level” which is needed to initiate the clinical evaluation of investigational products.

Atrazine Advances Immunomodulation by Altering Melanomacrophage in Spleen and Vascular Changes in the Gills of *Cyprinus carpio*

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ABSTRACT

Atrazine (ATR) is broadly utilized pesticide in rural practices all through world. It has brought about a progression of toxicological and ecological issues, for example, impacts on numerous non-target amphibian species, including fish. Atrazine is known to be an endocrine disruptor and its impacts on gonads have been widely announced, yet the lethal activity on different organs is inadequately recorded. In this paper, we explored the danger of atrazine on the gills and spleens of common carp (*Cyprinus carpio*). The aftereffects of intense poisonous quality tests demonstrated that the 96 h-LC50 of ATR for common carp was resolved to be 2.14 mg/L. They were exposed the 1/10th of the median lathal dose for 21 days. After the exposure period the fishes were sacrificed and the gills and spleens were stained with hematoxylin and eosin and histopathological discoveries were made. The Perls method was utilized on the spleens to recognize hemosiderin, lipofuscin, and melanin colors in the cells from melanomacrophage focuses (MMCs). The spleens were submitted to multiplying cell atomic antigen (PCNA) and inducible nitric oxide synthase (iNOS) immunohistochemistry, and morphometry was utilized to evaluate splenocyte multiplication and melanomacrophage iNOS expression. Vascular changes, venous sinus blockage, column cell hypertrophy, disarrangement of auxiliary lamellae, and epithelial lifting were seen in the gills of ATR exposed carp. Atrazine had an immunomodulatory impact on the spleen, seen by the adjustment in the level of red and white mash, modification of the MMC region, changes in the melanomacrophage color content, slight iNOS concealment, and decline in splenocyte expansion. The outcomes from the subchronic harmfulness test showed that expanding convergence of ATR in nature causes significant hazard for carps, recommending that ATR introduction causes severe immunotoxic effects to common carp.

Potential Anti-Haematotoxic and Antioxidant Effects of Pterostilbene against Fluoride: A Biochemical, Immunological and Histomorphological Changes in the Erythrocytes of Rats

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ABSTRACT

The present study was aimed to determine the toxicity of Sodium NaF on hematological parameters and conceivable approaches to restrain the unfriendly impacts of it using a blueberry stilbenoid, pterostilbene in male albino rats. In the studies reported here, sodium fluoride (25 mg/kg bw) was administrated intragastrically for 28 days to induce toxicity. Pterostilbene (PTSB) was administrated orally (40 mg/ kg bw) along with sodium fluoride treatment of rats by gavage for 28 days resulted in the induction of oxidative stress and immunotoxicity. It was shown here that NaF treatment lowered cellular immunity in the rats as illustrated by a significant diminution in peripheral blood lymphocyte, monocyte and neutrophil counts in conjunction with a reduction in splenocyte counts. Effects of NaF treatment on humoral immunity were reflected here in a lowering of the levels of plasma IgG specific to a test antigen. In the result demonstrated that estimations of blood records in NaF exposed group were essentially lower than that of the control group. Especially, the decrease in RBC count (frailty), leukocyte count (leukocytopenia), monocytosis, eosinopenia, neutrophilia and thrombocytosis on NaF inebriation. Hematological disturbances like microcytic hypochromic frailty and diminished leukocyte count might be connected to the incendiary oxidative impacts of NaF on lymphatic organs. We found that PTSB exhibited considerable antioxidant capacity and inhibited NaF induced oxidative stress in RBC and membrane bound ATPases alterations. Histomorphological alterations in RBC of NaF treated rats further supported our findings. Overall, our study indicates that PTSB could be a useful source of antioxidant agent, functional foods and nutraceuticals, particularly in fluorosis and related complications.

Isolation of Heavy Metal Tolerance Bacteria from Foundry Soil Samples

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ABSTRACT

Rapid increase of population and the increased demand for industrial establishments to meet human needs have created problems such as over exploitation of available resources, increased pollution taking place on land, air and water environment. Heavy metal pollution of soil and wastewater is a significant environmental problem.

The present study deals with isolation and identification and characterization of heavy metal resistant bacteria from foundry soil disposal sites at Namakkal district, Tamil Nadu. The found bacterial colonies were subjected to morphological identification, gram staining and biochemical analysis. From the isolated colonies, the serial dilution techniques were used for characterization of heavy metal tolerance (Zinc) through agar plate and MIC (Minimum Inhibitory Concentration) methods. In this study, totally 6 potential isolates were identified for the biodegradability assay of heavy metals.

Biopesticidal Effect of *Ocimum tenuiflorum* L against The Dengue Vector *Aedes aegypti* L

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ABSTRACT

India is endemic to mosquito-borne diseases due to favorable ecological conditions. Dengue fever (DF), dengue hemorrhagic fever and dengue shock syndrome are public health problems in Tamil Nadu, South India. The use of natural products for the control of insect pests offers an economically viable and eco-friendly approach, besides being harmless to beneficial insects when adopted on a large scale. Chemical pesticides have been used for several decades in controlling pests and vectors of various human diseases as they have a quick knock down effect. However, their indiscriminate use resulted in several problems such as resistance and resurgence of pests, elimination of natural enemies, toxic residues in food, water, air and soil which affect human health and disrupt the ecosystem, leading to the threat that their continued use may further harm the environment. Under such alarming situations, an attempt has made to assess the larvicidal potential of *Ocimum tenuiflorum* L. against the developmental stages of *A.aegypti*, by using ethyl acetate to isolate the polar and non-polar phytochemicals from the leaves of *O. tenuiflorum*. The secondary plant metabolites present in the active *O. tenuiflorum* leaf extract by means of a bioassay by Gas-Chromatography and Mass Spectrometry (GC-MS) analysis.

Antioxidant, Antibacterial Activities of Zinc Oxide Nanoparticles from *Anoectochilus Elatus*

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ABSTRACT

Anoectochilus elatus is an endemic medicinal plant belonging to the family Orchidaceae. The present study is focused to evaluate the in vitro antibacterial and

antioxidant of zinc oxide nanoparticles of *Anoectochilus elatus*. Synthesis of ZnO nanoparticles of *Anoectochilus elatus* revealed for its characterization studies by UV. ZnO nanoparticles of *Anoectochilus elatus* exhibited high antioxidant and free radical scavenging activities. These in vitro assays indicate that this plant extract possess a significant source of natural antioxidant, which might be helpful in preventing the progress of various oxidative stresses. ZnO nanoparticles of *Anoectochilus elatus* tested for antibacterial activity against the tested pathogens. The findings of the present investigation suggest that the ZnO nanoparticles of *Anoectochilus elatus* possess compounds with antibacterial activity and could serve as useful sources for new antibacterial agents. The results obtained in the above proved that the ZnO nanoparticles of *Anoectochilus elatus* possessed strong antioxidant, and antibacterial efficacy in the in vitro systems studied.

3D Structure Modeling of Protein Disulfide Isomerase (PDI) Present in *Homo sapiens*

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ABSTRACT

Proteins play a crucial role in governing several life processes. Stunningly complex networks of proteins perform innumerable functions in every living cell. Knowing the function and structure of proteins is a key for the development of better drugs, higher yield crops and even synthetic bio-fuels. As such knowledge of protein structure and function leads to crucial advances in life sciences and biology. Protein disulfide isomerases (PDIs) catalyze disulfide bond formation between protein and cysteine residues during protein folding in the endoplasmic reticulum (ER) lumen and are essential for maintaining ER homeostasis. The motivation behind the structural determination of proteins is based on the belief that structural information provides insights as to their function, Protein structure prediction is the key inference of the three dimensional structure of a protein from its aminoacid sequence, that is the prediction of its folding and its secondary and tertiary structure from its primary structure. This research focused in structural proteomics analysis of PDI protein. The FASTA format sequence of PDI was retrieved from NCBI databank and stored in a text document (.txt). The physicochemical parameters were found by PROTPARAM tool. The secondary structure properties were analyzed by SOPMA tool, 3D structure was modeled using SWISS PDB viewer using homology modeling technique and the quaternary structure properties were found by Sulfinator, Netphos, Noglyc and Signalp tools. This research yields a valuable clusto of predicting folding and understanding the biochemical function and the 3D structure. Then the status of approaches to biochemical function prediction based on protein sequence and structure is reviewed.

Comparative Effects of Chemical and Biosynthesized (*Leucas Aspera* and Oxy - Cyclodextrin Complex) Zinc Oxide Nanoparticles on Nile Tilapia (*Oreochromis Niloticus*)

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ABSTRACT

Wide application of zinc oxide nanoparticles can induce serious threats to the aquatic environment. The present study aimed at evaluating the effects of dietary nanozinc prepared by chemical method and by green approach in Nile tilapia. Green synthesis combined the plant extract *L. aspera* and oxy-CD complex. DPPH free radical scavenging assay, reducing power assay and antibacterial activity against *Aeromonas hydrophila* and *Streptococcus agalactiae* were greater in green synthesized ZnO NP suspension. After acclimatization, 420 Nile tilapia were randomly distributed into 21 glass tanks with 20 fish per tank in triplicates. Fish were fed control diet without any ZnO NP added, GT1, GT2 and GT3- 100, 200 and 400 mg/kg green synthesized ZnO NP feed, CT1, CT2 and CT3- 100, 200 and 400 mg/kg chemical synthesized ZnO NP feed. After 30 days, samples were analyzed for understanding oxidative stress, histopathological alterations, bioaccumulation of zinc in organs and immune response. The results revealed that GT3 diet significantly ($P < 0.05$) enhanced the level of catalase (CAT), superoxide dismutase (SOD), glutathione peroxidase (Gpx), reduced glutathione (GSH) and glutathione reductase (GR) and activities of lysozyme, myeloperoxidase and respiratory burst. Comparative histological study of liver and gill tissues revealed normal architecture in the tissues of fish fed GT3, whereas the tissues of fish fed CT3 exhibited histological alterations. Bioaccumulation of zinc was liver > muscle > gills. The results suggest that inclusion of GT3 diet (400 mg/kg) enhanced the level of antioxidant enzymes and immune response without causing the organs to undergo histological damage.

Synthesis and Antimicrobial Characterization of Lectin Conjugated Copper Nanoparticles and Its Application in Aquaculture

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ABSTRACT

Innate immune system plays an important role in combating infections in invertebrates. Lectins are glycoproteins which are involved in innate immune response

by helping in neutralizing pathogens by the recognition of Pathogen associated molecular patterns. However, it alone is insufficient to curtail severe infections. Then the antibiotics were extensively used for controlling the spread of bacterial infections. But the over dose and unethical use of antibiotics led to the evolution of several dreadful antibiotic resistant bacteria. Hence, there is an increasing demand for an alternative strategy to treat bacterial infections with no or minimal side effects along with the lack of resistance development on the part of the pathogen. Developments in nanotechnology have revealed metal nanoparticles as promising new generation antibacterial agents. However, the mechanism of action of nanoparticles remains unclear. It is proposed that the NPs can disrupt bacterial membrane integrity, generate reactive oxygen species and result in bacterial cell damage. But the overdosage of nanoparticles may lead to bioaccumulation which is another serious issue. Thus lectins, having antibacterial property, which are isolated from shellfish when conjugated with nanoparticles will enhance its antibacterial activity and in turn can help in combating bacterial infections at a minimum concentration of nanoparticles which are safe. In the present study we have synthesized lectin coated nanoparticles and characterized their functional properties including, antibacterial activity by zone of inhibition assay, lipid peroxidase assay, membrane integrity study etc. Thus after proper further research and findings this conjugate can be used as a biological tool in aquaculture.

Amino Acid and Fatty Acid Composition of Some Common Marine Brown Algae from Mandapam Region, South East Coast of India

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ABSTRACT

Seaweeds are a commercially important and renewable marine resource. Eight species of marine macro brown algae, *Sargassum wightii*, *Padina tetrastromatica*, *Chnoospora minima*, *Hormophysa triquetra*, *Sargassum myriocystum*, *S.plagiophyllum*, *S. ilicifolium* and *Turbinaria decurrens* collected from Gulf of Mannar, near Mandapam Coast, Tamil Nadu were investigated for their amino acid and fatty acid composition. Amino acids were analyzed using HPLC (High Performance Liquid Chromatography) unit and Fatty acids were identified and quantified as FAME (Fatty Acid Methyl Ester) using GC-MS (Gas chromatography Mass Spectrophotometer) unit. This study revealed that Aspartic acid and Asparagine are the most abundant amino acids in most of the species with Glycine in *T.decurrens* and Leucine in *P.tetrastromatica*. Saturated fatty acids were more than unsaturated fatty acids with Palmitic and Stearic acid as the major component. Oleic acid was the most commonly occurring mono unsaturated fatty acids. In conclusion, results indicated that brown seaweeds can be considered as alternative source of amino acid and fatty acid for feed supplement and animal nutrition.

