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Proceedings of the

NATIONAL SEMINAR

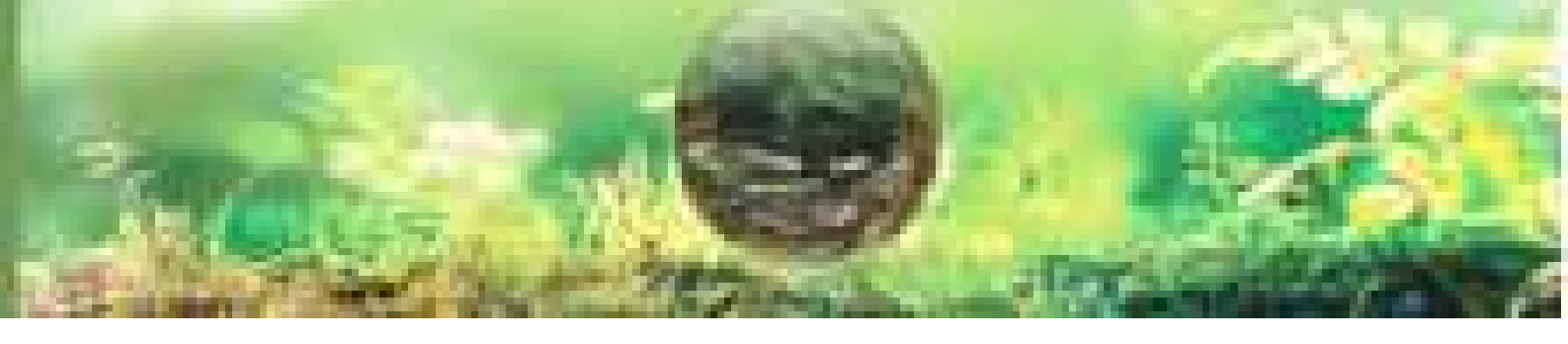
On

THE IMPACT OF NATURAL DISASTERS ON ENVIRONMENT

8th & 9th MARCH 2023

Organized by

The Department of Botany



PROCEEDINGS OF THE NATIONAL SEMINAR

The Impact of Natural Disasters on Environment

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STAR STATUS awarded by DBT, New Delhi

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Dr. SHAHIRA BANU D.A., M.Sc., M.Phil., B.Ed., Ph.D.

Vice Principal (Fore Noon) & Head of the Department of Botany

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Assistant Professor of Botany

Dr. SHAIK AZEEM TAJ, M.Sc., M.Phil., Ph.D.

Assistant Professor of Botany

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PREFACE

The National Seminar on *The Impacts of Natural Disasters on Environment* focusses on the Natural Disasters, The Current situation and technologies used for its mitigation and management.

Human beings rely on the environment for survival, more so during emergencies - for food, shelter, energy, medicine, agriculture, income-generation activities and so on. Unsustainable use of natural resources can lead to environmental degradation there by causing lasting impacts on nature and on the well being of all life on earth. Each day we hear news about natural disasters, such as earthquakes, forest fires and floods which cause unimaginable destruction. Hurricanes and tsunamis ravage coastal communities and fires turn lush forests into ashen spectres. Such violent events are fundamentally, unavoidable causing destruction to the global environment. It takes a long time to restore and rejuvenate the landscape.

Human societies are also assailed by silent disturbances that rarely merit mention in the media. Dunes creep out of a desert to swallow an oasis. Exotic species of shrubs invade grazing land. Lake levels slowly fall, eliminating unique biota and cultures. As our numbers increase, humans have unavoidably become a new form of disturbance. We rival volcanoes, floods, dunes and glaciers because our actions magnify other disturbances. Grazing gradually turns steppes to deserts and agriculture impoverishes the land. Our industries pollute in both subtle and more blatant ways than merely reduce productivity or poison the ecosystems.

The current studies of ecosystem reveal the damage caused by nature and by humans. We have to be greatly worried as the natural world is shrinking, losing its ability to sustain biodiversity and, indeed, the human species itself.

The Seminar would witness the expertise of the various Resource Persons and their innovative ideas will open the gates of research to the scholars, academicians and industry. We hope that the National Seminar will kindle the fire of Knowledge about the sustainability of life and ensure that we safeguard our Environment. The World also belongs to the future generation therefore it is our responsibility to preserve nature in its pristine form. As Mahatma Gandhi rightly said There is enough for everybody's need not for everybody's greed, Therefore lets join hands to conserve mother (earth) or nature for the well being and prosperity of all inhabitants of the earth.

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Assistant Professor of Botany

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Assistant Professor of Botany

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Principal Message

I am happy to note that the Department of Botany of Justice Basheer Ahmed Sayeed College for Women is organising a National Seminar on "The Impact of Natural disasters on Environment" on 8th and 9th March 2023.

With the recent unprecedented earthquakes occurring across the globe and natural hazards and climate changes which we are experiencing in our day to day lives there has been a severe impact on earth and its well-being.

The department of Botany has come forward with the objective to highlight and provide an understanding on Disaster Management and its mitigation process among people. This seminar will hopefully, through its deliberations disseminate the knowledge and facts and precautionary measures to be taken to create preparedness among human beings.

I congratulate the entire team of Department of Botany for the highly commended initiative on spreading beneficial knowledge on the crisis of Mother Nature, which is the Need of the Hour.

(Dr. AMTHUL AZEEZ)
PRINCIPAL

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FOREWORD

It is my pleasure and privilege to welcome you all for the two-day National Seminar on "The Impact of Natural Disaster on Environment" on 8th and 9th March 2023 which has been designed and organized for the budding scientists. This Seminar will create awareness on the conservation and protection of our Environment conducted by the Department of Botany Justice Basheer Ahmed Sayeed College for women (Autonomous) Chennai-18.

The Theme of the Seminar will ignite a great deal of interest in the younger generation and provide insights and opportunities for more research in the field of Life Sciences. Being the Convener of the seminar, I am delighted to host the event with the support of my colleagues from the Department of Botany. Today the Department has grown in strength and status due to a team of committed, skilled, supportive, and vibrant teaching faculty.

The objective of the Seminar is to provide a better understanding of the reasons for natural disasters and its management by creating awareness among the people. It is believed that with the excellent advancement of biotechnology, prediction of weather patterns and invention of new tools have advanced the development of environmental science.

I am pleased to invite renowned scientists and experts such as, Dr. Sabu Joseph Professor from the Department of Environmental Science, Kerala University, Dr. K. Kathiresan, Professor, Annamalai University, Dr. R.R. Krishnamurthy, Professor and Head Department of Applied Geology, University of Madras, Dr. N. Madhivanan Special officer and Director, Head Centre for Advanced study in Botany, Dr. Muthamilarasan. M, Assistant Professor of Plant sciences, University of Hyderabad.

I trust that they will infuse knowledge, instill new concepts and ideas also encourage the next generation of scientist with passion towards innovative research. Our sincere thanks to the resource persons and delegates for their valuable contribution and for sparing time to make this Seminar a grand success. I thank the Correspondent and Secretary Mr. Faizur Rahman Sayeed LL.B. (Bar-at-law), the Chief Patron of our college for all the support and encouragement. My heart felt thanks to the Patron Dr. Amthul Azeez, Principal of our college for her guidance. I personally thank all the participants from all over India, who have enrolled for this seminar.

I congratulate the organizing secretaries Dr. BeemaJainab. S.I and Dr. Shaik Azeem Taj for their tireless effort and coordination to bring out the Proceedings of the National seminar on "The Impact of Natural Disasters on Environment" 2023. My sincere appreciation is due to all the members of the department of botany for all their support.

Dr. Shahira Banu. D.A
Vice Principal (F.N) & Head
Department of Botany
Convener

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CONTENT

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PROGRAMME SCHEDULE
DAY – 1 (08.03.2023 - Wednesday)
INAUGURATION

09:30am – 09:35am	**Recitation from the Holy Quran**	
09:35am – 09:45am	**Welcome Address**	**Dr. Shahira Banu. D.A** VP (FN) & HoD of Botany Justice Basheer Ahmed Sayeed College For Women, Chennai
09:45am – 09:50am	**Dynamics of the Seminar**	**Dr. Beema Jainab .S.I** Assistant Professor of Botany Justice Basheer Ahmed Sayeed College For Women, Chennai
09:50am – 10:00am	**Presidential Address**	**Mr. Faizur Rahman Sayeed** Secretary S.I.E.Trust & Correspondent Justice Basheer Ahmed Sayeed College For Women, Chennai
10:00am – 10:15am	**Inaugural Address**	**Dr. SABU JOSEPH.** M.SC, Ph.D & PDF in Geology. Professor Dept. of Environmental Sciences Director, School of Earth System Sciences University of Kerala, Trivandrum, Kerala
10:15am – 10:20am	**Release of Souvenir**	
10:20am – 10:35am	**Keynote Address**	**Dr. R.R. Krishnamurthy** Head, Dept. of Applied Geology & Director, Guindy Campus, University of Madras, Chennai.
10:35am – 10:40am	**Vote of Thanks**	**Dr. Shaik Azeem Taj** Assistant Professor of Botany Justice Basheer Ahmed Sayeed College For Women, Chennai
	National Anthem	
10:40am – 11am	**Tea Break**	

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DAY – 1 (08.03.2023 – Wednesday)

11:00am – 12:00 noon	**PLENARY LECTURE – I**	**Dr. K.KATHIRESAN** Honorary Professor, Annamalai University, Formerly Dean & Director of Marine Biology & Syndicate member in Annamalai University **TOPIC: "MANGROVES FOR DISASTER RISK REDUCTION AND CLIMATE CHANGE MITIGATION"**
12:00 pm – 1:00pm	**PLENARY LECTURE – II**	**Dr. SABU JOSEPH** Prof. Dept. of Environmental Sciences Director, School of Earth System Sciences University of Kerala, Trivandrum, Kerala **TOPIC: "CLIMATE CHANGE: CONCEPT, IMPACTS IN INDIA AND MITIGATIONS"**
1:00pm – 1:30pm	**LUNCH BREAK**	
1:30pm – 3:30pm	**PAPER PRESENTATIONS**	**Mode: Online/ Offline**

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DAY – 2 (09.03.2023 - Thursday)

9:30am – 10:45am	**PLENARY LECTURE – III**	**Dr. MUTHAMILARASAN. M** Assistant Professor Dept. of Plant Sciences, School of Sciences, University of Hyderabad, Telangana. **Topic: "THE IMPACT OF NATURAL DISASTERS ON AGRICULTURE"**
10:45am – 11:30am	**PLENARY LECTURE – IV**	**Dr. R.R. KRISHNAMURTHY** Head, Dept. of Applied Geology & Director, Guindy Campus, University of Madras, Chennai. **Topic:" SATELLITE REMOTE SENSING & GIS APPLICATIONS IN DISASTER MANAGEMENT"**
11:30am - 11:45am	**TEA BREAK**	

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VALEDICTION

11:45am – 11:50am	**Recitation from the Holy Quran**	
11:50am – 12:00 pm	**Welcome Address**	**Dr. Shahira Banu. D.A** VP (FN) & HoD of Botany Justice Basheer Ahmed Sayeed College For Women, Chennai
12:00 pm – 12:15pm	**A Report on the Seminar**	**Dr. Shaik Azeem Taj** Assistant Professor of Botany Justice Basheer Ahmed Sayeed College For Women, Chennai
12:15pm – 1:15pm	**Valedictory Address**	**Dr. Mathivanan Narayanasamy** Professor Special Officer of University of Madras, Guindy Campus, Chennai.
1:15pm – 1:30pm	**Prize Distribution**	
1:30pm – 1:45pm	**Vote of Thanks**	**Dr. Beema Jainab .S.I** Assistant Professor of Botany Justice Basheer Ahmed Sayeed College For Women, Chennai
	National Anthem	
1:45pm – 2:30pm	**Lunch**	

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DAY – 1 (08.03.2023 - Wednesday)

RAPPORTEURS

INAUGURAL SESSION

Mrs. JABEENA BEGUM P

Assistant Professor of Botany

VALEDICTORY SESSION

Dr. ASIF JAMAL G.A.

