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# செம்மொழித் தமிழ்

(பன்னாட்டுப் பன்முகத் தமிழ் ...ாடு காலாண்டு ஆய்விதழ்)

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16 பகுதி-1 Part -1

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16 பகுதி-1
Part -1

# Effect of substrate temperature on structural and optical properties of nebulizer sprayed ZnSe thin films

A. Nirmala Shirley[1], J. Jebaraj Devadason[2], K.Jeyadheepan[3] ,C.Sanjeeviraja[4]

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**ABSTRACT**

We have investigated the structural and optical properties of ZnSe thin films grown on glass substrates by the nebulizer spray pyrolysis technique. The crystal structure and grain size of the particles were determined, using X-ray diffraction (XRD). The crystallites exhibit preferential orientation along the (111) and (200) direction. The band gap is estimated to increase from 2.80 to 2.94 eV with increase in substrate temperatures.

**Keywords**: Spray technique, ZnSe thin films, X-ray diffraction, UV-Vis, Band gap

## 1. Introduction

Zn based nanostructures have been widely investigated recently due to its potential applications. ZnSe and its lattice matched ternary alloys have been regarded as useful II-VI compound semiconductors for optoelectronic and photoelectronic devices with the energy range from visible to ultraviolet ever since the first manifestation of the blue- green laser on ZnSe based material structures in 1991(H Jeon et al). ZnSe has been a material of choice for blue diode lasers and photovoltaic solar cells since its bulk band gap is 2.67 eV which can be tuned by impurities. Out of varieties of applications, ZnSe can be used as optically controlled switching devices (H R Dobler 1989 and N kouklin et al 2001). Hence it is of great interest as a model material as thin film, quantum wells, bulk crystals and nano dots (N Xu et al 2001). Since last few decades the nano sized materials have been subject of great interest due to their unique physical and chemical properties. Thus the strong, size-dependent optical emissions of many semiconductor nano structures make them promising candidates for use as fluorescent tags in the study of biological systems.

The aim of this work is to study the structural and optical properties of ZnSe films deposited by nebulized spray pyrolysis technique and the results have been discussed.

## 2. Experimental details

After the cleaning process, the solution for depositing ZnSe thin films was prepared. 0.1 M of $ZnCl_2$ and 0.1 M of $SeO_2$ were dissolved in methanol with few drops of Con. HCl and the solution was sprayed at different substrate temperatures, starting from 300°C to 450°C.

The substrate to nozzle distance was kept as 5.5 cm and the carrier gas pressure was maintained as 1.6 kg/ $cm^2$ in all cases. The possible chemical reaction takes place on the heated substrate to produce ZnSe thin films.

The crystallographic properties were investigated by XRD (XPERT-PRO) and the optical properties were recorded by, (Jasco V-650).

## 3. Results and discussion

### 3.1. Structural properties

# On the investigation of structural and morphological properties of nebulizer sprayed ZnSe thin films

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## ABSTRACT

We have investigated the structural and morphological properties of ZnSe thin films grown on glass substrates by the nebulizer spray pyrolysis technique. The crystal structure and grain size of the particles were determined, using X-ray diffraction (XRD). The crystallites exhibit preferential orientation along the (111) and (200) direction. The average roughness and skewness of the films are determined.

**Keywords**: Spray technique, ZnSe thin films, X-ray diffraction, SEM, EDAX, AFM

## 1. Introduction

ZnSe has been a material of choice for blue diode lasers and photovoltaic solar cells. ZnSe thin film has wide band gap and low resistivity which is suitable for red, green and blue light emitting diode and thin film transistors. It is also applicable for buffer/ window layer in chalcogenide based thin film solar cells (Desai, H N et al., 2015).Out of varieties of applications ZnSe can be used as optically controlled switching devices. Hence it is of great interest as a model material as thin film, quantum wells, bulk crystals and nano dots. Since last few decades the nanosized materials have been subject of interest due to their unique physical and chemical properties. Thus the strong, size dependent optical emission of many semiconductor nanostructures make them promising candidates for use as fluorescent tags in the study of biological systems (Dhanasekaran, V et al., 2013). ZnSe thin film has been prepared by various growth techniques such as molecular beam epitaxy (MBE) (Song, J S et al., 2003), metalorganic chemical vapour deposition (MOCVD) (Morimoto, K, 1989), atomic layer epitaxy (ALE) (Lee, C D et al., 1996), electro-deposition (Riveros, G et al., 2001), chemical bath deposition (Chaparro, A M et al., 2000), photochemical (Kumaresan, R et al., 2002), spray pyrolysis (Bedir, M et al., 2005) and thermal evaporation ( Venkatachalam, S et al., 2005).

The aim of this work is to study the structural and optical properties of ZnSe films deposited by nebulized spray pyrolysis technique and the results have been discussed.

## 2. Experimental details

After the cleaning process, the solution for depositing ZnSe thin films was prepared. 0.1 M of $ZnCl_2$ and 0.1 M of $SeO_2$ were dissolved in methanol with few drops of Con. HCl and the solution was sprayed at different substrate temperatures, starting from 300°C to 450°C.

The substrate to nozzle distance was kept as 5.5 cm and the carrier gas pressure was maintained as 1.6 kg/ $cm^2$ in all cases. The possible chemical reaction takes place on the heated substrate to produce ZnSe thin films.

The crystallographic properties were investigated by XRD (XPERT-PRO), the morphology of the films were studied using SEM (ZEISS), EDAX (EDAX APEX) and AFM

# Morphological, structural, optical and electrical properties of nebulizer sprayed Zns thin films

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***Abstract***: In the present work, investigations on morphological and structural properties was done over the ZnS thin films grown on glass substrates using the nebulized spray pyrolysis technique. The X-ray diffraction was performed to identify the crystal structure and grain size of the particles, whereas the morphological properties was studied using Atomic Force Microscopy (AFM) and Scanning Electron Microscopy (SEM). The fabricated films were then annealed at 300ºC, 400ºC and 500ºC under vacuum, nitrogen at 500ºC and sulphur atmosphere at 500ºC for one hour. This process permits us to obtain peaks crystallized under mixture of hexagonal (H) and cubic (C) phase. Moreover, the crystallites exhibit preferential orientation along the (101) and (016) direction. In addition, the variation of grain size and roughness was studied and observed that when the annealing temperature increases the grain size of the ZnS film increases.

***Keywords*** **- Spray technique; ZnS thin films; Characterization; XRD; AFM; SEM; UV-VIS.**

## 1. INTRODUCTION

In the recent decades, ZnS belonging to II-VI compound semiconductors has been under extensive research because of its world-wide technological applications. ZnS is optically transparent in the visible region, whereas its band gap energy is relatively wide in nature [1]. Recently, ZnS has attracted more interest in the application of opto-electronic devices, since it is a transparent semiconductor, non-toxic and is abundantly available on the earth [2, 3]. Moreover, it has piezoelectric properties, high transparency and good conductivity, as well as chemical and mechanical stability. ZnS and ZnS doped films are mostly being used as transparent conducting coatings in liquid crystal displays and solar cells [4]. ZnS thin films can be produced by several techniques such as chemical vapor deposition [5], spray pyrolysis [1] and sputtering techniques [6]. Among them, the spray pyrolysis technique offers interesting possibilities owing to its large area technique, with a relatively low cost and a capacity to deposit optically smooth, uniform and homogeneous layers. Research report on structural and optical characteristics of ZnS thin films have been reported by many investigators. Nevertheless, their physico-chemical properties have not yet been widely studied in order to reach the bulk and surface composition. Hence, in the present work the main objective is to study the structural and morphological properties of ZnS films deposited by spray pyrolysis technique for implementing it as an alternative for antireflective coating in solar cells. Moreover, in the present investigation ZnS thin films have been deposited using nebulized spray pyrolysis techniques and the structural, morphological, optical and electrical properties for the fabricated ZnS thin films was characterized and the obtained outcomes are reported in the proceeding sections.

## 2. EXPERIMENTAL DETAILS

ZnS thin films were deposited using chemical spray technique and two different solutions were used in this work as precursors for making thin films of ZnS: zinc chloride ($10^{-2}$ M) and thiourea ($10^{-2}$ M) in distilled water. The glass substrates were cleaned with hydrochloric acid and the acetone is boiled in an ultrasonic bath for about 15 min and later then dried in a stream of nitrogen atmosphere. The deposition time was maintained at 30 min for each samples and the layers were sprayed at different temperatures of substrate from 250ºC to 450ºC. Moreover, the deposition parameters such as the molar ratio r = [Zn]/[S] is 1:3, the deposition time (td) and the spray rate are 30 to 60 sec and 0.6 mL per min respectively with a carrier gas pressure maintained at 1.6kg/cm$^2$.

The XRD patterns of all the thin films were performed under copper source in an Analytical X Pert PROMPD diffractometer. The morphological and surface topography of the films were analyzed by atomic force microscopy (AFM) at Park Scientific Instrument under contact mode and scanning electron microscopy (SEM).

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# CUSTOMER PERCEPTION AND SATISFACTION OF FMCG'S WITH SPECIAL REFEREENCE TO THOOTHUKUDI DISTRICT.

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**ABSTRACT** *The consumer behaviour plays an important role in marketing of fast moving consumer goods. This behaviour is effected by various factors. In the present era of globalisation needs and wants of consumers changes with time. The fast moving consumer goods (FMCG) sector contributes a lot to the growth of India's GDP. Therefore it is necessary to identify the changes in consumer buying behaviour towards FMCG products. This paper highlights and identify the factors affecting consumer buying behaviour towards FMCG products and finally effecting their decision making process. The data for this study has been collected through questionnaire and findings have been theoretically presented. The paper reveals that consumer behaviour is largely effected by place, product, price, promotion, physiological and psychological factors. However effect of these factors also differ from product to product.*

***Keywords:*** *Fast Moving Consumer Goods, Consumer Behaviour, Brand awareness, and*

## INTRODUCTION

FMCG Sector in India is one of the four largest sectors in Indian economy. The FMCG (Fast Moving Consumer Goods) companies have faced tough competition among themselves over the years which is continuously increasing. This is due to the increase in per capita income among individuals and also various developments in rural economy. The FMCG sector has changed its strategies and has opted for a more well-planned marketing of the products to penetrate both the rural and urban markets. To execute these tasks, the FMCG companies are hiring more and more people which has led to an increase in the job prospects in this sector. Thus, FMCG sector is creating massive employment with good career prospects. Marketing, retail, sales, services and supply are the key areas which generates maximum career scopes in FMCG Industry in India.

## Literature Review

Vibhuti, et.al (2014)[1] In their article titled "A study on Consumer Buying Behavior towards Selected FMCG Products" The consumer behaviour plays an important role in marketing of fast moving consumer goods. The authors highlighted that the present era of globalisation needs and wants of consumers changes with time. The fast moving consumer goods (FMCG) sector contributes a lot to the growth of India's GDP.Therefore it is necessary to identify the changes in consumer buying behaviour towards FMCG products. The study reveals examines the factors affecting consumer buying behaviour towards FMCG products and finally effecting their decision making process. The study found that consumer behaviour is largely effected by place, product, price, promotion, physiological and psychological factors. However effect of these factors also differ from product to product.

Thanigachalam (2014)[2] In his article highlights "the consumer behaviour towards fast moving consumer goods in Puducherry." The importance promotional offers, availability of brands are important that companies must give it sufficient consideration before they plan and implement their marketing strategies. The FMCGs sector is a very dynamic sector in India. A major goal is to satisfy the needs and wants of consumer and their target markets more effectively and efficiently.

Ganesh (2015)[3] - In his article titled Consumers' Perception towards Brand Loyalty of FMCG Products -An Analysis. The author analysed that the consumers' perception towards brand loyalty of the FMCG product is awareness, knowledge, attitude of the brand, risk aversion to change the brand, satisfaction and brand trust of the consumers, variables namely brand, image, product quality, product knowledge, product involvement, products attributes and brand loyalty of consumers. Mahaboob Basha (2016)[4] This article highlights "A Study on Consumer Behaviour towards Fmcg Goods An Empirical Study with Special Reference to Nellore District of Andhra Pradesh. The author finds that creating awareness regarding products is essential to grab

# Study on Customer's Perception and Satisfaction towards FMCG products with Special reference to Thoothukudi District.

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**Abstract**

Fast moving consumer goods (FMCG) sector is an important contributor to the India's GDP growth. Currently, FMCG industry is the fourth largest sector in the Indian economy and provides employment to around 3 million people. Over the years, India FMCG sector has been growing at a healthy pace on account of growing disposable income, booming youth population and increasing brand consciousness among consumers. The aim of this research work is to study the customer's satisfaction towards FMCG products. The researcher highlights the consumer perception towards fast moving consumer goods in Thoothukudi District of Tamilnadu. The study is started with the objective of examining socio economic background of respondents, analyzing factors motivate for purchasing FMCG products, identifying brand awareness and brand perception towards FMCG products. This paper reveals that consumer behaviour is largely affected by place, product price, and promotion, people' influence and market wide factors. However effect of these factors also differ from product to product.

**Key Words: Customer perception, Brand Awareness, Customer behaviour towards Fast Moving Consumer Goods.**

## Introduction

Globally, India is becoming one of the most attractive markets for foreign FMCG players due to easy availability of imported raw materials and cheap labour costs. The urban segment is the biggest contributor to the growth of India FMCG sector, accounting for around two-thirds of the total revenues. However, the share of semi-urban and rural segments in the country's FMCG sector is anticipated to increase by the end of 2020.Fast-moving consumer goods (FMCG) can be defined as packaged goods that are consumed or sold at regular and small intervals. The prices of the FMCG are low and profits earned are more dependent upon the volume sales of the products. The FMCG market can be broadly categorised as Personal Care, Household care, Food & Beverages and Others. The Indian FMCG sector is the fourth largest sector in the economy with a total market size of USD49 billion in 2016. The sector is projected to grow at a CAGR of 20.6% to reach USD103.7 billion by 2020.The FMCG industry in India, has grown rapidly over the

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EPRA International Journal of Economic and Business Review SJIF Impact Factor(2017) : 7.144
ISI Impact Factor (2013): 1.259(Dubai)

Research Paper

# AN ECONOMIC ANALYSIS OF WOMEN CONSTRUCTION WORKERS IN THOOTHUKUDI DISTRICT

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## ABSTRACT

*In India, the construction industry is the second largest and a fast growing sector. Transnational companies have been competing in the construction industry since the mid-1990s, engaging in both large public-sector infrastructure projects and private sector industrial projects India's construction labour force is estimated at 30 million people; about half are women. There has been a reduction of demand for unskilled labor since mid-1990s; one estimate suggests 1.5 million jobs are lost per year. Women in Construction in India. Women account for half (51%) of the total construction labour force. Women workers are almost exclusively unskilled, casual, manual laborers: carrying bricks, cement, sand, and water digging earth, mixing cement, breaking stones. Women are rarely found in male-dominated skilled trades: carpentry, masonry, plumbing, electrical wiring.*

**KEYWORDS:** *construction industry, infrastructure, employment, workers, expenditure*

## INTRODUCTION

Construction sector is the world's major industrial employee with seven percent of total world employment. Construction activity is an essential part of a country's infrastructure and industrial growth. This industry is one of the largest employers of the informal sector workforce in the country, predominantly in the built-up situation. This sector recorded the maximum growth rate in the last two decades, doubling its share in total employment and played a main part in the healthy development of the economy. Where more than 90% of workers are seasonal and temporary, while constructions is measured to be one of the principal industry in the country, the worker continue unskilled, exploited and discriminated against.

Construction industry is the backbone of a country as it creates the infrastructure necessary for economic and industrial growth. In India, it employs large number of skilled, semiskilled as well as unskilled workforce due to its huge demand. The workforce employed in the construction industry has to face several hardships at the work since it is one of the hazardous occupations.Women workers are equally employed in this sector especially in unskilled category for sundry and manual works. They are working at various construction and project sites that are highly dangerous in nature and thus face several issues and challenges. Their major hardships are related to health, the work-life balance, safety at work, wagediscrimination, harassment, and above all, working conditions as the biggest challenge.

The nature of work in this industry is usually seasonal, depending upon the important of work, which differs extensively with the nature of project, work is highly labour intensive in this industry and most of the workers are unskilled. Incongruously, even though the construction sector has been generating employment for a huge section of Indian population in urban areas, the workers in this sector all the most left out of segments of the society and nothing much has been done about this sector. Most of the women construction workers migrated from rural area to urban areas.

## WOMEN IN CONSTRUCTION SECTOR

Constructions workers are the mainstay of the economy as they generate the infrastructure essential for industrial development. In India, about 350-400 million people live in absolute poverty with a per capita annual income equivalent to US $ 275; of these, a majority is women. This sector draws in the largest number of women more than 50 per cent of the 32 million construction workers are women (GOI, 2008, P.189).