Screening of Active Component(S) Present in the Ethanolic Extract of Lemongrass (*Cymbopogon Citratus*) Using GC-MS

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ABSTRACT

Commercially available chemical-based insecticides and repellents are known to contain harmful and poisonous compounds which could pose threats to human health and toxicity to non-target organisms. Mosquitoes have been implicated in the transmission of very debilitating and deadly diseases to humans; such as malaria, filariasis, dengue fever and yellow fever. The control method using chemical insecticide has been known as many side effects for human as well as environment. To solving this problem, the safety control method is needed and it may be using bio-insecticide. Now we are using many bio-insecticides for example lemongrass crude extract has been reported that it has mosquito repellent effect. Hence, the present study is aimed to identify its active compound(s) using GC-MS. This analysis revealed nearly 19 active compounds in the ethanolic extract of *Cymbopogon citrates*. Among them, the compounds 9,12,15 octadecatrienoic acid and dodecanoic acid are present in high area percentage when compared to other compounds. The present study conclude that the extract can be used for the production of chemical-free and safe insect repellent and insecticide for vector control in the fight against diseases.

Vitamin Content in Prawns Collected from Different Niches in and Around Thanjavur

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ABSTRACT

Nutritional properties of commercial shrimps and prawn of wild origin was comparatively study between *Penaeus monodon*, *Penaeus indicus* and *Macrobrachium rosenbergii* these are collected along the Thanjavur district, fresh water niche-I Thirukattupalli, Kaveri River, Niche-II brackish water Kollukadu estuary and Sethubava chattram marine Niche-III. Water soluble and fat soluble vitamins in the Prawn muscle was determined by HPLC with UV-visible diode array detector. Fresh water prawn *M. rosenbergii* was found to be high and low (0.10 ± 0.20 mg/100g) in vitamin D. The highest value Vitamin D (0.21 ± 0.04 mg/100g) was estimated and lowest value of vitamin E was noted (0.017 ± 0.02 mg/100g) in estuarine shrimp *P.indicus*. The highest value of vitamin D (0.19 ± 0.03 mg/100g) was estimated and lowest value of vitamin E was recorded (0.11 ± 0.03 mg/100g) in marine shrimp *P. monodon*. Comparatively highest

value of vitamin D (0.21 ± 0.04 mg/100g) was observed in estuarine shrimp *P. indicus* and also lowest value (0.10 ± 0.02 mg/100g) was observed in fresh water prawn *M. rosenbergii* the maximum value vitamin B9 (0.74 ± 0.07 mg/100g) was noted and minimum vitamin B12 was recorded (0.11 ± 0.01 mg/100g) in the fresh water prawn *M. rosenbergii*. Shrimp *P. indicus* was found to be high (1.34 ± 0.06 mg/100g) in vitamin B9 and low (0.11 ± 0.01 mg/100g) in vitamin B12. The highest value of vitamin B9 (1.02 ± 0.07 mg/100g) was estimated and lowest values of vitamins B12 was noted (0.10 ± 0.02 mg/100g) in the marine shrimp *P. monodon*. The maximum vitamin B9 (1.34 ± 0.06 mg/100g) was noted in estuarine shrimp *P. indicus* and minimum vitamin B12 was recorded (0.10 ± 0.02 mg/100g) in marine shrimp *P. monodon*. High vitamins were observed in the estuarine shrimp *P. indicus*. This may be due to the diet which they consume and their ecological conditions.

Studies on Cultivation Aspects of Milky Mushroom *Tricholoma giganteum* (Masse.)

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ABSTRACT

Cultivation of *Tricholoma giganteum* (TGSLM) is considered as novel and important emerging edible mushroom under Tamil Nadu conditions. Oyster and button mushrooms are cultivated from September to March, and during summer there is no such mushrooms which can fulfill the gap. Hence, the present investigation was conducted on milky mushroom (*T.giganteum*) collection, cultivation and standardization. Morphological characters of the isolate of *T. giganteum* collected from Yercaud Hills are found very much similar to the isolate of *T. giganteum* M4 but varied slightly with *Calocybe indica*. Sorghum grain substrate was found to be superior for spawn production and yield performance of *T. giganteum*. Paddy straw was found to be the best substrate, which gave maximum yield (1698.14 g/bed) for production of *T. giganteum*. Casing with red soil + sand (1:1) showed better performance and recorded the maximum yield.

Efficacy of Amistar Xtra 280 SC (Azoxystrobin 18.2% + Cyproconazole 7.3%) Against Maize Downy Mildew Caused by *Peronosclerospora sorghi*

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ABSTRACT

The efficacy of combination fungicide Amistar Xtra 280 SC (Azoxystrobin 18.2% + Cyproconazole 7.3%) was tested against maize downy mildew diseases. The

two season field trials results revealed that the disease incidence of maize downy mildew was effectively managed by Amistar Xtra 280 SC. Amistar Xtra 280 SC @ 1.25 ml/lit was highly effective against maize downy mildew disease appeared on leaves, which recorded 85.28 and 82.57 per cent control over untreated check in first and second season respectively. This was at par with Amistar Xtra 280 SC @ 1.0 ml/lit (84.56 and 82.06%) in both seasons. Untreated check plots recorded a PDI of 42.12 and 48.90 at 15 days after 2nd spray in first and second season respectively. Amistar Xtra 280 SC at 1.25 and 1.0 ml/lit dose rates recorded significantly higher maize grain yield of 7.45 and 7.30 t/ha in first season and 8.13 and 8.0 t/ha in second season which were on par with each other. Amistar Xtra 280 SC @ 1.25 and 2.5 ml/lit dose rates tested for its phytotoxicity studies did not show any phytotoxic symptoms like leaf injury, wilting, vein clearing, necrosis, epinasty and hyponasty at any day after treatments on maize crop. Amistar Xtra 280 SC @ 1.0 ml/lit rate can be recommended for the effective control of downy mildew diseases in maize.

Impact of Heavy Metal, Chromium on Biochemical and Histoarchitectural Changes in Liver of Freshwater Fish, *Channa striatus* (BLOCH)

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ABSTRACT

Aquatic organisms have ability to accumulate heavy metals from various sources mainly effluents discharged from factories, industries and mills nearby aquatic medium. Heavy metals are non-biodegradable and consider as major environmental pollutants causing pathological effects in aquatic organisms. Fish have been considered excellent indicators for heavy metals contamination in aquatic ecosystems. Fish are consumed throughout the world by man and the fishes were captured from the polluted aquatic medium by rural people, sold in a market through food chain the heavy metals reach human beings and affect their health. It is essential to examine the toxic impacts of heavy metals on fish since they constitute a link in food chain and their contamination by heavy metal causes imbalances in aquatic ecosystem. The fish exposed to heavy metal concentrations, organs of fish may chromium which can lead to redox reactions generating free radicals and therefore, may cause biochemical and morphological alterations. The aim of the present study was to assess the transaminases (ALT and AST) enzymes, antioxidants like superoxide dismutase (SOD), catalase (CAT), reduced glutathione (GSH), lipid peroxidation (TBARS) and histopathological alterations in liver of *Channa striatus* was exposed to sublethal concentrations of chromium for the period

of 10, 20 and 30 days. The fish exposed to chromium showed a declined the ALT, AST, SOD, CAT and GSH activities whereas lipid peroxidation level was increased in the liver for 10, 20 and 30 days when compared with control. More over histoarchitectural changes showed necrosis, ruptured hepatocytes, space formation, vacuolization, aggregation of nucleus, enlargement of hepatocytes and hypertrophy in liver. The objective of the present investigation was to observe the effect of chromium on biochemical and histoarchitectural changes in liver of *Channa striatus*.

Bioaugmentation process for removing heavy metals from aqueous solution using fallen tree leaves of *Acanthophora spicifera*

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ABSTRACT

Biosorption has emerged as a cost-effective and efficient alternative technology for removal of heavy metals. In the present study the biosorption of heavy metals by an algal species, *Acanthophora spicifera* was evaluated. Acid digestion method and batch biosorption method was used to evaluate the efficiency of biosorption by *A. spicifera*. The effect of biomass dosage of *A. spicifera* (1-30g/L) on biosorption of metal ions Cr (VI), Cr (III), Pb (II), Cd (II) and Hg (II) was also studied. Acid digestion method showed maximum biosorption of Pb (II) (93.61%) whereas the batch biosorption method showed maximum biosorption of Cr (VI) (96.36%) followed by Hg (II) (96.20%), Cd (II) (92.68%), Pb (II) (51.84%), and Cr (III) (50.29%) in the order of (Cr (VI) > Hg (II) > Cd (II) > Pb (II) > Cr (III)). The biosorption was biomass dosage dependent and increase of biomass increased the biosorption process. The maximum biosorption of the metal ions was attained at a biomass dosage of 25g/L. Fourier transform infrared absorption spectra indicated the chemical interactions between the hydrogen atoms of carboxyl (-COOH), hydroxyl (-CHOH) and amine (-NH₂) groups of biomass with metal ions. Scanning electron microscopy revealed the enlargement size and surface modification of biomass. The results of our study suggest that seaweed biomass can be used efficiently for biosorption of heavy metals.

Immuno-modulatory Effect of Cinnamaldehyde in *Channa Striatus* against *Aphanomyces Invadans*

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ABSTRACT

Madecassic acid is a natural triterpene used in the present study as dietary supplementation to Labeo rohita against *Argulus siamensis* for the first time. Healthy and infected groups fed with 5 mg kg⁻¹ of madecassic acid supplemented diet at 5 mg kg⁻¹ significantly increased white blood cell (WBC) count after 4th week, while it was observed with 10 mg kg⁻¹ diet after 6th week and with 1 mg kg⁻¹ diet only on 8th week. Both groups treated with 5 mg kg⁻¹ of madecassic acid diet significantly increased serum total protein (TP), albumin (AB), and globulin (GB) at 6th week; with other doses diet noted only after 6th week. The lysozyme enzyme activity significantly ($p < 0.05$) increased in both groups with all doses of the diets. Group, haemolytic complement activity and lymphokine production index were significantly increased with 5 mg kg⁻¹ supplemented diet on 4th week and other diet after 6th week. The phagocytic activity significantly increased with 5 mg kg⁻¹ diet after 6th week while the SOD activity with 5 mg kg⁻¹ diet after 4th week. TNF α and TLR22 genes were up-regulation in head kidney tissue in both groups with 5 mg kg⁻¹ diet on 6th week whereas the CC3 and CXCa genes up-regulation with 5 mg kg⁻¹ diet on 4th week. In both groups fed with 5 mg kg⁻¹ diet, the lysozyme C and G, β 2-M, and transferrin genes were significant up-regulation after 6th week. The present study suggested that the immune system of rohu fed with madecassic acid at 5 mg kg⁻¹ level significantly modulated both the innate-adaptive immune response and expression of immune cytokine genes.

The Study of Fish Ladder of Migratory Species in The Wellington Lake, Cuddalore District, Tamilnadu

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ABSTRACT

Fisheries sector is one of the important food production sector in the State contributing to the livelihood as well as food security of a large section of the economically under-privileged population. In recent years, it has assumed greater significance and its contribution towards the State and the National economy in terms of livelihood and nutritional security, rural employment generation and foreign exchange

earnings have been enormous. Fisheries include marine, freshwater and brackish water subsectors. It is unique in terms of demographics - sparsely populated reservoir periphery, very low primary productivity, relatively less diversity in fish species and a typical institutional arrangement for benefit sharing and marketing. Reservoir are constructed not only to suppress floods and store water but also to quench the water supply, agricultural and industrial thirst. They have wiped out species, flooded huge areas of farmlands and forests; and displaced millions of people. Fish ladders are constructed to mitigate the effect of Reservoirs on migratory fishes. These are the structures that allow fish passage from downstream region of a river to upstream spawning area. India is the second biggest inland fish producer in the world but there is scarcely any fish ladder that is in operation. The study attempts to give consists of the fish ladder across the world and their efficiency; also to analyze if fish passages only provide one way movement to migratory fishes at Wellington Lake, Cuddalore District, Tamilnadu by analyzing the data obtained both using primary and from secondary sources. Results suggest that if guidance and entry conditions can be improved, this fishway design holds promise as an effective solution for providing passage in both directions.