Assistant Professor of Botany

PAPER PRESENTATION

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ONLINE MODE

Dr. THENMOZHI P

Assistant Professor of Botany

OFFLINE MODE

Dr. SARITHA B.

Assistant Professor of Botany

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INAUGURAL ADDRESS

Professor Dr. Sabu Joseph
Director, School of Earth System Sciences
University of Kerala, Thiruvananthapuram
jsabu@keralauniversity.ac.in

Impacts of Natural Disasters on the Environment - Inaugural Address

Abstract:

Natural disasters are disastrous events that occur worldwide, and their impacts on the environment are often devastating. Their impacts have become a growing concern recently due to their increasing frequency and severity, which is largely attributed to climate change. The dominant natural disasters in tropical countries like India include floods, landslides, earthquakes, cyclones, droughts and wildfires. This paper aims to examine the causes and impacts of natural disasters on the environment, and the measures that can be taken to mitigate these impacts. Natural disasters have both direct and indirect impacts on the environment. Direct impacts include physical damage to the environment, destruction of habitats, loss of life and damage to property, loss of biodiversity, environmental pollution etc. Indirect impacts include soil erosion, spread of invasive species.

The impacts of natural disasters affect on different types of environments such as coastal areas, river flood plains, urban areas, forests, highland regions etc. Coastal areas are particularly vulnerable to natural disasters such as cyclones, tsunamis, floods, which can cause extensive damage to ecosystems and infrastructure. Forests are also susceptible to natural disasters like flood, landslide, forest fire etc. which can cause deforestation, soil erosion, and loss of biodiversity. Urban areas are vulnerable to natural disasters such as floods and earthquakes, which can damage infrastructure, contaminate water supplies, and lead to the spread of diseases. The highland regions where slope is $>20^0$, slope length >150 m and soil thickness >1 m, in general, are prone to landslides. But the triggering factor is either extreme rainfall events or earthquakes.

This paper also explores the measures that can be taken to mitigate the impacts of natural disasters on the environment. These measures include disaster risk reduction, land-use planning, ecosystem-based adaptation, and the development of early warning systems.

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Disaster risk reduction measures include measures to reduce the vulnerability of communities, such as building infrastructure that can withstand natural disasters. Land-use planning can help to reduce the impact of natural disasters by avoiding development in high-risk areas. Ecosystem-based adaptation involves the conservation and restoration of ecosystems, which can reduce the risk of natural disasters. Early warning systems using modern tools like cloud computing, artificial intelligence, IOT, robotics, drones etc. can provide timely information to communities, enabling them to prepare for most of the natural disasters. The policymakers, communities, and other stakeholders work together to develop and implement effective strategies to mitigate the impacts of natural disasters on the environment and promote sustainable development.

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PLENARY LECTURE – I

Dr. K. Kathiresan, M.Sc., Ph.D., D.Sc.
Honorary Professor Centre of Advanced Study in Marine Biology
(Annamalai University),
Parangipettai- 608 502, India.

MANGROVES FOR DISASTER RISK REDUCTION & CLIMATE CHANGE MITIGATION

It is a matter of necessity for the world nations to remove 7% atmospheric CO_2; if not, the temperature will exceed 2^0C, and the impacts will be catastrophic to result in stronger disaster risks. In this critical situation, the mangroves can provide nature-based solution. Our recent budget has proposed a special programme namely "MISHTI" (Mangrove Initiative for Shoreline Habitats & Tangible Incomes) for undertaking an intensive mangrove planting along India's coastline and on salt pan lands.

Mangroves are the carbon-rich forests, the only blue carbon forest on the earth, and their role in carbon sequestration is remarkable. They produce greater carbon biomass than any other aquatic systems on the earth, and they store four times higher carbon than terrestrial forests, making them indispensable for climate change mitigation. Mangroves protect coastal communities to the impacts of climate change, such as sea-level rise, storms, flood and coastal erosion. The mangroves reduce flood risk to 15 million people every year, and prevent more than US$65 billion in property damages in the world. The value of mangroves in saving human life and properties was realized in India after the 1999 super-cyclone in Odisha and the 2004 tsunami. The mangroves protect groundwater aquifers from seepage of seawater, thereby ensuring water security for coastal population. Further, the mangroves support food fish production by providing "home" for feeding, breeding, and nursery grounds for the fishes. The mangroves serve in pollution removal, tourism development and as a source of high vale products. Thus, the mangroves are of great importance in providing a potential solution for climate change issues by building adaptive capacity of coastal communities, and making them more resilient to the impacts of climate change.

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PLENARY LECTURE – II

Professor Dr. Sabu Joseph
Director, School of Earth System Sciences
University of Kerala, Thiruvananthapuram
jsabu@keralauniversity.ac.in

CLIMATE CHANGE: CONCEPT, IMPACTS IN INDIA AND MITIGATIONS PLENARY LECTURE

Abstract:

Climatic change (CC) is one of the most important global environmental challenges facing humanity now-a-days. From a human perspective, CC is departure from the expected average weather or climate normal, in terms of temperature and rainfall, for a given place and given time of the year. In fact, CC indicates drastic changes in heat balance of the earth-atmosphere system, moisture, cloudiness, precipitation due to either external factors or internal factors or both.

The Intergovernmental Panel on Climate Change (IPCC) projects that the global mean temperature may increase between 1.4 and 5.8^{0}C by 2100. The drivers of CC are green house gases (mainly CO2), aerosols, and change in land use/land cover. Climate change and its impacts (i.e., environmental disasters) are the two major challenging environmental issues that human beings face today. It has, in general, implications for food production, natural ecosystem, freshwater supply, health, coastal settlements, energy security etc. The indicators of present climate change include severe and prolonged droughts, extreme rainfall events, storms, floods, cyclones, shift in climatic zones and seasonality, sea level rise etc. The major environmental disasters include cyclones, floods, droughts, landslides, forest fires etc.

The impacts of present climate change will be severe for tropical countries including India. The Indian concern is that about 700 million rural population directly depend on climate sensitive sectors, like agricultural, forest and fisheries, for their livelihood. India is both a major emitter of greenhouse gas and one of the major victims of projected climate change.

India's average temperature has risen by ~ 0.7°C during 1901–2018. By the end of 21st century, average temperature over India is projected to rise by ~ 4.4°C relative to the recent

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past (1976–2005 average), under the RCP8.5 scenario. The frequency of summer (April–June) heat waves over India is projected to be 3 to 4 times higher by the end of 21st century under the RCP8.5 scenario. Sea surface temperature (SST) of the tropical Indian Ocean has risen by 1°C on average during 1951–2015, markedly higher than the global average SST warming of 0.7°C over the same period, and causing severe impact on environment. Also a rise in extreme temperature and rainfall events, droughts, and sea levels; and an increase in the intensity of severe cyclones reported, alongside other changes in the monsoon system. Even though climate change is global, its impacts are local. So, the mitigations and adaptations should also be local. Reduce carbon footprint, and implement carbon neutral activities like clean, green and renewable energy sources; afforestation programmes, climate-smart agricultural activities etc. should be given higher priority to attain Net Zero Emission.

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PLENARY LECTURE - III

Dr. M. Muthamilarasan
Repository of Tomato Genomics Resources,
Department of Plant Sciences,
School of Life Sciences, University of Hyderabad,
Hyderabad 500046, Telangana, India
Email: muthu@uohyd.ac.in

THE IMPACT OF NATURAL DISASTERS ON AGRICULTURE

The effect of climate change and global warming on agriculture is irreparable. These natural disasters could be classified as (i) drought and other meteorological and climatological disasters (extreme temperatures, storms and wildfires), (ii) floods, (iii) geophysical (earthquakes, tsunamis and mass movements), and (iv) biological disasters (epidemics, infestations and animal disease). The impact of these disasters on agriculture, which feeds the global population, needs to be discussed. In recent years, India has seen a swarm of locusts attacking the wheat fields, resulting in tremendous yield loss. Thus, agriculture has become a victim of climate change and related disasters. With these challenges, agriculture faces another challenge of feeding 10 billion by the year 2050. While the yield and productivity of major crops are already declining, the FAO has predicted that the loss will increase by 25% more if we do not address climate change now. In this context, my talk will focus on the different aspects of natural disasters that challenge agriculture and food security and how technology and provide probable solutions to this issue.

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Department of Applied Geology

School of Earth & Atmospheric Sciences (SEAS)

Dr. R. R. Krishnamurthy M.Sc., M.Phil., M.Tech., Ph.D.
Professor and Head
Director – Guindy Campus &
Member Syndicate (Elected

SUMMARY OF KEY NOTE ADDRESS
&
PLENARY PRESENTATION- IV

SATELLITE REMOTE SENSING & GIS APPLICATIONS IN DISASTER MANAGEMENT

The availability of variety of optical remote sensing data in different spatial, spectral and temporal resolutions helpful to the scientific community to effectively map and monitor the vegetation cover, ecosystems, various natural resources and environmental conditions in near real time basis. My initial involvement in the National Programme entitled "Marine Remote Sensing Information Service (MARSIS)", which was coordinated by the Department of Space, Government of India, carried out at the Institute for Ocean Management, Anna University, during 1990s and in the aftermath of launch of the Indian Remote Sensing (IRS) satellite series with different spectral and spatial resolutions, including the availability of satellite data such as NOAA-AVHRR from other countries, was witnessed with the benefit of this technology for the mapping and monitoring of India's lengthy coastal zone. The sea surface temperature (SST) and ocean productivity information derived from AVHRR sensor data are used to demarcate the Potential Fishery Zone (PFZ), which was one of the pioneering end user products generated for the benefit of fishermen along the coast, which is being in continuous use now in the country.