India's three crore construction workers are accurately the builders of contemporary India. About one-third of these workers are women and children. In India women workers establish a main share in the work force of the

# Estimation of Carbon Storage in the Tree Growth ofSt. Mary's College (Autonomous) Campus, Thoothukudi, Tamilnadu, India

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**Abstract**

The present study addresses carbon storage and sequestration by trees grown in**St. Mary's College (Autonomous)** campus, Thoothukudi. The aboveground biomass was calculated. The above ground biomass includes non-destructive sampling. The Non-destructive method includes the measurement of height of thetree and diameter of the tree.There were total 41 species including individuals recorded in St. Mary's college campus in Thoothukudi. **Table 1** showed the details of various tree species in different sites there. *Azadirachta indica* has sequestered 686454.5 lbs which is compared to other trees species from the study area. It is due to high DBH and height of the tree. At the same time AGB 430422.02 lbs, dry weight 374467.2 lbs and carbon 187233.6 lbs which is highest in the *Azadirachta indica* which has only 62 tree count. *Murraya koenigii* sequestered lowest $CO_2$ 1006.61 lbs compared to other trees which is may be due to lowest DBH i.e. 104.25 meters. Total AGB 631.16lbs, total dry weight 549.118 and total carbon 274.55 lbs and total $CO_2$ sequestered is 10066.15 lbs.

**Keywords :** biomass, *Azadirachta indica, Murraya koenigii* , $CO_2$ sequestered

## Introduction

Global emissions of carbon have been increasing for about 140 years since the beginning of the Industrial Revolution. Researchers at the University of East Anglia (UEA) have forecast a rise of 0.2% $CO_2$ for 2016, average 2.3% year-on-year increases in $CO_2$ output from fossil fuels until 2013. The rise in 2014 was 0.7%. Trees are capable of effective sequestration and storage of atmospheric carbon in above-ground and below-ground biomass by way of processes of photosynthesis and tree growth. Carbon is absorbed and assimilated by tree foliage and is stored as carbon-rich organic compounds such as cellulose and hemicelluloses, lignin, starch, lipid and waxes, mostly in secondary woody tissues in tree boles and in large roots, as well as in foliage, branches and roots. Establishing forest plantations on presently non-forested land provides an energy-conscious world with a clean, efficient means of absorbing some of the excess in atmospheric $CO_2$ . Such absorption offers a significant offset against continuing greenhouse gas emissions and may be combined with other benefits such as timber production, environmental protection, added biodiversity and land rehabilitation. Three major components (or sets of processes) together constitute net sequestration of carbon in forest trees:

1. Carbon uptake and assimilation, including immediate respiratory losses which detract from previously 'fixed' carbon in photosynthetic plant cells;

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# Cleanup Textile Azo Dye Pollution by Using Silver Nanoparticles of Bacteria Isolated From Shrimp Shell Contaminated Soil in Thoothukudi Coast

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## ABSTRACT

Cryogenic silver nanoparticles (AgNPs) synthesized by using bacteria (*Acinetobacter sp.* and *Bacillus sp.*) isolated from shrimp shell contaminated soil in Tuticorin coast and it was confirmed by UV–visible spectroscopy. AgNPs show a peak around 540nm (*Acinetobacter sp.*) and 510nm (*Bacillus sp.*). Further the efficiency of synthesized AgNPs was assessed for the decolorization of azo dyes such as Congo red, Acid Orange 5 and Black 7984. Decolourization assay was measured in the terms of percentage decolorization using UV-Spectrophotometer. The results revealed that bio-synthesized silver nanoparticles using the selected bacteria were found to be negligible in degrading the selected dyes.

**Keywords :** AgNPs, Azo dye, Acinetobacter sp, Bacillus sp, decolourization, congo red, acid orange 5, black 7984.

## I. INTRODUCTION

Nanotechnology is an important field of research in modern science. The size of the nanoparticles ranges from 1-100nm within this size they exhibit improved physical, chemical and biological properties compared to their bulk ones [1, 2]. Nanoparticles show various diverse applications in areas such as biomedical science, optics, mechanics, magnetics catalysts, bio-sensors and energy science [3-5]. There are various routes accessible for the synthesis of silver nanoparticles, such as thermal decomposition, electrochemical, microwave assisted process etc. However, most these techniques employed involve huge inputs in terms of capital and energy. Therefore, biological synthesis mediated by plants, bacteria, fungi and algae is gaining more acceptance because of its cost effectiveness and eco-friendly nature [6-8].

The diversity of microorganisms is being used as ecofriendly nanofactories for bio-synthesis of nanoparticles [9-11] such as silver, cadmium sulfide, gold, tin and Ni [12-14]. The bio-synthesis of microbial metal nanoparticles shows several applications including the fields of bio-remediation, bio-mineralization, bio-leaching and microbial corrosion [15]. Because of these applications the current investigation was carried to synthesize silver nanoparticles, they were characterized by UV-Visible spectrophotometer and it can be used for bio-remediation of textile dye, as it is useful important in the polluted water treatment.

## II. METHODS AND MATERIAL

### DYES

The textile azo dyes viz. Congo Red, Acid Orange and Black 7984 were bought from the small textile industry in Erode.

### MICROORGANISMS

Two bacterial species namely *Acinetobacter sp.* and *Bacillus sp.* (Plate 1) were isolated and identified using standard procedures from shrimp shell waste contaminated soil in Tuticorin coast. The stock culture of both bacterial strains were maintained at 4°C on Muller Hinton agar slants.

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# *IN VITRO* ANTIOXIDANT ACTIVITY OF *CYPERUS BULBOSUS* VAHL

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**ABSTRACT**
In the present study the antioxidant potential of the tubers of *Cyperus bulbosus* was assessed. For this purpose the tubers of the plant was extracted by using different extraction solvents and evaluated for their antioxidant activity using different *in vitro* antioxidant assays like DPPH assay, hydroxyl assay, ABTS assay, superoxide assay and reducing power assay. The methanol extract showed high antioxidant activity for all assays. The radical scavenging abilities were found to be dose dependent. $IC_{50}$ values of the methanol extracts of the species studied for DPPH, hydroxyl, ABTS and superoxide radical scavenging activity compared with ascorbic acid and were found to be 38.24 µg/ml, 44.96 µg/ml, 40.26 µg/ml and 41.92 µg/ml respectively. The results indicated that the plant sample studied have antioxidant property and these activities observed could be due to the synergistic effects of phytocompounds present in the plant.

**KEYWORDS:** Antioxidant activity, *Cyperus bulbosus,* tubers.

## INTRODUCTION

Plants are the potential source of natural antioxidants. It produces various antioxidative compounds to be counteract with reactive oxygen species (ROS) in order to survive. In recent years much attention has been given to natural antioxidant and their association with health benefits.[1] Last few decades screening for antioxidant property of food and medicinal plants have been carried out increasingly in hope of finding remedy for non communicable diseases (NCDs) and to delay aging.[2] There is also a huge demand for natural antioxidants in food industry for replacing the synthetic preservatives used to prevent fat rancidity or colour loss. Plants have many phytochemicals with various bioactivities, including antioxidant, antiinflamatory and anticancer activities. Various studies had reported that extracts from natural products such as fruits, vegetables and medicinal herbs have positive effects against cancer, compared with chemotherapy or recent hormonal treatments.[3] Therefore, many plants have been screened to identify new and effective antioxidant and anticancer compounds.[4]

The family of the Cyperaceae includes about 123 genera and 6000 species, is abundant in wetlands and in the water edge from Ecuador to the poles.[5] The genus *Cyperus* has a great importance in terms of their uses in traditional medicine due to its broad spectrum of biological activities, from the estrogenic activity of the ethanolic extract of the inflorescences of *C.alopecuroides*[6], analgesic activity of the decotion of the rhizomes of *C.articulatus*[7], hepatoprotective activity of the methanol extract of *C.scariosus*[8] and antioxidant activity of the extracts of *C.rotundus.*[9] There are many studies related to the phytochemical and bioactivity of *C.rotundus*. *Cyperus bulbosus* Vahl is a coastal sedge of this family that has not been investigated. It is widely distributed in tropical Africa, Asia and Australia. In Australia they are called as "Tubers of Nagloo". The plant has a slender, scaly creeping rhizomes, bulbous at the base and arising singly from the tubers which are about 1 – 3 cm long. The tubers are extremely blackish in colour and reddish white inside, with a characteristic odour. The culm grows about 20 – 40 cm tall and leaves are long as culms, 1 – 2 mm wide, midvein prominent on lower surface of leaf. Inflorescence much longer than the leaves, with 2 – 4 bracts consisting of tiny flowers with a red brown husk. The nut is trigonous, obovoid to ellipsoid, about two fifths as long as glume, 1.3 – 1.5 mm long, dark greyish to blackish with a very smooth testa. The tubers being edible and used as food and have no toxic element.[10] Perusal of previous literature revealed that there is no studies related to the phytochemical and bioactive potential of *C.bulbosus*. So the present study was designed to examine the antioxidant and radical scavenging potential of tubers of *Cyperus bulbosus*.

### Preparation of powder and extract[11]

The tubers of the plants were shade dried and pulverized to powder in a mechanical grinder. The powder(100g)

Dr.S. Beulah Jerlin al. International Journal of Recent Research Aspects ISSN: 2349-7688, Special Issue: Conscientious Computing Technologies, April 2018, pp. 495-498

# Effect of Stone Crushers Dust on Chlorophyll Content of Some Medicinally Valuable Plants from Sri Moolakkarai Village of Thoothukudi District.

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*Abstract*- **The present investigation aims at studying the effect of stone crushers dust on chlorophyll content of some medicinally valuable shrubs. The dust deposition on the leaves affected the metabolic activities of these two plants. The moisture percentage of leaves was lower due to absorption of water vapours by dust particles. The pH of leaves at the polluted site was higher. There was maximum depletion of chlorophyll content in Cassia auriculata that showed the more sensitivity of the leaves of this plant towards stone crusher dust. It is suggested that stone crushers around Sri Moolakkarai Village of Thoothukudi District should take some suitable measures so that the vegetation around them is not affected so as to protect the biodiversity of this area.**

Keywords: Stone Crushers, Dust, Chlorophyll Content, Pigments.

## INTRODUCTION

Every day, Every Hour and Every Minute millions of tons of organic matter are oxidized into its ultimate constituents: CO2 and H2O which go back on the atmosphere and return to water. At this rate of destruction, all the organic matter on the earth will be consumed in a matter mere 20 or30 years. But at the same time an equal amount of organic matter is synthesized by the green plants to compensate for the loss of organic matter ( Johnsen I. and S.E. Jorgensen1989).

Green is the predominant colour of the plant kingdom. The green colouring of the plants is often termed as chlorophyll (Michelle Murphy 2014).

Chlorophyll is the most important primary photosynthetic pigment, which usually exists in Chloroplast and through which light energy gets converted into chemical energy. Besides Chlorophyll (primary pigment), Carotene and phycobillins (secondary pigment) also take part in photosynthetic. As Chlrophyll and other plant pigments are necessary in harnessing light energy by photosystems I & II, the effect of air pollutants on these pigments would greatly influence the Photosynthetic ability of plants. Destruction of chlorophyll due to air pollution has been recorded by a number of writers (Geeta and Namrata 2014)

Sri Moolakkarai has a number of stone crushers. In view of deposit of stone dust from these crushers on the vegetation in the nearby area, the present study has been carried out to envisage the effect of stone crushers dust on the chlorophyll content of leaves of two medicinally valuable plants .Viz.Cassia auriculata and Calotropis gigantea. The main objectives of this study are to study the vegetations, dust deposit, pH, moisture content and total Chlorophyll content of the leaf sample.

## MATERIALS & METHODS:

**Study Area:**

The selected stone crusher area is situated in the Sri Moolakkarai Village. It is 8km away from Srivaikumdam Taluk on the southern side of the Vallanad Hills. There are 450 houses with total population of 1804. Of these 10% of them are Land Lords, 80% of them are Middle Class people and remaining 10% are Low Class people. There are about three stone crushers located on Sri Moolakkarai Road in a single strip of 1.5km. These units together crush 1000 tonnes of stones per week, resulting in enormous dust pollution. The raw material used in stone crushers is riverbed stone, which contains 20-40% of river sand of less than 2mm size. There are about 24 plant species, present in the surrounding area of the stone crushers. Out of these only two plant species were collected from site I. The control site is 400m away from stone crushers .II polluted site-10m away from stone crushers. The dust deposit, pH, Moisture content and total chlorophyll content were estimated using standard techniques.(Agarwall and Tiwari 1997, Maclachilan and Zalik 1963).

**Floral Studies:**

Field trip were undertaken weekly for the exploration of flora and plant samples were collected and identified help of floras (Gamble 1956) .Binomials for the listed taxa are based on flora of presidency of Madras (Gamble 1956) . The herbaceous vegetation was recorded in 1x1m quadrant laid out at 5m intervals.

**Physico Chemical Characteristics of leaf samples:**

 

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# A Study on the Effect of NaCl Stress on Vigna radiata (L.) Wilczek. Var Co-6

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**Abstract: - Salt stress is a condition where, excessive soil solution causes inhibition of plant growth and leading to plant death. Soil salinization is one of the major factors of soil degradation. It has reached 19.5% of the irrigated land and 21% of the dry land agriculture. The effect of NaCl salinity on morphological parameters of Vigna radiata (L.) Wilczek, var.Co-6 was studied. The morphological characters such as shoot length, leaf number, fresh weight, dry weight, leaf area decreased with increasing concentrations. As the scarcity for the fresh water gets increasing, the need for salinity resistant plant emergence become inevitable. The work done here may not provide sufficient information to raise a model crop for salt resistant. So further research process can be conducted in molecular and genetic level to produce a model salt resistant transgenic plant.**

**Keywords**
**leaf area, dry and fresh weight, NaCl stress, shoot length.**

## 1. INTRODUCTION

Salt stress is a condition where excessive salts in soil solution cause inhibition of plant growth or plant death. On the world scale, no toxic substance restricts plant growth more than saline stress. Salt stress presents an increasing threat to plant agriculture. Jacob Levitt (1972), suggested that biological stress is any change in environmental conditions that might reduce or adversely change a plant's growth or development. We also defined salinity as "when the salt concentration is high enough to lower the water potential from 0.5 to 1.5 bar the stress will be called as Salt Stress." Salinity may also affect the germination of seeds by creating an externa; osmotic potential that prevents water uptake or due the toxic effects of Na+ and cl- ions on the germinating seed. (Hosseini et al., 2003).Vigna is an important legume grown in India. It is also known as Mung Bean, green gram. It is the native plant species of Pakistan and India. Mung beans are tropical crops and require warm temperatures.

Vigna radiata is mainly cultivated for its edible seeds. In India it is widely grown throughout the tropics, ascending from sea level to 1850m in the northwest Himalayan regions. In the present study, Vigna radiata (L) Wilczek var Co6 is subjected to saline stress and the following parameters have been studied to establish the physiological effects of salinity on this crop plant. In the present study it is propose to investigate the growth parameters of Vigna radiata (L) Wilczek.

## II. MATERIALS AND METHODS

The certified seeds of Vigna radiata (L) Wilczek var co6 were collected from Killikulam Agriculture College, Killikulam. The experiment was conducted in the Green House garden in St. Xavier's College (Autonomous), Palayamkottai. Eighteen Pots were selected which is divided into three series of six pots each.

### SALT CONCENTRATION:

Certified seeds of uniform size were surface sterilized with 0.1% Mercuric chloride for two minutes and rinsed thoroughly with distilled water. Various concentration of Sodium chloride solutions (50mM, 100mM, 150mM, 200mM, 300mM) were prepared.

The selected pots were filled with soil and organic manures. About 25 seeds were sown in each pot. The pots were watered with 100ml of well water in alternated days. Salt treatment was started from the 15th day after sowing. The plants were treated with NaCl salt using the following concentrations 50mM, 100mM, 150mM, 200mM,300mM once in three days for 35 days. The control pot was watered with well water.

### PHYSICAL PARAMETERS:

The effects of salinity were studied using Vigna radiata var co6. It is an annual legume. The plants were collected at the stages of 15th, 25th, 35th days for growth measurements such as shoot length, leaf area, number of leaves, dry weight and fresh weight.