BIO DIVERSITY – A Overview

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ABSTRACT

Biological diversity is the sum total of diversity in the biosphere around the planet earth in terms of number, variety and variability of all living organisms. Biodiversity (Biological diversity) is termed as the variability among the living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and ecological complexes in which they are the part, and this includes diversity within species, between species and of the ecosystems. Biodiversity facilitates processes of renewal of biomass, soil, water, and air, free recycling and purification in nature. The subset of biological diversity related to agriculture is known as agro biodiversity. It is defined as the diversity of the agricultural systems – all agriculture related species and individuals within the species. Individuals within the species include all flora and fauna – plants, animals, birds, reptiles amphibians, insects, soil organisms and others agriculture related organisms related to food production. Agro biodiversity is the basis of stability in agricultural production, livelihood of farming households and communities, sustainable development and resources for further development of improved strains. A rich agro biodiversity could provide both socio-economic and ecological benefits and thus it is important to both agriculture and society. The underlying important aspect of the need to

understand agro biodiversity is that it provides genetic resources of actual or potential value for further improvement value for further improvement of agriculture productivity and production. The current estimates vary drastically – 8- 125 million species. The best estimates, however, range between 10 and 13 million species. In India, according to the First National Report on Biological Diversity (MOEF, 1998) submitted to the convention on Biological Diversity (CBD), nearly 0.127 million biological species have been identified so far. Out of which 45.4 thousand belonged to plant kingdom and 81.3 thousand to animal kingdom. In India, 70% area of the country has been surveyed by the Botanical survey of India since 1890. India figures among the biodiversity rich countries in the world, having about 7.5 % of the identified biological species or nearly 2.5 of the global land-mass. It represents diverse ecosystems across their humid tropics to semi-arid, temperate and alpine regions. In terms of plant species, about 17500 species of higher plants estimated to occur in the country in its 16 major vegetation types. About 33% of the species are endemic. More than two dozen crop-plant species, besides some farm animals, particularly befalls, were domesticated by the Indians. There are more than 380 cultivated/semi-cultivated more crop species and 130 breeds of domesticated animals and poultry in the country. Rich crop diversity is available in India in terms of both between and within species. Land races, traditional cultivars and farmer's varieties in several agric- hoot – cultural plant species are abundant. Reports have indicated that more than 380 crop- plants are cultivated in India. It helps in providing stability in farming systems through a range inter and intra specific characteristics. Provides insurance against changing environments and embodies characteristics that are potentially valuable, but not yet exploited.

Marine Ornamental Fish

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ABSTARCT

Brazil is one of the leading exporters of ornamental fishes, mostly fresh water; however, monitoring of the trade is nearly non-existent in the country. This paper provides an intial assessment of a new venture, the marine acquriam fish trade at ceara state, northeast Brazil, aiming to document the species traded, to provide preliminary estimates of numbers of specimens traded, and to identify priorities in data collection and monitiring. A total of 143 species and 199, 304 species for were traded. From the total 109 species were negative and represented 84% of the fishes traded. Thirty four exotic species figured on the permit and amounted to nearly 16% of the exports; however most of them consist of misidentified native species. Nearly 19% of the fgish trade was directed of the internation market. Official figures represent an under estimation of the total number of captured specimens.

Protective Role of Forests in Conservation of Natural Resources

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ABSTRACT

Forests form an effective sink for the carbon dioxide produced as a result of animal respiration, burning of fossil fuels, volcanoes and other natural and human-induced phenomenon. And if that is not all, a by-product of photosynthesis is oxygen. Thus, the Amazon forests are the Earth's air purifiers, given the large amounts of carbon dioxide they absorb from the atmosphere. Forests play a significant role in maintaining the CO₂ balance in the atmosphere without sufficient forest cover all the CO₂ released in the atmosphere will not be utilised, resulting in a higher per cent of CO₂ in the atmosphere. According to scientists, this will result in warming of the world temperature; disturbance in the climate etc., The CO₂ percent in the atmosphere has already reached 0.042 per cent against the normal of 0.03%. If this increases continuously higher temperature and other disturbances on the earth may bring unimaginable miseries to mankind. Forests increase local precipitation by about 5 to 10% due to their orographic and microclimatic effect and create conditions favourable for the condensation of clouds. Forests reduce temperature and increase humidity. It also reduces evaporation losses. Forests maintain the productivity of the soil through adding a large quantity of organic matter and recycling of nutrients. The leaves are used as manure. Tree crowns reduce the violence of rain and check splash erosion. Forests increase the infiltration and water holding capacity of the soil, resulting in much lower surface runoff. This in turn results in checking of soil erosion. Forests check floods. Forests intercept 15 to 30% of the caused due to siltation of river channels caused due to erosion. Forests and trees reduce wind velocity considerably. Reduction of wind velocity causes considerable reduction in wind erosion, checks shifting of sand dunes and halts the process of desertification. Forests by reducing erosion check the siltation of irrigation and hydel resources. Rapid siltation of various reservoirs in the country is the result of deforestation in the catchment areas of these reservoirs. Forests protect us from physical, chemical and noise pollution, dust and other particulates and gaseous pollutants cause serious health problems. Forests protect us from these pollutants. Forests and trees provide shelter and wind break effect which is beneficial to agricultural crops, particularly in arid and semiarid areas and increase agricultural production. Trees act as a habitat for wildlife.

Limulus ameobocyte Lysate (LAL)

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ABSTRACT

Limulus ameobocyte lysate (LAL) is an aqueous extract of blood cells (amoebocytes) from the horseshoe crab, *Limulus Polyphemus*. LAL reagent reacts with bacterial endotoxin and lipopolysaccharide (LPS), which is a membrane constituent of

Gram-negative bacteria. This reaction is the base on the LAL reagent, which is then used for the finding and quantification of bacterial endotoxins. The Gel Clot LAL test provides very simple positive or negative result and is most often mentioned in international pharmacopeia monographs as the official test. Gel Clot assay is a qualitative LAL test for detection of Gram-negative bacteria endotoxins. The Gel Clot assay is run in tubes that are placed in a water bath or in dry heated oven at 37°C. After a one-hour incubation period, the tubes are flipped 180°. A firm clot that stays in the bottom of the tube indicates a positive reaction. If the liquid flows down the side of the tube, the result is negative for endotoxins.

ORAL PRESENTATION - MISCELLANEOUS

A Review on Cadmium toxicity in fish

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ABSTRACT

Natural pollutants have unsafe effect on living life form present on this planet. Natural pollutants give terrible effect on the soundness of animals just as individuals and have been classified as substantial metals, pesticides and so forth. Cadmium and its compounds are most regular natural toxicants with potential for bioaccumulation and determination in the body and produce adaptable biotic changes in the sea-going environment. Observing dangerous metal level in sea-going environment (particularly fish) is the need of the mindfulness from general wellbeing perspective. It presumed that our fishes likewise convey great amount of cadmium. It is gathered from the investigation that evacuation of tissues that collect largest amounts of cadmium for example kidney and liver may diminish the odds of danger because of this metal in human shoppers and in creatures bolstered with fishmeal.

Hepatoprotective Effect of *Asteracantha longifolia* (Nees) Leaves on Thioacetamide Induced Hepatotoxicity on Male Albino Wistar rats

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ABSTARCT

The aim of this present study is to observe the activity of methanol extract of *Asteracantha longifolia* leaves in curative the damaged liver induced by single dose of

thioacetamide. This current study was conducted using Wistar rats divided into six groups. Group 1 was the normal control group. Group 2,3,4,5 and 6 received single dose of thioacetamide to induce hepatotoxicity, Group 2 served as negative control, Groups 3,4 and 5 received *Asteracantha longifolia* methanolic extract at the dose level of 50, 100 and 200 mg/kg respectively for 28 days, Group 6 received silymarin 25 mg/kg b.w (positive control) for 28 days. After that, hepatoprotective activity was carried out towards parameters of AST, ALT, ALP and histopathology of the liver. The present results showed that single dose of 100 mg/kg b.w thioacetamide can cause liver damage which can be seen by the increasing levels of AST, ALT, ALP compared to the normal group ($p < 0.05$). The usage of three doses of *Asteracantha longifolia* methanolic extract of leaves for 28 days showed the curative effect by increasing the level of AST, ALT and ALP compared to normal control and standard drug control group ($p < 0.05$). Furthermore, the histopathology study revealed that the various doses of extract could protect the liver. The *Asteracantha longifolia* at the doses was given for 28 days can curative the liver from the damage caused by a single dose of thioacetamide.

Lecithinase Production and Cholesterol Degradation Potential of Gut Microbiota

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ABSTRACT

Gut microbiota are largely responsible for the overall health of the host. Recent works on gut microbiota reveals that alteration in the species and composition of the gut microbiota plays a role in the development of diseases in human beings. Fecal samples were collected from two individuals and 15 bacterial isolates were obtained by isolation on MRS agar. Two of the isolates were gram positive rods and 13 were gram positive coccobacilli. The isolates were tested for Lecithinase activity, using Tryptic Soy Agar, emulsified with egg yolk as egg yolk contains lecithin as its common compound. The isolates were also tested for their potential for Cholesterol degradation using Minimal Salt Media, with Cholesterol as the sole Carbon source. Microbes which have the ability to produce the enzyme cholesterol oxido reductase will be oxidising the cholesterol and in turn breakdown into fatty acids, which can be studied by the formation of clear zone around the organisms. The results are presented in the paper.

Antibiotic Resistance among Bacterial Isolates from Human Faecal Microbiota

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ABSTRACT

Microbiome was first defined by Joshua Lederberg as the ecological community of commensal, symbiotic, and pathogenic microorganisms that share our body space. The mixture of microorganisms regularly found at any anatomical site is referred to as the normal microbiota. Human microbiomes present complex ecosystems involving bacteria, viruses, archaea or eukaryotes that are coevolving in an atmosphere subject to various selective pressures, such as antibiotic administration, diet and lifestyle. The human gut microbiota plays an important role in health and disease of the host. The microbiota is often exposed to a variety of antimicrobial agents, such as antibiotics. The antibiotic susceptibility pattern of the members of the microbiota will be useful in understanding their resistance phenomenon and possible transfer of this resistance to other microorganisms within the microbiota. In the present study 30 Gram negative bacterial isolates from human faecal samples of healthy individuals are tested for their antibiotic susceptibility. Ten antibiotics were used in the study and among them all the antibiotics except Amoxyclav were effective against the isolates tested. The study shows that isolates from human faecal microbiota have not acquired resistance against most of the antibiotics currently in use.

Fishery Resources at Agatti and Kavaratti Islands of Lakshadweep Sea

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ABSTRACT

The presents study is under taken to have a detailed survey on commercially important fish landings in the Agatti and Kavaratti islands, Lakshadweep Sea from January to December 2016. Seasonal (winter, summer, summer monsoon and winter monsoon) survey was carried out and 59 species of commercially important fishes were recorded which belongs to 9 orders and 33 families. Among the surveyed families, Scombridae was found dominant followed by Carangidae, Lutjanidae and Mullidae. Katsumonu Splelamis is maximum number reported. The study indicates that the fishery resources in the islands have clear variation among seasons. Highest fish landings were noticed during summer monsoon season when compared to other seasons. The environmental parameters such as Sea Surface Temperature (SST), pH, salinity and dissolved oxygen were also measured and correlated with fish landings.

Antioxidant and Antitumour Activity of Acid Soluble Collagen Extracted From Freshwater Snakehead Fish *Channa Striatus*

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ABSTRACT

Fish have often been called the poor man's source of animal protein. The systematic use of fish concentrate has long proven advantageous in animal husbandry and there is growing recognition of its potential for improving human nutrition and health. *Channa striatus*, or snakehead murrel, is an obligate air-breathing freshwater fish which inhabits all types of water bodies. *C. striatus* is commonly consumed as a food fish. *C. striatus* is recorded as high medicinal properties containing fish. The popularity of *C. striatus* as a therapeutic agent is known to folk medicine in its efficacy in treating wounds, relieving pain and boosting energy in the sick and elderly. Hence in the present study effort has been made to study the antitumour and antioxidant activity of the acid soluble collagen isolated from the freshwater snakehead fish *C. striatus*. The acid soluble collagen extracted freshwater snakehead fish was tested against cancer cells (human colon cancer (HT-29) and human breast adenocarcinoma) at different concentrations. Similarly the free radical scavenging capability was also tested for the acid soluble collagen. The result revealed that the acid soluble collagen extracted from freshwater snakehead fish *C. striatus* exerts both antioxidant and anticancer activity. Whereas at lower concentration the acid soluble collagen has not much effect on the normal Vero cell line having 95 % cell viability which shows a new way for using as medicine against cancer.