Subsequent advent of the precise technological tools such as high spatial/spectral resolution remote sensing data and spatially enabled decision support system, including the latest mapping methods using drones, which have proved to be extremely helpful in the effective monitoring and management of coastal resources globally. Also, majority of the critical coastal habitats such as mangroves, coral reefs, sea grass meadows etc are also being monitored using the thematic information derived from multi-sensor optical remote sensing data. Advancements in the field of

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digital image processing and the related computer applications greatly helped for aerial estimation including the species level mapping of different vegetation, for examples, mangroves and coral reefs along the Indian coast. GIS based scientific database and its applications are realised by the scientific community in various areas and several end user oriented products are developed and documented by taking case studies across the country and the quantum of data generated is highly laudable.

In the aftermath of 2004 Indian Ocean Tsunami and the series of cyclonic impacts along the East Coast of India since 2005, the importance of satellite remote sensing and the spatial information technology tools in studying the environmental quality due to natural as well as climate change induced disasters have reached in all levels. The experiences gained from the participation in the India's ambitious national programme on the Establishment of Tsunami warning system and the funded research projects on Tsunami inundation mapping along Chennai coast and Andaman Islands, various training and capacity building activities carried out in India and Maldives, introduction of Disaster Management higher education in the University curriculum through international collaborations etc are highlighted in the plenary presentation for the benefit of young scholars and the participants of the National Seminar on The Impact of Natural Disasters on Environment.

R. R. Krishnamurthy

Phone (Office): 0091-44-2728 E-mail: teaching@rrkrishnamurthy.org

Mobile: (+91) 9677045519 (only voice calls and SMS)

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VALEDICTORY ADDRESS

Dr. N. Mathivanan
Biocontrol and Microbial Metabolites Lab,
Centre for Advanced in Botany,
University of Madras, Guindy Campus,
Chennai – 600 025, India
E-mail: prabamathi@yahoo.com

CLIMATE CHANGE IMPACTS ON BIODIVERSITY AND CHALLENGES FOR ITS CONSERVATION:

Every life form has the right to live on earth and the biodiversity at present is the continuous evolution for about billions of years. Although the presence of about three to 100 million species has been estimated, only about 1.75 million species have been identified so far. A large numbers of microorganisms, plants and animal species are the component of the biodiversity. It is well documented that the anthropogenic activities and also changes in climate and global warming are the largest threats to all the life forms on the earth. Every species in the biodiversity is undergoing tremendous pressure for its existence, multiplication and colonization in the situation of climate change. There are about 3.91 lakhs vascular plants identified on earth according to the report of Kew Botanical Garden, United Kingdom. However, the serious issues are that about 21% of all plant species are likely becoming threatened with extinction. The same scenario is prevailing for the animal species as the IUCN Red list of threatened species revealed that more than 42,100 species are threatened with extinction including a considerable number of animals. Therefore, awareness has to be created among the people on the adverse impacts of anthropogenic activities and also climate change on biodiversity, which hopefully will lead to find suitable ways for its conservation.

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STUDY OF THE OCCURRENCE OF RADON IN DRINKING WATER IN NEYYAR RIVER BASIN, KERALA, INDIA

Akhil. R.V[a], Sabu Joseph[a]

[a]Department of Environmental Sciences, University of Kerala, Thiruvananthapuram, 695581, India

Abstract:

The present study integrates hydrogeological, hydrochemical and radiogenic data of groundwater samples collected from Neyyar River Basin, Kerala. A total of 68 groundwater samples were collected during pre-monsoon and monsoon season period of 2021-2022. The collected samples from specific areas were analyzed important physico-chemical parameters such as pH, temperature, electrical conductivity, total dissolved solids, free CO_2, calcium, magnesium, sodium, potassium, bicarbonate, chloride, sulphate, nitrate, alkalinity and total hardnes. RAD7, RAD-H_2O accessory (Durridge Co.USA) was used to analyze the radioactive Radon (^{222}Rn) concentration in the groundwater.

The ^{222}Rn concentrations in groundwater samples in NRB varied from 250 Bq/m3 to 61700 Bq/m^3 with an average of 5707 Bq/m^3 in premon soon and from 190Bq/m^3 to 22000Bq/m^3 with an average of 3166Bq/m^3 in monsoon. The analytical results were interpreted with subsurface geology, lineaments and the ionic concentrations, there is no significant correlation between ^{222}Rn activity and depth of water table and physico- chemical parameters were observed. Various graphical, geographical and multivariate statistical tools were applied to understand the major hydrogeochemical processes controlling the groundwater quality with spatio-temporal variation and geological controls of radon enrichments.

Keywords: Radon (^{222}Rn), groundwater and Neyyar River Basin (nrb)

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MAPPING AND ASSESSMENT OF FLOOD RISK IN KABANI RIVER BASIN, KERALA, INDIA: A GIS AND REMOTE SENSING STUDY

Lakshmi. R, and Sabu Joseph*

Department of Environmental Sciences, University of Kerala.

Abstract:

Flooding is widely regarded as the most common natural disaster in recent decades. Flood risk cannot be completely eliminated, but its impact can be significantly reduced with geographic information system (GIS) and remote sensing-based solutions, making flood hazard potential mapping essential for flood management and mitigation. The current study sought to identify Flood Hazard Zone areas in the Kabani River Basin, Kerala, India. The preparation of a flood hazard risk zone map for the Kabani river basin aids in identifying potential flood risk prone areas for appropriate land use planning and necessary mitigation measures. The Arc GIS 10.2 software was used to analyses each of the factors. The various classes of factors are assigned ranks based on their relative significance in causing the flood event. For the preparation of the flood hazard risk zone map, the Weighted Overlay Analysis method is used, which assigns weightage to each of these considered factors. The result shows that 5.4 % of the Kabani River Basin is included in the "very high" risk category, 63.31 % in the "high risk" category, 24.86 % in the "moderate" risk category, 5.86 % in the "low" risk category and only 0.5 % of the Kabani River Basin in the "very low" risk category. Preparation of flood hazard risk map help to propose measures to reduce the risk of flood hazard in Kabani River Basin, Kerala, India.

Keywords*: Flood mapping; GIS and Remote sensing; climate change; River basin*

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SEASONAL VARIATION ON SURFACE WATER QUALITY OF NEYYAR RIVER BAIN, KERALA, INDIA

Nivedi S. Mohan and Sabu Joseph

Dept. of Environmental Sciences, University of Kerala, Kariavattom Campus, India 695581

E-mail: achunived16@gmail.com

Abstract:

Rivers are the one of the most abundant resources, but lack of proper monitoring and management often led to deterioration of the ecosystem. In present study, total of 111 surface water samples were collected from the Neyyar river basin (L=56 km, O =6, A= 497 km^2) during pre-monsoon (March), monsoon (July) and post-monsoon (October) seasons in 2022. The collected water samples were analysed for various physico-chemical parameters using the standard procedures prescribed by APHA (2015). The present study reveals that concentration of TDS, EC, TH and Cl were increased at downstream station in all seasons. Further, nutrients such as NO_3-N (av:4.25±1.23 mg/L), NO_2-N (av:0.15±0.08 mg/L) and NH_3-N (av:0.36±0.07 mg/L) were also increases at the monsoon season towards the downstream because of runoff from agricultural areas in Neyyar river. Significant correlation between various parameters were observed in the study. Continuous and proper monitoring of quality of Neyyar river help to adapt new management strategies by concerned local authority.

Key words: Physico-chemical, surface water quality, Seasonal variation

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DIVERSITY AND PREVALENCE OF ENTEROPATHOGENIC *VIBRIO* SP. IN MUD CRABS AND THEIR IMPACT ON THE PUBLIC HEALTH OF WEST BENGAL.

Sanjib Saha[1], Debajyoti Pradhan[2] and Gadadhar Dash[3]

[1] Assistant Professor in the Department of Zoology, Vidyasagar College for Women (University of Calcutta), 39, Sankar Ghosh Lane, Kolkata – 700009, West Bengal, India.

[2]Assistant Professor in Zoology, Egra Sarada Shashi Bhusan College, West Bengal

[3]Professor, Department of Aquatic Animal Health, Faculty of Fishery Sciences, West Bengal University of Animal & Fishery Sciences (WBUAFS), 5-B.H. Road, P.O: Panchasayar, Kolkata-700 094, West Bengal, India.

Corresponding author – Dr. Sanjib Saha[1], wbdstbt22@gmail.com

Abstract:

West Bengal has the two most valuable species of mud crab (*Scylla* sp.), which have high market demand because of their nutritional value. Fishermen indiscriminately capture juvenile and adult mud crabs from the Sundarbans, raise them in ponds, or trade them directly as a means of making a living in West Bengal. Bacterial diseases could cause mortality in all stages of the mud crab. Some *Vibrio* species are recorded worldwide to be related to infections, and some virulent genes of them may transmit to humans and cause mainly gastric-related diseases like diarrhea, gastroenteritis, abdominal cramping and health problems like fever, chills, nausea, hypotensive septic shock, secondary lesions, infection, cellulitis, and blistering skin lesions, most often on the legs and arms, particularly on the palms, fingertips and soles of the feet. Without proper treatment, pathogenic infection with *Vibrio* can result in mass mortality in *Scylla* sp. The main causes of bacterial infections are eating raw or undercooked crab, drinking water or other liquids contaminated with faeces or mucus from *Vibrio*-infected mud crabs and coming into contact with the infectious agent through open wounds, skin scrapes, or abrasions. It has been reported that more than 10% of *Vibrio* species are transmitted by consuming contaminated water containing infected organisms or by handling. Crab fisherpersons and farmers, in general, are less aware of environmental contamination and scientific-based fisheries. For this reason, they face various types of occupational hazards. The current study examines the distribution of various pathogenic zoonotic *Vibrio* sp. and their potential virulent genes in mud crabs that cause pathogenic diseases.

Keywords: Mud crab, *Vibrio* diversity, Zoonosis, Occupational

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FRESH WATER FISH BIODIVERSITY AND ARCTIC MELTDOWN: THE REAL SCENARIO

Dr. Chaitali Banerjee
Assistant Professor in Zoology
Vidyasagar College for Women (Affiliated to University of Calcutta)
39, Sankar Ghosh Lane Kolkata-700006, West Bengal, INDIA

Abstract:

Globally biodiversity of different ecosystems are at risk. Various anthropogenic activities have threatened and paved the pathway of extinction for several species and the threats are increasing owing to changing climatic conditions. Notably, one-third of freshwater fish species are threatened with extinction and 80 species have already been declared extinct. The year 2020 has been declared as "Black year for freshwater fish" (IUCN version 2020). Scientifically it's evident that aquatic organisms are largely sensitive to their environmental changes; crisis being more severe in freshwater ecosystem. The UNESCO have reported faster decline of freshwater biodiversity as compared to terrestrial and marine biodiversity in last few decades. The Convention on Biological Diversity conference (2020) have recommended an Emergency Recovery Plan to bend the freshwater biodiversity curve. Arctic waters harbours a significant percentage of freshwater fishes and their meltdown have raised significant concerns. Diversity of freshwater fish declines with increasing latitude. Longitudinally, diversity is greater at the unglaciated region. With limitations in time line and fewer monitoring sites, it's difficult to analyse the temporal trend in Arctic; though its evident freshwater fishes are colonizing northward along river corridors & biodiversity "hotspots" have become notable.