### GROWTH DETERMINATION:

**Shoot Length:**

 

Dr. Jacintha Tamil Malar

2018

# Antiinflammatory potential of plant and tuber extracts of *Cyperus bulbosus* Vahl. (Cyperaceae)

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*Abstract*

***The present study was carried out to evaluate the antiinflammatory activity of the methanolic tuber and plant extracts of Cyperus bulbosus - a coastal sedge. The antiinflammatory activity was investigated by using carrageenan induced rat paw edema. The methanol extracts of plant and tubers of Cyperus bulbosus were injected at different doses such as 100 mg/kg b.wt , 200 mg/kg b.wt and 400 mg/kg b.wt and the effect on inhibition of paw edema was studied. The effect was compared with standard drug indomethacin (10 mg/kg b.wt). There was a significant (<0.001) inhibition of inflamed hind paw edema volume with the treatment of plant and tuber extracts. The antiinflammatory activity was time and dose dependent. There was no inhibition of paw edema in 1hr of treatment. After 3hrs of treatment the inhibition with plant and tuber extract is 82.74% and 82.75% respectively. This effect could be attributed to phytocompounds present in the extract. The present study established the antiinflammatory potential of Cyperus bulbosus and its use as antiinflammatory agent.***

**Key words: Antiinflammatory, paw edema,** ***Cyperus bulbosus,***

## I.INTRODUCTON

Inflammation is one of the major world health problem today. Inflammatory process has two phases acute and chronic. The acute inflammation occurs a few minutes after tissue damage. It is characterized by alteration of permeability of blood vessel, extravasation of fluid, protein and white blood cells for short period. During this phase mediators like bradykinin, serotonin, histamine, tumour necrosis factor –α, Interleukin 6, Interleukin 1β, NO, phospholipase, COX 2 (Cyclooxygenase-2) are produced [1]. The failure of management of acute phase and an autoimmune response to self antigen may lead to chronic inflammation and disease [2]. An uncontrolled and persistent inflammation may result in many chronic diseases such as ulcers, asthma, rheumatoid arthritis, chronic peridontitis and cancer [3]. The steroidal antiinflammatory, non steroidal antiinflammatory sysnthetic drug (NSAID) and corticosteroids are used to treat inflammation has various side effects in the gastrointestinal tract and


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Ontology of Direction of Arrival Estimation Methods Based On Bias, Resolution, Variance, SNR & Performance

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# Mother Andchild Health-Care Programme in Kadambattur Block of Tiruvallur District

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**Abstract:**

*The main purpose of this paper was to examine the mother-child healthcare programme in the study area. The researcher aimed to find thesocio-economicconditionsofmaternalmotherandchildhealthcare, andtheutilization ofhealthcareprogrammes in thestudy area and also to find thehealth expenditureof the sample respondents and suggest-measuretoimprovetheefficiencyoftheprogrammeandhealthconditionsofmother-childin the studyarea. For that the researcher has computed the following hypothesis, there is significant association between the annual household income and mother and child health expenditure of the sample respondents, and there is significant association between the annual household expenditure and non-medical expenditure of the sample respondents. The researcher conducting a pilot study in Kadabature Block of Tiruvallur District, and theresearcher hasselected140samples from theselected two villages, each village carries 70 respondents.The researchercollectedtheprimary data byusinginterviewschedule. The researcher revealed that the computed Chi-square estimation of 16.163 is significant at 10 per cent level and along these lines the null hypothesis is rejected. The positive sign for liner-by-liner affiliation additionally infers that as the mother and child health expenditure, the acquiring limit of the respondents likewise increases. Also, the computed Chi-square estimation of 29.548 is significant at 5 per cent level and along these lines the null hypothesis is rejected. The positive sign for liner-by-liner affiliation additionally infers that as the non-medical expenditure, the acquiring limit of the respondents likewise increases. Hence, the researcher suggest and concluding that onecansay thatitisnow urgentthatthe nationadditionallytogenerate somecomprehensive legislative measuresinorder toimprovewomen's healthstatus.*

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# Analysis of Economic Impact of Female Beedi Workers

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**ABSTRACT**

*Beedi rolling is a main livelihood for the women in Tirunelveli district and it generates marginal income and employment prospects for them. The women beedi workers who are the mainstay of the industry should have friendly and encouraging social and economic life. The beedi industry is providing some subsistent living. It is in this backlog, this study has been attempted to analyse the impact of beedi industries on socio-economic status of female beedi workers in Tirunelveli district of Tamil Nadu.*

*The specific objectives of the study are*

1. *To study the socio-economic status of sample female beedi workers in the study area.*
2. *To assess the reason for selecting job in beedi industries*
3. *To measure the income inequality among the respondents before and after joining the beedi industries.*
4. *To analyse the impact of beedi industries on income of the sample female beedi workers.*
5. *To examine the relationship between the family size and income of respondents*
6. *To assess the problems faced by the sample female beedi workers.*

*In this present study, both primary and secondary data have been used. Percentage analysis, averages, standard deviation, Garrett ranking method, t test and Gini coefficient were used for the analysis. This study has also analysed the assessment of significance of beedi industries in the economic development genuinely, the role of women in the beedi industry, health impacts of beedi smoking, problems faced by the women, the socio-economic conditions of the sample female beedi industries workers etc., are the essential parts of the study. Thus, it may be concluded from the analysis of the findings of the present study that the life of the female people tends to be better economically after joining beedi industries.*

**Keywords:** Beedi rolling, economic development, foreign earnings, empowerment

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# Socio Economic Empowerment of Scheduled Caste Women – A Study

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**ABSTRACT**

*The state and place of the scheduled caste women was very dangerous in earliest and in primitive periods. The scheduled caste women are known to be particularly underprivileged. But when the western ruler held the power in India, the situation of the scheduled caste women was improved. The social and economic status of general women and scheduled caste women remains pathetic in the country due to non-implementation of constitutional provisions and development projects. Systematic government intervention for scheduled caste women empowerment helps the scheduled caste women to change their mindset, adopt healthy lifestyles, obtain the benefits of development projects and achieve development through active participation. Scheduled castes women's participation in the economic activity is important for their own personal advancement as also for an improvement of their status in the society. In this context, empowerment of rural scheduled caste women is very much necessary. The contribution of scheduled castes women and their role in the family as well as economic development and social transformation are pivotal and need to be taken into consideration. Keeping in view the above universal facts there is a greater need for the empowerment of scheduled caste women and the state is taking all the steps to empower the socio-economic conditions of women. The specific objectives of the present study are*

1. *To study the socio-economic profile of the sample respondents.*
2. *To assess the consumption empowerment function for the households of sample scheduled caste women in Thoothukudi district.*
3. *To examine the effect of social transformation of scheduled caste women.*
4. *To analyse the problems faced by scheduled caste women in the study area.*

*The present study delivers sufficient evidence to the fact that the social and economic status of scheduled caste women improved in the study area. The possible outcomes of women empowerment through social transformation improved health and employment, enhanced social dignity and*

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# Microwave synthesis, electrochemical studies and capacitance of benzalazine

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**Abstract-** Benzalazine was synthesized by the reaction of benzaldehyde and hydrazine dihydrochloride by microwave irradiation. Formation of benzalazine was confirmed by FT-IR and UV-Visible spectral studies. Percentage of crystallinity was found out by X-ray diffraction studies and it was found to be 43. Redox behavior was studied using cyclic voltammetry. Specific capacitance was calculated by electrochemical impedance spectroscopy. Specific capacitance was more for benzalazine at pH 7 with a value of 0.401μF/cm$^2$. Chronocoulometry was used to calculate the diffusion coefficient and it was found to be less in neutral medium.

**Keywords-** Benzalazine; specific capacitance; diffusion coefficient

## 1. INTRODUCTION

Class of compounds containing $R^1R^2C=N-N=CR^3R^4$ fragment are called as azines. The compounds which possess azomethine group (>C=N-) are normally called as a Schiff bases.[1] These azines have attracted the attention due to its applications in many fields. Some azines containing hydroxyl group which can acts as fluorescene chemosensor had been reported.[2] Azines can be used as nano optical sensors.[3] Literature revealed that symmetric azines which are having phenyl and thienyl groups were found to be efficient for organic field effect transistors.[4]

Azine can be synthesized by various methods. Normally by the condensation of aldehydes or ketones with hydrazine gives azine. Benzalazine is the azine obtained by the condensation of benzaldehyde and hydrazine. Apart from normal refluxing, several methods had been reported in literature for the synthesis of benzalazine. Synthesis of benzalazines by the reaction of benzaldehydes with thiosemicarbazide had been reported.[5] Green synthesis with self-condensation was reported by Ali Reza Molla Ebrahimlo et.al.[6] Solvent free reactions by grinding had also been reported.[7,8]. Here benzalazine was synthesized using microwave irradiation and its electrochemical behavior was studied.

## 2. MATERIALS

Benzadehyde and hydrazine dihydrochloride were bought from spectrum chemicals and used as such. Ethanol was bought from Jiangsu Huaxi, China. Indium tin oxide (ITO) coated glass plates which were used in cyclic voltammetry, electrochemical impedance spectroscopy and chronocoulometry studies were supplied by e-Merck.

Nicolet Si5 spectrometer (ATR) (model P-4600) was used to record FT-IR spectra. Jasco V-630 spectrophotometer was used to record UV-Visible spectra. These spectra were taken in the range of 200-800 nm. X'pert PRO power X-ray diffractometer was used to get X-ray diffraction patterns in the2θ position range 10 to 80 with copper as the anode material. Cyclic voltammograms, chronocoulograms and electrochemical impedance measurements were done using CH electrochemical work station Sinsil CH 650.

## 3. EXPERIMENTAL

### 3.1 *Preparation of benzalazine*

0.02M of benzaldehyde was dissolved in ethanol and 0.01M of hydrazine dihydrochloride was dissolved in distilled water. Both of the solutions were mixed and kept in the domestic microwave oven for 3 minutes. Then the solution was cooled and poured into water. Yellow solid was obtained and filtered, washed several times with ethanol and water to remove any unreacted benzaldehyde and hydrazine dihydrochloride respectively. The yellow colour precipitate was recrystallized from ethanol and used for further characterization.

## 4. Results and discussion

### *4.1 FT-IR studies*

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# Electrochemical reduction of Oxygen on Copper Nanoparticle Deposited Glassy Carbon Electrode with 1, 4 Naphthoquinone and its derivatives

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**Abstract: - The electrochemical reduction of oxygen has been studied on copper nanoparticle modified glassy carbon electrode (CuNP/GCE) with 1,4-naphthoquinones (NQ) in various buffer solutions of pH 1 to 13 employing cyclic voltammetry, chronoamperometry and chronocoulometric techniques. The stability of the modified electrodes was ascertained in acidic and neutral media. The modified electrode was prepared by solvent evaporation of copper nanoparticle on the surface of GCE. The surface morphology of CuNP/GCE was examined by atomic force microscopy (AFM). The influence of pH and scan rate on the electrochemical and electrocatalytic behavior of the modified electrode was studied and pH 7.0 or 8.0 was chosen as the optimum working pH by comparing the shift in oxygen reduction potential. The oxygen reduction behaviour of CuNP/GCE was compared with that of a bare GCE. Electrochemical studies reveal that CuNP/GCE shows a high electrocatalytic activity towards $O_2$ reduction. The oxygen reduction proceeds by a two-electron pathway.**

**Keywords: Copper nanoparticle modified glassy carbon electrode, 1,4-Naphthoquinone, Oxygen reduction.**

## 1. INTRODUCTION

Oxygen reduction in energy conversion system is an important reaction for the electrochemical devices. Modifying the surface of electrode has been one of the most interesting areas of research in electrochemistry [1]. In this way, a variety of compounds such as copper [2], vanadium [3], phenanthrenequinone [4], anthraquinone [5], naphthoquinone [6, 7], Au nanoparticle [8], silver nanoparticle [9] have been employed as electrocatalysts for the oxygen reduction. However, naphthoquinone/copper nanoparticle modified glassy carbon electrode has not been used so far for the study of reduction of oxygen.

In our present investigation, electrochemical behaviour of 1,4-naphthoquinone and its derivatives at copper nanoparticle deposited glassy carbon electrode (CuNP/GCE), efficiency and the stability of the modified electrodes in the electrocatalytic oxygen reduction have been studied by cyclic voltammetry, chronoamperometry and chronocoulometry. The nature of the electrode process and diffusional parameters were also determined.

## 2. EXPERIMENTAL

1,4-Naphthoquinone NQ), 2-Hydroxy-1,4-naphthoquinone (2-HyNQ), 5-Hydroxy-1,4-naphthoquinone (5-HyNQ) and 2-Amino-3-chloro-1,4-naphthoquinone (2-Am-3-ClNQ) and all other chemicals were purchased from Sigma-Aldrich. 1.25 mM solutions of NQs were prepared in ethanol. The buffer solutions of pH 1 to 13 were prepared using the chemicals of highest purity and doubly distilled water. The pH of the solution was measured using a Hanna pH-meter. 50% aqueous ethanol pH solutions were used as electrolyte along with the NQ compounds. 99.99% pure nitrogen and oxygen gases were used during the experiments.

A three electrode cell consisting of glassy carbon as working electrode, a platinum wire as counter electrode and silver electrode as reference electrode was used for this investigation. The copper nanoparticle modified electrode was fabricated by the evaporation of copper nanoparticle over the surface of glassy carbon electrode and used as working electrode. The copper nanoparticle coated GCE (CuNP/GCE) was immersed in the cell solution containing 50% aqueous – ethanol buffer and NQ solutions to carry out the electrochemical studies using CH Instrument Electrochemical workstation.

## 3. RESULTS AND DISCUSSION

### 3.1 Electrochemical Behaviour of NQs at CuNP/GCE

The cyclic voltammetric studies of 1,4-naphthoquinones were performed on the surface of CuNP/GCE under deoxygenated and oxygen saturated buffers of pH 1.0 – 13.0.

 

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# Structure-Based Pharmacophore Design and Natural Bond orbital analysis of Angiotensin Converting Enzyme inhibitors

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**ABSTRACT:** Hypertension and congestive heart failures are becoming epidemic throughout the world. Angiotensin Converting Enzyme (ACE), a metallo-peptidase is the best known important drug target in the treatment of hypertension and responds to broad range ACE inhibitors such as Captopril. Though there are many synthetic drugs that are being used as ACE inhibitors, the usage of natural compounds has its significance with less adverse effects. In this regard, many phytochemical compounds including alkaloids and flavonoids has been reported with anti-hypertensive activity. In this connections, the present study is focused on determining the anti-hypertensive actively of certain phytochemical compounds and synthetic drugs through docking studies and to explore their pharmacophoric features. The docking study implies that rosemarinic acid was relatively better that that of Standard drugs Lisinopril and Captropril. The pharmacophore modelling, validation and screening studies on rosemarinic acid along with Lisinopril and Captropril resulted in two compounds from Maybridge compound database (CD 01374 and CD 01278). Also the Density function theory (DFT) studies on these compounds explained the charge transfer (HOMO–LUMO energy gap of 2.90 eV) interactions that are taking place within the molecule through strong N–H···N and N–H···O hydrogen bonding is essential for the bioactivity of these compounds. Thus the finding of this study clearly emphasized that the rosemarinic acid could significantly possess better ACE inhibition activity and could be an alternative therapeutic agent to replace the drugs with severe side effects.

**Keywords:** *Angiotensin Converting Enzyme; ACE inhibitors; Pharmacophore; Lisinopril; Captropril; rosemarinic acid;*

## 1. INTRODUCTION

In recent years, cardiovascular diseases have become a serious problem worldwide. The World Health Organization has reported an increase in the number of patients suffering from this disease. Currently, existing treatments for high blood pressure are not very effective and are generally uncomfortable for patients. This relies in that the patient need to have a very strict control in the dosage and in the moment of the administration of the drug [1]. And also some patients have an unfavorable response after the administration, leading them to a fast blood pressure reduce. One of the most widely used compounds for the treatment of hypertension is captopril. Like many others on the market, this drug was designed with computational tools. Over the last few decades, computational studies, together with rational drug design, have become a critical part in the development of new drugs. Currently, cardiovascular diseases are a serious health problem worldwide. One example of cardiovascular disease is arterial hypertension, which is defined as increased systolic pressure, diastolic pressure, or both [2].

Hypertension is a silent, asymptomatic disease, and as a result, not many people know that they suffer from it. Hypertension is an important risk factor, contributing to other cardiovascular diseases such as blood vessel disorders, coronary heart disease, aortic aneurysm, stroke, etc [3]. Cardiac arrhythmia is another cardiovascular problem. An arrhythmia is any disorder of the heart rate that may cause stroke. Heart rhythm disorders may be caused by genetic factors or occur when the heart muscle (myocardium) is damaged, sometimes by hypertension [4]. Raised blood pressure, especially systolic pressure (hypertension), confers a significant cardiovascular risk and

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# A New Type of Quasi- open and Quasi - closed functions in Topological Spaces

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***Abstract:*** ***The purpose of this paper is to introduce the concepts of Quasi semi*δ-open and Quasi semi*δ-closed functions using semi*δ-open sets and investigate their basic properties. We also discuss their relationships with already existing concepts.***
***AMS Subject Classification: 54C10, 54C08, 54C05.***

***Keywords: semi*δ -open set, semi*δ -closed set, quasi semi*δ -open function and quasi semi*δ-closed function.***

## I INTRODUCTION

Levine [2] offered a new and useful notion in General Topology that is the notion of a generalized closed set. This notion has been studied extensively in recent years by many topologists. The investigation of generalized closed sets has led to several new and interesting concepts. After the introduction of generalized closed sets there are many research papers which deal with different types of generalized closed sets. Dunham[1] additionally defined a new closure operator cl* by using generalized closed sets. Quite recently S.Pious Missier and C.Reena [4] introduced a new notion of generalized closed sets called semi*δ-closed sets.

