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12 to 14 June 2019

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This is to certify that

MRS. SUMITHA CHANDRAN U K

Assistant professor, SN college,Kannur University

has presented a paper and participated in the International Conference on Advanced Materials held during 12-14 June, 2019 at Nirmalagiri College, Kannur, Kerala, India.

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OA001	Synthesis and Structural Studies of Ni-Mn based Heusler Shape Memory Alloys S. V. Dhana, Akash Ghaste , V. G. Akkimard, S.A. Kori, C. H. Bhosale
OA002	Structural and Lattice Dynamical study of Half Heusler Alloys RuMnX (X=P, As) M. M. Sinha, Yuhit Gupta , S. S. Verma
OA003	Laser assisted surface modification of Magnesium Alloys – A review V.K. Bupesh Raja, M. Saravanan, S.M. Afridi, S.A. Adil, Manoj Gupta
OA004	PVOH Modified Nano-kaolin as Barrier Coating Material for Food Packaging Application Vaishali Saroha, Ashis Bhowmick, Dharm Dutt
OB001	Metal oxide thin film based device for Biosensing Application Sapthami Hegde, Keerthana Nanju, Bhavana Anchan, Sudarshan Kini, Shounak De, Ajeetkumar Patil
OC001	Low Dose Gamma Irradiation Effects on Electrical Parameters and Current Conduction Mechanism of Ni/n-GaN SBD's Santosh Kumar, M Vinay Kumar, Asokan K, Krishnaveni
OC002	Semiconductor Quantum Dots as Smart Biocompatible Imaging Agents Jejiron Maheswari Baruah, Jyoti Narayan
OC003	Tuning the nature of charge carriers by controlling dual substitution in singie filled thermoelectric skutterudite, Yb-$CoSb_3$ Keshav Prasad Dabra, Satish Vitta
OC006	Structural and SHG efficiency relation between [illegible] derivatives with L-Tartric acid PS Raval, Hiral Raval , B B Parekh
OC009	Regenerated cellulose integrated PCC composite as [illegible] additive Indrasena Ghosh, Chhaya Sharma, Arti Nagawanshi
OC010	Shape-dependent variations in the Surface Enhanced Raman Spectra (SERS): Implications in the structure determination Sumitha Chandran U K, Vineeth Madhavan, Poovathinthodiyil Raveendran
OC011	Synthesis and Characterization of heteropolyacid (H3PW12O40) embedded Poly (vinyl alcohol)-g-Acrylamide Copolymeric Membranes and their Evaluation for Proton Exchange Membrane Fuel Cell Mallikarjunagouda Patil, Prabhu I. Mandi
OC040	Microstructure, hardness and wear properties of Cu-Sn-WC/Al_2O_3 composite developed by friction stir processing. Cherian Paul, Amal Krishnan, Akhil M Joseph
OD002	The Monte Carlo Simulation of Grain Growth in Polycrystalline Material Using Potts Q-State Model-A Perspective Rajendra P, K R Phaneesh
OD003	First-principles study of phase stability of TaO_3 C. Ravi
OD005	Modelling Piezoelectric materials by Finite Element Method for applications as sensors and actuators Sheeja P. George, Johney Isaac, Jacob Philip
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Central Themes In Indian Economy

Dr. Bindu. V.V
Dr. Praveed Nin[illegible]leri

CENTRAL THEMES IN INDIAN ECONOMY

CORE COURSE IN ECONOMICS
(3B03 ECO)

B.A Degree Programme Kannur University

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PREFACE

The book titled as "Central themes in Indian Economy" is prepared as a study material for the core course of Economics under Kannur University. It is prepared as per the revised syllabus which is in effect from 2019 onwards. The book aims to cater to the needs of third semester B A Economics students in Kannur University. Hope that this book is useful for those who prefer to overview Kerala and Indian Economies for their academic exercise. The book is actually a consolidation of ideas, perspectives and facts put forth by various authors, researchers and academicians regarding the subject matter of the paper. Utmost care has been taken to avoid factual, conceptual, spelling and grammatical errors, still there are chances for such errors. Authors assume no responsibility for any kind of loss or damage on account of any kind of errors in this book. Readers who come across such errors are requested to convey the same to the authors for making an improved version next time. Authors came across the difficulty to collect necessary data from official and reliable sources and compelled to use certain data from unofficial sources. Difficulty is also there in getting latest data. Time constraint and the threats posed by Corona age including necessary social distance are the major limitations of this work. Hope that the book will be helpful to enrich the academic interest of the students in Economics community. Finally, authors extend their deep gratitude to Central Co-operative Store, Calicut University for giving us such a great opportunity.

Dr. BINDU. V. V

Dr. PRAVEED NINKILERI

CONTENTS

Dynamics of Banking in India

K. Gangadharan

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Contents

8

An Analytical Study on Growth and Performance of Urban Cooperative Banks in India

Jayasree T.O.

Introduction

The cooperative movement in India started a century ago with the enactment of Cooperative Societies Act in 1904. Although joint stock banks opened branches in urban and semi-urban areas, they did not find it advantageous to cater to the banking and credit requirements of the urban middle/lower class comprising small traders/ businessmen, artisans, factory workers, salaried persons with limited incomes etc. The inability of joint stock banks to appreciate and cater to the needs of this class of clientele with limited means effectively drove them to money-lenders and similar agencies for loans at exorbitant rates of interest. This situation paved way for non-agricultural credit cooperatives coming into being in India. The main objectives of such cooperatives were to meet the banking and credit requirements of this section of people and to protect them from exploitation. Thus the Urban co-operative credit movement is a major innovation in the co-operative sector for protecting the middle classes and the men of a modest means from the clutches of the moneylenders and other agencies by providing credit on reasonable terms which is important in the context of rising prices and cost of living. Further, the movement is also aimed at inculcating the habit of thrift and self help. No doubt, the urban co-operative banking (UCB) sector has been

emerged as an important segment of Indian banking system. Reddy & Sreenivasulu (1986) opined that "Today, the urban cooperative banking sector is one of the strongest sector in Indian co-operative movement". The Reserve Bank of India also has recognised the importance of these banks by allowing them to extend their operation to rural areas and finance even to agricultural activities. These banks have recorded a higher growth rates both in deposits and advances. In this backdrop the study aims to examine the growth and performance of the UCBs in India.

Review of Literature

The contribution of urban cooperative banks in promoting the socio- economic status of the weaker sections and the nation's economic development has been recognized as a progressive key factor. The Committee on Urban Cooperative banks reported that "the urban cooperative banks are eminently suitable for filling-up the existing credit inadequacy in urban and semi-urban areas at comparatively lower cost (RBI, 1979). "The urban cooperative banking movement has been, to a greater extent, self-reliant in most of the States and in the cooperatively advanced and progressive states wherein it has developed on a sound footing of its own and has eye-catching achievements" (Amin, 1984). The urban cooperative banks play a very useful and purposeful role in promoting the habit of thrift and savings; and a major portion of their advances was to help the persons of small means as well (Singh,1984). Since the urban cooperative banks are an important part of the finance system in India, the urban cooperative banks should emerge as a sound and healthy network of jointly owned by the Board and the management which democratically controlled and ethically managed banking institutions providing the need based quality services of banking, essentially to the middle and lower middle-class and marginalized sections in urban and semi-urban areas of the society (James Jacob). Raikar (2005) observed that though the performance of urban cooperative banks is better as compared to other banks, due to the application of prudential norms, their performance has deteriorated since 2001-02. But, since then the performance is improving and improved the confidence among people." Teli concluded that "the urban cooperative banks showed a considerable growth in deposits, loans and net profits but coupled with overdues too. Diversification of the loan portfolio

13

Women Groups and Economic Empowerment: A Study of Kudumbashree in Kerala

Amutha R.

Introduction

Women play an integral role in the formation and growth of modern economies. The overall development and harmonious growth of a nation would be made possible only when women are considered as equal partners in the growth process with men. This is rationalized by the economic and social advancement exhibited by the developed nations by treating women in par with men in all aspects of the growth process. Learning from their experiences, the developing nations have also started experimenting with this development principle, reflections of which are seen in India too. In our context, this growth formula has its own significance because demography in India is more inclined towards women, and keeping them away from growth process will amount to underutilization of valuable human resource. This justifies the need for some movement for attracting women towards nation building process.