Keywords: Freshwater, Fish, Biodiversity, Extinct, Arctic

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DISASTER - THE DISTRESS FACTOR

AYESHA SABEEN M

Assistant Professor, Department of Biochemistry,

Marudhar Kesari Jain College for Women, Vaniyambadi, Tirupattur District.

Email - ayeshanfsmd@gmail.com

ABSTRACT:

Disaster is a natural or a man made calamity, bringing about vast destruction of life as well as the environment. It is an untoward incident not anticipated by human at any time, because it comes with a lot of distress, disruption and destruction as well. Disasters can be relatively sudden, such as an earthquake, volcanic disruption, flash flood, Tsunami, chemical explosion, critical infrastructure failure, landslides, oil spill or it may stay on for a very long period like the effects of an ongoing pandemic like COVID 19, climatic disruption. Disasters always comes up with a lot of health issues to the affected group of community along with life long serious complications as well. Natural and human caused disasters affect millions of people every year. Severely affected population exhibit catastrophic loss of life and physical destruction. Disasters are always unexpected and leave the victimized population in a state of shock. People who experience disasters face emotional distress like feelings of anxiety, prolonged worrying, insomnia, depression, inability to concentrate in day to day activities, failure to cope up with present situations, reluctant to behave normally, and end up having prolonged health issues for life. Many disaster affected population bounce back to their normal routine with the help of their friends and families, whereas many other affected counterparts need additional support to restart to their normal life and move on the path of recovery. Disaster affected population can rely on and look up to Disaster Distress helpline staff, who are available to help people before, during or after a disaster has taken place, by providing immediate crisis counseling and measures for rehabilitation

Keywords: Disaster, Tsunami, COVID - 19, distress, anxiety, destruction, insomnia, depression, counseling, rehabilitation.

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ANIMALS AS WEATHER FORECASTERS

S. A. Vidhya
Department of Zoology, Stella Maris College (Autonomous), Chennai – 600 086
sa.vidhya@stellamariscollege.edu.in

Abstract:

Since time immemorial, humans have had to adapt to ever-changing weather and climate, including natural disasters. Early humans were intimately connected to their immediate natural environment and soon learnt to predict the weather by observing the phenology of certain plants and the behaviour of certain animals. This ability to forecast weather and climate by observing plants and animals has been part of innumerable cultures and peoples around the world. The behaviour, physiology and reproductive cycles of certain animals are natural indicators of weather. Various species of animals that serve as zooindicators, have thus helped guide local choices regarding cultivation of crops, hunting, gathering and animal husbandry in different parts of the world. This knowledge has been handed down from generation to generation and forms part of Traditional Ecological Knowledge (TEK). Even today, farmers, fisherfolk and hunters, who rely on the environment for their livelihood, are adept at using zooindicators to foretell changes in the weather. This study is a review of the literature on some of the animals used as zooindicators of weather, climate and natural disasters in India and in different parts of the world.

Keywords: animals, weather, climate, natural disaster, forecast, zooindicator, Traditional Ecological Knowledge, TEK

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IDENTITY AND UNDERSTANDING OF SOMA PLANT IN PERSPECTIVE OF INDIAN BIOCULTURE AND MEDICINE

Ahirrao, Y.A[1] and Patil, D.A.[2]

[1]Department of Botany S.S.V.P. Sanstha's Arts, Commerce & Science College Shindkheda, District Dhule-425406 (M.S.) India. *Corresponding Author E-mail: yaabotany@gmail.com

Post-Graduate Department of Botany,

[2]S.S.V.P.Sanstha's L.K. Dr.P.R.Ghogrey Science College, Dhule-424005 (M.S.), India.

(Former Professor & Principal), Email: dapatil_10aug@yahoo.com

Abstract:

The Soma plant is considered to be the most sacred in Rigveda. Its extract (Soma Rasa) was offered to deities and regarded as a sacred drink. Its identity has remained a subject of great ambiguity, curiosity, investigations and debates. Its all-pervasive examination is still awaited as the earlier investigators always thought it in isolation and attempted to equate to some plant species in their neighborhood. The present communication is an attempt to collate all evidences and thoughts to arrive at home in the state of present circumstances. A literary survey was conducted from the ancient Indian Sanskrit scripts and till date research is carried out for its identity. The current scenario focus on different opinions of various exponents of subject matters is introspected to arrive at the present state of knowledge. Different plant species judged or suspected as 'Soma Plant' are enumerated in the Tables I, II and III. It is evident that 26 plant species clearly representing Soma plant, including a fungal and a gymnospermic species. 14 species are exposed as substitutes for proper Soma plant. Common or Sanskrit names have been named after the epithet 'Soma' for another 13 species. During Vedic period Soma plant underwent lot of discussions and investigations to prove its identity. Various script writers ventured to decipher its identity based on their knowledge and observations but no one could arrive at satisfactory explanation of Soma plant. However, they emerged triumphant in searching out psychoactive plant species and even their active principles. Vedic Soma plant still remains a botanical enigma.

Keywords: Vedic Soma Plant, Indian Bioculture, Ethnomedicine, Psychoactive.

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PHYTOCHEMICAL AND FOURIER TRANSFORM INFRARED SPECTROSCOPIC ANALYSIS OF*TORENIA CRUSTACEA*CHAM. & SCHLTDL.

***Anusha S and **Mary Kensa V**

*Research Scholar (Full time), Reg: No: 22113152312008,

Email Id: anushaanusha9788932134@gmail.com., Abishehapatti, M. S. University, Tirunelveli.

**PG Research Centre of Botany, S.T. Hindu College, Nagercoil.

Email Id:surejkensa@gmail.com.

Abstract:

Medicinal plants play a significant part in natural wealth. Phytochemicals are non-nutritive chemical compounds that occur naturally on plants and have diverse protective properties. The phytochemical analysis shows the presence of alkaloids, flavonoids, tannin, terpenoid, glycoside, phenol, saponin, steroid, protein and carbohydrate in chloroform, ethyl acetate, ethanol, methanol and aqueous extracts of *T. crustacea*. FTIR perhaps the most powerful tool for identifying the types of chemical bonds / functional groups present in the phytochemicals. FTIR analysis in the whole dry powdered material in the ethanol extracts of *T. crustacea*. provides the various phytochemicals having functional groups such as hydroxyl compound, methyl group, cyclo alkane, carbonyl compound, sulphur compound, alkyl ketone, aminoacids, sulphones compound, halogen compound and alkyl halides. The wavelength of light absorbed is the salient features of the chemical bonds seen in the annotated spectrum. The results confirm the fact that these plant posses' important bioactive constituents useful for our health, so further scientific investigation is needed. Further work will emphasize the isolation and characterization of active principles responsible for bio-efficacy and also bioactivity.

Key Words: Acetone, bio-efficacy, ethyl acetate, *Torenia crustacea* and spectrum.

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SURVEY OF NATURAL DYE YIELDING PLANTS IN VELLAMCODE PANCHAYATH, KANYAKUMARI DISTRICT, TAMILNADU, SOUTH INDIA

Anju, H.G. Iswarya. S. and Mary kensa V.
PG Research centre, Department of Botany, S.T. Hindu College, Nagercoil-629 002, K.K. Dist, Tamil Nadu. Email: surejkensa@gamil.com.

Abstract:

Plants are considered to be the major source of natural dyes. Natural dyes are colourants which can be derived from plants, minerals and animals; capable to dye other substances such as textile material, leather, food, medicine etc. The present study is a first attempt to compile a list of dye yielding flowering plant resources in the study area (Vellamcode Panchayath). The present study revealed that the natural dye yielding plants of the study area. A total of 56 plant species under 34 families. Among the 34 families, Fabaceae was the dominant family with 6 species followed by Caesalpinioideae, Moraceae with 4 species each, Rubiaceae with 3 species, Apocynaceae, Asteraceae, Combretaceae, Euphorbiaceae, Lamiaceae, Lythraceae, Nyctaginaceae, Rosaceae, Solanaceae with 2 species; Acanthaceae, Amaranthaceae, Anacardiaceae, Annonaceae, Arecaceae, Basellaceae, Bignoniaceae, Boranginaceae, Casuarinaceae, Liliaceae, Malvaceae, Meliaceae, Mimosaceae, Myrtaceae, Nymphaceae, Oleaceae, Phytoloccaceae, Rutaceae, Utricaceae, Verbinaceae, Zingiberaceae contain single species each. Based on the percentage composition, the family Fabaceae (10.7%), Caesalpinioideae, Moraceae (7.1%), Rubiaceae (5.3%), Apocynaceae, Asteraceae, Combretaceae, Euphorbiaceae, Lamiaceae, Lythraceae, Nyctaginaceae, Rosaceae, Solanaceae (3.5%), Acanthaceae, Amaranthaceae, Anacardiaceae, Annonaceae, Arecaceae, Basellaceae, Bignoniaceae, Boranginaceae, Casuarinaceae, Liliaceae, Malvaceae, Meliaceae, Mimosaceae, Myrtaceae, Nymphaceae, Oleaceae, Phytoloccaceae, Rutaceae, Utricaceae, Verbinaceae and Zingiberaceae (1.7%) are distributed in the study area. The present study recorded 3 annuals and 53 perennials. The study revealed that, the different plant parts like leaves, flower, seed, bark, rhizome, nut, fruits, whole plants, peel are used by the local people of study area. The plant parts used in extracting colour include peel (1), fruit (11), Leaves (19),root (1), flowers (23), bark (9) and the whole plant (1).The identified plants produced the different colours like Yellow (14), red (11), grey(2), black (9) and blue (5).To conclude, as the natural dyes are quite safe and economically viable, it needs to explore the sustainable utilization of these dyes for various practices. To know the real potential and availability of natural dye yielding resources more detailed studies and scientific investigations are necessary.

Keywords: Apocynaceae, Combretaceae, scientific, investigations, and necessary

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A MORPHO-ANATOMICAL ASSESSMENT OF MEDICINAL PLANT MATERIAL OF *MORUS ALBA* L.