In this paper, we will continue the study of related functions by involving semi*δ-open set. We introduce and characterize the concept of quasi semi*δ-open and quasi semi*δ- closed functions.

## II PRELIMINARIES

Throughout this paper (X, τ), (Y, σ) and (Z, η) will always denote topological spaces on which no separation axioms are assumed, unless otherwise mentioned. When A is a subset of (X, τ), cl (A) and int (A) denote the closure and the interior of A respectively. We recall some known definitions needed in this paper.

**Definition 2.1:** A subset A of a topological space (X, τ) is called a **semi*δ-open set** [4] if there exists a δ-open set U in X such that U⊆A⊆Cl*(U).

**Definition 2.2:** The **semi*δ-interior** [4] of A is defined as the union of all semi*δ-open sets of X contained in A. It is denoted by **s*δInt(A).**

**Definition 2.3:** A is **semi*δ-closed** [5] if Int*(δCl(A))⊆A.

**Definition 2.4:** The **semi*δ-closure** [5] of A is defined as the intersection of all semi*δ-closed sets in X containing A. It is denoted by **s*δCl(A).**

**Definition 2.5:** A function f: X→ Y is said to be **semi*δ-continuous** [6] if $f^{-1}(V)$ is semi*δ-open in (X, τ) for every open set V in (Y, σ).

**Definition 2.6:** A function f: X⟶Y is said to be **semi*δ-irresolute** [6] if $f^{-1}(V)$ is semi*δ-open in X for every semi*δ-open set V in Y.

**Definition 2.7:** A function f: X⟶Y is said to be **semi*δ-open** [7] if f (U) is semi*δ-open in Y for every open set U in X.

**Definition 2.8:** A function f: X⟶Y is said to be **pre-semi*δ-open** [7] if f(U) is semi*δ-open in Y for every semi*δ-open set U in X.

**Definition 2.9:** A function f: X⟶Y is said to be **semi*δ-closed** [7] if f(F) is semi*δ-closed in Y for every closed set F in X.

**Definition 2.10:** A function f: X⟶Y is said to be **pre-semi*δ-closed** [7] if f(F) is semi*δ-closed in Y for every semi*δ-closed set F in X.

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# On Semi*δ-regular and Semi*δ-normal Spaces

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***Abstract:-*** **The purpose of this paper is to introduce the concepts of semi*δ-regular and semi*δ-normal spaces using semi*δ-open sets and investigate their basic properties. We also discuss their relationships with already existing concepts.**

**Mathematics Subject Classification: 54D10, 54D15.**

**Keywords: semi*δ-regular, semi*δ-normal.**

## 1. INTRODUCTION

Maheswari and Prasad [4, 5] first defined the notion of S-normal spaces by replacing open sets in the definition of normal spaces by semi-open sets. Dorsett [1, 2] introduced the concept of semi-regular and semi-normal spaces and investigate their properties. The purpose of this paper is to introduce the concepts of semi*δ-regular space, semi*δ-Normal Space and study their basic properties.

## II. PRELIMINARIES

Throughout this paper$(X,\tau)$,$(Y,\sigma)$ and $(Z,\eta)$ will always denote topological spaces on which no separation axioms are assumed, unless otherwise mentioned. When A is a subset of $(X,\tau)$, Cl(A) and Int(A) denote the closure, the interior of A. We recall some known definitions needed in this paper.

***Definition 2.1:*** A subset A of a topological space $(X, \tau)$ is called semi-open [3] ( respectively semi*-open [11]) if $A \subseteq Cl(Int(A))$ (respectively $A \subseteq Cl^*(Int(A))$ .

***Definition 2.2:*** A subset A of a topological space $(X, \tau)$ is called semi*δ-open [6] (respectively semi*δ-closed [7]) if $A \subseteq Cl^*(\delta Int(A))$(respectively $Int^*(\delta Cl(A)) \subseteq A$).

***Definition 2.3:*** A function $f : (X, \tau) \rightarrow (Y, \sigma)$ is said to be

(i) closed [12] if f (V) is closed in Y for every closed set V in X.

(ii) semi*δ-continuous[8] if $f^{-1}(V)$is semi*δ-open in X for every open set V in Y.

(iii) semi*δ-irresolute[8] if $f^{-1}(V)$ is semi*δ-open in X for every semi*δ-open set V in Y.

(iv) semi*δ-open[9] if f (U) is semi*δ-open in Y for every open set U in X.

(v) pre-semi*δ-open[9] if f(U) is semi*δ-open in Y for every semi*δ-open set U in X.

(vi) pre-semi*δ-closed[9] if f(F) is semi*δ-closed in Y for every semi*δ-closed set F in X.

***Definition 2.4:*** A space X is said to be $T_1$[12] if for every pair of distinct points x and y in X, there is an open set U containing x but not y and an open set V containing y but not x.

***Definition 2.5:*** A topological space X is said to be

(i) regular if for every pair consisting of a point x and a closed set B not containing x, there are disjoint open sets U and V in X containing x and B respectively.[12]

(ii) s-regular if for every pair consisting of a point x and a closed set B not containing x, there are disjoint semi-open sets U and V in X containing x and B respectively.[4]

(iii) semi-regular if for every pair consisting of a point x and a semi-closed set B not containing x, there are disjoint semi-open sets U and V in X containing x and B respectively.[1]

(iv) semi*-regular if for every pair consisting of a point x and a semi*-closed set B not containing x, there are disjoint semi*-open sets U and V in X containing x and B respectively.[10]

(v) s*-regular if for every pair consisting of a point x and a closed set B not containing x, there are disjoint semi*-open sets U and V in X containing x and B respectively.[10]

***Definition 2.6:*** A topological space X is said to be

(i) normal if for every pair of disjoint closed sets A and B in X, there are disjoint open sets U and V in X containing A and B respectively.[12]

(ii) s-normal if for every pair of disjoint closed sets A and B in X, there are disjoint semi-open sets U and V in X containing A and B respectively.[5]

(iii) semi-normal if for every pair of disjoint semi-closed sets A and B in X, there are disjoint semi-open sets U and V in X containing A and B respectively.[2]

(iv) semi*-normal if for every pair of disjoint semi*-closed sets A and B in X, there are disjoint semi*-open sets U and V in X containing A and B respectively.[10]

(v) s**-normal if for every pair of disjoint closed sets A and B in X, there are disjoint semi*-open sets U and V in X containing A and B respectively.[10]

***Theorem 2.7:*** A function f: X→Y is semi*δ-irresolute if $f^{-1}$(F) is semi*δ-closed in X for every semi*δ-closed set F in Y. [8]

# LUCKY EDGE LABELING OF STAR RELATED GRAPHS

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**Abstract**

*Let G be a Simple Graph with Vertex set V(G) and Edge set E(G) respectively. Vertex set V(G) is labeled arbitrary by positive integers and let E(e) denote the edge label such that it is the sum of labels of vertices incident with edge e. The labeling is said to be lucky edge labeling if the edge set E(G) is a proper coloring of G, that is, if we have $E(e_1) \neq E(e_2)$ whenever $e_1$ and $e_2$ are adjacent edges. The least integer k for which a graph G has a lucky edge labeling from the set {1, 2,....,k} is the lucky number of G denoted by η(G).*

*A graph which admits lucky edge labeling is called Lucky Edge Graph.*

*In this paper, it is proved that $K_{1,1,n}$, Shadow Graph, Splitting Graph and Middle Graph of Path, Friendship Graph and $P_n^+ : S_m$ are Lucky Edge Graphs.*

***Keywords:*** *Lucky Edge Graph, Lucky Edge Labeling, Lucky Number.*
*2010 Mathematics subject classification Number: 05C78.*

**1. Introduction:**

A graph G is a finite non empty set of objects called vertices together with a set of pairs of distinct vertices of G which is called edges. Each e= {uv} of vertices in E is called an edge or a line of G. For Graph Theoretical Terminology, [2].

A vertex labeling of a graph G is an assignment of labels to the vertices of G that induces for each edge $uv$ a label depending on the vertex labels of $u$ and $v$.

A graph $G$ is said to be labeled if the $n$ vertices are distinguished from one another by symbols such as $v_1, v_2, \ldots, v_n$. In this paper, it is proved that $K_{1,1,n}$,Shadow Graph $D_2(P_n)$, Splitting Graph $S'(P_n)$ and Middle Graph $M(P_n)$, Friendship Graph and $P_n^+ : S_m$ are Lucky Edge Graphs.

**2. Preliminaries:**

**Definition:2.1** $\boldsymbol{K_{1,1,n}}$ is a graph obtained by attaching root of a star $K_{1,n}$ at one end of $P_2$ and the other end is joined with each pendent vertices of $K_{1,n}$.

**Definition:2.2** Let G be a connected graph. A graph constructed by taking two copies of G say $G_1$ and $G_2$ and joining each vertex $u$ in $G_1$ to the neighbours of the corresponding $v$ in $G_2$ that is for every vertex $u$ in $G_1$ there exists $v$ in $G_2$ such that $N(u) = N(v)$. The resulting graph is known as the **Shadow Graph** and it is denoted by $\boldsymbol{D_2(G)}$.

**Definition:2.3** For each vertex $u$ of a graph $G$, take a new vertex $v$. Join $v$ to all the vertices of $G$ adjacent to $u$. The graph $\boldsymbol{S'(G)}$, thus obtained is called as the **Splitting Graph** of $G$.

**Definition:2.4 Friendship Graph** can be obtained by joining n copies of the Cycle graph $C_3$ with a common vertex.

**Definition:2.5 The Middle Graph** $\boldsymbol{M(G)}$ of a graph $G$ is a graph whose vertex set is $V(G) \cup E(G)$ and in which two vertices are adjacent if and only if either they are adjacent edges of $G$ or one is a vertex of $G$ and the other is an edge incident with it.

**Definition:2.6** $(\boldsymbol{P_n^+ : S_m})$ is a graph obtained by joining the root of $S_m$ at each vertex of $P_n^+$.

**3.Main Result:**

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# Complex Composition Cordial Labeling of Cycle and BI-Star Graph

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**ABSTRACT**

Let <A, *> be any abelian group. A graph G= (V(G), E(G)) is said to be A-cordial if there is a mapping f:V(G)→A which satisfies the following two conditions with each edge e = uv is labeled as f*(uv) = f(u)*f(v)

- $|v_f(a) - v_f(b)| \leq 1 \ \forall\ a, b \in A$
- $|e_f(a) - e_f(b)| \leq 1 \ \forall\ a, b \in A$

where $v_f(a)$ = the number of vertices with label a
$v_f(b)$ = the number of vertices with label b
$e_f(a)$ = the number of edges with label a
$e_f(b)$ = the number of edges with label b
In[3], $V_4$-cordial labeling is defined. It mooted me an idea to define CCCL as follows.

We have defined a set $\mathbb{C}=\{f_1, f_2, f_3, f_4\}$ where $f_1=z$, $f_2=-z$, $f_3=1/z$, $f_4=-1/z$ $\forall$ $z \in C-\{0\}$ is an abelian group and under binary operation * is defined as $f_1 * f_2 = f_1 \circ f_2 = f_1(f_2)$.

We note that if A=<$\mathbb{C}$, *> is a multiplicative group. Then the labeling is known as Complex Composition Cordial Labeling, and in short denoted as CCCL. A graph which admits CCCL is called as Complex Composition Cordial Graph, which is denoted as CCCG.

In this paper, it is proved that Cycle $C_n$ and Bi-Star $B_{m,n}$ when m < n are Complex Composition Cordial graphs.

R.Maria Irudhaya Aspin Chitra. et al. International Journal of Recent Research Aspects ISSN: 2349-7688, Special Issue: Conscientious Computing Technologies, April 2018, pp. 274-277

# Lucky Edge Labeling Of Some Special Graphs.

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*Abstract-* **Let G be a Simple Graph with Vertex set V(G) and Edge set E(G) respectively. Vertex set V(G) is labeled arbitrary by positive integers and let E(e) denote the edge label such that it is the sum of labels of vertices incident with edge e. The labeling is said to be lucky edge labeling if the edge set E(G) is a proper coloring of G, that is, if we have E(e1) ≠ E(e2) whenever e1 and e2 are adjacent edges. The least integer k for which a graph G has a lucky edge labeling from the set {1, 2,....,k} is the lucky number of G denoted by η(G). A graph which admits lucky edge labeling is called Lucky Edge Graph. In this paper, it is proved that Z − (P$_n$), Fish Graph C$_n$@K$_3$,Butterfly Graph K$_3^2$, Double Triangular Snake DT$_n$, Flower Graph fl$_n$, P$_n^2$ are Lucky Edge Graphs.**

Keywords: Lucky Edge Graph, Lucky Edge Labeling, Lucky Number, 2010 Mathematics subject classification Number: 05C78.

## 1. INTRODUCTION

A graph G is a finite non empty set of objects called vertices together with a set of pairs of distinct vertices of G which is called edges. Each e= {uv} of vertices in E is called an edge or a line of G. For Graph Theoretical Terminology, [2].

A vertex labeling of a graph G is an assignment of labels to the vertices of G that induces for each edge $uv$ a label depending on the vertex labels of $u$ and $v$.

A graph $G$ is said to be labeled if the $n$ vertices are distinguished from one another by symbols such as $v_1$, $v_2$, ....., $v_n$. In this paper, it is proved that $Z-(P_n)$, Fish Graph $C_n@K_3$,Butterfly Graph $K_3^2$, Double Triangular Snake $DT_n$, Flower Graph $fl_n$, $P_n^2$ are Lucky Edge Graphs.

## 2. PRELIMINARIES:

**Definition: 2.1**

Let G be a Simple Graph with Vertex set V(G) and Edge set E(G) respectively. Vertex set V(G) is labeled arbitrary by positive integers and let E(e) denote the edge label such that it is the sum of labels of vertices incident with edge e. The labeling is said to be **Lucky Edge Labeling** if the edge set E(G) is a proper coloring of G, that is, if we have $E(e_1) \neq E(e_2)$ whenever $e_1$ and $e_2$ are adjacent edges. The least integer k for which a graph G has a lucky edge labeling from the set {1, 2,....,k} is the **Lucky Number** of G denoted by **η(G)**.

A graph which admits lucky edge labeling is called **Lucky Edge Graph**.

**Definition: 2.2**

$Z-(P_n)$ is a graph obtained in a pair of path $P_n$, in which the $i^{th}$ vertex of a path $P_1$ is joined with $(i+1)^{th}$ vertex of a path $P_2$.

**Definition: 2.3**

**Fish Graph** is a graph obtained by attaching one of the vertex of $K_3$ to any one of the vertex of $C_n$. It is denoted by $C_n@K_3$.

**Definition: 2.4**

**Butterfly Graph** is a planar undirected graph with 5 vertices and 6 edges. It is denoted by $K_3^2$ or $C_3@K_3$ or $K_3@K_3$.

**Definition: 2.5**

**Double Triangular Snake** is a graph obtained from a path $P_n$, by replacing each edge by two triangles $C_3$. It is denoted by $DT_n$.

**Definition: 2.6**

**Flower Graph** is a graph obtained from a Corona of a Wheel in which the end of the pendant vertices are connected to the center of a Wheel. It is denoted by $fl_n$.

**Definition: 2.7**

$P_n^2$ is a graph obtained from a path of length $n-1$ by joining a vertex to another vertex which is away from a path of length 2.

## 3. Main Results

**Theorem: 3.1**

$Z-(P_n)$ is a Lucky Edge Graph and the Lucky number is 6.

**Proof:**

Let $G = Z-(P_n)$ be the graph.

Let $V(G) = \{u_i, v_i : 1 \le i \le n\}$

$E(G) = \{(u_iu_{i+1}), (v_iv_{i+1}) : 1 \le i \le n\text{-}1\} \cup \{(v_iu_{i+1}) : 1 \le i \le n\}$

Let $f$: V[G] →{1, 2, 3} defined by

$$f(u_i) = \begin{cases} 1 & i \equiv 1,2 \bmod 6 \\ 3 & i \equiv 3,4 \bmod 6 \\ 2 & i \equiv 0,5 \bmod 6 \end{cases}, \quad 1 \le i \le n.$$

$$f(v_i) = \begin{cases} 2 & i \equiv 1,2 \bmod 6 \\ 1 & i \equiv 3,4 \bmod 6 \\ 3 & i \equiv 0,5 \bmod 6 \end{cases}, \quad 1 \le i \le n.$$

Thus the induced edge labeling are

$$f^*(u_iu_{i+1}) = \begin{cases} 2 & i \equiv 1 \bmod 6 \\ 4 & i \equiv 2,5 \bmod 6 \\ 6 & i \equiv 3 \bmod 6 \\ 5 & i \equiv 4 \bmod 6 \\ 3 & i \equiv 0 \bmod 6 \end{cases}, \quad 1 \le i \le n-1.$$

# Symmetric Bi-T-Derivations of Incline Algebra

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**Abstract**

*The concept of derivation in incline algebra was introduced by N.O.Alsherhi[1] . Kyung Ho kim and so Young Park[2] introduced the symmetric bi-f- derivation in incline algebra. In this paper, we introduce the concept of symmetric bi-t-derivation in incline algebras and present some properties of symmetric bi-t-derivations. Also, we characterize $Ker_{dt}(K)$ and $T_a(K)$ by symmetric bi-t-derivations in incline algebra and give some examples. Also we define isotone symmetric bi-t- derivation in incline algebra and analyse its properties.*

**Key words**: *bi-t-derivation, isotone, incline algebra, joinitive, $Ker_{dt}(K)$*

**AMS Mathematics Subject Classification:** 06F35, 03G25, 08A30

## 1.Introduction

Z.Q.Cao, K.H.Kim and F.W Roush[2] introduced the notation of incline algebras in their book. After that Some authors studied incline algebra and its application. N.O.Alsherhi [1] introduced the notation of derivation in incline algebra. Kyung Ho kim [2] a introduced the symmetric bi-f-derivation in algebra. In this paper we introduced some concept of a symmetric bi-t-derivation of incline algebra and give some properties of incline algebras. Also we characterize $Ker_{dt}(K)$ and $T_a(K)$ by symmetric bi-t-derivation in incline algebra.