Molecular Docking Studies of Phenol, 2- methoxy-3 - (1- propenyl) - From *Pimenta Dioica* with Target Dipeptidyl Peptidase-1V (dpp-1V) related to Type -2 Diabetes

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ABSTRACT

Computational biology and bioinformatics have the potential not only in speeding up the drug discovery process for diseases such as diabetes mellitus by reducing the costs, but also in changing the way drugs are designed. Rational Drug Design helps to facilitate and fasten up the process of drug designing, which includes various methods for identifying novel compounds. One of such methods is the docking of the drug molecules with the receptor proteins that acts as the targets. Diabetes mellitus is one of the most common chronic diseases across the world and the number of diabetic patients

is on the rise. *Pimenta dioica*, commonly known as Allspice was used by early Central American civilizations as a flavoring for chocolate. The botanical name of allspice is *Pimenta dioica* (L) Merr, and it belongs to Myrtaceae family. It possesses an aromatic taste and flavour resembling a mixture of cinnamon, Cloves and nutmeg, and hence the name allspice. Dipeptidyl peptidase - 1V (DPP -1V) is a multifunctional protein involved in many physiological processes such as a binding protein, receptor and proteolytic enzyme. DPP-1V was discovered in the late 80's, as a serine peptidase belonging to the S9b protein family. DPP -1V has become an attractive target of drug discovery and diabetes treatment.

Disease and Diagnosis - Leukemia

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ABSTRACT

Leukemia is a cancer of white blood cells. It is characterized by an abnormal accumulation of WBC in the bone marrow which leads to bone marrow failure and is manifested in form of anemia and thrombocytopenia. This arises from neoplastic transformation usually of a single cell. There are four common types of leukemia: 1) Acute lymphoblastic leukemia; 2) Acute myeloblastic leukemia; 3) Chronic lymphocytic leukemia; and chronic myeloid/ myelocytic leukemia. The study was designed to find out the predominant type of leukemia. 80 leukemia cases which comprised of all bone marrow aspirates and peripheral blood slide results with specific age, sex and ward of the patients was analyzed in the hematology laboratory. The study was revealed that leukemia occurred in following order of types of predominant that is AML 15(18.75%), CLL 12 (15%) and least type was CML 11(13.75%). The result also showed that the most affected age group by all age. From the study a male preponderance (M:F) of 4:3 was found in cases of ALL. The study emphasizes that special staining techniques be adopted in diagnosing and typing of leukemia.

Nipah Virus and the Outbreak of the Disease, Transmission, The Symptoms and The Diagnosis Method

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ABSTRACT

Human Nipah virus infection is an emerging zoonotic disease which was first recognized in a large outbreak of 276 reported cases in Malaysia and Singapore from September 1988 to May 1999. The first identification of Nipah virus as a cause of an outbreak of Encephalitis was reported in 2001 in Meherpur district of Bangladesh. There is circumstantial evidence of human to human transmission in India the same year.

During the outbreak in Siliguri, 33 health workers and hospital visitors became ill after exposure to patients hospitalized with Nipah virus illness. Nipah cases tend to occur in a cluster or as an outbreak. The virus can travel from infected bats to pigs to humans or directly to humans from bats. Large fruit bats of Pteropus genus are the natural reservoir of NiV. Nipah virus causes severe illness characterized by inflammation of the brain (encephalitis) or respiratory diseases. Currently there is no known treatment or vaccine available for either people or animals and treatment is limited to supporting care. Nipah virus is one of the pathogens in the WHO Research & Development (R&D) blueprint of epidemic threats needing urgent R&D action.

Antibacterial and Antioxidant Activities of *Rhizophora mucronata* lam., a Mangroove Plant of Pitchawaram

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ABSTRACT

Medicinal plants carry the essential therapeutic aids for such infectious diseases. As such, the present study was focused on phytochemical screening, antioxidant activity and antibacterial activity of *Rhizophora mucronata* Lam., it is belongs to the family Rhizophoraceae. The leaf extracts for the treatment of urinary tract infections. A total of 20 urine samples were collected and tested for the prevalence of infection. Escherichia coli (26%) and Klebsiella pneumoniae (20%) were found to be the main cause of UTI, when compared to other isolates. Our results also indicated that around 65% of females were affected with UTI than male (34%). The phytochemical screening of different solvent extracts of *Rhizophora mucronata* leaf showed the presence of secondary metabolites such as alkaloids, flavonoids, steroids, tannins, triterpenoids and phytosterols. The antioxidant activity of *Rhizophora mucronata* was determined by DPPH radical scavenging activity and phosphomolybdenum reduction assay. The methanol extracts of leaves showed higher antioxidant activity than acetone, ethyl acetate and water extracts. The antibacterial activity of six different solvent extracts of *Rhizophora mucronata* leaf was determined by agar well diffusion method. The results were found promising with significant zones of inhibition ranging from 9-18 mm, against all the tested bacterial strains. The ethanolic extracts of *Rhizophora mucronata* leaf showed maximum activity against Staphylococcus aureus and Escherichia coli. Hence, the present study concludes that leaves of *Rhizophora mucronata* are rich in natural antioxidants and a possible source for the production of new antibacterial drugs.

Plastics in the Environment and Its Effects on Living Organisms

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ABSTRACT

Most of the plastics are designed to degrade speedily, such as Oxo degradable and while they may become less noticeable, they are still present in the environment. In marine environments, filter-feeding organisms ingest the fragments of plastics. So that some plastic may be designed to degrade quickly, it is still present in the environment. Floating plastic waste that can survive thousands of years in water can serve as a transportation device for invasive species that disrupt habitats. Plastic has enabled advances in the quality of life through advantages in processing, ease of packaging, boom in industry, and overall convenience, it has proved to be harmful to living organisms; plastic also harms habitat in the form of pollution, contamination, and particularly through its quality of persistence. Fortunately, society has documented this problem and is in hot pursuit of ways to combat these negative environmental effects as they become a huge problem. To raise public awareness, the regional and national different levels of educational curriculums must comprise the waste management systems from the grass-roots as information resources. In addition to creating public awareness on the significance of a healthy environment, mechanisms of monitoring the generation of wastes at the source, substitute disposal ways, establishing extra drop-off areas (landfills) and incineration mechanisms, plastic reusing facilities are also suggested.

Histological studies on the lymphoid organs and Mucus Associated Lymphoid Tissues (MALT) in *Heterotneustes fossilis*

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ABSTRACT

The present study focused on the lymphoid organs Thymus, spleen, pronephros and mucus associated lymphoid tissues in *H.fossilis*. Histoarchitecture of lymphoid organs and Intra epithelial leucocytes (IEL) and Intra laminal lucocytes (ILL) were studied and discussed in details in relation to defence mechanism in fish.

Health Risk Assessment of Heavy Metals in Soils near Coastal Area, Cuddalore

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ABSTRACT

This Study was carried out to investigate the level heavy metals in soils in and around SIPCOT region of Cuddalore District. Heavy metal concentration in soil is a sum of metals originating from natural processes and human activities. It is estimated that the contribution of metals from anthropogenic sources in soil is higher than the contribution from natural ones. A total of 11 soil samples were collected from the investigated area. The order of dominance of the heavy metal concentration levels of the soil samples are Fe>Zn>Cr>Ni>Cu>Pb. The degree of contamination was also assessed by using the enrichment factor to understand the distribution of the elements of anthropogenic factor. The test results revealed that the heavy metals originated from many sources such as runoff due to rainfall and anthropogenic activities in the study area. These sources cause annoyance in environment and changes occurred in the geochemical concentrations ratio of metals and thus increase the metals concentration from their standard range. Therefore, this study recommends that the regular assessment of the heavy metals present in soil to evade human health risks.

A Research on Environmental Issues in Wastewater and Recent Wastewater Treatment Technology

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ABSTRACT

Textile industries are the source of environmental pollution on terms of quality as well as quantity. The textile industries consume large quantities of water out of which around 90% is appeared as wastewater. Textile wastewater contains dye as the major pollutant not only recalcitrant but also imparts intense color to the waste effluent. Improper disposal of textile wastewater causes serious environmental problems affecting the aquatic organism adversely. The present study deals with the detailed study of environmental issues and treatment options. The industry generates huge amount of wastewater contains toxic pollutants. Several treatment technologies are using now days with high efficiency and from the study it was found that hybrid upflow anaerobic sludge blanket reactor (HUASBR) is very effective in terms of pollutants removal efficiency as well as cost requirement.

Evaluation of phytochemical screening and antibacterial activity of ethanolic extract of *Solanum Lycopersicum*

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ABSTRACT

The antibacterial activities of the extract of *Solanum lycopersicum* L were evaluated against five bacteria: *Staphylococcus aureus*, *Bacillus subtilis*, *Streptococcus pyrogenes*, *Pseudomonas aeruginosa* *Bacillus cereus*, *E.Coli* and fungal strains such as *Candida albicans*, *A.niger*, Ethanolic extract (SEE) of *Solanum lycopersicum* L were obtained by standard methods. The antibacterial activity was assayed using agar well diffusion method. The SEE exhibited antibacterial effects with inhibiting zones ranging from 2.09±0.01 mm to 7.53±0.01 mm. The extract showed appreciable quantity of total phenol (Gallic acid equivalent) of 22.12 Mg GAE/g. The higher phenolic content of SEE may be responsible for its antibacterial activity. This study shows that useful bioactives component that can be used in food processing industries.

Studies on Bacterial Association in Skin Epidermal Mucus of Fish (*Brachirus orientali*)

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ABSTRACT

One of the most nutrient-rich surfaces available to aquatic pathogens is mucosal surfaces of fish, in particular, the skin mucous surface (SMS). The bacterial population colonizing internal and external surface also emphasise strongly on the health status of fishes, thus fish mucus can include benefit, opportunist and pathogen bacteria. The bacterial population includes aerobic and anaerobic strains, in the skin mucus. The fish (*Brachirus orientali*) was collected from Annakovil (Lat, 11° 21' 32.27 N Long 79 °49' 24.92 E). The present investigation was aimed to check the presence of bacterial strains in the fish skin mucus by various biochemical testing and microscopic examination. The following pathogenic strains were isolated. They are *Vibrio* sp, *Staphylococcus* sp, *Klebsiella* sp. and *E. coli*. The fish skin mucus seems to have an important selective role to discriminate between pathogenic and commensal bacterial strains and it plays a critical role in the defence mechanisms of the fishes by also acting as a biological barrier.

Optimization of Free Cooling Using PCM Filled Air Heat Exchanger for Energy Efficiency in Building

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ABSTRACT

Power shortage and unstable power supply remain serious problems. Conventional cooling technologies that utilize harmful refrigerants consume more energy and cause peak loads leading to negative environmental impacts. As the world grapples with the energy and environmental crisis, there is an urgent need to develop and promote environmentally benign sustainable cooling technologies. Thermal storage systems are essential to overcome the disadvantage of the intermittent nature of energy and variation in cooling demand. The advantages of LHTES in comparison with sensible storage are a greater density of stored energy and a narrow operational temperature range. In this work empirical relationships were developed to estimate the PCM temperatures during charging and discharging by incorporating independent heat exchanger parameters (mass flow rate of air, air inlet temperature, charging and discharging time) using statistical design of experiments (DoE) concept. A central composite rotatable design with three factors and five levels was chosen to minimize the number of experimental conditions. Within the scope of the design space, the mass flow rate and the charging and discharging time appeared to be the most significant two parameters affecting the PCM temperature among the three investigated heat transfer parameters. Further, ANOVA analysis also proved that all the considered factors are significant and these models can be effectively used for prediction purpose.