To accomplish women empowerment in its holistic sense and broader meaning, it is essential to harness the women labor in the main stream of economic development process. It is a multi-dimensional approach and should cover cultural, political,

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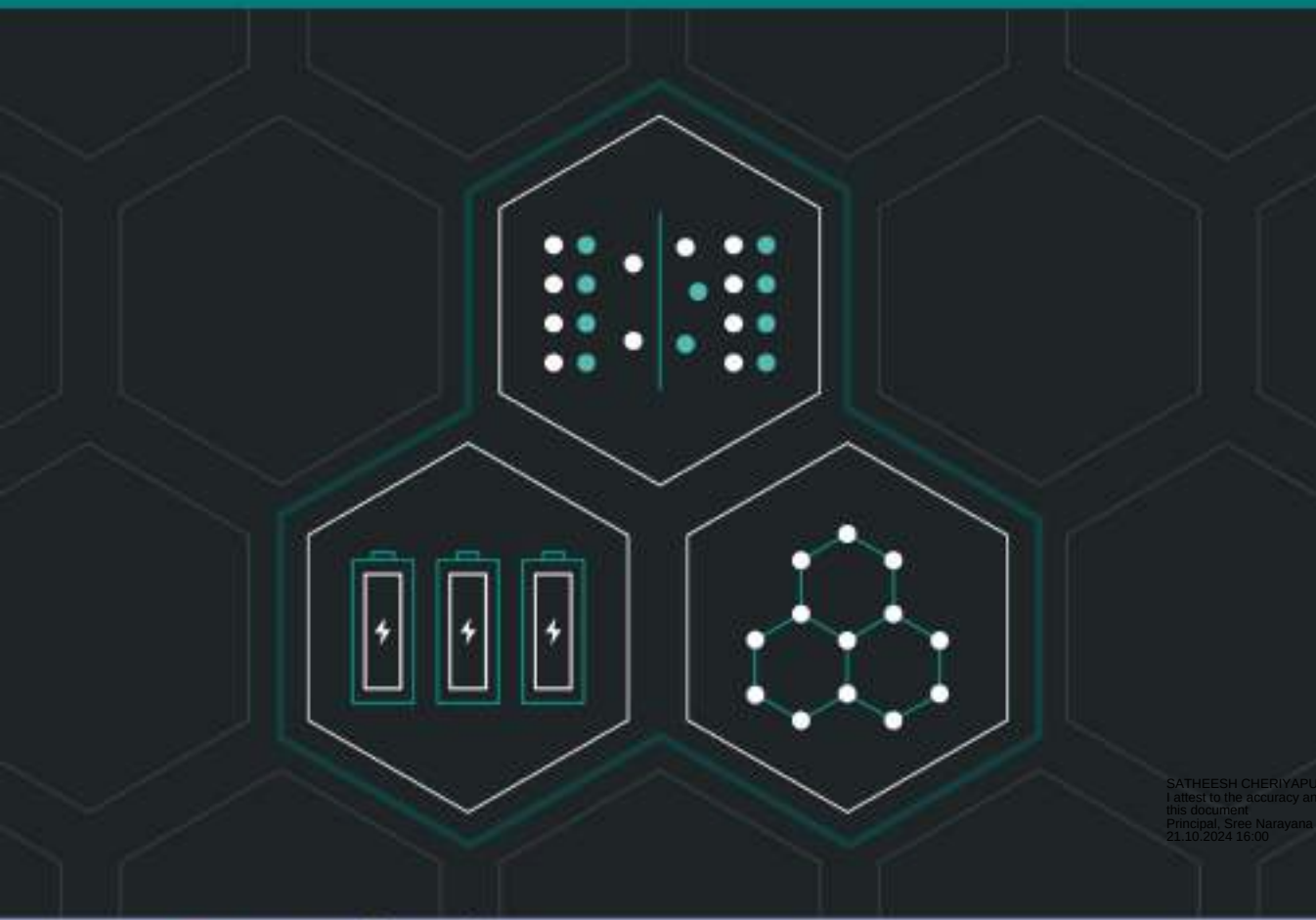

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Contents

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Chapter 3

Defect engineering in 2D materials and its application for storage and conversion

C P Jijil, Jithesh Kavil and Pradeepan Periyat

2D materials have gained immense attention in the recent past owing to their thin layered nature, unusual shape-dependent features, large specific surface area and high mechanical flexibility. They have been extensively studied as electrode and catalyst material for electrochemical storage and conversion reaction, respectively. Defect engineering in the 2D lattice has resulted in improved performances. Various strategies have been employed for incorporating defects in these 2D materials. Here we discuss the defects in 2D materials and their effect on the performance of energy storage devices and energy conversion reactions. At the end of the chapter, the challenges in designing 2D materials are described, and plausible approaches for designing improved material for electrochemical applications are mentioned.

3.1 Introduction

Two-dimensional materials (2D) have received a great deal of attention after the successful exfoliation of graphene in 2004, especially in the area of energy storage and conversion [1]. They are a large kind of layered structured materials such as graphene, transition metal dichalcogenides (TMDCs), transition metal carbides/nitrides (MXenes), black phosphorus, covalent organic frameworks (COFs), 2D oxides, etc [2]. They are reported to exhibit high electrocatalytic activity or serve as catalyst substrates for various energy conversion reactions such as oxygen reduction reaction (ORR), oxygen evolution reaction (OER), hydrogen evolution reaction (HER), CO_2 conversion, and also as future energy storage materials. Layered materials generally have strong in-plane chemical bonds and weak interlayer force of attraction. When exfoliated in 2D materials, these layered structures exhibit different physicochemical, electronic, and mechanical properties. Graphene exfoliated from graphite is the most widely studied 2D material. Apart from graphene, several 2D materials have been explored in recent years. However, for the commercialisation of these 2D materials,

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CONTENTS

Category A

Category B

Occurrence of Stored Grain Pests in Thrissur District

Jipsa.J.R[1], Sethulakshmi V.A[2]
[1,2] PG Department of Zoology, Sree Narayana College, Nattika, Thrissur
jipsaaa@gmail.com

Abstract

In the present study, a variety of stored grain insect pests were recorded for 6 months from 2 sites in Thrissur District. For the convenience of the study, the period is divided into 2 seasons. The seasonal studies were done and find the species diversity in each season through the survey and statistical analysis. From two seasons 9 species were recorded from both sites of the Order Coleopteran and Lepidoptera. *Sitophilus oryzae* was more abundant in both monsoon and post-monsoon seasons. The second, abundant species is *Tribolium castaneum* from *Curculionidae* and *Tenebrionidae families respectively.* Apart from *Chrysomelidae, cueculionidae, Bostrichidae, Dermestidae and Carabidae* were the families recorded of the order Coleoptera. Pyralidae was the only Lepidopteran family recorded during the study.

The study on the diversity of stored grain pests in two sites gives the knowledge of insect diversity in that area. Through the collection and statistical analysis, different types of species were recorded from both sites. The breeding season of each species is different, so it is kindly affecting their abundance. Although *Sitophilus oryzae* and *Tribolium castaneum* are more abundant in both seasons from both sites. Overall, the study gave me an idea about the insect pest diversity of two sites from the Thrissur district and abundance are more in various seasons during the study periods.

Keywords: Stored grain Pest, Coleoptera, Diversity, Pest, Season, Abundance, etc.

Introduction

Insects are the most diverse and dominant group of organisms on the earth with a number of known species exceeding over a million. The quality of grains and seeds during storage depends on various factors such as crop or variety, initial seed quality, storage conditions, seed moisture content, insect pest, bacteria, and fungi (Amrutha *et al.,* 2015). Among these factors, the insect does a significant contribution to the total productivity of agricultural crops of India in 3 tones/ha as compared to the global average (Manohar lal *et al.*,2017).

Deterioration of stored grains results from the interaction of several factors such as physical, chemical, and biological variables existing in the overall chains from production to consumption (Dubale *et al.,* 2012). Most storage pests are able to increase in numbers drastically within a relatively short time.