## 2. Preliminaries

**Definition 2.1**

An *incline algebra* is a set K with two binary operations denoted by " + " and " $*$ " satisfying the following axioms:

$(K1)\ x + y = y + x$

$(K2)\ x + (y + z) = (x + y) + z$

$(K3)\ x * (y * z) = (x * y) * z$

$(K4)\ x * (y + z) = (x * y) + (x * z)$

$(K5)\ (y + z) * x = (y * x) + (z * x)$

$(K6)\ x + x = x$

$(K7)\ x + (x * y) = x$

$(K8)\ y + (x * y) = y$

For all $x, y, z \in K$
For pronounce " + " (resp. " $*$ ") as addition (resp. multiplication).
In an incline algebra K, the following properties hold.

$(K9)\ x * y \leq x$ and $y * x \leq x$ for all $x, y \in K$
$(K10)\ y \leq z$ implies $x * y \leq x * z$and $y * x \leq z * x$for all $x, y, z \in K$

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# New Class of Continuous Functions in Bitopological Spaces

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**Abstract: - The concept of bitopological space was first introduced by J.C.Kelly in 1963 (i.e) a non empty set X equipped with two arbitrary topologies τ_1 and τ_2.The concept of generalized closed sets plays a significant role in general topology and these are the research topics of many Topologists worldwide.In 1970 Norman Levine introduced the concept of generalization of closed sets in topological spaces and he defined the semi-open sets and semi-continuity in bitopological spaces.The concept of continuity in topological spaces was extended to bitopological spaces by Pervin (1967).we have already introduced (i,j)-g^(##) closed sets (i.e)a subset A of a bitopological space (X,τ_1,τ_2 ) is called (i,j)-g^(##)-closed if τ_j-cl(A)⊆U,whenever A⊆U,U is τ_i-g^#-open in (X,τ_1 【,τ】 _2 ) and some of the properties were discussed. In this paper we introduce (i,j)-g^(##) continuous functions in bitopological spaces and discuss the relation with other continuous functions and obtained their characteristics**

**Keywords**
**Bitopological space,(i,j)-g^(##) closed set,(i,j)-g^(##) continuous map.**

**AMS Mathematics Subject Classification 2010:54A05,54A10**

## I. INTRODUCTION

A triple $(X, \tau_1, \tau_2)$ where X is a non-empty set $\tau_1$ and $\tau_2$ are topologies on $X$ is called a bitopological space and Kelly[7] initiated the study of such spaces.In 1985,Fukutake[4] introduced the concepts of g-closed sets in bitopological spaces.In this paper we introduce new type of continuous map called $(i,j)$-$g^{\#\#}$ continuous map by applying $(i,j)$-$g^{\#\#}$ closed sets[12] in bitopological spaces and investigated their properties.

## II. PRELIMINARIES

**Definition 2.1** A subset A of a topological space $(X, \tau)$ is called

1. regular-open set[10] if $A = int(cl(A))$
2. generalized closed set[8]($g$-closed) if $cl(A) \subseteq U$ whenever $A \subseteq U$ and $U$ is open in $(X, \tau)$.
3. generalized star closed set[16 ](briefly $g^*$-closed) if $cl(A) \subseteq U$ whenever $A \subseteq U$ $U$ is g-open in $(X, \tau)$.
4. $g^{\#}$-closed set[18] if $cl(A) \subseteq U$ whenever $A \subseteq U$ and $U$ is $\alpha g$-open in $(X, \tau)$.
5. $\alpha$-closed[9] if $cl\left(int(cl(A))\right) \subseteq A$
6. a $\alpha$-generalized closed[2] (briefly $\alpha g$-closed) if $\alpha cl(A) \subseteq U$ whenever $A \subseteq U$ and U is open in $(X, \tau)$.
7. $g^*p$-closed[17] if $pcl(A) \subseteq U$ whenever $A \subseteq U$ and $U$ is $g$-open in $(X, \tau)$.

**Definition 2.2** A subset $A$ of a bitopological space $(X, \tau_i, \tau_j)$ is called

1. a $(i,j)$-$g$-closed[4] if $\tau_j$-$cl(A) \subseteq U$ whenever $A \subseteq U$ and $U$ is open in $\tau_i$.
2. a $(i,j)$-$g^*$-closed[14] if $\tau_j$-$cl(A) \subseteq U$ whenever $A \subseteq U$ and $U$ is $g$-open in $\tau_i$.
3. a $(i,j)$-$gs$-closed[15] if $\tau_j$-$scl(A) \subseteq U$ whenever $A \subseteq U$ and $U$ is open in $\tau_i$.
4. a $(i,j)$-$gsp$-closed[3] if $\tau_j$-$spcl(A) \subseteq U$ whenever $A \subseteq U$ and $U$ is open in $\tau_i$.
5. a $(i,j)$-$gpr$-closed[6] if $\tau_j$-$pcl(A) \subseteq U$ whenever $A \subseteq U$ and $U$ is $r$-open in $\tau_i$
6. a $(i,j)$-$(g^*p)^*$-closed[17] $\tau_j$-$cl(A) \subseteq U$ whenever $A \subseteq U$ and $U$ is $g^*p$-open in $\tau_i$.
7. a $(i,j)$-$g^{\#}$-closed[16] $\tau_j$-$cl(A) \subseteq U$ whenever $A \subseteq U$ and $U$ is $\alpha g$-open in $\tau_i$.
8. a $(i,j)$-$g^{**}$-closed[11] if $\tau_j$-$cl(A) \subseteq U$ whenever $A \subseteq U$ and $U$ is $g^*$-open in $\tau_i$.
9. a (i,j)-$g^{\#\#}$-closed[12] if $\tau_j$-$cl(A) \subseteq U$ whenever $A \subseteq U$ and $U$ is $g^{\#}$-open in $\tau_i$.
10. a $(i,j)$-$wg$-closed[5] if $\tau_j$-$cl(int(A)) \subseteq U$ whenever $A \subseteq U$ and $U$ is open in $\tau_i$.
11. a $(i,j)$-$rg$-closed[1] if $\tau_j$-$cl(A) \subseteq U$ whenever $A \subseteq U$ and $U$ is $r$-open in $\tau_i$.
12. a $(i,j)$-$\alpha g$-closed[13] if $\tau_j$-$cl(A) \subseteq U$ whenever $A \subseteq U$ and $U$ is open in $\tau_i$.

 

# A NEW NOTION OF CLOSED SETS IN TOPOLOGICAL SPACES

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**Abstract:** The aim of this paper is to introduce a new class of closed sets namely $\beta^*$- closed sets and discuss its properties with already existing other sets. Additionally, we define the complement of $\beta^*$- closed sets, and we find the basic properties and characterizations of $\beta^*$- open sets in topological spaces.

**Keywords:** $\beta^*$- Open, $\beta^*$- Closed.

**Introduction:** In general topology repeated application of interior and closure operators give rise to several different new classes of sets. Some of them are generalized form of open sets. These classes are found to have applications not only in mathematics but even in diverse fields outside the realm of mathematics ([7] , [8], [18 ]). The most well known notion and inspiring sources are the notions of β–open (semi–preopen) sets by Abd–El–Monsef et al. [ 13] (by Andrijevic ([1], [2])). Due to this, investigation of these sets have gained momentum in recent days. By originating the concept of generalized closed (g–closed) sets, Levine [9 ] provided an umbrella for the researchers working in the field of generalized closed sets. Levine [9 ] used the closure operator and the openness of the superset in the definition of g–closed sets.

In [17] Robert et al. originated the concept of semi*–closed sets by using the closure operator Cl* due to Dunham [5]. They investigated many fundamental properties of semi*–closed sets. This class of set lies between closed sets and semi–closed sets. They also established semi*–closure of semi*- closed set. Missier [15] devised and studied the new notion of sets called α*–open sets and α*–closed sets and discussed the relationship of α*–open sets and α*–closed sets with some other sets. Selvi et al. [20] defined and investigated a new class of sets called pre*–closed sets by using the generalized closure operator Cl* due to Dunham [5].

In this paper a new notion of generalized closed sets namely $\beta^*$- closed sets has been devised. A brief synopsis of the paper is as follows: The main objective of this paper is to introduce and study $\beta^*$- closed sets, which is the generalization of β–closed sets by using the generalized closure operator Cl*. This class of sets are the generalization of $\beta^*$- closed sets, pre*–closed sets and semi*–closed sets. This paper is organized as follows, section 1, gives basic notions which underpin our work. In section 2, we have define $\beta^*$- closed sets and discuss their characterization and basic properties and its relationships with already existing generalized closed sets.

**Preliminaries:** Throughout this paper (X, τ ) will always denote a topological space on which no separation axioms are assumed, unless explicitly stated. If A is a subset of the space (X, τ ), Cl(A) and Int

# Functions Related To β* - Closed Sets in Topological Spaces

P. Anbarasi Rodrigo , K.Rajendra Suba

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**Abstract**

*The purpose of this paper is to introduce Strongly β* - continuous , Perfectly β* - continuous maps and basic properties and theorems are investigated.*

**Keywords:** *Strongly β*- continuous functions, Perfectly β* - continuous functions.*

## I. Introduction

In 1960, Levine . N [7] introduced strong continuity in topological spaces. Abd El-Monsef et al. [1] introduced the notion of β-open sets and β-continuity in topological spaces. Semi-open sets, preopen sets, $\alpha$-sets, and $\beta$-open sets play an important role in the researches of generalizations of continuity in topological spaces. By using these sets many authors introduced and studied various types of generalizations of continuity. In 1982, Mashhour et. al. [10] introduced preopen sets and pre-continuity in
topology. Levine [5] introduced the class of generalized closed (g-closed) sets in topological spaces. The generalized continuity was studied in recent years by Balachandran et.al. Devi et.al, Maki et.al, [3, 5]. Levine [7], Noiri [13] and Arya and Gupta introduced and investigated the concept of strongly
continuous , perfectly continuous and completely continuous functions respectively which are stronger than continuous functions. Later, Sundaram [15] defined and studied strongly g-continuous functions and perfectly g-continuous functions in topological spaces. In this paper we introduce and investigate a new class of functions called strongly β*- continuous functions. Also we studied about β* - open and β* - closed maps and their relations with various maps.

## II. Preliminaries

Throughout this paper (X, τ), (Y, σ ) and (Z, $\eta$ ) or X , Y , Z represent non-empty topological spaces
on which no separation axioms are assumed unless otherwise mentioned. For a subset A of a space (X, τ), cl(A) and int(A) denote the closure and the interior of A respectively. The power set of X is denoted by P(X).

**Definition 2.1:** A function f: (X, τ) → (Y, σ ) is called a strongly continuous [3]if $f^{-1}(O)$) is both open and closed in (X, τ) for each subset O in (Y, σ ).

**Definition 2.2:** A function f: (X, τ) → (Y, σ ) is called a $\beta$ - continuous if $f^{-1}(O)$ is a $\beta$ - open set of (X, τ) for every open set O of (Y, σ ).

**Definition 2.3:** A function f: (X, τ) → (Y, σ ) is called a $\beta$ *- continuous if $f^{-1}(O)$ is a $\beta$ * - open set of (X, τ) for every open set O of (Y, σ ).

**Definition 2.4:** A function f: (X, τ) → (Y, σ) is called a g -continuous if $f^{-1}(O)$ is a g -open set of (X, τ) for every open set O of (Y, σ ).

**Definition 2.5:** A function f: (X, τ) → (Y, σ) is called a perfectly continuous if $f^{-1}(O)$ is both open and closed in (X, τ) for every open set O in (Y, σ ).

**Definition 2.6:** A map f: (X, τ) → (Y, σ) is called a g-closed if f(O) is g-closed in (Y, σ ) for every closed set O in (X, τ).

**Definition 2.7:** A Topological space X is said to be $\beta$ * - $T_{1/2}$ space if every $\beta$ * - open set of X is open in X.

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# On β* - closed and β* - open maps in Topological Spaces

**P. Anbarasi Rodrigo[1] , K.Rajendra Suba[2]**

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*Abstract*- **We investigated a new class of β*- open and β*- closed maps in topological spaces and study some of its basic properties and relations among them. It is shown that the composition of β*- closed maps need not be β*- closed .The applications of these maps in some topological spaces are also studied.**

Keywords: β* -open maps and β*- closed maps.

## I. INTRODUCTION

In 1960, Levine . N [7] introduced strong continuity in topological spaces. Abd El-Monsef et al. [1] introduced the notion of β-open sets and β-continuity in topological spaces. Semi-open sets, preopen sets, $\alpha$-sets, and $\beta$-open sets play an important role in the researches of generalizations of continuity in topological spaces. By using these sets many authors introduced and studied various types of generalizations of continuity. In 1982, Mashhour et. al. [10] introduced preopen sets and pre-continuity in topology. Levine [5] introduced the class of generalized closed (g-closed) sets in topological spaces. In this paper we introduce and investigate a new class of functions called β* - open and β* - closed maps and their relations with various maps.

## II. PRELIMINARIES

Throughout this paper (X, τ), (Y, σ ) and (Z, $\eta$ ) or X , Y , Z represent non-empty topological spaces on which no separation axioms are assumed unless otherwise mentioned. For a subset A of a space (X, τ), cl(A) and int(A) denote the closure and the interior of A respectively. The power set of X is denoted by P(X).

**Definition 2.1:** A subset A of a topological space (X, τ ) is called $\beta$ *- closed Set if Int*(Cl(Int*(A))) ⊆ A.

**Definition 2.2:** A subset A of a topological space (X, τ ) is called $\beta$ *- open Set if X \ A is $\beta$ *- closed Set.

**Definition 2.3:** A function f: (X, τ) ⟶ (Y, σ ) is called a $\beta$ *- continuous if $f^{-1}$(O) is a $\beta$ * - open set of (X, τ) for every open set O of (Y, σ ).

**Definition 2.4:** A function f: (X, τ) ⟶ (Y, σ) is called a g - continuous if $f^{-1}$(O) is a g -open set of (X, τ) for every open set O of (Y, σ ).

**Definition 2.5:** A function f: (X, τ) ⟶ (Y, σ) is called a perfectly continuous if $f^{-1}$(O) is both open and closed in (X, τ) for every open set O in (Y, σ ).

**Definition 2.6:** A map f: (X, τ) ⟶ (Y, σ) is called a g-closed if f(O) is g-closed in (Y, σ ) for every closed set O in (X, τ).

**Definition 2.7:** A Topological space X is said to be $\beta$ * - $T_{1/2}$ space if every $\beta$ * - open set of X is open in X.

**Theorem 2.8:**

(i) Every open set is $\beta$ *- open and every closed set is $\beta$ *- closed set

(ii) Every $\beta$ -open set is $\beta$ *- open and every $\beta$ -closed set is $\beta$ *- closed.

(iii) Every g-open set is $\beta$ *-open and every g-closed set is $\beta$ *-closed.

## III. $\beta$ * - Open maps and $\beta$ * - Closed maps

**Definition 5.1:** A map f: (X, τ) ⟶ (Y, σ ) is called a $\beta$ *- open if image of each open set in X is $\beta$ * - open in Y.

 

# Contra β * - Continuous Functions in Topological Spaces

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***Abstract***

*The notion of contra continuous functions was introduced and investigated by Dontchev. In this paper, we apply the notion of β* -closed sets in topological space to present and study a new class of functions called contra β* - continuous and almost contra β* -continuous functions as a new generalization of contra continuity.*

**Keywords:** *contra β* -continuous and almost contra β* -continuous functions*

## I. Introduction

Generalized open sets play a very important role in General Topology and they are now the research topics of many topologist worldwide. Indeed a significant theme in General Topology and Real Analysis concerns the variously modified forms of continuity, separation axioms etc, by utilizing generalized closed sets. Recently, as generalization of closed sets, the notion of β* -closed sets were introduced and studied by [13]. Dontchev [6] introduced the notions of contra continuity and strong S-closedness in topological spaces. He defined a function f : X → Y is contra continuous if the preimage of every open set of Y is closed in X. A new weaker form of this class of functions called contra semicontinuous function is introduced and investigated by Dontchev and Noiri [7]. Caldas and Jafari [5] have introduced and studied contra β-continuous function. Jafari and Noiri [9, 10] introduced and investigated the notions of contra super continuous, contra precontinuous and contra α-continuous functions. Almost contra precontinuous functions were introduced by [8] and recently have been investigated further by Noiri and Popa [12]. Nasef [11] has introduced and studied contra γ-continuous function. In this direction, we will introduce the concept of contra β* - continuous and almost contra β*-continuous functions via the notion of β* -open set and study some properties of contra β* -continuous and almost contra β* -continuous functions.