Study on Environmental Impacts of Seawater Desalination

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ABSTRACT

Water scarcity mitigated worldwide by desalination of seawater plant in most of the country especially Gulf country. This technology gradually occupied in our India nowadays, approximately worldwide 18,000 desalination plants were established, with a total installed production capacity of 86.55 million m³/day or 22,870 million gallons per day (MGD). Around 44% of this capacity (37.32 million m³/day or 9,860 MGD) is located in the Middle East and North Africa. The intense desalination activity increases “hotspot” in the marine kingdom by the discharge of desalination final reject again and again in the same environment places of the ocean, but the gap increases between supply and demand for water in the rest of the countries due to limited available fresh water,

high population growth, urbanization development, poor management practices, water depletion and deterioration of quality. Increasing demand for water in the domestic sector has shifted attention to the role of desalination in alleviating water shortages. Desalination remains in most of the countries feasible alternative option for satisfying current and future domestic water supply requirements, in comparison to the development of other water resources. Despite the many benefits the technology has to offer, concerns rise over potential negative impacts on the environment. Key issues are the concentrate and chemical discharges to the marine environment. To safeguard a sustainable use of desalination technology, the impacts of each major desalination project should be investigated and mitigated by specific environmental impact assessment study, while the benefits and impacts of different water supply options should be balanced on the scale of regional management plans. In this context, our paper intends to present an overview on present seawater desalination capacities by region, a synopsis of the key environmental concerns of desalination, including ways of mitigating the impacts of desalination on the environment, and of avoiding some of the dangers of the environment to desalination.

Concentration of Heavy Metals in Shrimp Pond (*Litopenaeus vannamei*) Southeast Coast of India, Tamilnadu

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ABSTRACT

In the present study, two different stocking density shrimp ponds (l. vannamei) were selected at sirkali, southeast coast of India. Ponds sediment was collected from (December 2018 to November 2019) in the period of one year. Samples were collected from four different areas of the shrimp ponds. Metal content (Fe, Mg, Mn, Hg, Zn, Cr and Cd) were analyzed using atomic absorption spectrophotometer (AAS). Total seven elements were found to be present sediment sample, at a level within the permissible limit, do not contain any harmful metals that may cause serious health hazards through the culture systems. The result of the present study showed, there was no much variation in HSD & LSD ponds.

Health Hazards Due to Characteristics of Groundwater Situation in Sipcot Industrial Area

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ABSTRACT

Water is an indispensable natural resource on this earth on which all life depends. About 97 percentage of the earth's surface is covered by water and most of animals and

plants have 60% to 65 % in their body. Due to its unique properties water is of multiple uses for all living organisms. Human beings depend on water for almost every development activity. Uptake of nutrients, their distribution in the body, regulation of temperature and removal wastes are all mediated through water. The water which is taken up but not returned for reuse. Globally, only about 60 % of the water with drawn is consumed due to loss through evaporation with increasing human population and repaid development. The world water with drawn demands have increasing many folds and a large proportion of the water with drawn is polluted by the anthropogenic activities. So it is essential to analyse the drinking water quality by using standard methods and their comparison with WHO standard values and permissible limit given by BIS. This study deals with the drinking water quality in SIPCOT, Cuddalore.

Utilizing Biodegradable Waste as a Plantation Media – A Novel Approach

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ABSTRACT

The open dumped hostel generated wasted in the college releases greenhouse gases and causes global warming. Taking this as a core problem the wastes are processed and experiment was carried out to utilize the processed waste as a soil media for plants growth. The research has attempted to pre-process the waste and mixed with soil in the ratios of 25% waste and 75% soil, 50% waste and 50% soil, 75% waste and 25% soil, 100% waste and 100% soil. The seeds of the plant *Sorghum bicolor* were used for the experiments. During experiment PH, temperature, ml of water supplied were regularly monitored. The experiment was carried out in 15 day duration. At the end of the experiment period, it is inferred that the plants in 75% waste and 25% soil gave the required growth result. Hence it is identified from the research that the pre-processed waste has been identified as a medium for the growth of plants. It has also been observed that porosity and voids ratio keeps changing so plants requiring high root capacity faces difficulty.

Characterization of a Natural Agglutinin from Latex of the Plant *Cnidocolus Aconitifolius* and Its Biomedical Potential

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ABSTRACT

Lectins are widely distributed in nature and are isolated from plants, animals and microorganisms. Plant lectins perform various biological activities like endocytosis, binding of microorganism and metastatic activities. *Cnidocolus aconitifolius* commonly

called as Chaya or tree spinach belongs to the family Euphorbiaceae. The plant is said to have many medicinal benefits, and is used to cure alcoholism, diabetes, insomnia, skin disorders, venereal diseases, gout, and scorpion stings and to improve brain function and memory. Agglutinin from the *Cnidoscolus aconitifolius* latex was physico chemically characterized. The latex agglutinin showed agglutinability with human erythrocytes of ABO blood group, Rabbit and rat erythrocytes. It showed maximum activity at pH 6- 9 and temperature between 30 to 50°C. The Haemagglutination Inhibition Assay revealed the agglutinin as galactose specific and was also inhibited by sugars like D-galactose, N-acetyl D-Glucosamine, L-Fucose, Xylose and by glycol proteins Fetuin and PSM. The Antimicrobial activity of both crude and partially purified agglutinin by ammonium sulphate fractionation was analyzed and the purified agglutinin showed maximum inhibition zone of 20 mm against *Staphylococcus aureus*. Anticancer assay carried out against A549 cells showed an IC 50 value of 96.5 µg/ml and cytotoxicity test using L929 normal cells documented an IC50 value of 118µg/ml. In the study it is revealed that the galactose specific agglutinin of latex *Cnidoscolus aconitifolius* is a potent inhibitor of microbes and has anticancer property.

Effect of Propolis, Against Microbial Activity and Gingival Inflammation

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ABSTRACT

Dental plaque is the primary etiology for chronic gingivitis. Micro-organisms colonize a variety of surfaces of the human body, such as skin, the respiratory and digestive tracts and the oral cavity in the form of biofilms. Biofilms consisting of *Actinomyces oris*, *Candida albicans*, *Fusobacterium nucleatum*, *Streptococcus mutans* and *Veillonella dispar*. The role of dental plaque at the interfaces of tooth causes the main basis of gingival inflammation, which could lead eventually to periodontitis. Natural, organic and herbal products are gaining popularity among today's more educated consumers. Propolis is flavonoids effective against bacteria commonly found in the oral cavity and more recently propolis has been recognized as useful for human and veterinary medicine. The microorganism isolates were identified by cultural, morphological and biochemical characteristics. The isolated bacteria were screened and done in tube and plate assay and the isolated bacteria were screened of biofilm bacteria by spectrophotometer and antibacterial activities were studied by disc diffusion method. Antibacterial activities were estimated based on the zone of inhibition around the discs. The maximum antibacterial activities were observed in propolis than standard antibiotics. The present study is only a preliminary work done on isolation and characterization of oral microflora and an extensive study is needed to prevent the formation of biofilm formation

Role of Lactic Acid Bacteria in Fermentation of Beet Root Juice

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ABSTRACT

The present research was conducted to determine the suitability of cabbage as a raw material for the production of probiotic beetroot juice by lactic acid bacteria (*Lactobacillus plantarum*, *Lactobacillus delbrueckii* and *Lactobacillus acidophilus*). The beet root juice was inoculated with a 24 h old culture of *Lactobacillus plantarum*, *Lactobacillus delbrueckii* and *Lactobacillus acidophilus* and incubated at 30°C for 72 h and observations were made for changes in pH, acidity and viable cell counts during fermentation under controlled conditions. All the lactic cultures were found capable of rapidly utilizing beet juice for cell synthesis and lactic acid production. However, *L. acidophilus* and *L. plantarum* produced a greater amount of lactic acid than *Lactobacillus delbrueckii* cultures and reduced the pH of fermented beet juice from an initial value of 6.3 to below 4.5 after 48 h of fermentation at 30°C. Although the lactic cultures in fermented beet juice gradually lost their viability during cold storage, the viable cell counts of these lactic acid bacteria except for *L. acidophilus* in the fermented beet juice still remained at 10⁶–10⁸ CFU/ml after 4 weeks of cold storage at 4°C.

Farming and Disease Management of The Pacific White Shrimp, *Litopenaeus vannamei*

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ABSTRACT

The Pacific white shrimp, *Litopenaeus vannamei*, is a euryhaline and eurythermal shrimp species. *L. vannamei* is native of pacific coast of Mexico and Central and South America as far south as Peru. This penaeid shrimp has fast growth rate, thus, its culture period is significantly reduced. Viral and bacterial diseases are of major concern in intensive shrimp farming systems. Major constraints of shrimp aquaculture are improper farm management, lack of technical services, lack of good quality shrimp seed, lack of infrastructure facilities and bad weather condition. Many different forms of bacteria can potentially infect shrimp, frequently as opportunistic follow-on to viral infection or environmental stress (*Vibrio* bacteria, *Pseudomonas* sp., *Citinoelastic* sp., *Luminous* sp., *Leucothrix* sp. and *Thiothrix* sp.) White Spot Syndrome virus (WSSV), Taura Syndrome Virus (TSV), Yellow Head Virus (YHV), Infectious Hypodermal Haematopoietic Necrosis Virus (IHHNV), Lymphoid Organ Vacuolization Virus (LOW), and Reo like

Viruses (REO) is some of the viruses reported in the species. Improper use of antibiotics and chemical drugs in aquaculture is accompanied with the potential negative impacts on the environment as well as human health and is also ineffective for many pathogens, particularly virus. Although the effective control of infectious viral diseases without chemicals is important in the cultivation of aquatic organisms. The strategies for dealing with diseases is the use of probiotics, high quality SPF seed stocking, improved pond cleaning and an increase in water exchange.

Food and Feeding Habits of the Silver Pomfret, *Pampus Argenteus* (Euphrasen 1788) from Nagapattinam Coast, Tamil Nadu

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ABSTRACT

Silver Pomfret, *Pampus argenteus* (Perciformes: Stromateidae) is widely distributed throughout the Indo-west Pacific region. The silver pomfret is one of the most valuable food fishes available along the Indian coast. It is an inshore species, usually seen in shoals over the muddy bottoms associated with other demersal fishes. Food and feeding habit studies on fishes are necessary to understand the role in the food web. Information on the importance of this species as a constituent of the food web along the east coast of India is limited. In the present study, the food and feeding habits of the Silver Pomfret was concentrated by following 'Points method' of gut content analysis. The fish samples were collected from Nagapattinam fish landing centre, Tamil Nadu. They were measured (cm, TL) and weighed (g). The results revealed that the food items found in the stomachs of Silver Pomfret were crustaceans, fishes, diatoms and others. Among the food items, crustaceans dominated with the mean 65% (62-65.5%) followed by fishes (mean 21% (19-21.5%)), diatoms (mean 8% (7-8%)), others (mean 6% (5-6%)). The feeding intensity (%) observed in different size groups for *P. argenteus* were also discussed.

Effect of Alkoxy Glycerol with Nanoparticle as Immunostimulant in Nile Tilapia (*Oreochromis Niloticus*)

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ABSTRACT

The present study evaluated the effect of application of a marine lipid alkoxy glycerol derived from shark liver oil with Nanoformulated diet oi Nile Tilapia

(*Oreochromis niloticus*). We analysed growth, immune as well as haematological parameters. Experimental feed was formulated after the physico chemical characterization of silver nanoparticle. The fishes were fed in triplicate groups along with the control diet. The fishes were fed with experimental diet twice a day for 45 days. Growth parameters like weight gain (WG), final weight (FW), specific growth rate (SGR), and feed conversion ratio (FCR) were measured. For disease resistance studies, Fishes were challenged with *Aeromonas hydrophila* and then, post challenge observations, immunological assays like alternative complement (ACH₅₀), phagocytosis (PI), respiratory burst activities (RB), and serum lysozyme (SL) were performed. Further, molecular analysis using a transcriptome- wide sequencing technique will help the evaluation of molecular mechanism involved in the immunostimulation by nanoformulated feed in innate defense.

Phloretin encapsulated chitosan nanoparticles enhance the antioxidants and apoptotic mechanisms in DMBA induced experimental carcinogenesis

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ABSTRACT

The main aim of this study was to investigate the effects of phloretin loaded chitosan nanoparticles (PhCsNPs) on 7,12-dimethylbenz[a]anthracene (DMBA) induced experimental cancer in hamsters. Oral squamous cell carcinoma (OSCC) was induced in male golden Syrian hamsters by painting with 0.5% DMBA three times a week for 14 weeks. Varying concentration of PhCsNPs (5, 10, and 20 mg/kg b.wt.) was orally administered on alternate days to evaluate the optimum dose. The experiment design was terminated at the end of the 14th week. The development of OSCC was confirmed by histopathological and biochemical analysis (lipid peroxidation, antioxidant profile, and detoxification enzymes) in plasma, erythrocyte, buccal, and liver tissues. Significant increases in oxidation and lipid peroxidation were noticed in DMBA-painted hamsters. Oral administration of PhCsNPs in various doses on alternate days reversed the deleterious effects induced by DMBA. In addition, immunoblot analyses of PhCsNPs treatment enhanced the release of Bax, Cytochrome-C, caspase-3, 9 and suppressed the Bcl-2 expression, which the use of PhCsNPs for mitochondrial-mediated apoptosis. These findings suggest biofabricated PhCsNPs may act as a potent antioxidant and anti-carcinogenic in DMBA induced oral cancer in experimental animals.