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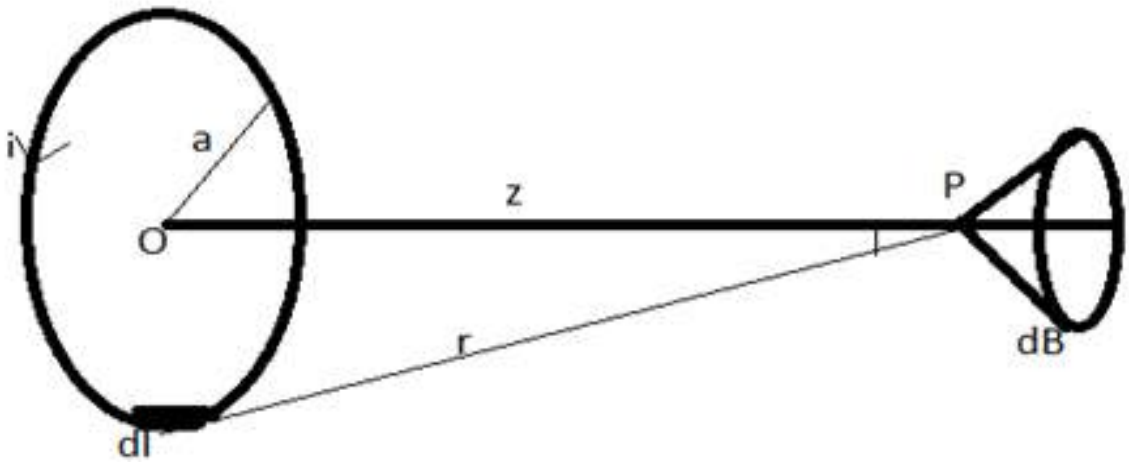

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In this Issue

Why nature made chemical potential of photons zero, for a black body?

Reshma. P[1], Prasanth. P[2], Sreshma Rajan[3] and K. M. Udayanandan[4]

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Submitted on 28-03-2021

Abstract

Chemical potential of photons in a black body is zero. Thermodynamic interpretations for this can be seen in books and publications[1, 2, 3]. In this short communication we are trying to find out the reasons of making zero chemical potential of photons in a hot body from the quantum statistical mechanics view point.

1 Introduction

In thermodynamics, chemical potential forms a central concept and has marked its name in almost all the branches of science and technology. The knowledge of chemical potential of a material helps to obtain almost all its thermodynamic properties at a given temperature and pressure. Every substance has a tendency to change, may be a chemical reaction like rusting of iron or a phase change like evaporation of water, it is the chemical potential which controls them. Josiah Willard Gibbs[4] formally introduced the concept of chemical potential in his paper "On the Equilibrium of Heterogeneous Substances." Initially Gibbs termed it as 'intrinsic potential' but later it was Wilder Dwight Bancroft who coined it as 'chemical potential'[5]. Gibbs introduction of chemical potential marked the birth of chemical thermodynamics and made it possible to apply thermodynamics to material science and engineering. Maxwell[6] identified temperature, pressure, and chemical potential as potentials more than 140 years ago.

2 Classical and quantum systems

There are two types of physical phenomena which govern our lives, one is called clas-

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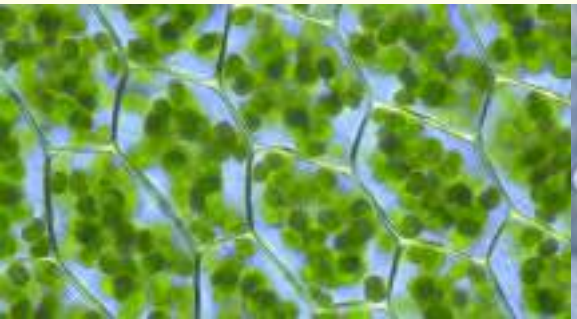

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OP-09

Study on distribution of *Rotala L.* species in Northern Malabar region of Kerala.

Sarga[1], Jeeshna MV[2] , Sreelakshmi T[3] .

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Assistant Professor Departments of Botany, SreeNarayana College, Kannur, Kannur University, Kerala, India.

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Abstract

The genus *Rotala* L. is found throughout the world's tropical and subtropical regions, with the majority of the species found in South Asia. It is usually found in laterite shallow ponds as well as in paddy fields. A brief survey on distribution of *Rotala* L. and its associated plant species in North Malabar region of Kerala is carried out. Fifteen species of *Rotala* L. have been identified from Northern Malabar region, of which *Rotalatulunadensis , R. malabarica , R. malampuzhensis , R.baileyana , R.cheruchakkiensis , R. meenkulamensis , R.kasargodensis and R.khaleelianaare* endemic while *R. indica , R. rosea , R. rotundifolia , Rotaladensiflora, , R.macrandra , R.mexicana ,R.occultiflora* are indigenous. Most common associated plants of *Rotala*in laterite shallow ponds include *Eriocolon, Blyxa, Dopatrium, Shoenoplectiella* and *Weisneria*. There are about thirty two new distributional sites but most of these areas are under threat due to anthropogenic activities. These areas must be protected for the conservation of *Rotala* L. along with its associated plants.

Keywords: *Rotala*, associated plants, laterite, shallow ponds.

1. Introduction

The genus *Rotala* L. belongs to the family Lythraceae found on laterite soil and is now represented by more than 55 species distributed in tropical and subtropical regions of the world. It shows greatest diversity in tropical Asia (Cook, C.D.K. 1979). In India, 66 percent of the globally recognized species have represented the genus, and 83 percent of them are strikingly endemic, indicating their evolutionary significance (Rijuraj, M.P. et al. 2017). Several researchers (Bamps,1989; Beesley, 1990; Lu, 1979; Mathew, and Lakshminarasimhan,. 1990; Pradeep, *et al.* 1990; Prasad, *et al.* 2012; Prasad and Raveendran 2013; Sunil,*et al.* 2013; Yadav,*et al.* 2010) introduced 11 species to the genus after Cook's revision in 1979. *Rotala* L. is characterised by 29 species with an overall morphological diversity of 26 species, including 18 endemic taxa, in Peninsular India. In Peninsular India, Kerala is the largest genus distribution

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OP-01

The profile diversity of species under the family Linderniaceae selected areas along Kannur district Kerala

Sreelakshmi T[1], Jeeshna MV[2], Sarga[3]

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Abstract

Vast stretches of laterite capped hillocks are the characteristics of Kannur district. We analysed the distribution of species under the family Linderniaceae in different ecological condition along laterite stetches and paddy fields of the Kannur district during pre-monsoon, monsoon and post monsoon. Associated plants are *Utricularia cecilii, Limnophilia repens, Cyperus rotundus, Justicia ekakusuma, Desmodium trifolium, Eriocaulon eurypeplon, Centranthera*. In the monsoon season mostly *Lindernia cibata, Lindernia crustacea* was observed in the laterite stretches from Cheemeni, Ponnurikkipara, Karakund, Madyipara, Mattanur, Chenglayi, Chudala, Keezhara, Ammuparamb. During post monsoon more *Lindernia* species such as *Lindernia crustcea, Lindernia antipoda, Lindernia anagallis, Lindernia caesopitosa, Lindernia hyssopioides, Lindernia rotundifolia, Lindernia tenuifolia* was observed in the paddy fields of Bakklam, Pariyaram, Pazhayangadi, Pappinisseri, Vaaram. Likewise it was found that the some of the species are surviving in water deficit condition, and disturbed sites along the roadsides. To conclude *Lindernia* species might be promising candidate for stress tolerance study, but more investigation is needed to reveal the phytochemicals involved in the stress response.

Keywords: Distribution, Diversity, Linderniaceae, Laterite stretches, Phytochemicals.

1. Introduction

Kerala is divided according to its geomorphological condition into three regions: coastal plain, midland hills and highland hills. Vast stretches laterite hillocks are one of the characteristic features of the midland hills which include Kannur district. Besides the fact that it provides a good watershed area, it also serves as a major ecosystem for many plants. Laterite plateaus can be considered as an amphibious ecosystem where there is an unusual ecosystem that supports a unique biota due to the alteration of very wet and dry conditions. So, to tolerate the shift of environmental conditions they grow and reproduce in a short time. Many species forms endemics to such geographic areas (Balakrishnan *et al*., 2010). Linderniaceae, a herbaceous angiosperm flourishing in these geographic areas predominantly occurs in laterite stretches, paddy field and also thrives in disturbed sites along the edges of roadside, damp places, marshy and wetlands (Randall, 2012).There are huge reports and case studies from different regions

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OP-11

Preliminary phytochemical analysis and FTIR studies in *Brachystelma ariyittaparensis*, an endemic plant in North Kerala

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Abstract

Brachystelma ariyittaparensis P Biju et al. belong to the family Asclepiadaceae and belongs to endemic and critically endangered categories in IUCN.Many of the tuberous *Brachystelma* are known to be used medicinally as well as food by local people. The present paper deals with the preliminary phytochemical analysis of the tuber extracts of *B.ariyittaparensis* in different solvents and FTIR study of the functional groups.The results revealed the presence of carbohydrates, amino acids, protein,glycosides, tannins, alkaloids, saponins, monosaccharides, and phenolic compounds are present in different extracts. While FTIR analysis depicted different functional groups in the tubers of *B. ariyittaparensis*. Hence the species can be studied further for their medicinal and food properties.