## II. Preliminaries

Throughout this paper (X, τ), (Y, σ ) and (Z, $\eta$ ) or X , Y , Z represent non-empty topological spaces on which no separation axioms are assumed unless otherwise mentioned. For a subset A of a space (X, τ), cl(A) and int(A) denote the closure and the interior of A respectively. The power set of X is denoted by P(X).

***Definition 2.1:*** A subset A of a topological space X is said to be a β*- open [2] if A $\subseteq$ cl (int* (cl( A ))).

***Definition 2.2:*** A function f: (X, τ) → (Y, σ ) is called a β* - continuous [1] if $f^{-1}$ (O) is a β *- open set of (X, τ) for every open set O of (Y, σ ).

***Definition 2.3:*** A map f: (X, τ) → (Y, σ ) is said to be perfectly β*- continuous [3] if the inverse image of every β*- open set in (Y, σ ) is both open and closed in (X, τ) .

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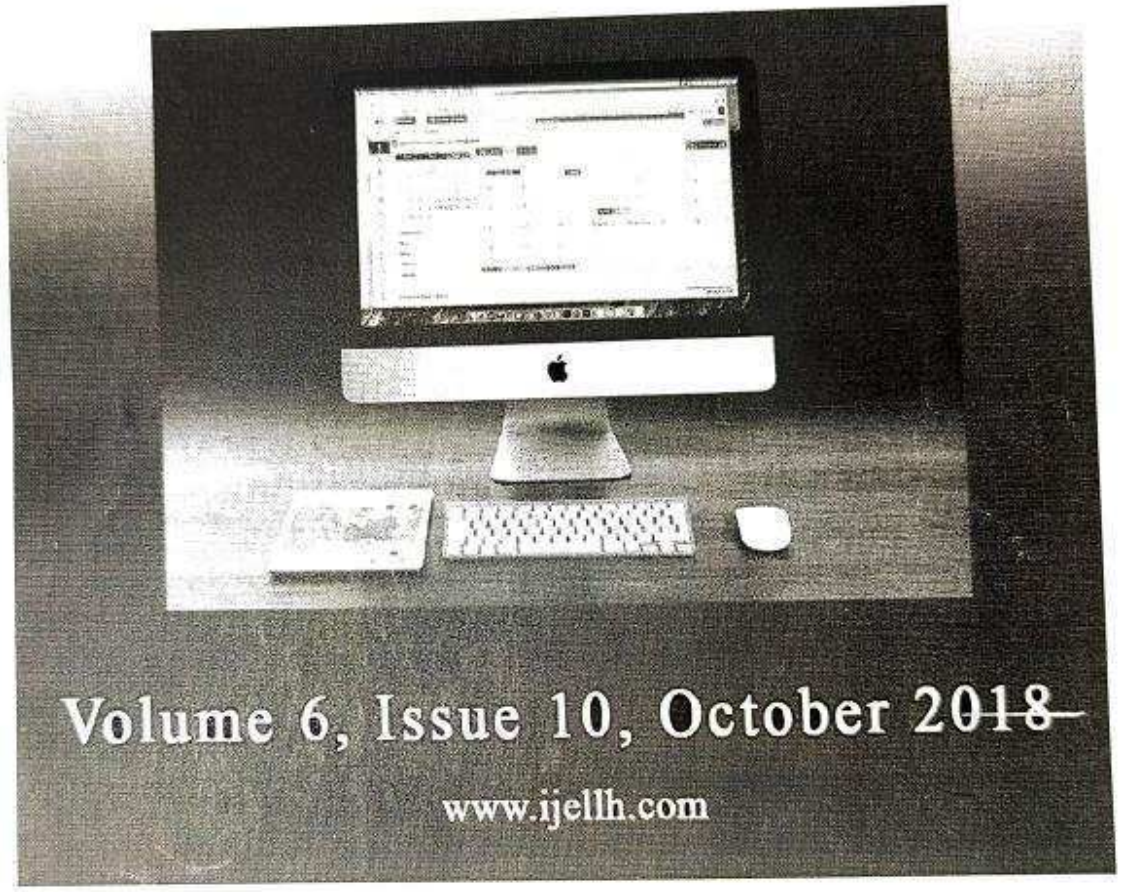

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# Antibacterial Activity of Crab Portunus Pelagicus from Three Stations of Gulf Of Mannar Coast.

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*Abstract*- **Marine crabs are potential sources of new antibiotics. The search for antibacterial agents has taken a definite direction in developed countries. The present investigation was taken up to study the antibacterial activity of methanol extract of the crab Portunus pelagicus were collected from three stations. Different concentrations (1.25mg,2.5mg and 5mg) of methanol extract of the crab tissue tested against five bacterial strains such as Enterococcus faecalis (ATCC - 29212), Enterobacter aerogens (MTCC-111), Staphylococcus aureus (ATCC-25923), Proteus vulgaris (MTCC-1771) and E. coli (ATCC 25922) for antibacterial activities. The highest zone of inhibition was observed against Staphylococcus aureus at 5mg concentration at stations I and III and station II showed highest zone of inhibition against Enterobacter aerogens at 5mg concentration. The lowest zone of inhibition was observed against E.coli at 1.25mg concentration in all three stations. No inhibition zone was observed against Enterococcus faecalis, and Proteus vulgaris in all the concentration.The present study indicates that the crab can be used as an antibacterial for many pathogens.**

Key words: Portunu pelagicus, Enterococcus faecal, Enterobacter aerogens, Staphylococcus aureus , Proteus vulgaris and E. coli.

## 1. INTRODUCTION

Antibiotics are one of the most important weapons in fighting bacterial infections and have greatly benefited the health quality of human life since their introduction (Sarkar et al., 2003). In recent years one of the more alarming conditions of clinical microbiology is high risk of antibiotic resistance which is increasing day by day among pathogens. Now this increase in resistance is a global problem, no country is immune to this condition and all major bacterial pathogens have acquired resistance to at least one or more drugs (Schito, 2002). As resistance is increased, patients are on high risk of severity because of untreated pathogens (Kerr, 2005).

The ocean serves just not only as the source of antibiotics but indeed a reservoir of other bioactive compounds too. Invertebrates represent the most diverse taxon of animals on the planet, accounting for more species than all other animals combined. Invertebrates have to rely on the innate immune processes to combat pathogens which closely resemble the innate immune system of the vertebrates. As a result, these animals have developed various competent strategies to defend their lives against invading pathogens (Jiravanichpaisal et al., 2006).

Crabs, among numerous other invertebrates are considered as an essential shell fishery product (Nalan et al., 2003). In crustaceans, the antimicrobial substances are considered to be a main component of innate immunity (Smith and Chisholm, 2001). Crabs are the very good resource of antimicrobial proteins with wide range of antimicrobial properties. Antimicrobial peptides are a major component of the innate immune defense system in invertebrates (Tincu and Taylor, 2004).

## 2. MATERIALS AND METHODS

### 2.1. Collection and Preparation of extract

In the present study the animals (P. pelagicus) were collected from three stations (Kanyakumari- Station I, Therespuram- Station II and Rameshwaram- Station III) by trawl catch, kept in ice and transferred to the laboratory within 24 hours. For removing mud, algae and barnacles stuck to external skeleton, crabs were washed with fresh sea water. The shells were removed and the tissues were then dried in hot air oven at 56oC for 48 hours. The dried tissue was immersed in 10% AR grade methanol for 10 days at room temperature. After filtration with Whatman No.1 paper, the methanol extract was reduced by vacuum evaporation. The extract residue was resuspended in 20 ml of 100% A.R grade methanol. The methanol soluble extracts were dried and solidified in distilled and deionized water. Different concentrations of extracts were prepared and stored at 0oC for further use.

### 2.2. Bacterial cultures

Five bacterial strains such as Enterococcus faecalis (ATCC - 29212), Enterobacter aerogens (MTCC-111), Staphylococcus aureus (ATCC-25923), Proteus vulgaris (MTCC-1771) and E. coli (ATCC 25922) were used for antimicrobial activities. (All the bacterial strains were clinical isolates, obtained from

 

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# Determination of Antibacterial Activity of Marine Puffer Fish *Arothron Immaculatus* Collected From Thoothukudi Coast

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## Abstract

The antibacterial activity of crude acetic acid extracts of puffer fish *Arothron immaculatus* against ten bacterial strains has been evaluated. Skin, liver, muscle, intestine and ovary extracts of *Arothron immaculatus* prepared by using acetic acid. The antibacterial test was performed by Agar diffusion technique. The ovary extract showed maximum activity with zone of inhibition with 14.0 mm radius at 10mg/10µl in *Shigella flexneri* and the muscle extract showed minimum zone of inhibition with 6.0 mm radius at 10mg /10µl in *Pseudomonas sp.* The antibacterial activity of tissue extracts of *Arothron immaculatus* was compared with the standard antibiotics like Malachite green, Penicillin and Streptomycin. The results indicated that the Skin, liver, muscle, intestine and ovary tissue extracts of *Arothron immaculatus* may have potent antibacterial compounds that can be further explored and utilized for the welfare of mankind.

**Key words** : *Arothron immaculatus,* antibacterial activity, *Bacillus cereus* and Zone of inhibition.

## INTRODUCTION

Ocean offers a large biodiversity of fauna and flora which is estimated to be over 5,00,000 species and more than double that of the land (Anand *et al.*, 1997). This rich diversity of marine organisms assumes a great opportunity for the discovery of new bioactive substances. Thus the marine environment is an exceptional reservoir for bioactive natural products, many of which exhibit structural features that are not found in terrestrial natural products (Johansson and Soderhall, 1985).

Marine organisms are a rich source of structurally novel and biologically active metabolites. Primary and secondary metabolites produced and stored by these organisms may be potential bioactive compounds of interest in the pharmaceutical industries. The number of natural products isolated from marine organisms increases rapidly (Faulkner, 2002 and Proksch *et al.,* 2006). Many classes of natural products from marine sources exhibiting antitumour, anti-leukaemia, antibacterial and antiviral activities have been reported worldwide (Khora, 2013).

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# ANTIBACTERIAL AND ANTIFUNGAL ACTIVITIES OF MARINE PUFFER FISH *LAGOCEPHALUS LUNARIS* COLLECTED FROM THOOTHUKUDI COAST

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## ABSTRACT

*Antibacterial and antifungal activities of tissue extracts of puffer fish Lagocephalus lunaris against various bacterial and fungal pathogens have been evaluated. Liver, skin, muscle, intestine and ovary extracts of L.lunaris were prepared by using acetic acid and methanol. The antibacterial and antifungal activities were performed by Agar diffusion technique. All the extracts showed inhibitory activity for antibacterial test. The ovary extract showed maximum activity with zone of inhibition 13.0 mm radius at 10 mg/ µl in Salmonella typhi and the muscle extract showed minimum zone of inhibition with 6.5 mm radius at 10 mg/ µl in Pseudomonas aeruginosa. Among the extracts tested except the muscle extract, all the other extracts exhibited antifungal activity. The skin extract showed maximum zone of inhibition against A. niger with 9.50 mm radius at 200 µg concentration. These results revealed that the extracts of puffer fish L.lunaris possess potent bioactive compounds which can be further explored and utilized as drug for the welfare of mankind.*

**Key words:** *Lagocephalus lunaris*, antibacterial activity, antifungal activity, *pseudomonas aeruginosa*, zone of inhibition.

## INTRODUCTION:

The marine biota is the largest source of novel discovery of natural products such as pharmacological metabolites and medicines. There has been an extensive research showing that vast bioactive substances were identified and characterized from marine organisms, indeed several of them showed promising results to treat human and animal diseases

# ANTIBACTERIAL AND ANTIFUNGAL ACTIVITIES OF MARINE PUFFER FISH *LAGOCEPHALUS LUNARIS* COLLECTED FROM THOOTHUKUDI COAST

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## ABSTRACT

*Antibacterial and antifungal activities of tissue extracts of puffer fish Lagocephalus lunaris against various bacterial and fungal pathogens have been evaluated. Liver, skin, muscle, intestine and ovary extracts of L.lunaris were prepared by using acetic acid and methanol. The antibacterial and antifungal activities were performed by Agar diffusion technique. All the extracts showed inhibitory activity for antibacterial test. The ovary extract showed maximum activity with zone of inhibition 13.0 mm radius at 10 mg/ µl in Salmonella typhi and the muscle extract showed minimum zone of inhibition with 6.5 mm radius at 10 mg/ µl in Pseudomonas aeruginosa. Among the extracts tested except the muscle extract, all the other extracts exhibited antifungal activity. The skin extract showed maximum zone of inhibition against A. niger with 9.50 mm radius at 200 µg concentration. These results revealed that the extracts of puffer fish L.lunaris possess potent bioactive compounds which can be further explored and utilized as drug for the welfare of mankind.*

**Key words:** *Lagocephalus lunaris*, antibacterial activity, antifungal activity, *pseudomonas aeruginosa*, zone of inhibition.

## INTRODUCTION:

The marine biota is the largest source of novel discovery of natural products such as pharmacological metabolites and medicines. There has been an extensive research showing that vast bioactive substances were identified and characterized from marine organisms, indeed several of them showed promising results to treat human and animal diseases

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# STUDIES ON PLANKTON DIVERSITY OF TUTICORIN MANGROVE ECOSYSTEM

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Abstract

Investigation on phytoplankton and zooplankton diversity of the mangrove environs of the Gulf of Mannar biosphere reserve, in specific to Karapad Bay and Korampallam Creek of Tuticorin was carried out from March 2010 to February 2011. Regular monthly samples were collected from the study area and were subjected to plankton identification and biomass estimation. From this one year study, a total of 14 phytoplankton and 12 zooplankton species were evidenced.Thallasiothrix sp., Rhizosolenia sp. and Cossinodiscus sp. were the dominant forms of phytoplanktons from the study area. The maximum number of phytoplanktons wasrecordedas242.36 cells /l at Korampallam creek during April 2010
Keywords: Gulf of Mannar, mangroves, biomass, plankton

## Introduction

Ecologically, mangroves are defined as an assemblage of tropical trees and shrubs that inhabit thecoastal intertidal zone. The area under mangrove ecosystem in Tamil Nadu is about 225 $km^2$. Mangrove forests are rich in biodiversity providing a habitat for wide varieties of animal and plant species.They also act as nurseries for fin fish, shell fish, crustaceans and molluscs. In addition, mangrove forests play a vital role in trapping sediments, thereby stabilizing coastlines and protectingcoral reefsand sea grass meadows. Fertility and healthiness of mangrove environment is reflected through productivity of the phytoplankton and zooplankton as primary and secondary producers. Organic materials derived from decaying mangrove leaves are also used as primary food source, which sustain larval and juvenile stocks.

Both phytoplankton and zooplankton communities have been successfully used in coastal water quality monitoring and as bio indicators of pollution (Wang et al., 1999; Brooks et al., 1999; Dunbar and Webber, 2003; Webber et al., 2005). They are the initial biological components from which energy is transferred to higher organisms through food chain (Ananthanet al., 2004; Tiwari et al., 2006). Data on abundance, distribution and species composition of phytoplankton are essential to know the status of an estuarine ecosystem. They form the vital source of energy in the marine environment. They initiate the marine food chain, by serving as food to primary consumers, which include zooplankton, shellfish, finfish and others (Ananthanet al., 2004; Tas and Gonulol, 2007).Robertson and Blabber (1992) suggested that the plankton in mangrove habitats contribute about 20 to 50% of total fish productivity.

Influence of physical and chemical variables on planktonic communities in mangrove waters are more pronounced than the near shore coastal environment, resulting in seasonal changes of planktonic species composition and densities (Kannan and Vasantha, 1992). Thus, planktonic communities and their periodic shift in abundance and composition is an important biotic factor in the mangrove ecosystem. Information on species diversity, richness, evenness and dominance evaluation on the biological components of the ecosystem is essential to understand detrimental changes in environs (Krishnamoorthy and Subramanian, 1999). Some studies on the annual distribution patterns of phytoplankton have been made earlier in the Pichavaram mangroves (Krishnamurthy and Jeyaseelan, 1983; Mani, 1992; Kathiresan, 2000).