Bioformulated gold nanoparticles from wedelolactone ameliorate the antidiabetic activities in RIN-5F cell line through regulation of PI3K/AKT and Bcl-2 expression

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ABSTRACT

This work synthesized the gold nanoparticles (AuNPs) using wedelolactone (WDL) and characterized using UV-visible spectroscopy, fluorescence spectroscopy, FT-IR, XRD, SEM, TEM, EDS and AFM. Further, the anti-diabetic activity of WDL-AuNPs was elucidated in pancreatic RIN-5F cell lines. The UV-Visible spectra exhibited the maximum absorption peak at 535 nm. FT-IR results proved that WDL was stabilized on surface of AuNPs by acting as a capping or reducing agent. The crystalline structure was affirmed by XRD pattern and the spherical shape of WDL-AuNPs was evidenced by SEM, TEM, and AFM. The elemental constituents were observed by EDX. In addition *in vitro* results showed that WDL-AuNPs improved the DEHP-caused deleterious effects on insulin secretion and cell viability capability in RIN5F cell lines. WDL-AuNPs down regulated the pro-apoptotic proteins up regulated the anti-apoptotic proteins expression and normalized protein levels in DEHP-exposed RIN-5F cells. The exposure of DEHP resulted an increased ROS production, lipid peroxidation, and decreased in antioxidant status in RIN-5F cells, Furthermore, mRNA expression related to the insulin signaling protein in RIN-5F cells were decreased. Overall, this study concluded that the regulation of Bcl-2 family protein expression by WDL-AuNPs as a promising approach to reduce the levels of lipid peroxidation markers and improved antioxidant status, increasing insulin secretion and activated the PI3K/AKT pathway in RIn-5F cells.

Ruxolitinib conjugated liposomes to increase the efficacy of docetaxel for the treatment of triple negative breast cancer

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ABSTRACT

Triple negative breast cancers (TNBCs) are highly aggressive malignant form of epithelial breast tumors characterized by negative expression of estrogen receptor (ER), progesterone receptor (PR) and lack gene amplification of HER2. Common chemotherapeutic agent for TNBC includes docetaxel (DTX), paclitaxel (PTX), cisplatin and doxorubicin etc. However, there is a huge lacuna conventional chemotherapy due to dose dependent side effects and development of chemo-resistance eventually limit the

success of chemotherapy in TNBC. Despite recent advances, clinical outcome of TNBC patients has not significantly improved. Therefore, combination therapies to target specific oncogenic pathway has been needed to overcome drug resistance and to improve clinical outcome. Persistent activation of STAT3 is associated with cancer growth and progression and also involved in cell resistance. Therefore, Targeting JAK/STAT3 signaling could be a potential novel therapeutic approach for treating advanced and chemoresistant TNBC. Here, for the first time we planned to investigated the therapeutic potential of ruxolitinib, a JAK1/JAK2 inhibitor that conjugated liposome increases the efficacy of docetaxel for the treatment of triple negative breast cancer. Thus, liposome mediated co-delivery ruxolitinib/docetaxel significantly to increases the sensitivity of docetaxel in TNBC.

Polydatin encapsulated PLGA nanoparticles counteract the DMBA induced experimental carcinogenesis through the inhibition of cell proliferation

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ABSTRACT

In the present study, we are aimed to fabricate the Polydatin encapsulated Poly [lactic-co-glycolic acid] (POL-PLGA-NPs) to counteract the 7, 12- dimethyl benzyl anthracene (DMBA) promoted buccal pouch carcinogenesis in experimental animals. The bio-formulated POL-PLGA-NPs were characterized by dynamic light scattering (DLS), Fourier transform infrared (FTIR) spectroscopy, X-ray powder diffraction (XRD) pattern analysis, transmission electron microscope (TEM) In addition, the nano-chemopreventive potential of POL-PLGA-NPs was assessed by scrutinizing the neoplastic incidence, analyzing the status of lipid peroxidation, antioxidants, phase I, phase II detoxification status and histopathological changes and in DMBA treated animals. In golden Syrian hamsters, OSCC was generated by painting with 0.5% DMBA in liquid paraffin three times a week for 14 weeks. 100% tumor formation was observed high tumor volume, tumor burden and altered level of biochemical status were observed in the DMBA painted hamsters. Intra gastric administration of varying concentration of POL-PLGA-NPs (7.5, 15 and 30 mg/kg b.wt) to DMBA-treated hamsters suggestively prevented oncological incidences and restored the status of the biochemical markers. It also significantly enhances the apoptotic associated and inhibited the cancer cell proliferative markers expression (p53, Bax, Bcl-2, caspase 3, cyclin-D1). The present study reveals that POL-PLGA-NPs has a penitential candidate for nano-chemopreventive, anti-lipid peroxidative and antioxidant potential and also modulating effect on phase I and Phase II detoxification system which associated with reduced cell proliferation and induced apoptosis in experimental oral carcinogenesis.

Impact of Placer Mining on Nematoda and Oligochaeta of the Intertidal Zone, Along the South West Coast of Tamil Nadu, India

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ABSTRACT

The present research describes the composition and distribution of benthic nematode and oligochaete assemblages of the SW coast of India in relation to placer mining activity. Sediment samples are collected from the intertidal zones of nine sandy beaches in the study area during different seasons. A total of 11 species of nematodes and 16 species of oligochaetes have been identified. During post-monsoon the numerical abundance of nematode species per sq.m include *Sabatieria lucia* 85, *Helicotylenchus pseudorobustus* 80 and *Metoncholaimus* sp.79. During summer *Terschellingia longicaudata* 68, *Helicotylenchus pseudorobustus* 58 and *Eurystomina terricola* 50 have been recorded. During NE monsoon *Eurystomina terricola* 61, *Metachromadora remanei* 49 and *Helicotylenchus* 47 have been identified. During SW monsoon *Enoplus* sp. 51, *Metachromadora remanei* 47 and *Eurystomina terricola* 46 have been recorded. The numerical abundance of oligochaetes during post-monsoon include *Aeolosoma quaternarium* 85, *Marionina* sp. 72 and *Tubificidae* sp.71. During summer *Grania acanthochaeta* 78, *Nais barbata* 78 and *Marionina* sp. 76 have been recorded. During NE monsoon *Grania acanthochaeta* 39, *Paranais litoralis* 28 and *Lumbricillus* sp. 27 have been recorded. Finally during SW monsoon *Marionina* sp. 41, *Paranais litoralis* 37 and *Pristina leidy* 31 have been recorded. The analyses clearly show dissimilarities in community structures between the sampling sites with and without mining activity. This may be due to the removal of organic matter and placer minerals from the habitat due to mining. The overall distribution and diversity of meiofauna is low in mining beaches indicating the impact of mining on meiofaunal community.

Industrial Wastes as Nutrient Source for Augmenting the Productivity of Sesame

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ABSTRACT

The agro-based industries produce increasing amounts of liquid and solid bio resources. One of the byproducts of sugar industry is press mud, a solid residue,

obtained from sugarcane juice before crystallization of sugar. Press mud contains trace quantity of micronutrients and prevents soil erosion, crusting and cracking, adjusts soil pH, improve drainage and promote normal bacterial and microbial growth in the soil. It is used as both soil reclamant as well as soil conditioner. Spent wash generated from the distilleries caused environmental problems due to its high organic load. On the other hand, its high organic matter and nutrient content make it a valuable resource as a fertilizer and a source of organic compound. Spent wash contains organic matter and nutrient minerals derived from the sugarcane; yet direct application of concentrated spent wash on agricultural lands may lead to economic and environmental problems. Composting solid agricultural residues with spent wash could be followed to overcome these disadvantages by producing compost that can be easily handled. Sugar industries byproduct pressmud and distillery industry liquid waste spent wash can well serve as suitable raw material for the production of organic manure viz., biocompost. Field experiment was carried out to evaluate the various sources of organic manures integrated with chemical fertilizers with various proportions viz., 25, 50 and 75 per cent along with 100 per cent organic source/chemical fertilizers alone. The organic manures included FYM, vermicompost and biocompost. The experiment was conducted at farmers' holdings of Vallam padugai village in summer 2010 with randomized block design. Application of 25% RDF through biocompost + 75% RDF as chemical fertilizer recorded the highest growth and yield attributes and it was statistically on par with application of 25% RDF through vermicompost + 75% RDF as chemical fertilizer. Application of 25% RDF through biocompost + 75% RDF as chemical fertilizer registered the maximum seed yield kg ha^{-1} and it was at par with 25% RDF through vermicompost + 75% RDF as chemical fertilizer. The lowest seed yield was observed with 100 % RDF through FYM.

Studies on the growth and development of lac insect at Cuddalore, Tamilnadu

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ABSTRACT

The growth and development of lac insect, *Kerria lacca* (Kerr.) (Tachardiidae : Hemiptera) was studied during 2014-15 under Cuddalore (Tamilnadu) climatic conditions. The results exhibited that under Cuddalore agro-climatic conditions lac insects could successfully be raised on *Cajanus cajan* and *Flemingia semialata* Roxb. In case of the Rangeeni strain of Baishaki crop, the period from inoculation to the emergence of nymph of succeeding generation was recorded as 220 and 222 days on Arhar and Flemingia respectively, while, the Kusumi strain of Jethwi crop took 152 days

on *Flemingia*. The first instar nymphs were pinkish red in colour, oval in shape and measured about 0.61 mm in length (leaving aside the antennae and caudal setae) and 0.22 mm in width. The settling density of Rangeeni strain was recorded as 202 nymphs/cm². The nymphs of Kusumi strains were found to be relatively larger than the Rangeeni strain and measured on an average 0.86 and 0.31 mm in length and width, respectively. The female shell in general was reddish in colour and spherical in shape and measured 3.0-6.0 mm in diameter and weighed about 0.025g. Being an immobile pest, generating information on development and growth stages under the local conditions is essential. Information on the three instars, female cell weight and cell diameter were identified. The study is helpful in designing future integrated management of this pest.

Key words: *Kerria lacca*, Cuddalore, Arhar, *Flemingia semialata*, growth and development

Spatial and temporal pattern of primary production in Ashtamudi backwater

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ABSTRACT

Wetlands are highly productive ecosystems in the biosphere supporting a rich variety of flora and fauna. The Ashtamudi wetlands have been under severe environmental stress due to plethora of anthropogenic activities which drastically destroyed the health of the wetland ecosystems. Ashtamudi backwater forming a major part of the Ashtamudi wetland ecosystem which is an important Ramsar site noted for its valuable biotic resources, strong endemism and scenic beauty. Ashtamudi is the second largest backwater system in Kerala with eight creeks covering an area of 5598ha and lying between latitude 8°53'N and 9°02'N and longitude 76°31'E and 76°41'E. Four stations representing different environmental conditions such as Neendakara (marine zone), Chavara (industrial zone), Ashtamudi (brackish water zone) and Ashramam (mangrove zone) were selected for regular monthly monitoring of primary productivity. Gross and Net productivity values showed distinct variation with respect to seasons and stations in the backwater. Post monsoon showed higher gross and net productivity values in the four stations of the Ashtamudi backwater (GP: 1.55g Cm⁻³ day⁻¹ ± 0.59, NP: 1.24g Cm⁻³ day⁻¹ ± 0.56). The marine zone, Neendakara showed maximum gross and net production (GP: 1.90g Cm⁻³ day⁻¹ ± 0.27; NP: 1.56g Cm⁻³ day⁻¹ ± 0.25) followed by Ashtamudi (GP: 1.68g Cm⁻³ day⁻¹ ± 0.32; NP: 1.35g Cm⁻³ day⁻¹ ± 0.31) and Ashramam (GP: 0.75g Cm⁻³ day⁻¹ ± 0.27; NP: 0.54g Cm⁻³ day⁻¹ ± 0.25). Minimum gross and net production was reported from the impacted zone, Chavara (GP: 0.63g Cm⁻³ day⁻¹ ± 0.26; NP: 0.39g Cm⁻³ day⁻¹ ± 0.20). The primary productivity was comparatively lower in the impacted zone, Chavara because the industrial wastes have considerably disturbed the productivity regime of this zone. Surface and bottom water productivity in the four stations of the Ashtamudi backwater was analyzed it was seen that the surface water productivity was comparatively higher than the bottom water productivity.