Milvee K. Vyas

Government Commerce & Science College, Dahej, Dist. Bharuch, Gujarat

(Affiliated to Veer Narmad South Gujarat University, Surat, Gujrat)

Abstract:

Morus alba L. (Moraceae) is an important medicinal plant used in traditional Ayurvedic preparations, and is also extensively used to obtain valuable phytoconstituents. Nevertheless, correct identification of plant is needed to avoid adulteration, and for this anatomical and morphological characters are a prerequisite which will enhance the quality of botanical materials. In present study, anatomical analysis of various parts viz., root, stem, leaves, midrib, petiole, lamina, stomata, trichomes, and histochemical localization of substances viz. calcium oxalate, lignin and suberin had been carried out. The results revealed that the plant exhibited distinguishing microcharacters such as diarch root, uni-triseriate xylem rays, eglandular and glandular trichomes. The stomatal apparatus of plant is anomocytic and the peculiarity of node was unilacunar single trace. Further, leaves were also analyzed for accumulation of different metals and they were in range: Cu (48.33±1.16 µg/g) > Zn (26.33±1.52 µg/g) > Cd (20.33±0.98 µg/g) > Cr (14.00±1.89 µg/g) > Pb (12.00±0.94 µg/g) > Ni (6.00±1.70 µg/g). This study can serve a basis for determining the taxonomic affiliation of the species by anatomical features and authenticity of the plant. In addition, heavy metals analysis suggested that this plant can be used as a potential phytoremediation agent.

Key words: Anatomy, Heavy metals, Medicinal plant, *Morus alba* L., Pharmacognosy

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PHYTOCHEMICAL AND ANTIBACTERIAL EFFECT OF AQUEOUS AND COMMERCIALLY AVAILABLE ROSE WATER EXTRACT (ROSA DAMASCENA)

Nushrath Fathima J[1] and Dr. V. Anuradha[2]

[1]Research Scholar – P.G. and Research Department of Zoology, J.B.A.S College for Women.

[2]Associate Professor, Head of the Department, P.G. and Research Department of Zoology, J.B.A.S College for Women.

Abstract:

Roses are beautiful flowers having enormous variety in colours. Roses are considered as the King of Flowers. They are in use since ancient times in the fields of medicine, decorations, perfumes, culinary, spiritually etc. Many studies have shown that they contain many phytochemical components. Due to this they possess anti-inflammatory, anti-diabetic, anti-oxidant, antibacterial, astringent, and analgesic activities. Rosa damascena Mill (Rosacea) is a well-known ornamental plant. This rose is also called as paneer rose in Tamil. The aim of the present work is to compare aqueous rosewater sample with that of commercial rose water sample and to study their phytochemical and antibacterial effect. The methodology followed was steam distillation method, Qualitative phytochemical analysis and agar well diffusion method. Two Gram-positive bacteria and one Gram-negative bacteria were used for this purpose. The results showed the presence and absence of phytochemical constituents. The present study also showed that the aqueous rose water extract had better antibacterial activity when compared with the commercial rose water sample. Furthermore, homemade remedies are used to overcome many health issues. This work also showed that the aqueous extract started degrading within few weeks and it was of pure form without any mixture of chemicals. This work paves a way for entrepreneurship.

Keyword: Phytochemical, Rosewater, Paneer rose

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ROLE OF HARMFUL PESTICIDE IN CLIMATIC CHANGE

Dr. R. Vijayalaskshmi,

Assistant Professor, Department of Botany, Queen Marys College, Chennai – 600 004.

Email: rvijaya2799@gmail.com

Abstract:

Pesticides are used to manage a variety of pests and disease carriers, including rats, mice, ticks, mosquitoes, and tick-borne diseases. In agriculture, pesticides are used to manage illnesses, insect infestations, and weeds. Pesticides come in a wide variety of forms, and each is designed to be efficient against a particular insect. Pesticides may be carried by runoff as soil-borne particles or as substances dissolved in water. Pesticide runoff from treated regions can contaminate wells, ponds, lakes, and streams. Surface water containing pesticide residues can harm wildlife and plants and affect groundwater. Pesticides release a variety of pollutants, including volatile organic compounds and hazardous air pollutants. These toxins may cause health issues that have an impact on locals, their surroundings, and the neighbourhood. Pesticides are crucial because they allow growers to produce more food on a smaller amount of land by shielding crops from weeds, diseases, and pests while also increasing yield per hectare. Since 1960, the production of key crops has more than tripled. These pesticides prevent insects and fungi from harming the plants, increasing yields. These substances may also interact with soil to create gases that damage the ozone layer on Earth. Pesticide overuse and misuse contaminate nearby soil and water supplies, resulting in biodiversity loss, climate change, the eradication of populations of helpful insects that serve as pests' natural enemies, and a decrease in the nutrient content of food.

Keywords: Productivity, Protection of crops, Vector disease control, Quality of food.

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DISASTER MICROBIOLOGY :A PERSPECTIVE ON THE DISASTER IMPACT OF ON NORMAL MICROBIOTA AND ITS ADAPTION

Dr. Sumitha. J , Sakina Shabbir Lodhger and Yamunakshri R

Department of Microbiology, Justice Basheer Ahmed Sayeed College for Women, Chennai-18

Abstract:

Microorganisms are ubiquitous in nature and are well known for their adaptation to external changes. Being central to Earth's systems and cycles and an essential part of agricultural practices, they form an integral part of the natural ecosystem. Normal Microbiota defines the presence and importance of conventional microbes in the environment and their interactions with their niche. Natural disasters are large-scale geological or meteorological events that have the potential to cause tremendous alterations in the environment and the inhabiting microbes. Alterations for microbial populations can lead to new ecological interactions and could potentially have adverse consequences for many higher species including humans. Detangling the microbial interaction, the succession, the spore formation, adaptation through genetic and enzymatic mechanisms pave the way to newer scopes of genetic manipulation and lead to beneficial products. Harnessing the microbial adaptation in disaster sites can reveal new biological processes, especially beneficial interactions such as bioremediation and manipulating them for our advantage will be a promising area of research. The basic objective of this presentation is to discuss disasters and their impact on microbes both physical or biological adaptation and their possible outcomes. The four major natural disasters discussed with reference to native microbes versus newer species and their adaptation mechanisms are flood, cyclone, earthquake, fire and a natural hazard-COVID pandemic.

Key Words: Disaster Microbiology, Impact of Natural disaster, Microbial adaptation.

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EFFECT OF COW URINE AND LEAF EXTRACT FROM *LANTANA CAMARA L.* ON THE GROWTH BEHAVIOUR OF *CORIANDRUM SATIVUM* L: VOCAL FOR LOCAL SOLUTIONS

R D Raviya* and Twinkle Godhaniya

Department of Life Sciences, Bhakta Kavi Narsinh Mehta University,

Juanagadh, Gujarat, INDIA

*rdraviya@gmail.com

Abstract:

Coriandrum sativum L. belong to the Apiaceae family and is an annual herb having great importance in Indian food as a spice. The current study was carried out at village Beran taluka, district Porbandar as the region cultivates *Coriandrum sativum L*. *Lantana camera L.* is an invasive species according to National Biodiversity Authority, Department of Environment Forest and Climate Change, Government of India. The Species is having the ability to adapt to the changing climate that creates a potent threat. The current study was focused on a Vocal for a local solution to catch up with the changing scenario of Organic Farming. on the theme to use Cow Urine and *Lantana camera* L.on *ex-situ* cultivation of *Coriander sativum* L. in which various concentrations of Cow Urine and leaf extract of *Lantana camera* L.was sprayed on *Coriander sativum* for two major purposes viz. (a) as a Growth promoter (b) to increase the health of a plant. The result shows that Cow urine and *Lantana camera L* an effective growth promoter. An optimization of the concentration of cow urine and *Lantana camera L*. leaf extract was achieved that gave a better result than of the control, detail of the work is discussed herewith.

Key Words: Cow urine, organic farming, vocal, local, spices, *Coriandrum*

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BIOPROSPECTING COMMON WEEDS AS ANTI-BIOFILM AGENTS

Largus Shylee M[1] and Dr. Mujeera Fathima[2]

[1]Assistant Professor, Department of Biotechnology, Alpha Arts and Science College, Chennai.

[2]Principal, Government Arts and Science College, T.C. Koot Road, Vanur, Villupuram.

Abstract:

Biofilms are formed by the clumping of free-living bacterial cells, adhering to a solid substratum in a common mucilaginous matrix. Such cluster initiated biofilm forming is considered to be an important virulence potential which increases the resistance of the pathogen to the common antimicrobial treatment. Quorum sensing (QS) is a cell density-dependent regulation of virulent bacterial gene expression which regulates pathogenesis of bacterial infection. Biofilm is an important factor in the quorum sensing mediated virulence in which the bacterial cell encompasses itself within a protective extracellular matrix. It promotes bacterial infection by resisting antibiotic treatment due to relative impermeability. Anti- quorum sensing agents would offer a way of controlling microbial infections with the advantage of reducing risks of resistance development. Oral diseases such as dental caries and periodontal disease are directly linked with the ability of bacteria to form biofilm. Gram- positive and Gram- negative bacteria like *Streptococcus sp.* and *Enterococcus sp.* have been linked with periodontal diseases. Over the past decade, interest in drugs derived from medicinal plants as anti-quorum sensing agents has markedly increased. It has been well documented that medicinal plants and natural compounds confer considerable antibacterial activity against various microorganisms including cariogenic and periodontal pathogens. In the present study, common weeds like *Leucas aspera, Passiflora foetilda, Antigonan leptopus*, *Alternanthera sessilis, Lantana camara, Mimosa pudica, Ricinus communis, Rivina humilis and Sida acuta* were investigated for screening anti-biofilm agents and extract were subjected to further studies.

Keywords: Biofilm, Quorum Sensing, Extracellular matrix, Dental caries and periodontal disease.

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STUDY ON ZOOPLANKTON COMPOSITION IN FRESHWATER BODIES AT MINJUR TOWN OF TAMILNADU

F. Akthari Begum and B. Dilshad Begum

Post Graduate and Research Department of Zoology, Justice Basheer Ahmed Sayeed College For Women (Autonomous) Teynampet , Chennai - 18.

Abstract:

Fresh water bodies are natural source depend upon the primary productivity, nutrient recycling that are used by man and other organisms for various purposes. It contains water fauna especially zooplankton which are the most important ecological parameter in water quality assessment, serve as bioindicator and plays vital role in aquatic biota. The present study was carried out to investigate the biological parameter include diversity and density of zooplankton in four selected freshwater bodies of Minjur town ponds which are season perennial and temporary ponds with lotic and lentic habitat. Further the selected four fresh water bodies were station I- M.G.R Nagar, Station II- Mullaiwayal, Station III- Burma Nagar, Station IV – Manali New Town. The selected water samples were collected to analyze the qualitative and quantitative of zooplankton during the monsoon season. The present study reveals that Zooplankton diversity shows the occurrence of 8 species belonging to 7 genera of rotifers, cladocerans, copepods and ostracods. With regard to the density of the zooplankton the higher values are recorded in station - IV. In most of the water bodies copepods accounted for higher density and rotifer next to the copepods. Moderate density of cladocerans and low density of ostracods were observed. This study indicates that the diversity and density of the zooplankton of different freshwater bodies of Minjur depends on various ecological parameters as well food and feeding habit and reproductive potential of different species.