Key words: *Phytochemicals, FTIR spectra, Bioactive compounds, Brachystelma*

1. Introduction

Brachystelma R.Br. (Apocynaceae: Asclepioideae) is one of the poorly studied and little-known genera of geophytic plants in India. The plant groups that consist of short-lived ephemerals or geophytes with underground storage organs such as bulbs, corms, tubers or rhizomes are inadequately explored and studied due to their narrow seasonality and highly restricted distribution ranges. The genus *Brachystelma* R.Br. is the second largest genus in the tribe Ceropigiae of the subfamily Asclepiadoideae (Apocynaceae) and consists of about 160 species, distributed mainly in the old-World tropics, particularly in sub-Saharan Africa. India, Sri Lanka, South East Asia and Northern Australia (Prasad *et al*,2016). After the recent revision the genus is now represented by 38 taxa in India, which includes 34 species and four varieties. Among them, five new species and one new combination available (Prasad and Venu, 2021). Among the Indian species, four are from the foothills of the Himalaya in northern India and the remainder are from peninsular India, where they are known from the extreme south in Kerala and Tamil Nadu to Maharashtra in the west and are particularly associated with the foothills of the Western Ghats. A total of 21 are endemic to India (Venu and Prasad, 2015). About 10% of the species of the genus *Brachystelma* occur in India with high intra specific diversity.

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Glyoxalase gene imparting drought tolerance from selected plants under the family Linderniaceae

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Methylglyoxal and its detoxifying system Glyoxalase serve as a biomarker for stress tolerance in plants. Along with other environmental stress water deficit actuate the survival of plants. The increased tolerance of the plants against drought stress may be due to the fact that under water deficit conditions more amount of glyoxalase enzyme was produced in the plants to detoxify MG and ROS utilizing GSH as the cofactor. Linderniaceae is one among the described desiccation tolerant angiosperms reporting both desiccation tolerant and desiccation sensitive species. The total cellular genomic DNA from *Lindernia crustacea* (L.) F. Muell, *Lindernia ciliata* (Colsm.) Pennel, *Lindernia hyssopioides* (L.) Haines, *Lindernia antipoda* (L.) Alston was isolated, purified and a partial genomic sequence coding for glyoxalase I was PCR amplified using 2 specific primers designed on the already published sequences of GLY I from the database using Megalign software. We report glyoxalase I and its functional role for the first time in drought tolerant plants under the Linderniaceae family. It is significant to explore the signaling pathway and multiple roles of glyoxalase involved in water deficit tolerance for producing transgenic plants. MG based selection system can be explored to design potential transformants.

Keywords: Desiccation, Glyoxalase, Linderniaceae, Methylglyoxal, Stress

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AN OVERVIEW OF POTENTIAL PHYTOCHEMICALS FROM LINDERNIACEAE - REVIEW

Sreelakshmi T[1], Jeeshna M V[2], Sarga[3]

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Abstract

Even though considered as a weed, Linderniaceae is one among the valuable ethnomedicinal plants. Linderniaceae is a family traditionally well known as a folk medicine used to cure numerous health issues such as to relieve cough, abdominal ailments, liver complaints, urinary disturbances, jaundice, gonorrhoea, gynaecological issues, skin diseases, antidiabetic and many more. So, the phytochemical profiles of some of the plants were evaluated by pharmacological studies. This review aims to generate an analysis of existing knowledge of the ethnomedicinal, phytochemical, traditional, pharmacological aspects of species under the family Linderniaceae. Among the accepted species *Torenia crustacea* (L.) F. Muell, *Bonnaya ciliata* (Colsm.) Pennell, *Lindernia ruellioieds* (Colsm.) Pennel, *Lindernia anagallis* (Burm. F.), *Lindernia madayiparense* were reported in the phytochemical analysis research establishing its antiviral, antimicrobial, antihyperglycemic, anti-hepatitis, neuritogenic, antioxidant activity, antifungal activity. Phytochemically the plant is reported to possess considerable amounts of phytoconstituents such as aloe-emodin, phytol, linderside A, lindersine B, verbascoside, menthol, pulegone and many more. Through the pharmacological and phytochemical studies, it is evident that plants under the family Linderniaceae possess active phytoconstituents. Among the Linderniaceae family, owing to the traditional knowledge, pharmacological experiments, genus *Lindernia* has been studied regarding ethnopharmacological as well as phytochemical search. Through the pharmacological and phytochemical studies, it is evident that plants under the family Linderniaceae possess active phytoconstituents such as saponins, steroids, tannins, terpenoids, flavonoids, phenolic compounds, essential oil, diterpene, coumarin, phytosterol, polyphenol. So there need to be more relevant studies on the isolation and characterisation, standardisation of plant extracts, primary screening assays of the biologically active phytochemicals which account for further drug development. Through the literature, a few studies reported on the desiccation tolerance in some of the species in Linderniaceae, Recently, extracts from desiccation tolerant plants are explored for secondary metabolites which have significant biological activities.

Keywords: Linderniaceae, phytochemicals, phytoconstituents, desiccation, metabolites

PLS - 535

STUDIES ON PHENOLOGICAL CHARACTERISTICS OF DIFFERENT SPECIES OF *ROTALA* IN NORTH MALABAR REGION OF KERALA, INDIA

Sarga[1], Jeeshna M V[2], Sreelakshmi T[1]

Abstract

Plant phenology is the timing of plant growth and development, which is changing as a result of global climate change. The present study describes the phenology of the species of Genus *Rotala* such as budding, vegetative growth, flowering, fruiting, seed maturation and seed dispersal. The genus *Rotala* belongs to the family Lythraceae and it includes annual and perennial herbs growing submerged, emergent, and as rheophytes, with decussate, whorled or rarely alternate leaves; bracts of solitary flowers scalelike or leaf-like; flowers 3–5-merous, monomorphic or dimorphic (heterostylous), occasionally cleistogamous, solitary or in racemes; stamens as many as or fewer than the calyx lobes; capsule 2–4-valved, style persistent on the capsule; seeds numerous, ellipsoid or ovoid, with mucilaginous hairs in the seed coat upon wetting. Detailed phenological study of *Rotala malabarica, Rotala malampuzhensis, Rotala occultiflora, Rotala mexicana, Rotala meenkulamensis, Rotala khaleeliana, Rotala indica, Rotala rosea, Rotala thulunadensis, and Rotala baileyana* were carried out from January, 2021 to November, 2022 in the Northern Malabar region. The presence of major phenophases was decided on the basis of their percentage of occurrence. It is noted that the respective phenophases of some species occurred in the different months. It showed that *R. malabarica and R. malampuzhensis, R. thulunadensis* and *Rotala baileyana, Rotala indica* and *Rotala rosea* responded uniformly to environmental conditions. The phenophases of all the species was observed to be higher during rainy months (June - December,) and become lower during summer or low rainfall months (February-May). The study provides a baseline data of phenophases of different species of *Rotala* which can be used to initiate a progressive step to establish a co-relation of climate change with phenograms.

Keywords: *Rotala*, Phenophase, Lythraceae, Ecology.

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widely used formedicinal purpose and as spice. After harvesting the pseudo-stem is discarded and becomeswaste. This discarded pseudo-stem can be converted as a new source of natural fiber. Thecharacterisation of the fibers obtained from the *Alpiniagalanga*are studied. The physical andchemicalcharacterization of the *Alpiniagalanga*(AG) fibers were studied. The chemicalcompositionofthe fiberswas analyzedandrevealedto have70.5%cellulose,18.5%hemicellulose and 12.7% lignin. The crystallinity percentage and thermal stability of the fibers were also examined. All the results show that the *Alpiniagalanga*can be utilized as a novelsourceofnaturalfibers.