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# India's backbone is break bone

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**Abstract:**

Agriculture is the backbone of Indian Economy because of its high share in employment and livelihood creation. The majority of population in rural India is dependent upon agriculture. Agriculture contributes significantly to the growth in GDP of the country but has remained the slowest moving sector of Indian economy. The agricultural sector's growth decreased to 2.9 percent during 1992-93 which was further reduced to 2.5 percent during 1997-98 to 2006-07. The major reason for the slowdown of agricultural productivity is larger. The present paper discusses the reason for break bone of backbone. There are many drawbacks comes from various sides. The present paper converse three sides only. They are policy side, demand side and supply side. The policy side represents the government policies, the demand side represents the consumer and the supply side is the farmers. The government gives more important to agriculture growth through the five year plans. Farmers are taken larger efforts and investment for their land higher yield. Consumers are interested to consume the agricultural products more than industrial goods. The weakness of the agriculture yield is based on these three sides. These three sides are clearly focuses the break of bones. These weaknesses should be strengthening. The government, consumer and the farmers are responsible for the decreasing trend of agriculture. If they are correct their break, the agriculture will be grow in coming years.

**Keywords:** Agriculture, diseases, policy side, supply side, demand side, recommendation, conclusion.

**"He who does not cultivate his field, will die of hunger"- Guinean Proverb**

According to the International Monetary Fund's, World Economic Report, April 2015 strong-minded India is a developing nation. In an Old Testament God said, "I have provided grass and leafy plants for food"- from these words, we knows agriculture was an only food variety in the early period. And it was a first sector in the world economy. Agriculture plays a prominent role in the economic development of countries like India. If anything goes wrong in agriculture that will be automatically


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# PROPER HRU (HUMAN RESOURCE UTILISATION) - WINNING LETTERS IN LIFE

**Dr.D.Rathi, Assistant Professor of Economics, St.Mary's College (Autonomous), Thoothukudi**

**Introduction:**

**'You can do anything and everything with the help of GOD'**

**Abstract:**

The term 'Human Resources Utilization' means the people properly use their resources for reach the final of success. Some people in this modern age with cowardice and weak mind take shelter of higher principles and pretend non- violence to run away from problems. Many a time fear stops us from going ahead and we strangely back out accepting failure in a queer and ignorant manner. The primary reason behind this is lack of self – confidence and self – respect. Human are doing anything and everything with the help of GOD. GOD are, G – God, O- Originality (Own talents), and D- Dedication. The present paper focuses two concepts. They are: Commitment and Competence. If you want to reach your life success, you should follow HRU- human Resource Utilization - winning letters in your life through Competence and Commitment Competence is skills and attitudes demonstrated to meet requirements of specific tasks. It's come from some character. Commitment is an act of binding oneself to a course of action. Commitment is a message that makes a pledge. Making a commitment is means of dedicating yourself. The characters of commitment and competence will be clearly discussed in this paper. Human life is more valuable than the other. God created this world for human utilization. The nature came from god for the human utilization. So, we should utilize our resources of skills and way of actions for our own growth and others growth to reach the life formula of success.

**Key words:** Human Resource, Utilization, Winning letters, GOD, Competence, Commitment, Conclusion.

Human Resources are heterogeneous in the sense that they differ in personality, perception, emotions, values, attitudes, motives and modes of thoughts. In common parlance, human resources means the people. Michael J.Jucius has defined human resources as "a whole consisting of inter-dependent and interacting physiological, psychological, sociological and ethical components'.

An Economic progress and prosperity has largely been due to technological progress and innovations in different fields of production. But, efficient utilization of human resources is the crucial factor in determining the growth and prosperity of the life. The human resources refers not only the organizational growth, it's an essential for the life of individual person's growth. Human resources are heterogeneous, this means, they differ in personality, perception, emotions, values, attitudes, motives and modes of thoughts. Human are doing anything and everything with the help of GOD. GOD are, G – God, O- Originality (Own talents), and D- Dedication. These three are including in two characters: they are: Commitment and Competence.

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# Microwave synthesis, electrochemical studies and capacitance of benzalazine

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**Abstract-** Benzalazine was synthesized by the reaction of benzaldehyde and hydrazine dihydrochloride by microwave irradiation. Formation of benzalazine was confirmed by FT-IR and UV-Visible spectral studies. Percentage of crystallinity was found out by X-ray diffraction studies and it was found to be 43. Redox behavior was studied using cyclic voltammetry. Specific capacitance was calculated by electrochemical impedance spectroscopy. Specific capacitance was more for benzalazine at pH 7 with a value of 0.401μF/cm$^2$. Chronocoulometry was used to calculate the diffusion coefficient and it was found to be less in neutral medium.

**Keywords-** Benzalazine; specific capacitance; diffusion coefficient

## 1. INTRODUCTION

Class of compounds containing $R^1R^2C=N-N=CR^3R^4$ fragment are called as azines. The compounds which possess azomethine group (>C=N-) are normally called as a Schiff bases.[1] These azines have attracted the attention due to its applications in many fields. Some azines containing hydroxyl group which can acts as fluorescene chemosensor had been reported.[2] Azines can be used as nano optical sensors.[3] Literature revealed that symmetric azines which are having phenyl and thienyl groups were found to be efficient for organic field effect transistors.[4]

Azine can be synthesized by various methods. Normally by the condensation of aldehydes or ketones with hydrazine gives azine. Benzalazine is the azine obtained by the condensation of benzaldehyde and hydrazine. Apart from normal refluxing, several methods had been reported in literature for the synthesis of benzalazine. Synthesis of benzalazines by the reaction of benzaldehydes with thiosemicarbazide had been reported.[5] Green synthesis with self-condensation was reported by Ali Reza Molla Ebrahimlo et.al.[6] Solvent free reactions by grinding had also been reported.[7,8]. Here benzalazine was synthesized using microwave irradiation and its electrochemical behavior was studied.

## 2. MATERIALS

Benzadehyde and hydrazine dihydrochloride were bought from spectrum chemicals and used as such. Ethanol was bought from Jiangsu Huaxi, China. Indium tin oxide (ITO) coated glass plates which were used in cyclic voltammetry, electrochemical impedance spectroscopy and chronocoulometry studies were supplied by e-Merck.

Nicolet Si5 spectrometer (ATR) (model P-4600) was used to record FT-IR spectra. Jasco V-630 spectrophotometer was used to record UV-Visible spectra. These spectra were taken in the range of 200-800 nm. X'pert PRO power X-ray diffractometer was used to get X-ray diffraction patterns in the2θ position range 10 to 80 with copper as the anode material. Cyclic voltammograms, chronocoulograms and electrochemical impedance measurements were done using CH electrochemical work station Sinsil CH 650.

## 3. EXPERIMENTAL

### 3.1 *Preparation of benzalazine*

0.02M of benzaldehyde was dissolved in ethanol and 0.01M of hydrazine dihydrochloride was dissolved in distilled water. Both of the solutions were mixed and kept in the domestic microwave oven for 3 minutes. Then the solution was cooled and poured into water. Yellow solid was obtained and filtered, washed several times with ethanol and water to remove any unreacted benzaldehyde and hydrazine dihydrochloride respectively. The yellow colour precipitate was recrystallized from ethanol and used for further characterization.

## 4. Results and discussion

### *4.1 FT-IR studies*

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# $B_{g^{**}}$-Closed Sets In Topological Space

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**ABSTRACT:** In this paper we introduce and study new class of sets called $B_{g^{**}}$-closed sets in topological spaces.Also we discuss some of their properties and investigate the relations between other closed sets.

**KEYWORDS:** b-closed, bcl(A,)$B_{g^{**}}$-closed,$B_{g^{**}}$-open,g**-closed,g**-open,g*-open

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## I. INTRODUCTION

In 1970, Levine introduced the concept of generalized closed set and discussed the properties of sets, closed and open maps, compactness, normal and separation axioms. Later in 1996 Andrjevic gave a new type of generalized closed set in topological space called b closed sets.. A.A.Omari and M.S.M. Noorani made an analytical study and gave the concepts of generalized b closed sets in topological spaces. In this paper, a new class of closed set called $B_{g^{**}}$-closed set is introduced to prove that the class forms a topology.Throughout this paper $(X,\tau)$ and $(Y,\sigma)$ represent the non-empty topological spaces on which no separation axioms are assumed, unless otherwise mentioned.Let A⊆X, the closure of A and interior of A will be denoted by cl (A) and int (A) respectively, union of all b-open sets X contained in A is called b-interior of A and it is denoted by bint (A),the intersection of all b-closed sets of X containing A is called b-closure of A and it is denoted by bcl (A).

## II. PRELIMINARIES:

Before entering into our work we recall the following definitions which are due to Levine.

**Definition 2.1:**

(1) a pre-open set **[11]** if A ⊆ int(cl(A)) and a preclosed set if cl(int(A)) ⊆ A.
(2) a semi-open set [**9**] if A ⊆ cl(int(A)) and and semi-closed set if int (cl(A)) ⊆ A.
(3) a semi-preopen set **[2]** if A ⊆ cl(int(cl(A))) and a semi preclosed set **[1]** if int(cl(int(A)))⊆A
(4) an α-open set **[15]**if A ⊆ int(cl(int(A))) and an α-closed set **[17]** if cl(int(cl(A))) ⊆ A.
(5)a b-open set**[3]** if A⊆cl(intA)∪ int (cl(A)) and a b-closed set if (cl(intA))∩ (int(cl(A))⊆A
(6)a generalised closed set (briefly g-closed) **[8]** if cl(A)⊆U whenever A⊆U and U is open in$(X, \tau)$ .The complement of g-closed set is g-open in X.
(7)a g*-closed**[20]** if cl(A)⊆U whenever A⊆U and U is g-open in$(X, \tau)$. The complement of g*-closed set is g*-open in X.
(8)a g**-closed**[19]** if cl(A)⊆U whenever A⊆U and U is g*-open. The complement of g**-closed set is g**-open in X.
(9) an generalised semi pre-closed set (briefly gsp-closed) **[6]** if spcl(A)⊆U whenever A⊆U and U is open in $(X,\tau)$
(10)a generalized b-closed set(briefly gb-closed )**[16]**if bcl(A)⊆U whenever A⊆U and U is open in X
(11)a generalized α closed set (briefly gα-closed)**[10]** if αcl(A)⊆U whenever A⊆U and U is α-open in X.
(12)a weakly closed set (briefly W-closed)**[18]** if cl(A)⊆U whenever A⊆U and U is semi-open in X
(13)a generalized pre-closed (briefly gp-closed)**[12]** if pcl(A)⊆U whenever A⊆U and U is open in X
(14) a semi generalized closed set(briefly sg-closed)**[5]**if scl(A)⊆U whenever A⊆U and U is semi open in X

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# Triple Connected Line Domination Number For Some Standard And Special Graphs

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**Abstract**

The concept of triple connected graphs with real life application was introduced by considering the existence of a path containing any three vertices of a graph G. A subset S of V of a non - trivial graph G is said to be a triple connected dominating set, if S is a dominating set and the induced subgraph <S> is triple connected. The minimum cardinality taken over all triple connected dominating set is called the triple connected domination number and is denoted by $\gamma_{tc}$(G). A subset D of E of a non- trivial graph G is said to be a triple connected line dominating set, if D is an edge dominating set and the edge induced subgraph <D> is triple connected. The minimum cardinality taken over all triple connected line dominating set is called the triple connected line domination number and is denoted by $\gamma_{tcl}$ (G). In this paper, we determine this number for some standard and special graphs.

***Keywords:*** *Triple connected, Triple connected domination number of a graph, Triple connected line domination number of a graph.*

## 1. Introduction

All graphs considered here are finite, undirected without loops and multiple edges. Unless and otherwise stated, the graph G = (V, E) considered here have p = $|V|$ vertices and q = $|E|$ edges. A set S of vertices in a graph G is called a dominating set if every vertex in V – S is adjacent to some vertex in S. The domination number $\gamma$ ($G$) of $G$ is the minimum cardinality of a dominating set of $G$. As an analogy to vertex domination, the concept of edge domination was introduced by Mitchell and Hedetniemi. A set $F$ of edges in a graph $G$ is called an edge dominating set if every edge in $E$ – $F$ is adjacent to at least one edge in $F$. The edge domination number $\gamma$ '($G$) of $G$ is the minimum cardinality of an edge dominating set of $G$. An edge dominating set $F$ of a graph $G$ is a connected edge dominating set if the edge induced subgraph $\langle F \rangle$ is connected. The connected edge domination number $\gamma'_c(G)$ of $G$ is the minimum cardinality of a connected edge dominating set of $G$. The concept of connected edge domination was introduced by Kulli and Sigarkanti. The concept of triple connected graphs with real life application was introduced by considering the existence of a path containing any three vertices of a graph G. G. Mahadevan et. al., introduced the concept of triple connected domination number of a graph. A subset S of V of a nontrivial connected graph G is said to be triple connected dominating set, if S is a dominating set and the induced sub graph <S> is triple connected. The minimum cardinality taken over all triple connected dominating sets is called the triple connected domination number and is denoted by $\gamma_{tc}$. A subset D of E of a nontrivial connected graph G is said to be a triple connected line dominating set, if D is an edge dominating set and the edge induced subgraph <D> is triple connected. The minimum cardinality taken over all triple connected line dominating sets is called the

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# Triple Connected Line Domination Number of a Graph

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**Abstract**

The concept of triple connected graphs with real life application was introduced by considering the existence of a path containing any three vertices of a graph G. In this paper we introduce a new domination parameter, called triple connected line domination number of a graph. A subset S of V of a non - trivial graph is said to be a triple connected dominating set, if S is a dominating set and the induced subgraph <S> is triple connected. The minimum cardinality taken over all triple connected dominating sets is called the triple connected domination number and is denoted by $\gamma_{tc}(G)$. A subset D of E of a non- trivial graph G is said to be a triple connected line dominating set, if D is an edge dominating set and the edge induced subgraph <D> is triple connected. The minimum cardinality taken over all triple connected line dominating sets is called the triple connected line domination number and is denoted by $\gamma_{tcl}(G)$. In this paper, we determine the bounds for general graph. Its relationship with other graph theoretical parameters is also investigated.

**Keywords:** edge domination, connected edge domination, triple connected graphs, triple connected domination number of a graph, triple connected line domination number of a graph.

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# G*α-LOCALLY CLOSED SETS AND G*α-LOCALLY CLOSED FUNCTIONS

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*ABSTRACT*

*The purpose of this paper is to introduce the concepts of g*α- locally closed sets and g* α- locally closed functions. We investigate their basic properties. We also discuss their relationship with already existing concepts.*

## INTRODUCTION

The notion of locally closed sets in topological space was introduced by Bourbaki [3]. Ganster and Reilly [6] further studied the properties of locally closed sets and defined the LC-continuity and LC-irresoluteness. In Literature many general topologists introduced the studies of locally closed sets. Balachandran *et al.* [1] introduced the concept of generalized locally closed sets and seven different notions of generalized continuities. In this paper we continue the study of generalizations locally closed sets and investigate the classes of G*α-Locally closed functions and study some of their properties.

## PRELIMINARIES

Throughout this paper $(X,\tau)$denotes a topological space with a topology $\tau$ on which no separation axioms are assumed unless otherwise mentioned.For a subset A of a space $(X,\tau)$,cl(A),int(A), $A^c$, P(X) denote the closure of A, the interior of A, the complement of A, the power set of X. We recall the following Definitions, Remarks, Corallary and Theorem which are prerequisite for this paper.

**Definition 2.1:** A subset A of a topological space $(X,\tau)$ is called

(1) a semi-open set [9] if $A \subseteq cl(int(A))$ and a semiclosed set if $int(cl(A)) \subseteq A$
(2) an α-open set if [12] $A \subseteq int(cl(int(A)))$ and a α-closed set if $cl(int(cl(A))) \subseteq A$
(3) a regular open set [16] if $int(cl(A))=A$ and regular closed set if $A= int(cl(A))$

**Definition 2.2:** A subset A of a topological space $(X,\tau)$ is called

(1) generalized closed (briefly g-closed) set [8] if $cl(A) \subseteq U$ whenever $A \subseteq U$ and U is open; the complement of g-closed set is g-open set.
(2) regular generalised closed set (briefly rg-closed) [13] if $cl(A) \subseteq U$ whenever $A \subseteq U$ and regular open in $(X, \tau)$; the complement of rg-closed set is rg-open set.
(3) α- generalised closed set (briefly αg-closed) [10] if $\alpha cl(A) \subseteq U$ whenever $A \subseteq U$ and U is Open in $(X, \tau)$; the complement of αg-closed set is αg-open set.
(4) g^-closed set [20] if $cl(A) \subseteq U$ whenever $A \subseteq U$ and U is semi open in $(X, \tau)$; the
(5) complement of g^-closed set is g^-open set.
(6) g*-closed set [22] if $cl(A) \subseteq U$ whenever $A \subseteq U$ and U is g*-open in $(X,\tau)$; the complement of g*-closed is g*-open set.
(7) $g^{\#}$-closed set [18] if $cl(A) \subseteq U$ whenever $A \subseteq U$ and U is αg-open in $(X,\tau)$; the complement of $g^{\#}$- closed set is $g^{\#}$-open set.
(8) g*α closed set if $\alpha cl(A) \subseteq U$ whenever $A \subseteq U$ and U is g*open in X.