Keywords: Water bodies, Zooplanktons, Rotifers, Cladocerans, Copepods, Ostracods. Biological Parameters, Diversity and Density

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SURVEY OF SEAGRASSES ALONG TAMILNADU COAST

Shanthi M[1] and Dr. Mujeera Fathima[2]

[1]Ph. D Scholar, Department of Botany, Government Arts College (Men), Nandanam, Chennai, Tamil Nadu, India

[2]Principal, Government Arts &Science College, TC Koot Road, Vanur, Villupuram – 605111 Tamil Nadu, India

Abstract:

Seagrasses are the only flowering plants which grow in marine environment. These are paraphyletic group of Marine angiosperms. About 60 species of fully marine seagrasses are found in and around the coast of Tamil Nādu., along the costal of TamilNādu Seagrasses concentrated in the Gulf of Mannar regions like Idinthakarai, Mandapam, Thavakulum and Vembar, Palk Bay, the Pichavaram and Pulicat backwaters, Muttukadu backwaters and Marakkanam area. Sea grasses have been used by humankind for almost 10000 years. They have been used as fertilizer fields, insulation houses, weave furniture, thatch roofs, make bandages and fill mattresses and car seats. Seagrass meadows help to filter the water pollutants and sediments, thus increasing the water clarity and quality. Seagrasses can also absorb excess nutrients, that enter the ocean from land runoff, helping to protect themore fragile and sensitive ecosystem like coral reefs. Since, seagrasses are known to possess medicinal uses like curing urinogenital infections and prevention of biofilm formation and as potential sources of phytomedicine. Inorder to conserve these marine species attempts made to obtain this bioresource through micropropagation and the calli could be used for extraction be active principle.

Keywords: Seagrass, urinogenital infections, phytomedicine, biofilm, Tamil Nadu, angiosperms, calli.

ISBN: 978-93-95423-46-5

AN INTRODUCTORY SURVEY OF TREE SPECIES IN ARUMANALLOOR VILLAGE, KANYAKUMARI DISTRICT, TAMIL NADU, INDIA

S. Ani Besant[1]* and A. Anami Augustus Arul[2]

[1]Research Scholar, Department of Botany, Holy Cross College (Autonomous) Nagercoil, Tamil Nadu, India,

[2]Assistant Professor, Department of Botany, Holy Cross College (Autonomous) Nagercoil, Tamil Nadu, India.

Affiliated to Manomaniam Sundaranar University, Abhishekapatti, Tirunelveli, Tamil Nadu, India.

Corresponding author: anibesant23@gmail.com

Abstract:

An investigation was carried out to survey the tree species present in Arumanalloor village, Kanyakumari District, Tamilnadu. A total of 57 tree species belonging to 27 families were reported. Of the 57 trees, Moraceae family was noted as the dominant family with 6 species. Annonaceae, Arecaceae, and Myrtaceae families contain 4 species. The Caesalpiniaceae, Euphorbiaceae, Fabaceae, Meliaceae, and Rutaceae families each contain 3 species. It was found that the majority of trees in the study were edible. Few of the trees were edible and they are used as timber and fuelwood. There are a few trees that possess medicinal properties. As far as its parts are concerned, the fruits of the tree are the most commonly used, followed by medicine, timber, fuel wood, as well as other products. Various biota also benefits from the shelter provided by these trees. Overall, the trees provide good green cover, control pollution, and prevent soil erosion, as well as habitat for a variety of living organisms.

Keywords: Trees, Arumanalloor, Edible, Medicinal, Timber

ISBN: 978-93-95423-46-5

FLORISTIC DIVERSITY STUDIES ON NELLIKULAM WETLAND OF VILAVANCODETALUK IN KANYAKUMARI DISTRICT, TAMIL NADU, INDIA

Catherine Sheeja V[1*] and Anami Augustus Arul A[2]

[1]Research Scholar,Department Of Botany, Holy Cross College (Autonomous) Nagercoil, Tamilnadu, India,

[2]Assistant Professor, Department of Botany, Holy Cross College (Autonomous) Nagercoil, Tamilnadu, India.

Affiliated to Manonmaniam Sundaranar University, Abhisekapatti, Tirunelveli, Tamilnadu, India

[*]Corresponding Author: catherinesheeja80@gmail.com

Abstract:

Ecosystems of wetlands play an important role in the relationships between aquatic plants and animals that love moisture. For the understanding of biological diversity, floristic studies of wetlands are essential. This study focuses on the flora of the Nellikulam wetland located in the Kanyakumari district of Tamil Nadu. Periodic field visit was carried out during 2021-2022 in the wetland. A total of 90 plant species belonging to 40 families and 82 genera were collected and documented from Nellikulam wetland. Families with maximum number of species include Poaceae with 14 species followed by Asteraceae (10 species) and Acanthaceae (6 species). Habit wise showed herbs were dominant having (61 species) followed by shrubs (10 species) and climbers (3 species) have been documented. 23 families were Angiosperms, 2 families were Monocots and a Pteridophyte belongs to the family Davalliaceae is also reported. The majority of the space is occupied by herbs followed by shrubs and ferns. This study provides baseline information on the floral diversity of wetland plants that will be useful for managing and controlling plant species. A better understanding of factors like threats and conservation of wetlands is necessary for the proper balance of ecosystems.

Keywords: Wetland diversity, Nellikulam, Kanyakumari District

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PRELIMINARY PHYTOCHEMICAL SCREENING OF *SOLANUM TRILOBATUM* L. LEAF EXTRACTS

A.R. Florence*, Bojaxa A. Rosy

[1]Assistant Professor, Department of Botany, Holy Cross College(Autonomous), Nagercoil, Kanyakumari District- 629 004, Tamilnadu, India

*Corresponding author- E-Mail: florencedavid28@gmail.com

Abstract:

Background: Medicinal plants have been considered as healthy source of life and used in the treatment of various diseases as they possess potential pharmacological activities. The phytochemical analysis is very much important to evaluate the possible medicinal utilities of a plant and also to determine the phytochemicals in the sample which is responsible for the biological activities exhibited by the plants. *Solanum trilobatum* L. is an important medicinal plant and commonly known as "Climbing brinjal" and called thoothuvalai in Tamil belonging to family Solanaceae. It is used traditionally for curing various diseases such as asthma, cough, tuberculosis etc.

Objective: This study was carried out to analyse the phytochemical constituents of the plant *Solanum trilobatum* L. leaf extracts.

Method: Aqueous, petroleum ether, ethanol and benzene extracts of the leaves were prepared by adding 100 g of leaf powder to 1000 ml of these solvents and subjected to soxhlet extraction. The extracts were concentrated by using vacuum evaporator and dried at 60^{o}C. Preliminary phytochemical screening was performed by Harborne method.

Result: Different leaf extracts of *Solanum trilobatum* L. showed the bioactive constituents such as carbohydrates, saponins, phytosterols and tannins, whereas the stem portion possess carbohydrates, saponins, phytosterols, tannins, flavonoids and cardiac glycosides. The presence or absence of the phytoconstituents depends upon the solvent medium used for extraction and the physiological property of leaves.

Conclusion: The finding of the study revealed that the leaf extracts of *Solanum trilobatum* L have a potential source of useful drugs due to the presence of various phytochemicals and can be utilized in the treatment of many diseases and also be exploited for use in the pharmaceutical and traditional systems of medicine.

Key words: Medicinal plants, phytochemicals, traditional medicine

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PRESENT STATUS AND THREATS OF FISH DIVERSITY OF EAST KOLKATA WETLANDS: A SIGNIFICANT RAMSARSITE OF WEST BENGAL, INDIA

Debkanta Ghosh[1,2*], Samir Kumar Saha[1]

[1]Department of Zoology, West Bengal State University, Barasat, W.B., India

[2]Department of Zoology, Vidyasagar College for Women, Kolkata, W.B, India

*Corresponding Author's mail id: ghoshdebkanta40@gmail.com

Abstract:

The East Kolkata Wetlands (EKW), animportant Ramsar site that is a part of the enormous inter-distributory water networks of the Gangetic Delta, are located on the eastern suburbs of Kolkata, India.It functions as Kolkata's natural kidney, taking in 250 million gallons of sewage every day.It is the world's largest collection of sewage-fed fish ponds and is also incredibly rich in genetic resources and biodiversity. The ecological health of EKW is continuously being harmed by urban growth, industrial pollution, siltation, weed infestation, and altered land use patterns.The current study was conducted in the water bodies of EKW in order to compile an extensive database on the variety of fish in West Bengal, India. There were identified 65fish species belonging to 23 families. The family Cyprinidae represented the largest diversity accommodating 15 genera and 23 species. According to the International Union for Conservation of Nature (IUCN), the conservation status of the fishes are listed as 1 (2%) species as Critically Endangered, 4(6%) species as Endangered, 15 (23%) species as Vulnerable, 18 (28%) species as Near Threatened, 21 (33%) species as Least Concerned, 2 (2%) species as Data Deficient and 4 (6%) species as Not Evaluated. About 58% of fish species are, near threats, vulnerable, endangered, and Critically Endangered in this region. Among the fish diversityof East Kolkata Wetlands,85%of species were indigenous species and 15%of species were exotic. It is determined that anthropogenic pressure resulting from the conversion of wetland habitats to agricultural lands, habitat destruction, over-exploitation, wanton destruction, aquatic pollution, disease, the introduction of exotic species, and a general lack of awareness of the importance of biodiversity are significantly contributing to the rich diversity of fish in their natural habitat's alarming vulnerability.

Keywords: East Kolkata wetlands, Ramsar site, Fish Diversity, Threats and conservation status

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RECOMBINANT BACULOVIRUS AS BIOPESTICIDE FOR ENVIRONMENTAL PROTECTION

YASASWINI.K

III year BSc year Biochemistry Justice Basheer Ahmed Sayeed College for Women (Autonomous)

Chennai - 18.

Abstract:

The use of recombinant baculoviruses in pest control programs is one of active areas of research for environmental protection. Based on the survey of relevant literature, this paper presents an interesting multidisciplinary approach for pest control. The approach involves the usage of recombinant baculoviruses (AcMNPV) expressing the *tox*-34 gene encoding for the TxP-I neurotoxin to paralyze specific lepidopteran species (permissive insects). This approach also involves a reduction in the consumption of the crop by the larvae of specific insect species resulting in their weight loss. This research paper presents more details of the approach and about its role in pest control, crop management thereby protecting the environment.

Keywords: Recombinant, Baculovirus, Biopesticide and Environment

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PREPARATION OF CHEMICAL-FREE HERBAL COSMETICS

Bojaxa A. Rosy*, Florence A. R, Anusha R, Misha A, Asma Nasreen S, ArockiaSajina U and Rethi Devi R

Holy Cross College (Autonomous), Affiliated to Manonmanium Sundaranar University, Tirunelveli
Nationally Accredited with A+ Grade (IV Cycle - CGPA 3.35) by NAAC Nagercoil-629004

Abstract:

Herbal cosmetics are becoming more and more popular. Natural beauty products promote a philosophy that links environmental protection with health promotion. It has been in use for a long time. Plant materials are gathered from their natural habitats and from certain nearby herbal shops to make a variety of herbal cosmetics. The dried plant parts of some of the collected plants are used, and extracts are obtained from some plants after drying, some plant parts from the collected plants are used, and extracts are extracted from other plants. Herbal formulations such as hair oil, tooth powder, creams, and shampoo powder were prepared for this study. The literature survey shows that herbal cosmetics are safe for use on human skin.In this study, several medicinal plants including *Coleus aromaticus*, *Azadirachta indica*, *Mentha piperita* L., *Aloe vera*, *Ocimum sanctum*, *Hibiscus rosa-sinensis*, *Sapindusmukorossi*, *and Ecliptaprostrata*were successfully used to make diverse herbal cosmetics.