Keywords–*Alpiniagalanga,natural*fiber,*Zingiberaceae*

AN OVERVIEW ON THE IMPACT OF MINING AND LOSS OF BIODIVERSITY IN NORTHERN KERALA

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ABSTRACT

In Kerala, the low altitude plateaus distributed in the Kasargod, Kannur, Kozhikode, Malappuram, Palakkad and Thrissur districts. Mining is one of the oldest professions, and its environmental impacts are important to society. Laterite is a rock formation found in the Western Ghats and its foothills, and its mining has become a major economic activity of the local people. The midland hillocks in Kerala's north Malabar area, particularly those in the districts of Kannur, Malappuram and Kasaragod, are characterized by mining. A significant source of income for the local population has evolved from laterite mining in locations with substantial laterite deposits. These laterite plateaus provide diverse microhabitats for the growth of flora and fauna. The microhabitats

ETHNOBOTANICAL RELEVANCE AMONG THE FAMILY LINDERNIACEAE

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ABSTRACT

Ethnobotanical aspects under the family Linderniaceae which needs to be explored by phytochemical analysis for further production of phytocompounds Even though it is considered a weed, Linderniaceae is a family traditionally well known as a folk medicine used to cure numerous health issues The study aimed to identify the traditional healing practices of the plants under the family Linderniaceae around the globe especially in India Data were collected from literature search reported so far using the keywords medicinal aspects of Linderniaceae, Ethnobotany related to Lindernia, traditional use of Lindernia Traditionally consumed as deworming agents by the tribal communities of Bodoland region of Assam Ethnic communities of Garhwal Himalaya used *Torenia crustacea*(L.) F Muell for the treatment of abdominal ailments. Traditional medicine by Kom tribal community in Thayong village of Manipur used *Lindernia ciliata*(Colsm.) Pennell against kidney stone Among the plants under the family Linderniaceae, *Torenia crustacea*(L.) F is reported the most in the traditional healing practices around different parts in India among the tribes Currently great research efforts are carried out in a few plants of Linderniaceae to validate the claimed ethnomedicinal properties But further research is needed in several of the traditionally claimed plants under the family Linderniaceae.

Keywords Linderniaceae, ethnomedicine, folk medicine, phytocompounds

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ORI 03 : Ecological distribution and existential crisis of two Brachystelma sp. in northern Kerala.

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ABSTRACT

Brachystelma ariyittaparensis and B. vartaki have recently been discovered in northern Kerala, Members of the genus are exclusively geophytes and the studied species are under-utilized plants belonging to the family Apocynaceae. Both are closely related species and are reported from the low-lying laterite plateau of Kasaragod district of Kerala. On further explorations, distribution extended up to some locations in the nearby Kannur district. Both plants have highly restricted and sparse distribution and are less noticed among other plant populations. Hence, they are under existential crisis over the distributed areas.

Key words: Brachystelma, Ceropigiae, geophytes, laterite plateaue

OR 02 : Analyzing the Environmental Impact of Mining on Laterite Soil and Plant Ecosystems in Northern Malabar Region, Kerala

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ABSTRACT

In Kerala, a region known for its low-lying plateaus scattered across districts like Kasargod, Kannur, Kozhikode, Malappuram, Palakkad, and Thrissur, mining stands as one of the oldest professions, with profound environmental implications for society. The local people have turned to mining the unique rock formation called laterite, found in the Western Ghats and their foothills, as a major economic activity. Particularly in districts like Kannur, Malappuram, and Kasargod in the north Malabar area, mining characterizes the landscape. The substantial deposits of laterite in these regions have evolved into a significant source of income for the local population. These laterite plateaus offer diverse microenvironments that nurture the growth of flora and fauna, including sacred groves, shrubbery, soil-filled rock crevices, and wet areas. Many endemic species have been reported to inhabit these laterite plateaus, but both the floral and faunal communities face numerous grave threats to their existence. The overarching aim of this investigation is to scrutinize the consequences of laterite mining and its role in the loss of biodiversity in Northern Kerala.

Key words: laterite, endemic, biodiversity loss

Antimicrobial peptide resistance and scope of computational biology in antimicrobial peptide research

14

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14.1 Introduction

One of the potential issues overcomes at present is the emerging patterns of antimicrobial resistance. The uncontrolled growth and the explosion of antimicrobial resistance demand an urgent need for an alternative. The best solution to overcome this situation is small peptides having antimicrobial activities, that is, antimicrobial peptides (AMPs) [1]. In recent years AMPs are getting high interest among scientists and pharmaceutical fields because of their high therapeutic properties [2]. AMPs are large classes of low molecular weight protein molecules which are part of the innate immunity of all types of organisms [3]. They are having a broad spectrum of antibacterial, antifungal, antiviral, and antiinflammatory activities [4]. They are highly specific and possess immune-modulatory activities [2]. Because AMPs make bacteria develop low or no resistance, they are highly promising compounds that can be used as an effective alternative to antibiotics [5]. In many bacterial species, one of the major mechanisms of antibiotic resistance is the formation of biofilm. It is found that biofilm formation can be effectively hindered by many of the AMPs. AMPs exhibit broad-spectrum activity against most strains of gram-positive and gram-negative bacteria, including multidrug-resistant strains. Studies of different animal models found that AMPs are also effective in neutralizing toxins [6].

AMPs can be categorized into various classes that include thionins, snakins, defensins, glycine-rich proteins, lipid transferases, cyclotides, and hevein proteins [7]. There are various types of AMPs isolated and characterized from various sources such as plants, animals, and microbes [8]. AMPs are found abundantly in plants and can be extracted from all parts of plants like root, stem, seeds, leaves, and different organs of the plants [9]. In plants, AMPs not only protect plants from microbial diseases but also help in the growth and development of the plant [7]. Another important source of AMPs is insects [10]. A diverse type of AMPs is also

* These authors have equally contributed.

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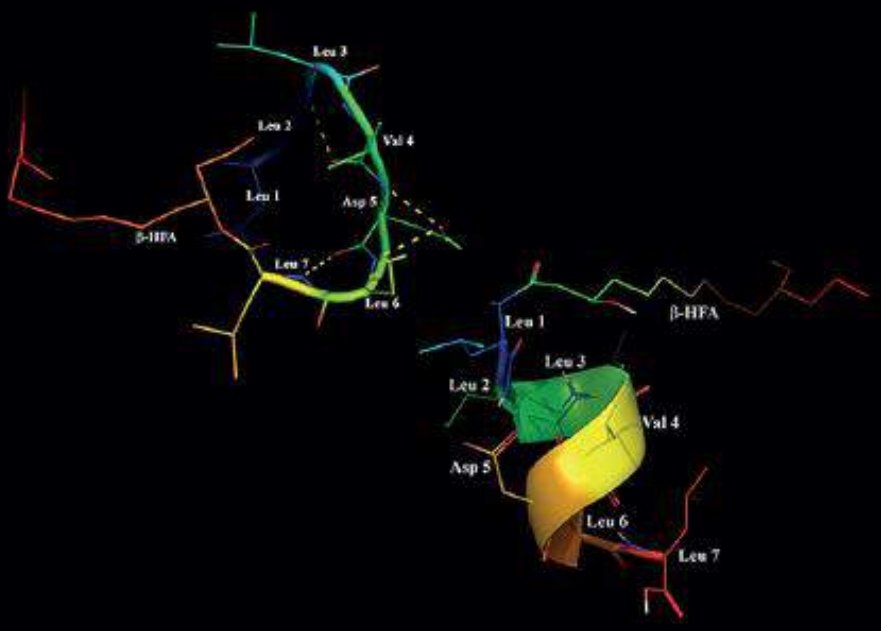

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नासिरा शर्मा की कहानियों में आर्थिक समस्याएँ