Bioconversion of food waste using *E. fetida*: assessing the stability and maturity for environmental health

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ABSTRACT

The organic fertilizer using exotic earthworms *Eiseniafetida* was produced from food waste and main physic-chemical parameters and seed germination rate was examined in order to assess the stability and maturity indicators during the vermicomposting (bioconversion) process. The ranges of EC, pH, C: N and germination index were 7.5-4.9 mS/cm, 5.5-7.69, 29.14-13.11% and 11.6-60.7%, respectively. The germination index (GI) value revealed that organic fertilizer rendered as moderate phytotoxicity to selective radish seed and Pearson correlation coefficient was used to assess the relationship between the parameters. Results revealed that high statistically significant correlation coefficient was calculated between the GI value and EC in the final product (vermicompost) at the 99% confidence level. The C:N value showed that the vermicompost was constant. Finally, as a result of these observations, stability test alone was not able to ensure fertilizer quality. Consequently, it appears that determining fertilizer quality requires a simultaneous use of maturity and stability tests.

Key words: Food waste, *E. fetida*, bioconversion, fertilizer quality and seed germination

Impact of water pollution

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ABSTRACT

On a worldwide scale, water is a valued natural resource for the existence of all living organisms. Of our earth surface is covered by water and almost every living organism needs water for nutrients transportation. Water pollution is a serious problem for the environment. Water pollution is a serious large set of adverse effects upon the water bodies (lakes, rivers, ocean soil, ground water) caused by human activities. Water is a basic resource that guarantees the life of all the living beings on the planet. However, its scarcity and pollution causes many problems. The effect of water pollution is more on aquatic life, because their existence depends on water and when there is any disturbance in their ecosystem, the impact is maximum on them. Pollution of our water bodies poses a great threat to humans and the aquatic ecosystem while marked population increase catalyzes climate change. High levels of organic chemicals can make the water unfit for

drinking purposes and harmful to marine organisms. The main problem caused by water pollution is that kills organisms that depend on these water bodies. The industries are the primary sources of water pollution as the waste discharged in to water bodies are harmful. Hence the water pollution has endangered many lives including humans and aquatic, so we need to take some measures if not to eradicate but at least to reduce the risk of water pollution.

Plant cultivation induced poison is more dangerous than poisonous plants in southern part of India

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ABSTRACT

In present statistical data numerated as very low of plant poisonous cases into hospitalized recent years. These were reported as suicidal and accidental poisoning in India. But poisonous from the cultivation was raised accumulated poisoning into the human body and domestic animals in high by silent killer and leads to Non-Communicable Diseases. Therefore, list out the silent killer like using chemicals in cultivation purpose and poisons from plants in southern area. In this research revealed results as: pesticides, insecticide, fungicides and Fertilisers such as Organo Phosphate, Organo Chlorines, Carbamates and Pyrithroides etc. were used to plant cultivation leads to poisonous effect than the poisonous plants such as; *Ricinuscommunis*, *Croton tiglium*, *Calotropisgigantea*, *Abrusprecatorius*, *Semecarpusanacardium*, *Daturametel*, *Gloriosasuperba*, *Jatrophacurcus*, *Papaversomniferum*, *Strychnousnux vomica*, *Neriumodorum*, *Nicotinatobaccum*, *Aconitum ferox*. Finally conclusion was promote the organic farming leads to build healthier future generation and free from chemical added foods to recommended for new generation and include governmental regulation about it also.

Key words: Chemical used in cultivation, Poisonous plants, Non-Communicable Diseases

Indian biodiversity involved into health care management of around the world

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ABSTRACT

In present trend, World Health Organization (WHO) Revealed Indigenous medical care followed by the 80% of the total population of the world. In the Indigenous medical care involve as traditional medical practitioners, Ayurveda, Siddha,

Homoeopathy, Unani and naturopathy medical systems. In these medical systems developed by the Indian Continents from many years ago. Because of the Biodiversity resource and man civilization of the centre part of world. This research objectives were to find out the usage of natural resources in Indigenous medical system in India, to estimate the value of Indian bio diversity spread out to other countries in the world. This was descriptive and collection of secondary data from authenticated reports leads to find the results. Indian Bio diversity such as Plants, Animal and Metals and minerals were exporting to other countries which were situated South Asia, South East Asia, Europe, American continent and Australia, etc with demand scale of property. Indian Market competed with Chinese's Biodiversity however Indian Bio diversity is preference of other countries as Wild variety or cultivated Variety in Plants source respectively. Indian virgin forest resources of flora and fauna was big resources in the Indigenous Medical system's basic source of raw materials of its product in world wide. Indian IPR and other laws were help to control Resource management and Research & Development in particular Biodiversity source was very important to future generations.

Key Words: Indian Biodiversity, Indigenous Medical System, Plants, Animal

Alpha pinene modulates UVA-induced oxidative stress, DNA damage and apoptosis in human skin epidermal keratinocytes

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ABSTRACT

This study aims to evaluate the protective effect of alpha pinene (AP), an essential oil monoterpene, against ultraviolet-A (UVA; 320-400 nm) induced cellular damages in human skin epidermal keratinocytes (HaCaT cells). In this study, HaCaT cells were subjected to single UVA-irradiation (10 J/cm²) in the presence and absence of AP (30 µM) then different cellular end points were analyzed. The protective effect of AP against UVA-induced cytotoxicity was evaluated by MTT-based metabolic assay. Generation of reactive oxygen species (ROS), alteration of mitochondrial membrane potential (MMP), DNA single- and double strand breaks (SSBs and DSBs) and apoptotic morphological changes during different treatment conditions were measured by fluorescence microscopy and spectrofluorometry. Modulatory role of AP against UVA-mediated inflammatory markers expression, nucleotide excision repair (NER) proteins and apoptotic markers expression during AP and/or UVA treatment were studied by western blot. Pretreatment with AP prevented UVA-induced cytotoxicity, generation of ROS, lipid peroxidation and DNA stand breaks probably through its antioxidant property. AP also inhibited UVA-induced inflammatory mediators such as NF-κB, TNF-

α and IL-6 expression in HaCaT cells. Further, AP modulates NER proteins via activation of p53 and p21 thereby subsequently prevent the formation of UVA-induced cyclobutane pyrimidine dimers (CPDs). We also noticed that AP inhibits apoptotic cell death by preventing UVA-induced loss of mitochondrial membrane potential through modulating Bax/Bcl-2 expression in HaCaT cells. The present findings suggest that AP prevent UVA-induced oxidative stress, inflammation, DNA damages and apoptosis in human skin cells.

Bio Diversity and Mental Health: a Review

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ABSTRACT

The biodiversity of our planet sustains us. From the air we breathe and the water we drink, to the soil we sow and the fuel we use. But Earth does more than provide the basic necessities that allow humans to survive and prosper. Our ability to experience nature could have the capacity to improve our well-being and consequently mental health. But, with the earth's biodiversity in decline, it's worth taking a look at how this will in turn affect human well-being and health. In a recent study of ours we argue that biodiversity loss could threaten the well-being benefits we get from nature, with potential repercussions for human mental health. Mental health disorders already affect nearly nine million people in the UK and are projected to cost £88.5 billion by 2026. So, if biodiversity loss does impact on mental health, it could be even more costly than previously thought. Biological diversity in city parks and green spaces can have psychological benefits for humans, according to a new study from the United Kingdom. Researchers found that visitors to city parks with a greater diversity of birds, butterflies, plants, and other organisms reported feeling better than visitors to less-diverse green spaces. Such findings have important implications for urban planning and policy as the human population becomes increasingly urbanized. Similar studies point to the same conclusion. A nine-year survey of U.S. gall bladder patients showed that patients recovered faster and required less pain medication if their hospital windows overlooked trees rather than brick walls. Other research has indicated that inner city residents who had some nearby nature outside their apartments showed significantly lower levels of aggression and violence. Similarly, workers in buildings that contain plant life have been found to have better concentration and less anxiety on average than those working without plants. This paper reveals about how Bio diversity affects mental health.

Key words: Bio diversity, Mental health

Molecular diagnostics an overview of applications

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ABSTRACT

Molecular diagnostics is based on the detection of biological molecules and may also involve the quantification of the same. Essentially it involves DNA or RNA based assays although advanced proteomics-based methods are also being used nowadays. The detection of proteins (antigens) by standard immunological methods using antibodies is both routine and confirmatory and such methods have been used for everything from typing blood groups to identifying cancer-associated molecules. However for a number of proteins, the corresponding antibodies do not exist and hence detection strategies have been directed at DNA or RNA. Further mutant proteins may or may not be recognized by the available antibodies, again calling for interrogation at the level of DNA or RNA. Classical molecular biology has demonstrated the innate capacity of nucleic acids to hybridize and elucidated the intricacies regarding the polymerization of deoxyribonucleotides and ribonucleotides. Building upon these fundamental aspects of nucleic acids, technological advances have led to the development of molecular diagnostics methods that not only provide rapid results but are also cost-effective and provide for high specificity and sensitivity. Crucially, these methods can be applied where there is limited sample material. Importantly, the capacity to interrogate the entire genome has provided ample scope for identifying interactions that were hitherto undetectable. In essence these tools afford an opportunity to identify genetic defect(s) at virtually every stage starting from an in vitro fertilized embryo to an aging individual. Thus, both gross chromosomal rearrangements and single nucleotide changes can be detected in in vitro fertilized embryos before implantation. Such deleterious changes can also be detected in DNA from fetal cells by methods such as quantitative fluorescence PCR or next generation sequencing. Genetic variants that lead to or increase predisposition to non-communicable diseases can also be detected using these protocols. Cancer-associated mutations can also be detected similarly. The expression level of genes can also be quantified to identify the causes of pathological manifestations. Given the personalized approaches to modern medicine the genetic underpinnings must be identified for a more effective therapy. The same molecular diagnostics tools also allow for the rapid identification of infectious agents. Since these methods do not require the culture of organisms, nucleic acids can be extracted from environmental samples such as soil or seawater and subjected to next generation sequencing to assess for biodiversity.

Glaucarubinone enhances paclitaxel and mitoxantrone chemosensitivity in MCF-7 breast cancer cells through inhibition of MDR1 activity.

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ABSTRACT

We examined the role of multidrug resistance protein (MDR1) *in* the paclitaxel (PTX) and mitoxantrone (MXR) resistant MCF-7 breast cancer cells. Consequently, oncologists are interested in finding new MDR1 inhibitors originating from herbal medicines to have less side-effect. Here, we investigated an inhibitory effect of glaucarubinone (GLU) on MDR1 in PTX/MXR -resistant MCF-7 breast cancer cells. Our results showed that PTX *and* MXR did not inhibit a proliferation in PTX/MXR-resistant MCF-7 breast cancer cells. GLU treated PTX/MXR-resistant MCF-7 cells showed an increase of MDR1 activity. However, qRT-PCR and Western blot assays were confirmed that PTX/MXR-resistant MCF-7 cells exhibited high MDR1 expression level. We also found that a combinatorial treatment of GLU and PTX/MXR in resistant MCF-7 cells caused apoptosis in synergistic manner, which was due to GLU inhibition of MDR1 expression. Therefore, GLU could be a potential agent for overcoming MDR resistant breast cancer cells.

Key words: Glaucarubinone, Breast Cancer, MCF-7, Paclitaxel and Mitoxantrone.