Keywords: Herbal cosmetics, medicinal plants, safe.

ISBN: 978-93-95423-46-5

SURVEY OF WILD EDIBLE PLANTS IN CHENBAGARAMANPUTHOOR PANCHAYATH, KANYAKUMARI DISTRICT, TAMIL NADU, SOUTH INDIA.

Mary kensa, V.

PG Research Centre of Botany, S.T. Hindu College, Nagercoil.

e-mail id: surejkensa@gmail.com

Abstract:

Wild edible plants are those that are not tamed or accomplished as food source but are wildly appearing as a part of the verdure. India being a diverse country with varied ethnic groups and phytogeography the preference of wild edibles their occurrence also varied greatly in different regions. To best of our knowledge, there is no previous report on this survey of wild edible plants. The sight of the present investigationis to analyse the possible wild edible plants in the selected study area (Chenbagaramanputhoor). The current study recorded 50 wild edible plants, among that 4 species are annuals and 46 species are perennials. Based on the mode of regeneration of wild edible plants, 34 species are regenerated by seeds, followed by 13 species are by stem cutting, 3 species are by budding or grafting. Among the collected plants, 48 plants are used as medicinal, 2 plants are grown as ornamental. There are about species of angiosperms belonging to 40 genera and 29families of wild edible plant species were reported. The predominant family is Myrtaceae, Solanaceae, Anacardiaceous with 4 species; Arecaceae, Phyllanthaceae, Piperceae, Sapotaceae contains 3 species each; Moraceae, Rutaceae, Cucurbitaceae, Fabaceae, Amaranthaceae contains 2 species each; Annonaceae, Apiaceae, Apocynaceae, Cactaceae, Caeselpinioidiaceae, Caricaceae contains one species each. Therefore, this study may be pivotal and provocative source for advance ethno botanical studies in the region. The wild plants will be devoid of fertilizers and pesticides, and some suggest that, they come with higher antioxidant content. Therefore, there is a need to fabricate awareness among the local people for the importance as well as conservation of these wild edible in their original habitat.

Key words: Alleviating, domesticated, eradication, malnutrition, pesticides.

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A STUDY ON THE MICROBIAL QUALITY OF FRESH FRUIT JUICES SOLD OUTSIDE SCHOOLS AND COLLEGES IN CHENNAI

S. Irfana Tabassum[1], Nashika*[1] and Dr. Amthul Azeez[2]

[1,*]Depatment of Microbiology, Justice Basheer Ahmed Sayeed College for Women, Chennai.

[2]PG & Research Department of Zoology, Justice Basheer Ahmed Sayeed College for Women, Chennai.

Abstract:

Millions of people consume fruit juices sold by street vendors in developing countries. Fruit juices provides potential health benefits to the consumers as they are rich in vitamins, minerals and other nutrients that contribute to good health. Contamination of fruit juices by pathogenic microbes has lead to outbreaks of food borne diseases. Poor sanitation and unhygienic practices of the street vendors is the major cause of these food borne outbreaks. In this study, the fresh fruit juices sold by street vendors outside the schools and colleges in Chennai city were analyzed quantitatively and qualitatively. All the samples analyzed were found to be of poor microbiological quality. *Asperigillus niger* (28%) was the dominant fungi in this study followed by *Mucor spp* (10%), *Penicillum spp* (12%), *Aspergillus fumigatus* (8%) and *Rhizopus spp* (8%). All the samples showed the presence of yeast. *Bacillus spp* (56%) was the leading bacteria isolated from the samples tested followed by *Escherichia coli* (20%), *Klebsiella pneumoniae* (8%) and *Pseudomonas aeruginosa* (4%). To avoid food borne disease outbreaks associated with fruit juices, regular monitoring of the quality of fruit juices sold by street vendors should be introduced while shop locations that predispose fruit juices to contamination should be avoided.

Key Words: Fresh juices, Food borne pathogens, Contamination of fruits and fruit juices, microbial quality of foods.

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IMPACT OF ANTHROPOGENIC CLIMATE CHANGE ON HUMAN PATHOGENIC MICROBES: A PUBLIC HEALTH CONCERN

Sraya Saseendran & Anu Swedha Ananthan

Department of Microbiology, Justice Basheer Ahmed Sayeed college for Women, Teynampet, Chennai-600018, Tamil Nadu, India

*corresponding author Email Id: medmicroanu@gmail.com

Abstract:

Global warming and climate change is a serious challenge facing the human population today. Changes in the earth's climate due to increased anthropogenic activities are having widespread effects on the environment. Droughts, wildfires, flooding due to extreme rainfall and rise in global temperature are happening at an accelerating rate than predicted. Infectious diseases are caused by pathogenic microbes which have their own optimum physiological growth requirements. Changes in weather patterns will affect their ability to survive a particular environmental condition and eventual spread. Pathogenic microbes require animals and vectors as intermediate hosts for their survival and climatic changes seem to have an influence on the adaptations which may in turn facilitate the spread of disease. Environmental changes can affect population levels of the host, vector, or environmental stage of the pathogen as well as the transmission rate at which pathogens move between hosts, vectors, and environment. Development and survival of multidrug resistant bacteria in common environmental habitats such as soil, water, air, cases of virus spill over, alteration of a parasite's life cycle, adaptation of fungi to shifting host range are some of the direct effects of disasters. Mitigation strategies include reversing climate change and using preventive measures to counteract infectious diseases.

Keywords: climate change, pathogenic microbes, infectious diseases

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OPTIMIZATION AND CHARACTERIZATION OF FISH OIL FROM FISH WASTE

Shakira Begum S M[1] , Priya Lakshmi S [1*] and Dr. Amthul Azeez [2]

[1] and [1*] Department of Microbiology, Justice Basheer Ahmed Sayeed College for Women, Teynampet, Chennai, Tamilnadu.

[2] PG and Research Department of Zoology, Justice Basheer Ahmed Sayeed College for Women, Teynampet, Chennai, Tamilnadu.

Abstract:

Fish waste oil gained significant importance due to waste utilization and its application in the pharmaceuticals and food industries. The ratio of Waste obtained from fish markets and fish processing industries depends upon the type of fish and process involved. The presence of omega-3 fatty acids in fish oil has gained medical importance because of their antimicrobial properties. Fish waste collected from pattinappakam and Roya Puram was used for oil extraction. The internal organs from the fish waste such as fins, head, and tails were separated and each part was processed separately for the extraction of fish oil. After proper cleaning and drying fish waste powder was obtained and stored in a freezer till the process. The extraction procedure was done by modified Soxhlet Extraction method using Ethanolsolvent. After every 12 hours small amount of fish oil was obtained by the extraction procedure. Every time 8 g of fish waste was used for the extraction procedure. Recovery of the fish oil was done by centrifugation process, centrifugation process was done to separate the solvent and fish oil, after the formation two layers of fish oil were sucked by a micropipette. Fish oil is weighed and stored for further analysis. The fish waste obtained from soft tissues and tail has given more yield of fish oil. In this study, we have optimized the yield of extraction of fish oil from various species of fish. The fish waste obtained from soft tissues and tail has given more yield of fish oil in all species.

Keywords: fish oil, omega 3 fatty acids, and fish waste.

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EXTRACTION AND CHARACTERIZATION OF COLLAGEN FROM FISH SCALES FOR AGRICULTURE USES – FROM WASTE TO VALUABLE RESOURCE

Shakira Begum S M[1], Sangeetha G [1*]and Dr. Amthul Azeez[2]

[1*]Department of Microbiology, Justice Basheer Ahmed Sayeed College for Women, Teynampet, Chennai, Tamilnadu.

[2]PG and Research Department of Zoology, Justice Basheer Ahmed Sayeed College for Women, Teynampet, Chennai, Tamilnadu.

Abstract:

Widespread use of natural resources has been increased massively in recent years. The application of marine based collagen increased rapidly because of its distinctive properties and cost-effective practices in food and agriculture industries. Currently significant increase of the fish waste has been noted worldwide, which creating a vast environmental concern. This study demonstrates the extraction of collagen obtained from fish scales. Fish scale waste obtained from nearby market of porur and pattinappakm region from Chennai, Tamilnadu was investigated for this study. The preparation steps consist of washing, cleaning, and separation scales from animal part. Scales undergone the acidic form of pre-treatment to remove the non-collagenase substances. Collagen was extracted by acid extraction procedure under different concentration, also the effect of different parameters (temperature, ph and different ratio in acid concentration) during extraction on collagen was investigated. Collagenhydrolats release the free amino acids which may serve as nitrogen source of the crop to maintaining long term viability and protecting the plant from pest. Future work should focus on the formulating various application process of collagen in crops for the protection and viability.

Key words: fish scales, collagen and crop protection.

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A STUDY ON PHARMACOLOGICAL ACTIVITIES OF STEM EXTRACT OF *HIBISCUS SABDARIFFA, LINN.*

Mrs. P. Jabeena Begum[1,*], G. Shree Vidyadharani[2], S. Sahar Shanaz[2], U. Rubini[2], N.M. Sanmadhi Yaazhini[2], G. Sharmila[2]

[1]Department of Botany, Justice Basheer Ahmed Sayeed College For Women (Autonomous), Teynampet, Chennai, Tamilnadu, India.

[2]III B.SC Plant Biology and Plant Biotechnology of Justice Basheer Ahmed Sayeed College for Women (Autonomous), Teynampet, Chennai, Tamilnadu, India.

Abstract:

In this present investigation the traditional medicinal plant *Hibiscus sabdariffa, L.*belonging to the family of Malvaceae is chosen to conduct studies on Anti-oxidant and Phytochemical analysis. *Hibiscus sabdariffa L.* or locally known as Asamkumbang, Asamsusur, and Asampaya belongsto the family of Malvaceae. *H. sabdariffa L.* is used in many folk medicines. The Qualitative phytochemical screening of stem extract of *H. sabdariffa* showed the presence of alkaloids, terpenoids, steroids, phenols, flavonoids, tannins, glycosides carbohydrates, and saponins. The aim of the present study was to evaluate the anti-oxidant and anti-bacterial activities of stem extract of *H. sabdariffa.* Oxidant assays were carried out for evaluating the anti-oxidant capacity of stem extract of *H. sabdariffa*. The anti-oxidant assays such as $DPPH^{\cdot}$ radical and superoxide radical scavenging assays as well as phosphomolybdenum reduction and Fe^{3+} reducing power assays were carried out for stem extract of *H. sabdariffa L.*were conducted respectively. *H. sabdariffa* can be considered as a very useful source of phytomedicine. The phytochemical constituents exhibits the anti-bacterial, anti-fungal, anti-oxidant and anti-inflammatory which shows the potent therapeutic activity of the plant.