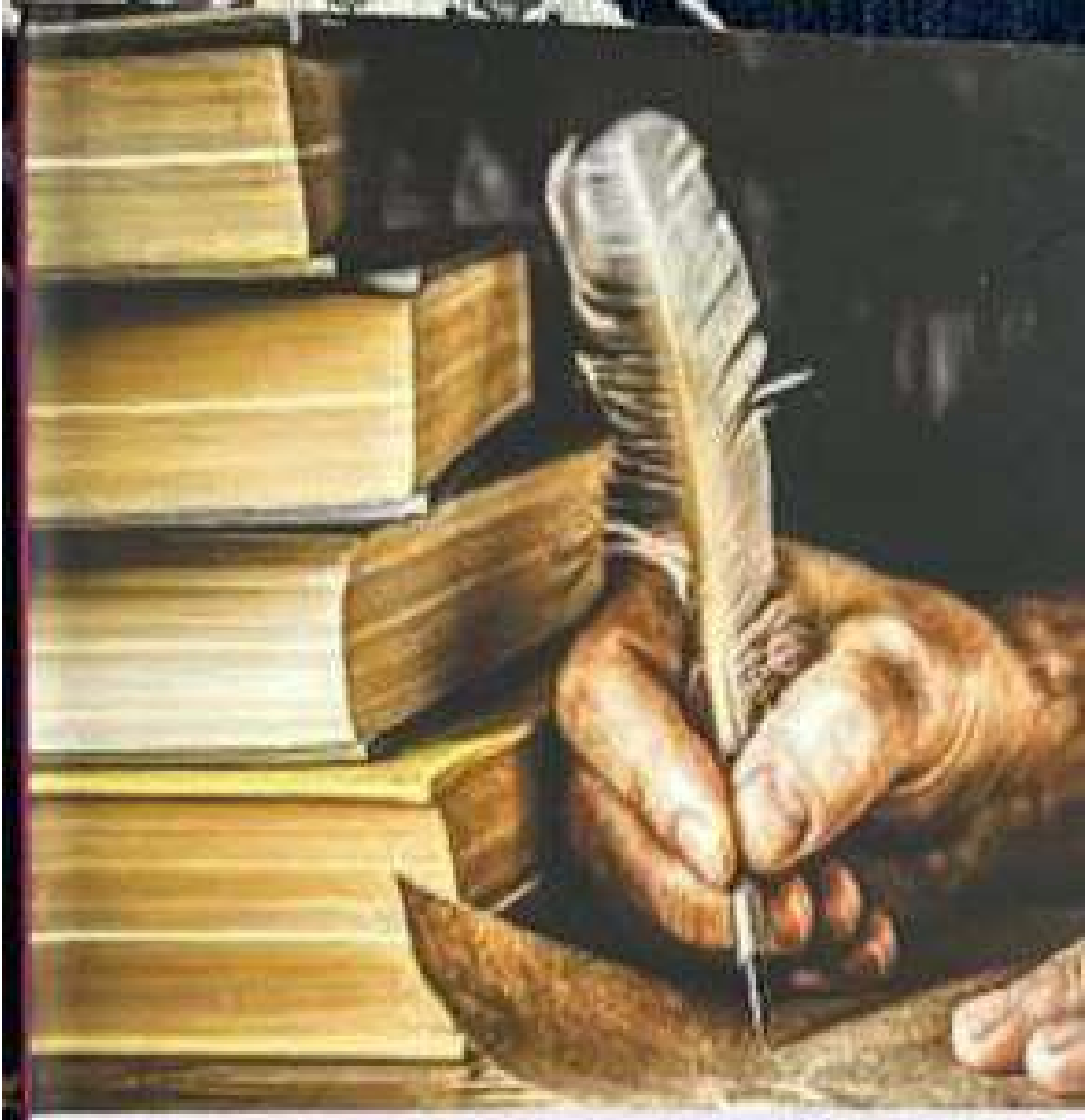
- डॉ. रातिका पी.के.

आधुनिक हिन्दी साहित्य में महिला साहित्यकारों का योगदान महत्वपूर्ण रहा है। इन महिला साहित्यकारों ने अनेक अछूते संदर्भों का उद्‌घाटन किया है। नासिरा शर्मा वर्तमान समस्याएँ, भावबोध, परिवेशगत अनुभूति और संवेदना आदि को लेकर साहित्य सृजन करने वाली महत्वपूर्ण साहित्यकार है। उन्होंने प्रधान रूप में उपन्यास और कहानियों का सृजन किया है। संवेदनशील लेखिका नासिरा शर्मा ने अपने साहित्य में अनेक समस्याओं का चित्रण करते हुए कई समस्याओं का समाधान देने का प्रयास किया है। हर वर्ग, हर प्रांत देश की समस्या अलग-अलग होती है, इसका समाधान भी अलग-अलग होता है। अपनी कहानियों में जिन-जिन समस्याओं को दिखाया है उनमें मुख्य समस्या है–आर्थिक समस्या। "विभिन्न सामाजिक संघर्षों, राजनीतिक समस्याओं एवं क्रांतियों का मूल कारण प्रत्यक्ष या अप्रत्यक्ष रूप से अर्थ ही होता है।"[1]

अर्थ का प्रभाव व्यक्ति के पूरे जीवन पर पड़ता है। धनोपार्जन के लिए आदमी इधर-उधर भटकते हैं। पूँजीवाद के कारण धनिक अधिक धनवान बन गया तथा दरिद्र और अधिक दरिद्र होता गया। धनवान लोगों द्वारा दरिद्रों का आर्थिक शोषण सदा होता है। गरीबी होने के कई कारण है। गरीबों को अपनी दशा सुधारने के लिए काफी संघर्ष करना पड़ता है। नासिरा शर्मा की कहानियों में आर्थिक दृष्टि विविध पहलुओं पर देखा जा सकता है।

बेरोज़गारी की समस्या मुख्य रूप से नासिरा शर्मा की कहानियों में पाया जाता है। 'परिंदे' कहानी का विजय पढ़ा लिखा युवक है। लेकिन उसे नौकरी नहीं मिली। घर में माँ-बाप और बहन है, उनकी जिम्मेदारी उनके कंधों पर है। बेरोज़गारी से तंग आकर वह विदेश नौकरी के लिए चला जाता है। इसी प्रकार जहीर को भी यही समस्या है। "उसने एम.ए. कर लिया और पी.एच.डी. के लिए अपने को एनरोल करा लिया था। अब उसको नौकरी की तलाश थी। सारे स्कूल-कॉलेजों का हाल बेहाल था। स्वयं विश्वविद्यालय की स्थिति बुरी चल रही थी। उसका रोज़ का काम था कि यह पता लगाया कि किस स्कूल में जगह खाली है और किस कॉलेज में कोई अध्यापक रिटायर होने वाला है।"[2]

'जैतुन के साये' कहानी के तौफीक को अपने देश फिलिस्तिन में कोई काम नहीं



साहित्यिक वैचारिकी

डॉ० ओकेन्द्र
डॉ० सत्येन्द्र प्रकाश

अनुक्रमणिका

१

पं.रामनरेश त्रिपाठी जी के काव्यों में प्रेम, सौन्दर्य और राष्ट्रीयता

डॉ॰ रतिका पंचारपोईल कोट्टाई

भारतेन्दु युग के उत्तरार्द्ध में पं.श्रीधर पाठक के हिन्दी काव्यधारा में प्रवेश के साथ ही स्वच्छन्दतावाद का श्रीगणेश हुआ। द्विवेदी युग में स्वच्छन्द काव्यधारा क्रमशः विकसित होती हुई प्रसाद–काल में आकर अपने चरमोत्कर्ष पर पहुँच गयी। द्विवेदी युगीन इतिवृत्तात्मक अवरोध के होते हुए भी बीसवीं शताब्दी के प्रारंभिक पच्चीस वर्षों में हिन्दी स्वच्छन्दतावाद का पूर्ण विकास हुआ। वस्तुतः यदि श्रीधर पाठक को हिन्दी स्वच्छन्द काव्यधारा का प्रवर्तक, पं.रामनरेश त्रिपाठी को उन्नायक तथा निराला को चरमस्पर्शी कहा जाय तो अनुचित न होगा।

त्रिपाठी जी के खंड़ काव्य 'पथिक', 'मिलन' और 'स्वप्न' का मूल स्वर एक ही है। प्रारंभ किशोरावस्था के प्रणय व्यापार से होता है, मध्य में रूपाकर्षण और कर्तव्य–पथ के बीच अंतर्द्वन्द्व होता है लेकिन शीघ्र ही कर्तव्य ज्ञान के व्याज से उन्मुक्त वासना का परिष्कार हो जाता है और अंत में नायक मातृभूमि की सेवा में अपना सर्वस्व समर्पण करता है। प्रेम भावना से राष्ट्रीय चेतना को उभारकर नवयुवकों को मातृभूमि की रक्षा के लिए प्रेरित करना ही इन खंडकाव्यों का उद्देश्य था और इस उद्देश्य की पूर्ती में कवि सफल हुआ है। किशोरावस्था में नायक–नायिका का प्रेम–पथ पर अग्रसर होना मनोवैज्ञानिक सत्य है। उद्‌बोधन द्वारा नायक में राष्ट्रीय चेतना का संचार, फलस्वरूप सर्वोत्संग की भावना का विकास और अंत में लक्ष्य की प्राप्ति सहज ढंग से हुई है।

सहायक आचार्या, विभागाध्यक्षा (हिन्दी विभाग) एस. एन. कॉलेज, कन्नूर (केरल)