BIOFLOC-COPEFLOC: A novel shrimp farming technology for the sustainable production

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ABSTRACT

The aquaculture as a food production sector offers ample opportunities to improve poverty, food shortage, and malnutrition generates economic growth and ensures better use of natural resources on aquaculture. The necessity to increase aquaculture production has been triggered by the increasing demand per capita in parallel of the increase of global population. It is predicted that aquaculture will provide the most reliable supply of seafood in the future. Shrimp farming is a fast-expanding activity that has supported the growth in the supply of these crustaceans' species to consumers around the world. However, there are many controversial issues in aquaculture regarding food quality, food nutrition, food safety and sustainability; many of which are directly related to nutrition and feeds for farmed shrimp. Some issues in the area of shrimp nutrition require consideration, improvement, such as feed and nutrient efficiency, overfeeding

and waste, fish meal and fish oil replacements, shrimp/fish health, biotechnology, and human health concerns. The improvement of aquaculture hatchery and industry through innovative farming a new technology is the need of the hour. In this perspective, the manner Biofloc - Copefloc the technique (BFT and CFT) is considered as a promising a novel technology for the aquaculture system. Biofloc-Copefloc is the new shrimp farming technique introduced in the first time of Thailand, was developed on the basis of technology Biofloc; advantages and floc particles are to use live food as the main food for shrimps, not food industrial use. BFT and CFT of recirculation aquaculture system (RAS) is the most advanced technology to the shrimp farming industry that provides natural live diets (live feed) "Copepod" for post larvae (PL) prior to stocking, pond water stability enhances good survival rate (SR), fastest growth rate (GR), high profitable, totally sustainable and without any destructive to our environment ecosystem. This research paper reveals that the advantage of using BFT and CFT a novel technology system in sustainable shrimp farming of aquaculture practice and training.

Influence of Environment Pollution on the Health of Human Populations

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ABSTRACT

Environmental pollution remains a major source of health risk throughout the world, especially in developing countries. Over the last three decades there has been increasing global concern over the public health impacts attributed to environmental pollution, the exposure to pollution is believed to be more intense in human existence. Urbanization and industrialization development have led to increase in energy consumption and waste discharges. The greenhouse gas emissions, acid deposition, also water pollution and waste management is considered as major public health problems, which has the necessity to investigate from multiple perspectives like social, economic and environmental engineering systems. Environmental pollutants results in infectious diseases such as cancer, birth defects, increase in oxidative stress, endothelial dysfunction, mental disorders and various other harmful effects which may be associated with environmental exposures. Though, short-term effects of environmental pollutants are usually highlighted, wide range of hazards of air pollution from early life and their possible implication on chronic non-communicable diseases of adulthood should be underscored. Numerous studies have exposed that environmental particulate exposure has been linked to increased risk of morbidity and mortality. Therefore it is time to take action and control the pollution. The goal is to familiarize the different aspects of environmental pollution and the measure taken for prevention and reduction of the harmful effects of environmental factors.

Keywords: pollution, infectious diseases, environmental exposures, risk factors.

Treatability of Pulp and Paper Mill Wastewater by Anaerobic Digestion in Batch Process

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ABSTRACT

Quantity and quality of wastewater from pulp and paper industry varies depending on the product and process selected. Anaerobic biological treatment methods are preferred to physico-chemical methods for safe disposal due to their cost effectiveness and efficient treatability of effluent. A wastewater with high strength organic waste was studied in a batch anaerobic digester with acclimatized seed sludge. In the present study an attempt has been made to evaluate the efficiency of batch type anaerobic reactor for pulp and paper mill wastewater. Continuous monitoring of parameters like COD, pH, volatile fatty acids and alkalinity were carried out to evaluate the performance of the batch reactor. The study is carried out for three different organic loading rates such as 1.33, 2, 4 kg COD/m³.day and the maximum COD reduction of 90.1% is obtained at organic loading of 2 kg COD/m³.day. The gas production was observed as 3080 ml.

Treatment of changing complex characteristics of Municipal Wastewater by *Rhizophora mucronata*

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ABSTRACT

Treatment of municipal wastewater by conventional methods like Activated sludge process and Oxidation pond have become expensive for installation and operation because of the rapid growth of the population and urbanization. Advancement in the construction field also leads to the generation of domestic wastewater by providing many sewer appurtenances which aims for the facility and sophistication for a nuclear family itself. The above said factor also one of the reasons for the generation of high volume of sewage which was unaccounted in the quantity of the sewage generated per capita in the

society of sewerage system during planning. In addition to the quantity change in the lifestyle of the present generation leads to the usage of many different chemicals mixed foods and household materials causing consequently various types of pollutants which increases the organic and inorganic content of the municipal wastewater. Alternate treatment method has become necessary for the present day situation to overcome the problems of changing quantity and changing quality of the municipal wastewater faced by the conventional methods. Phytoremediation an eco-friendly treatment method was attempted using *Rhizophora mucronata* for treating municipal wastewater. Laboratory scale experiment providing the Aerobic, Facultative and Anaerobic zone with fujinos spiral media was conducted using *Rhizophora mucronata* plant for treating municipal wastewater and efficiency was evaluated for the removal of COD and BOD. The results showing the reduction 92% of BOD and 85% of COD which is satisfactory when considered with any forms of conventional municipal wastewater treatment methods.

Simulation of Dairy Wastewater Treatment using ANN

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ABSTRACT

The performance of the Dairy Wastewater Treatment Plant depends on the inlet flow and the pollutant concentrations of the Dairy wastewater. The prediction of Dairy wastewater pollution strength gives promising opportunities to further operational actions of wastewater treatment. The forecasting control level has been introduced. Applying the properties of universal determination of Artificial Neural Network (ANN), a description of the Dairy wastewater treatment characteristics has been achieved. Multi ANN propagation model have been used to predict the pollution level by means of its variation in concentrations determined and the quantity of the wastewater to be treated. A constructive analysis of the major pollution parameters in Dairy wastewater treatment was taken. Classifying the pollution parameters in accordance with their characteristics like organic and inorganic sources, a set of clusters has been divided. Separate ANN propagation model describe the above clusters taken. Demonstration of the applicability of the developed ANN approach in the wastewater treatment installation of a Dairy industry is presented in this article. The obtained results shows that the using of the pollution parameters characteristics prediction makes easier the processes in the wastewater treatment plants. Better model based predictive control made more advantageous for the prediction of variation of various pollution parameters like COD, Colour, pH, Temperature and Suspended solids were determined in treating the Dairy wastewater treatment. The difference between the real and the predicted values was less than 1%.

Macrobenthos Distribution and Community Structure in Ashtamudi Backwater

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ABSTRACT

Wetlands are the most productive ecosystems in the biosphere supporting a rich variety of flora and fauna. Ashtamudi backwater forming a major part of the Ashtamudi wetland ecosystem is an important Ramsar site noted for its valuable biotic resources, strong endemism and scenic beauty. Ashtamudi is the second largest backwater in Kerala with plan metric shape covering an area of 5598 ha and lying between lat.8^o53' and 9^o02' and long.76^o31' and 76^o41'. Four stations representing different environmental conditions such as Neendakara (marine zone), Chavara (industrial zone), Ashtamudi (brackish water zone) and Ashramam (mangrove zone) were selected for regular monthly monitoring of macro benthos. Macrobenthos distribution and community structure elaborates the abundance and diversity of macrobenthic fauna in the Ashtamudi backwater. The macrobenthic fauna in Ashtamudi backwater belonged to seven groups such as Nematoda, Oligochaeta, Amphipoda, Gastropoda, Bivalvia and Fish larvae. Twenty eight species of macro benthos were identified from Ashtamudi backwater where polychaetes expressed maximum abundance in all the study stations including sixteen species. Qualitatively and quantitatively the benthic organisms were comparatively poor in the polluted stations. *Capitella capitata*, the polychaete species was seen only at Chavara (industrial zone) as an indicator species of industrial pollution in the region. The considerably low diversity indices in Ashtamudi backwater during the study indicate the stressed condition of macro benthic community due to pollution from industrial source and anthropogenic factors.

DHF-BAHPC Reverses 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridin (MPTP) Induced Neurodegeneration in C57BL/6 Mice Model of Parkinson's Disease

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ABSTRACT

We investigated the therapeutic effect of DHF-BAHPC against MPTP enhanced neurotoxicity in mice, estimation of striatal dopamine and loss of dopaminergic neurons in substantia nigra (SN) and striatum (ST) by studying the behavioral changes, protein expression, oxidative stress and antioxidants. In this study shows that DHF-BAHPC could protect MPTP induced depletion of striatal dopamine and its metabolites in a dose dependent manner. It also attenuated MPTP-induced oxidative stress by decreasing and

enhancing levels of thiobarbituric acid reactive substances and reduced glutathione (GSH), with diminishing activities of superoxide dismutase and catalase and enhancing activity of glutathione peroxidase (GPx) in substantia nigra. Moreover, intraperitoneal administration of DHF-BAHPC improved the motor abnormalities in PD mice. Our immunohistochemical and western blot studies shows that TH, DAT and VMAT immunoreactivity and protein levels were decreased significantly in the ST and SN in 3 days after MPTP treatment, which were reversed by DHF-BAHPC treatment. Treatment with DHF-BAHPC significantly improves all the neurochemical parameters, oxidative stress, transporter proteins and physiological abnormalities compared to PD mice and offer promise as new strategy in the treatment of this neurodegenerative disease.

An Outline of Applications of Nanotechnology

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ABSTRACT

Nanotechnology is defined as the study and use of structures between 1 nanometer and 100 nanometers in size. To give you an idea of how small that is, it would take eight hundred 100 nanometer particles side by side to match the width of a human hair. Scientists have been studying and working with nanoparticles for centuries, but the effectiveness of their work has been hampered by their inability to see the structure of nanoparticles. In recent decades the development of microscopes capable of displaying particles as small as atoms has allowed scientists to see what they are working with. This paper deals with the application of nanotechnology in various fields.

To study the Photosynthetic Pigment in Legume crop - Groundnut (*Arachis hypogaea*) in and around the cement dust industry

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ABSTRACT

The Present study was carried out to ascertain the impact of cement industry pollution on *Arachis hypogaea* plant species in the vicinity of cement industry. Effect of cement dust on photosynthetic pigments was studied in *Arachis hypogaea*. Sampling station was done at different distance like 0.5 km, 1.0, 1.5 km, 2.0 and 2.5 km from the cement industry. The Chlorophyll pigments were reduced in dust-exposed Groundnut species when compared with control site (20 km away from the factory). Changes in chlorophyll content were finding out in selected plant species exposed to dust emitted by the cement industry. The concentration of chlorophyll in the selected plant species were analyzed and noted that amount of chlorophyll in all plants that are away from cement

plant have more chlorophyll than that of nearer to the cement industry. Control plants were found always with higher chlorophyll content in comparison to dusted plants. In general, pollution by the cement dust has caused adverse effects on the photosynthetic pigments.

Evaluation of Winery Effluent for the Growth and Biochemical Constituents of *Abelmoschus Esculentus* (L.)

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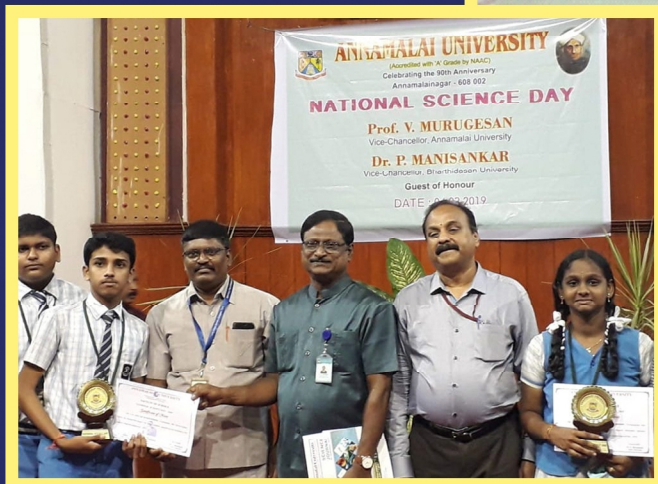
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ABSTRACT

Water pollution is a serious issued caused mainly by industrial development, and by the discharge of its effluent into the environment. Usage of effluent for agriculture, is well practiced, in the water low areas. So, a study was carried to analyse the physico-chemical parameters of winery effluent and to analyze its effect on growth and biochemical constituents of *Abelmoschus esculentus* (L.) grown with different concentration of winery effluent such as 10%, 25 %, 50%, 75% and 100% (v/v) made with tap water. Winery effluent collected was acidic, with more EC value, having high pollution load in it. The effect of effluent on the growth and biochemical constituents analysed on 45th day, showed reduction in the growth parameters and also showed reduction in the total chlorophyll, carotenoids, carbohydrates, protein, nucleic acids with a hike report in anthocyanin, amino acid, leaf nitrate, and on enzymes like peroxidase and catalase on the plants grown with increasing the concentration of effluent than the control grown with tap water, indicating the stress response of the plants.

Key words: *Abelmoschus esculentus*, Biochemical, Growth, Stress.





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Current immunological tools: Biodiversity & environmental issue



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