Keywords: *Hibiscus sabdariffa L.,* Thai traditional medicine, Phytochemical screening test, DPPH, Anti-oxidant activity.

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EFFECT OF BIO-FERTILIZER ON *TRIGONELLA FOENUM – GRAECUM, LINN.* SEED GERMINATION AND ITS POTENT ANTI-OXIDANT ACTIVITY.

Mrs. P. Jabeena Begum,*[*,1], MUSFIRA BANU. I[2], PREMA. G[2], PRIYADHARSHINI. S[2], PRIYANGA. A[2], RESHMA. M.G.[2]

[1]Assistant Professor, Department of Botany,

Justice Baseer Ahmed Sayeed College for Women, (Autonomous) Chennai-18, Tamilnadu, India.

[2]III B.Sc, Plant Biology and Plant Biotechnology

Justice Baseer Ahmed Sayeed College for Women (Autonomous), Chennai-18, Tamilnadu, INDIA.

Abstract:

Fenugreek (*Trigonella foenum-graecum*) belongs to the family Fabaceae, with leaves consisting of three small obovate to oblong leaflets. *Trigonella foenum-graecum* is a very important medicinal plant and is a rich source different phytochemical constituents. The seeds may be considered as better source for antibiotics and may also be a treatment for fungal ailments. Leaves, as well as seeds, are a rich source of dietary fibre and also protein content is high in them. Several studies have shown that fenugreek seeds lowered blood glucose levels and improved lipid metabolism, the effective components are yet unknown. The aim of the present study was to evaluate the antioxidant activities of aqueous seeds and leaves extracts of Fenugreek. Antioxidant assays such as $DPPH^{\cdot}$ radical and superoxide radical scavenging assays as well as phosphomolybdenum reduction and Fe^{3+} reducing power assays were carried out for seed and leaves extracts of Fenugreek were conducted respectively. The radical scavenging activity of aqueous seeds and leaves extracts of Fenugreek were measured by scavenging activity of the stable 1, 1- diphenyl 2-picrylhydrazyl (DPPH) free radical[6]. The seeds of Fenugreek have wide range of biological and pharmacological benefits including antioxidant, hypoglycaemic, hypercholesterolemia and immunomodulatory activities.

Keywords: *Trigonella foenum-graecum*, seeds, leaves, Bio – fertilizer, rhizobium, Antioxidant activity & $DPPH^{\cdot}$ radical scavenging activity.

ISBN: 978-93-95423-46-5

COMPARATIVE STUDY-ON PHYSIOLOGICAL ANALYSIS OF DRIED LEAVES OF HIBISCUS ROSA-SINENESIS, MANGIFERAINDICA AND PSIDIUM GUAJAVA (HIBISCUS, MANGO, GUAVA)

Dr. Asif Jamal G.A[1,*], Sierin Sameera.H[2], Sindhu.S[2], Sneha.G[2], Sowmiya.P[2], Suganya.P[2]

[1]Assistant professor Department of Botany, Justice Basheer Ahmed Sayeed College for women, Teynampet, Chennai, Tamilnadu, India.

[2] III. BSc, Plant Biology and Plant Biotechnology, Justice Basheer Ahmed Sayeed College for women, Teynampet, Chennai, Tamilnadu, India.

E-mail id: ajgroupproject2223@gmail.com

Abstract:

Hibiscus rosa-sinenesis, is an oranamental, woody and perennial plant. Mangiferaindica is one of the most important tropical plants in world. Psidiumguajava is a well known tropic tree, abundantly grown for fruit. These plants has a long history for their medicinal purposes from the ancient era. The current study is based on comparative study - physiological parameters of dried leaves extract. The leaves of Hibiscus rosa- sinensis, Mangiferaindica and Psidiumguajava were collected from JBAS Campus to test the extract with respect to its, which are beneficial for curing several diseases related to antibiotics, antimicrobial, antioxidants, etc.

***Keywords*:** Hibiscus, Mango, Guava, Antibiotics, Antioxidants.

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COST EFFECTIVE MASS PROPAGATION – SOIL LESS CULTURE TECHNIQUE USING CONDENSATE

Dr. Asif Jamal G.A[1,*], Sujiba. R[2], Wazeeha. M[2], Aanisha Fathima. M[2], Rasheeda azleena. M[2], Shruthika. P. Nair[2]

[1]Assistant Professor Department of Botany, Justice Basheer Ahmed Sayeed College for Women, Teynampet, Chennai, Tamilnadu, India.

[2]III Bsc Plant Biology and Plant Biotechnology , Justice Basheer Ahmed Sayeed College for Women, Teynampet, Chennai, Tamilnadu, India.

Email Id : ajgroupproject2223@gmail.com

Abstract:

In modern days the more effective and sustainable method in agriculture farming is soil less culture method. The current study is based on the rapid development of hydroponic farming used in soil less cultivation for growing *Ocimum teniflorum* and *Ocimum sanctum Linn.* The hydroponic system used in the study is condensate which is also known as grey water. As this water is free from chlorine, fluoride, salt and chemicals found in tap or pool water. As it is free from chemicals, to overcome this deficiency 10 g of vermicompost is added to 1000 ml of condensate to observe the growth parameter of *Ocimum teniflorum* and *Ocimum sanctum Linn.* which has high medicinal value. It is used to treat bad breath, regulates blood sugar level and boost immunity. The condensate ended up being logically notable in a short period of time and this strategy lead to begin indoor and outdoor hydroponic planting rapidly.

Keywords: hydroponics, soil less culture, condensate, vermicompost, *Ocimum teniflorum, Ocimum sanctum Linn.*

ISBN: 978-93-95423-46-5

UTILIZATION OF BIO ENZYME FOR MASS CULTIVATION OF SWAP MALLOWS WITH EFFECT OF ITS MORPHOLOGICAL PARAMETERS

Dr. Asif Jamal G.A[1,*], Yuvanika[2], Angelnathan[2], Fathimafarris[2], Nida Fathima[2], Santhoshkumari[2]

[1]Assistant Professor Department of Botany, Justice Basheer Ahmed Sayeed College for Womens, Teynampet, Chennai, Tamilnadu, India.

[2]III Bsc Plant Biology and Plant Biotechnology, Justice Basheer Ahmed Sayeed College for Womens, Teynampet, Chennai, Tamilnadu, India.

Email Id **:** ajgroupproject2223@gmail.com

Abstract:

Bio enzymes is natural and effective solution for all the physiological preparations of soil and it's biodiversity. The current study is based on the mass cultivation of swamp mallows by using Bio enzyme as fertilizer. The bio enzymes are non toxic, on hazardous, non corrosive, eco friendly and completely natural liquid. They are easily synthesized by anaerobic fermentation by using jaggery and plant waste (orange peels, used scented flowers etc) and water along with microorganisms of a small quantity in a plastic containers. These bio enzymes were treated with *Hisbiscus rosa sinensin* (*Swap mallows***)** for the analysis of growth parameters such as height of the plants and no of leaves etc. As Bio-enzymes are of great importance which is in general created out of waste and turns out to be a excellent economical feasible to the people and the end product is sustainable to the nature which enhances the quality of life as a whole.

Keywords**:** Bio enzymes, Organic Fertilizer,

ISBN: 978-93-95423-46-5

ASSESSMENT OF FLORA IN THE CAMPUS OF JUSTICE BASHEER AHMED SAYEED COLLEGE FOR WOMEN

Dr. Shahira Banu D.A[1,*], Hashima Tavraid. S[2], Jamalia Fathima[2], Janani[2], Jeeva[2], Jenifer[2]

[1,*]Assistant Professor and Head Department of Botany

[2]III B.Sc Plant Biology and Plant Biotechnology, Justice Basheer Ahmed Sayeed College for women

*E mail: sbgroupproject2023@gmail.com

Abstract:

Trees are the versatile part of the Nature and they play an integral part in fulfillment of the major resources required for the well being of human sustainability. This study accounts the diversity of the flora which is in abundance in terms of Medicinal properties at Justice Basheer Ahmed Sayeed College for women (Autonomous) Chennai, Tamil Nadu, India, and Affiliated to University of Madras. The Stratified sampling technique was used for extensive field survey with the view of investigating the remnant flora with higher medicinal properties. Data collection was done by dividing the study area into several plots. In one slot of area about 15 woody trees were selected belonging to 11 families. Among the 15 trees only 5 trees were selected for further investigation. *Mangifera indica, Psidium guavaja, Azadirachta indica, Citrus lemon, Bambusa vulgaris* are taken into further descriptive studies due to the presence of higher medicinal such as anti-inflammatory, anti-septic, anti-viral, anti-allergic and anti-oxidant activities.

Keywords: Stratified, remanent flora, medicinal trees, descriptive studies, medicinal properties.

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INVESTIGATION ANTI-MICROBIAL ACTIVITY OF FRUIT EXTRACT OF *TERMINALIA BELLIRICA*, ELIZABETH.

Mrs .P. Jabeena Begum[1],*, Kavitha. K[2], Karthika. S[2], Mahalakshmi Selvakumar[2]
Mahalakshmi Seker[2], Malathi.M[2]

[1,*]Assistant Professor, Department of Botany,
Justice Baseer Ahmed Sayeed College for Women, (Autonomous) Chennai-18, Tamilnadu, India.
[2]III B.Sc, Plant Biology and Plant Biotechnology
Justice Baseer Ahmed Sayeed College for Women) (Autonomous) Teynampet, Chennai-18, Tamilnadu, India.

Abstract:

In current era, natural products are measured to be the symbols of safety in comparison to the synthetic products that are regarded to be hazardous to human life and environment. Although herbs had been priced for their therapeutic importance, their phytochemical and pharmacological activities are conducted on different parts. With this, an attempt has been made to investigate the antibacterial activity of leaf extracts of *Terminalia bellerica, Terminalia chebula* and *Emblicaofficinalis* and their formulation known as Triphala. The antimicrobial activity was evaluated using agar well diffusion method against the both gram positive bacteria and gram bacteria, bacterial isolates using ethanol, methanol, acetone, chloroform and aqueous leaf extracts of *Terminalia bellerica, Terminalia chebula* and *Emblicaofficinalis.* It was observed that the ethanolic extract exhibited effective activity against the tested bacterial isolates than that of with methanol, acetone, chloroform and aqueous extract, respectively. From this study, it can be concluded that Triphala and its constituents reveal effective antibacterial activity against various human pathogenic bacteria.

Keywords: Phytochemical analysis, Anti-bacterial activity, *Terminalia Belirica,* diffusiontechnique.

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