हिंदी यात्रावृत्तांत साहित्य

डॉ॰ ओकेन्द्र

अनुक्रमणिका

११

नेपाल की यात्रा का वृत्तांत : सयौ टूँगा फूलका

डॉ॰ रतिका पंचारपोईल कोट्टायी

जब हम सपना देखते हैं तो कभी नहीं सोचते कि यह सपना साकार हो जाएँगे। हम सिर्फ कल्पना करते हैं कि काश! ऐसा होता। ऐसा ही एक सपना हमारे जीवन में हकीकत में बदल गया। वह सपना नेपाल जाने का था। जब यह सूचना मिला की क्रांतिधारा अकादमी की ओर से नेपाल, भारत साहित्य महोत्सव नेपाल (काठमंडू) में तीन दिन होने वाला है। तब से लेकर नेपाल जाने के सपने में हम (मैं, राम्या और दिलना) खो गई। साहित्योत्सव में भाग लेने के लिए तथा पुरस्कार प्राप्त होने के लिए अपनी लिखी हुई किताबें भेजनी चाहिए। हम तीनों ने अपनी अपनी पुस्तकें जल्द से जल्द भेज दी। तब से लेकर हमारी हर बातों में नेपाल मुखरित था स खाने के वक्त, पढ़ने के वक्त, यात्रा करने के वक्त, पूरा समय हमारी चिंताएँ नेंपाल की ओर भागने लगीं। ठीक एक महीने के बाद हमें मेसेज आया कि तीनों की पुस्तकें 'अमृता प्रितम पुरस्कार' के लिए योग्यता पायी हैं। हम खुशी से पागल हो गयीं। यदि इनमें से किसी एक की पुस्तक योग्यता नहीं बन पायी तो३ इस प्रकार हमने सोचा ही नहीं था। सपना साकार होने जा रहा है। अगला कदम फ्लैट टिकट लेना है।

सहायक आचार्या, हिंदी विभाग, श्री नारायणा कॉलेज, कण्णूर,

भारतीय साहित्य

भाषा और संचार मीडिया

संपादन

डॉ. मंजू ए.

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अनुक्रम

भूमण्डलीकरण के दौर में गाँव-'ग्लोबल गाँव के देवता' उपन्यास के संदर्भ में

-डॉ. रम्या बालन के.

उपन्यास समाज का संसार संरचनात्मक, भावनात्मक एवं वैचारिक दस्तावेज़ होता है। समाज में घटित हर घटना की प्रतिक्रिया-प्रतिरोध साहित्य में मिलती है। रणेन्द्र का 'ग्लोबल गाँव के देवता' इस प्रकार का एक प्रतिरोधी दस्तावेज़ है। 'ग्लोबल गाँव के देवता' उपन्यास में लेखक ने भूमण्डलीकरण से प्रभावित झारखंड के कीकट प्रदेश की असुर जनजातियों के संघर्ष को चित्रित किया है। यहाँ लेखक ने 'ग्लोबल गाँव के देवता' के रूप में बहुराष्ट्रीय कंपनियों एवं कॉरपोरेट वर्ग को प्रस्तुत किया है। वेदों, पुराणों से उपेक्षित असुर जनजाति जन्मांतरों से पीड़ित और उपेक्षित है। मुख्यधारा के समाज ने इन्हें कभी मानव का दर्जा नहीं दिया। इन्हें पुराणों में यज्ञ और पुण्य कर्मों को भंग करने वाले राक्षसों के रूप में चित्रित किया है। आज भी 'असुर' नाम सुनते ही हर आदमी के मन में वेदों, पुराणों द्वारा निर्मित की गई वही क्रूर छवि सामने आती है। रणेन्द्र ने इसी बिंदु को पकड़कर उपन्यास की शुरुआत की है। मुख्यधारा से हटकर आदिवासी समाज ने जंगल में अपनी अलग दुनिया बसायी है। लेकिन भूमण्डलीकरण के क्रूर प्रभाव से बचना इन लोगों के लिए भी आसान नहीं है। दरअसल भूमण्डलीकरण से सबसे अधिक प्रभावित आदिवासी समाज ही है। विकास के नाम पर यहाँ प्रतिदिन बाक्साइट का खनन होता है। इसके बाद उसी ज़मीन में शेष गहरी खाईयों में आदिवासियों का भविष्य ख़त्म हो जाता है। इससे आदिवासियों को अपनी ज़मीन से भी विस्थापित होना पड़ता है।

भूमण्लीकरण ने दुनिया को हमारी उँगलियों पर ला दिया है। लेकिन दुनिया मुट्ठी में सिर्फ उन्हीं लोगों के लिए है जो मुख्यधारा में है। हाशिएकृत यह समाज आज भी जल, जंगल और ज़मीन के लिए संघर्षरत है। कोका-कोला जैसी कंपनियाँ भू-गर्भ जल को बोतलों में भरकर बेचती हैं। यहीं आदिवासियों के बच्चे एक बूँद जल के लिए तड़पते हैं। सरकार भी इन बहुराष्ट्रीय कंपनियों के गुलाम बना है। सी.के जानु ने यह सही कहा है कि यह कंपनियाँ हमारे जंगल, जल सबको बेचने के लिए तुली बैठी हैं। अगर आदिवासियों की साँसें भी बेचने से इन्हें पैसा मिल जाए, तो यह हमारे साँसें भी बोतलों में भरकर आपके सामने पेश करेंगे। लेकिन आज समय बदल रहा है। दुनिया के हर कोने से आदिवासी संगठित हो रहे हैं। लेकिन उनके प्रतिरोध और संघर्ष को दबाने के

वैश्विक परिप्रेक्ष्य में हिन्दी

सम्पादक : डॉ. राधिका के.

अनुक्रमणिका

6

विज्ञान में हिंदी का स्थान

राम्या बालन के.

प्रस्तावना- प्रस्तुत आलेख में बाजारवाद के इस युग में विज्ञापन और उसकी भाषा के बारे में अध्ययन करने का प्रयास किया है। विश्व में सबसे अधिक बोली और समझी जाने वाली दूसरी भाषा है हिंदी। इसलिए विज्ञापन के क्षेत्र में हिंदी भाषा का महत्वपूर्ण स्थान है। वर्तमान समय में बदलते सामाजिक प्रक्रिया के साथ अध्ययन करती हुई हिंदी भाषा विज्ञापन के क्षेत्र में अपनी जगह स्थापित कर रही है।

कुंजी शब्द- विज्ञापन, औद्योगिक क्रांति, विपणन

विज्ञापन विक्रिय कला का एक नियंत्रित जनसंचार माध्यम है। वर्तमान समय में अंतर्राष्ट्रीय विपणन में विज्ञापन के सिवा किसी भी चीज़ों की बिक्री संभव नहीं है। इसलिए विज्ञापन की माँग दिन ब दिन बढ़ती जा रही है। औद्योगिक क्रांति के बाद दुनिया में वस्तुओं का उत्पादन बढ़ने लगा। उसमें मशीन का निर्माण क्रांतिकारी कदम है। हम आज ऐसी दुनिया में जी रहे हैं जहाँ मशीनों के बिना काम चलाना बिल्कुल असंभव है। हम देख सकते हैं कि अंतर्राष्ट्रीय विपणन में मशीनी चीज़ों की माँग अधिक है। एक तरह से कहा जाए तो औद्योगिक क्रांति ने विज्ञापन की माँग को बढ़ाया है। इसलिए इन दोनों का नाभिनाल संबंध है। विज्ञापन का इतिहास अगर देखा जाये तो 1400 से है। लेकिन 1700 के बाद ही इसका प्रचार हुआ है। औद्योगिक क्रांति के बाद ही विज्ञापन का आधुनिक रूप और जन-सामान्य में इसका व्यापक प्रचार हुआ है।

कोई भी वस्तु जब बाजार में आती है तो विज्ञापन के बिना इसकी बिक्री बेहद मुश्किल है। विज्ञापन केवल वस्तुओं को जनता तक पहुँचाता ही नहीं बल्कि वस्तुओं का पूरा विवरण भी हमें देता है। ध्यान देने की बात यह है कि विज्ञापन बहुत कम समय में अपनी माल की जानकारी ही नहीं उसके अलावा उस चीजों का पूरा विवरण देते हैं। इससे ग्राहक को सही गलत की पहचान कराने में सहायता मिलती है। कम

8th Asia Oceania Conference on Green and Sustainable Chemistry

AOC-GSC8 CONFERENCE HANDBOOK

29 November – 1 December 2023
Auckland, New Zealand

CONTENTS

AOC-GSC8 Programme

Wednesday 29th November

TIME	EVENT	LOCATION
09:30 - 15:00	Registration Opens	Engineering Building 405 Level 4 Foyer
10:00 - 11:00	Arrival Tea & Coffee	Engineering Building 405 Level 4 Foyer
11:00 - 11:30	Opening and Welcome	Lecture Theatre 401-401
11:30 - 12:30	**Plenary Session 1: John Warner** *Green Chemistry: The Missing Elements*	Lecture Theatre 401-401
12:30 - 13:30	Lunch	Engineering Building 405 Level 4 Foyer
13:30 - 14:00	**Keynote Session 1: Debabrata Maiti** *En-Lightening C-H Functionalization*	Lecture Theatre 401-401
	Oral Session 1	
	Lecture Theatre 401-401	**Lecture Theatre 401-439**
	Sustainable Agriculture and Pollutant Remediation	**Synthesis**
14:00-14:20	*New Frontiers in Polymers Made from Sulfur* **Justin Chalker**	*Computation and Experiment in Synergy: A Sustainable Research Approach* **Nadeem Sheikh**
14:20-14:40	*Regulation of plant ethylene biosynthesis for sustainable agriculture* **Ivanhoe Leung**	*Development of heterogeneous catalysts for hydrogenation of carboxylic acids* **Masazumi Tamura**
14:40-14:55	*Esterified Lignin Nanoparticles for Pesticide Delivery to Plant Leaves* **Matilda Andersson**	*Electrochemical oxidation of 3-substituted indoles* **Juan Arteaga Giraldo**
14:55-15:10	*Using the potential of waste biomass in the bioremediation of soil contaminated with heavy metal ions* **Izabela Michalak**	*Endo-selective 1,4-addition of thiols to (–)-levoglucosenone* **Atsushi Tahara**
15:10-15:25	*Removal of antibiotic residues in aqueous solutions using Polyvinyl alcohol-Glycine-Zirconium(IV)tungstophosphate (PVA-Gly-ZWP) Membrane* **Jitha Kunhikrishnan**	

ORAL SESSION 1, LECTURE THEATRE 401-401, 29 NOVEMBER, 2023, 3.10 – 3.25 PM

Removal of antibiotic residues in aqueous solutions using Polyvinyl alcohol-Glycine-Zirconium(IV)tungstophosphate (PVA-Gly-ZWP) Membrane

Charishma Ravindran[1], Jitha Kunhikrishnan Maniath[2], Anitha Panayam Parambil Kunnathulli[3]

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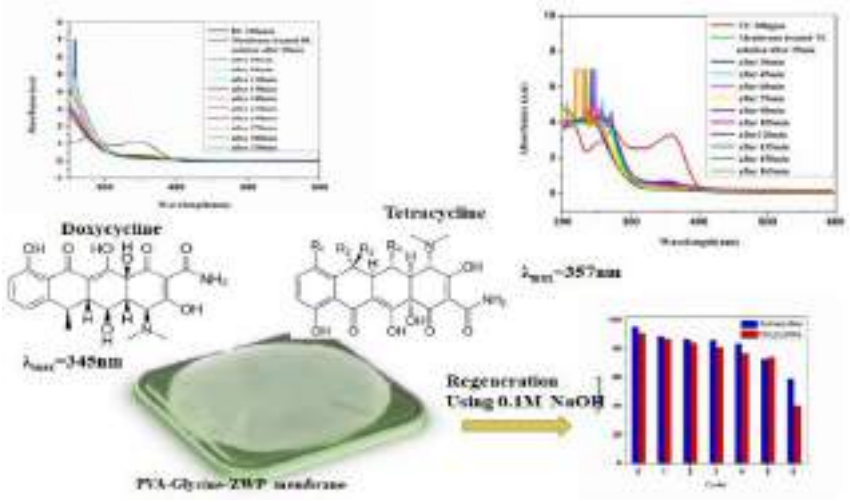
The serious problem of excess antibiotic usage and release into our environment has to be considered under immediate action. Antibiotic residues induce antibiotic resistance among microorganisms and thereby they create a threat of incurable dreadful diseases. An easy method to rectify the problem is to discard the residue from pharma waste and other waste streams which are primary sources of antibiotic residues. The current study deals with the removal of two antibiotic- residues (tetracycline and doxycycline) at a time using a newly fabricated polymer composite filtration membrane of Polyvinyl alcohol (PVA), Glycine (Gly), and with an ion exchanger as filler. The addition of filler - Zirconium(IV)tungstophosphate (ZWP) enhanced the performance of the membrane for the purpose. The PVA-Gly-ZWP membrane was characterized by XRD, FTIR, SEM-EDX, TGA-DTA and UV-Visible spectrophotometer, contact angle goniometer etc. Adsorption behavior of membranes towards TC and DC were carried out using a batch adsorption system. The concentration of TC and DC was measured by UV-Visible spectrophotometer at a maximum wavelength of 357nm and 345nm, respectively. The optimum pH for the removal of both antibiotics was found to be 6. The filtration studies showed that the flux of membrane increased from 73.38±22.39L/m^{2}h to 106.79±13.73L/m^{2}h. A retention of about 70% were obtained for both the antibiotics simultaneously with bare membrane. But about 98% retention was observed when the feed was pretreated with activated charcoal. The maximum adsorptive removal rate of 94.89% for TC and 90.24% for DC using PVA-Gly-ZWP membrane was observed in the batch adsorption process. As a theoretical approach, the nature and extent of adsorption were evaluated by kinetic, isotherm and thermodynamic studies. Pseudo second order kinetic model and Langmuir isotherm models fits significantly more than that of other models. Regeneration of TC and DC adsorbed membranes were successfully done using sodiumhydroxide showing the reusability of the membrane.



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Occurrence of Stored Grain Pests in Thrissur District, Kerala, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The aim of this study is not to eliminate all pests. Some pests are tolerable and essential so that their natural enemies remain in the crop. Rather, the aim is to reduce pest populations to less than damaging numbers**.** Hence the objective of the study is to enumerate the species composition and diversity of the stored grain pests of the study area. In the present study a variety of stored grain insect pests were recorded for 6 months from 2 sites in Thrissur District. For the convenience of the study the period is divided into 2 seasons. The seasonal studies were done and find the species diversity in each season through the survey and statistical analysis. From two seasons 9 species

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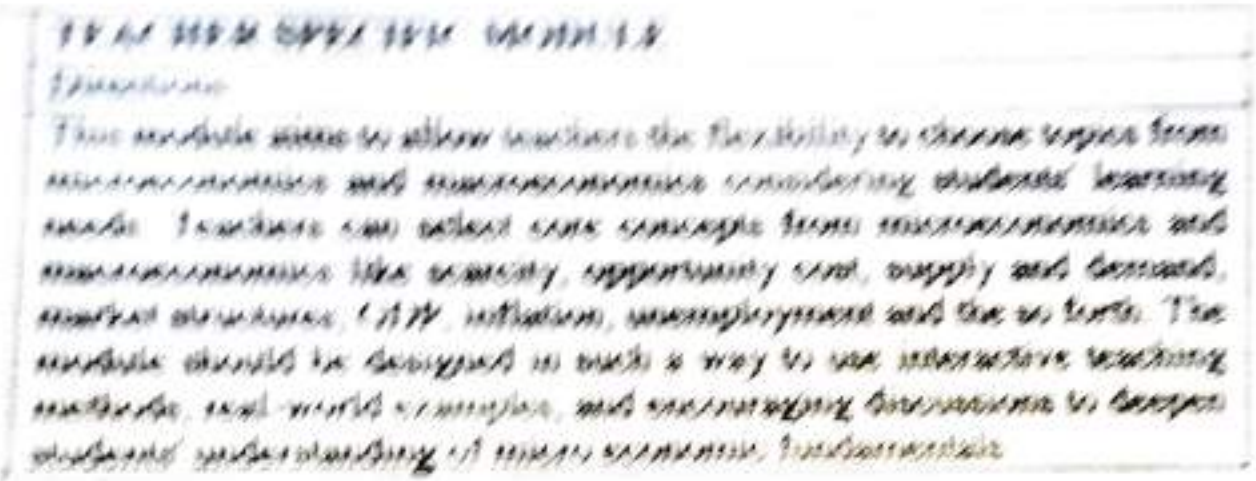

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