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# A study on g*α-Compact and g*α-Connected Spaces

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**Abstract**

In this paper, we introduce the concept of g*α-compact space and g*α-connected space. We also investigate their basic properties. We also discuss their relationship with already existing concepts.

*Keywords: g*α-compact, g*α-separated, g*α-connected*

## 1. Introduction:

The notion of Compactness and connectedness are useful for fundamental notions of not only general topology but also of other advanced branches of Mathematics. Many researchers have investigated the basic properties of compactness and connectedness. In 1974,Das defined the concept of Semi connectedness in topology and investigated its properties. In 1981 Dorsett introduced and studied the concept of Semi compact spaces. Since then, Hanna and Dorsett , Ganster and Mohammad S. Sursak investigated the properties of semi compact spaces. The aim of this paper is to introduce the concept of g*α-connectedness and g*α-compactness in topological spaces.

## 2. Preliminaries:

**2.1. Definition** A subset A of $(X,\tau)$ is called

(i) g-closed**[5]** if $cl(A)\subseteq U$ whenever $A\subseteq U$ and U is open in $(X,\tau)$

(ii) g**-closed**[9]** if $cl(A)\subseteq U$ whenever $A\subseteq U$ and U is g*-open in $(X,\tau)$

**2.2. Definition** A function $f: (X,\tau)\to(Y,\sigma)$ is

said to be

(i) g*α-continuous**[10]** if $f^{-1}(V)$ is g*α Closed (g*α-open)set of $(X,\tau)$ for every Closed (open) set V of $(Y,\sigma)$.

(ii) g*α-irresolute**[10]** if $f^{-1}(V)$ is g*α closed set of $(X,\tau)$ for every g*α closed set V of $(Y,\sigma)$

(iii) g*α-resolute**[10]** if f(U) is g*α-open in Y whenever U is g*α-open in X.

# Subdivision of Integral Root Labelling Of Graphs

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*Abstract*— Let $G = (V, E)$ be a graph with $p$ vertices and $q$ edges. Let $f: V \to \{1,2, \dots q+1\}$ is called an Integral Root labeling if it is possible to label all the vertices $v \in V$ with distinct elements from $\{1,2, \dots q+1\}$ such that it induces an edge labeling $f^+: E \to \{1,2, \dots q\}$ defined as $f^+(uv) = \left\lfloor \sqrt{\frac{(f(u))^2+(f(v))^2+f(u)f(v)}{3}} \right\rfloor$ is distinct for all $uv \in E$. (i.e.) The distinct vertex labeling induces a distinct edge labeling on the graph. The graph which admits Integral Root labeling is called an Integral Root Graph.

## I. Introduction

By a graph we mean a finite undirected graph without loops or parallel edges. For all detailed survey of graph labeling, we refer to J.A. Gallian [1]. For all other standard terminology and notations we follow Harary[2]. The concept of Integral Root labeling has been introduced by V.L. Stella Aruptha Mary, and N.Nanthini [5]

In this paper we investigate the Subdivision of Integral Root labeling of graphs. We will provide brief summary of definitions and other information which are necessary for our present investigation.

### A. Basic Definition

*1) Definition: 1.1*

A walk in which $u_1, u_2, \dots u_n$ are distinct is called a path. A path on $n$ vertices is denoted by $P_n$ .

*2) Definition: 1.2*

The graph obtained by joining a single pendent edge to each vertex of a path is called a Comb.

*3) Definition: 1.3*

A Triangular Snake $T_n$ is obtained from a path $u_1, u_2, \dots u_n$ by joining $u_i$ and $u_{i+1}$ to a new vertex $v_i$ for $1 \le i \le n-1$.That is every edge of a path is replaced by a triangle $C_3$.

*4) Definition: 1.4*

A Quadrilateral Snake $Q_n$ is obtained from a path $u_1, u_2, \dots u_n$ by joining $u_i$ and $u_{i+1}$ to two new vertices $v_i$ and $w_i$ respectively and then joining $v_i$ and $w_i$. that is every edge of a path is replaced by a cycle $C_4$.

## II. Main Result

### A. Theorem: 2.1

Subdivision of any comb $P_n \odot K_1$ is an Integral Root graph.

*1) Proof*

Let $P_n \odot K_1$ be a graph obtained from a path $\{u_1, u_2, \dots, u_n\}$ by joining the vertex $u_i$ to pendant vertices $v_i$.

Let $G = S(P_n \odot K_1)$ be a graph obtained by subdividing all the edges of $P_n \odot K_1$.

Here we consider the following cases.

*2) Case: (i)*

Let $G$ be a graph obtained by subdividing each edge $u_i u_{i+1}$ of $P_n \odot K_1$.

Let $w_i$, $1 \le i \le n-1$ be the vertices which subdivide $u_i$ and $u_{i+1}$.

Define a function $f: V(G) \to \{1,2,3, \dots, q+1\}$ by

$f(u_i) = 3i - 1; \quad 1 \le i \le n;$
$f(v_i) = 3i; \quad 1 \le i \le n;$
$f(w_i) = 3i - 2; \quad 1 \le i \le n-1.$

Then it is found the edge labels are

$f^+(u_i v_i) = 3i - 1; \quad 1 \le i \le n;$
$f^+(u_i w_i) = 3i - 2; \quad 1 \le i \le n;$
$f^+(w_i u_{i+1}) = 3i; \quad 1 \le i \le n.$

Clearly $f^+$ is an Integral Root labeling.

The integral root labeling of $P_5 \odot K_1$ is displayed in the following figure.

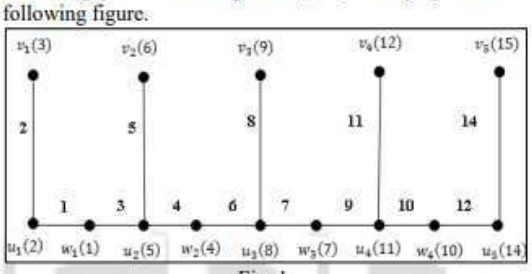


Fig. 1:

*3) Case: (ii)*

Let $G$ be a graph obtained by subdividing each edge $u_i v_i$ of $P_n \odot K_1$.

Let $t_i$, $1 \le i \le n$ be the vertices which subdivide $u_i$ and $v_i$.

Define a function $f: V(G) \to \{1,2,3, \dots, q+1\}$ by

$f(u_i) = 3i - 1; \quad 1 \le i \le n;$
$f(v_i) = 3i; \quad 1 \le i \le n;$
$f(t_i) = 3i - 2; \quad 1 \le i \le n.$

Then it is found the edge labels are

$f^+(t_i v_i) = 3i - 1; \quad 1 \le i \le n;$
$f^+(u_i t_i) = 3i - 2; \quad 1 \le i \le n;$
$f^+(u_i u_{i+1}) = 3i; \quad 1 \le i \le n-1.$

Clearly $f^+$ is an Integral Root labeling.

The integral root labeling of $P_5 \odot K_1$ is displayed in the following figure.

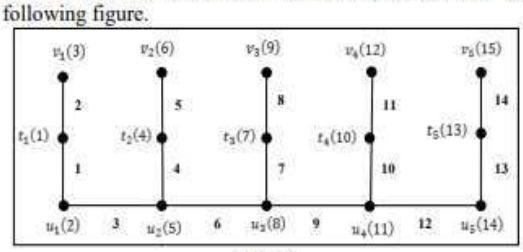


Fig. 2:

*4) Case: (iii)*

Let $G$ be a graph obtained by subdividing all the edge of $P_n \odot K_1$.

Let $w_i$, $1 \le i \le n-1$ be the vertices which subdivide $u_i$ and $u_{i+1}$.

Let $t_i$, $1 \le i \le n$ be the vertices which subdivide $u_i$ and $v_i$.

 

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# Results on Integral Root Labeling of $P_m \cup G$ Graphs

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**ABSTRACT:**

Let $G = (V, E)$ be a graph with $p$ vertices and $q$ edges. Let $f: V \to \{1,2, \dots q+1\}$ is called an **Integral Root labeling** if it is possible to label all the vertices $v \in V$ with distinct elements from $\{1,2, \dots q+1\}$ such that it induces an edge labeling $f^+: E \to \{1,2, \dots q\}$ defined as

$f^+(uv) = \left\lfloor \sqrt{\frac{(f(u))^2+(f(v))^2+f(u)f(v)}{3}} \right\rfloor$ is distinct for all $uv \in E$. (i.e.) The distinct vertex labeling induces a distinct edge labeling on the graph. The graph which admits Integral Root labeling is called an **Integral Root Graph**.

In this paper, we investigate the Result on Integral Root labeling of $P_m \cup G$ graphs like $P_m \cup T_n$, $P_m \cup Q_n$, $P_m \odot D(T_n)$, $P_m \odot D(Q_n)$, $P_m \cup (T_n \odot K_1)$, $P_m \cup (Q_n \odot K_1)$,

**KEYWORDS:**

$P_m \cup T_n$, $P_m \cup Q_n$, $P_m \odot D(T_n)$, $P_m \odot D(Q_n)$, $P_m \cup (T_n \odot K_1)$, $P_m \cup (Q_n \odot K_1)$,

**INTRODUCTION:**

The graph considered here will be finite, undirected and simple. The vertex set is denoted by $V(G)$ and the edge set is denoted by $E(G)$. For all detailed survey of graph labeling we refer to Gallian [1]. For all standard terminology and notations we follow Haray[2]. V.L Stella Arputha Mary and N.Nanthini introduced the concept of Integral Root Labeling of graphs in [8]. In this paper we investigate Result on Integral Root labeling of $P_m \cup G$ graphs. The definitions and other informations which are useful for the present investigation are given below.

**BASIC DEFINITION:**

**Definition: 3.1**

A walk in which $u_1, u_2, \dots u_n$ are distinct is called a **Path**. A path on $n$ vertices is denoted by $P_n$

**Definition: 3.2**

A **Triangular Snake $T_n$** is obtained from a path $u_1, u_2, \dots u_n$ by joining $u_i$ and $u_{i+1}$ to a new vertex $v_i$ for $1 \le i \le n-1$. That is every edge of a path is replaced by a triangle $C_3$

**Definition: 3.3**

A **Quadrilateral Snake $Q_n$** is obtained from a path $u_1, u_2, \dots u_n$ by joining $u_i$ and $u_{i+1}$ to two new vertices $v_i$ and $w_i$ respectively and It is found joining $v_i$ and $w_i$. That is every edge of a path is replaced by a cycle $C_4$.

**Definition: 3.4**

A **Double Triangular Snake $D(T_n)$** consists of two Triangular Snakes that have a common path.

**Definition: 3.5**

A **Double Quadrilateral Snake $D(Q_n)$** consists of two Quadrilateral Snakes that have a common path.

**Definition: 3.6**

A graph that is not connected is disconnected. A graph $G$ is said to be disconnected if there exist two nodes in $G$ such that no path in $G$ has those nodes as endpoints. A graph with just one vertex is connected. An edgeless graph with two (or) more vertices is disconnected

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# Integral Root Labeling of $P_m \cup G$ Graphs

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**ABSTRACT**

Let $G = (V, E)$ be a graph with $p$ vertices and $q$ edges. Let $f: V \to \{1,2, \dots q+1\}$ is called an **Integral Root labeling** if it is possible to label all the vertices $v \in V$ with distinct elements from $\{1,2, \dots q+1\}$ such that it induces an edge labeling $f^+: E \to \{1,2, \dots q\}$ defined as $f^+(uv) = \left\lfloor \sqrt{\frac{(f(u))^2+(f(v))^2+f(u)f(v)}{3}} \right\rfloor$ is distinct for all $uv \in E$. (i.e.) The distinct vertex labeling induces a distinct edge labeling on the graph. The graph which admits Integral Root labeling is called an **Integral Root Graph**.

In this paper, we investigate the Integral Root labeling of $P_m \cup G$ graphs like$P_m \cup P_n$,$P_m \cup (P_n O K_1)$, $P_m \cup L_n$,$P_m \cup (P_n O K_{1,2})$, $P_m \cup (P_n O K_{1,3})$, $P_m \cup (P_n O K_1) O K_{1,2}$

***Key words:*** *P_m∪P_n, P_m∪(P_n ʘK_1), P_m∪L_n, P_m∪(P_n ʘK_1,2), P_m∪(P_n ʘK_1,3), P_m∪(T_n ʘK_1), P_m∪(P_n ʘK_1)ʘK_1,2*

## INTRODUCTION

The graph considered here will be finite, undirected and simple. The vertex set is denoted by $V(G)$ and the edge set is denoted by$E(G)$. For all detailed survey of graph labeling we refer to Gallian [1]. For all standard terminology and notations we follow Haray [2]. V.L Stella Arputha Mary and N.Nanthini introduced the concept of Integral Root Labeling of graphs in [8]. In this paper we investigate Integral Root labeling of $P_m \cup G$ graphs. The definitions and other informations which are useful for the present investigation are given below.

## BASIC DEFINITIONS

**Definition: 3.1**

A walk in which $u_1, u_2, \dots u_n$ are distinct is called a **Path**. A path on $n$ vertices is denoted by $P_n$

**Definition: 3.2**

The graph obtained by joining a single pendent edge to each vertex of a path is called a **Comb.**

**Definition: 3.3**

The Cartesian product of two graphs $G_1$=($V_1$,$E_1$) and $G_2$=($V_2$,$E_2$) is a graph $G$=($V$,$E$) with $V$=$V_1$×$V_2$ and two vertices $u$=($u_1u_2$) and $v$=($v_1v_2$) are adjacent in $G_1$×$G_2$ whenever ($u_1$=$v_1$and $u_2$ is adjacent to $v_2$) or ($u_2$=$v_2$and $u_1$ is adjacent to $v_1$) .It is denoted by $G_1$×$G_2$.

**Definition: 3.4**

The Corona of two graphs $G_1$ and $G_2$ is the graph $G$=$G_1 \odot G_2$ formed by taking one copy of $G_1$ and $|(G_1)|$ copies of $G_2$ where the $i^{th}$ vertex of $G_1$ is adjacent to every vertex in the $i^{th}$ copy of $G_2$.

# Integral Root Labeling of Graphs

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**ABSTRACT**

Let $G = (V, E)$ be a graph with $p$ vertices and $q$ edges. Let $f: V \to \{1,2, \ldots q+1\}$ is called an **Integral Root labeling** if it is possible to label all the vertices $v \in V$ with distinct elements from $\{1,2, \ldots q+1\}$ such that it induces an edge labeling $f^+: E \to \{1,2, \ldots q\}$ defined as

$f^+(uv) = \left\lfloor \sqrt{\frac{(f(u))^2+(f(v))^2+f(u)f(v)}{3}} \right\rfloor$ is distinct for all $uv \in E$. (i.e.) The distinct vertex labeling induces a distinct edge labeling on the graph. The graph which admits Integral Root labeling is called an **Integral Root Graph**.

In this paper, we introduce Integral Root labeling and investigate Integral Root labeling of Path, Comb, Ladder, Triangular Snake and Quadrilateral Snake.

**KEY WORDS**

Integral Root labeling, Integral Root graph, Path, Comb, Ladder, Triangular Snake, and Quadrilateral Snake.

## INTRODUCTION

By a graph *G= (V (G), E (G))* we mean a finite undirected graph without loops or parallel edges. For all detailed survey of graph labeling we refer to Gallian[1]. For all other standard terminology and notations we follow Harary[2]. A graph labeling is an assignment of integers to the vertices or edges or both subject to certain conditions.

In this paper we investigate the Integral Root labeling of Path, Comb, Ladder, Triangular Snake, and Quadrilateral Snake.

## 2. BASIC DEFINITIONS

**Definition: 2.1**

A walk in which $u_1, u_2, \ldots u_n$ are distinct is called a **path**. A path on $n$ vertices is denoted by $P_n$ .

**Definition: 2.2**

A Closed Path is called a Cycle. A cycle on n vertices is denoted by $C_n$.

**Definition: 2.3**

The graph obtained by joining a single pendent edge to each vertex of a path is called a **Comb.**

**Definition: 2.4**

The Cartesian product of two graphs $G_1$=($V_1$,$E_1$) and $G_2$=($V_2$,$E_2$) is a graph $G$=($V$,$E$) with $V$=$V_1$×$V_2$ and two vertices $u$=($u_1u_2$) and $v$=($v_1v_2$) are adjacent in $G_1$×$G_2$ whenever ($u_1$=$v_1$and $u_2$ is adjacent to $v_2$) or ($u_2$=$v_2$and $u_1$ is adjacent to $v_1$) .It is denoted by $G_1$×$G_2$.

**Definition: 2.5**

The Corona of two graphs $G_1$ and $G_2$ is the graph $G$=$G_1$⊙$G_2$ formed by taking one copy of $G_1$ and $|(G_1)|$ copies of $G_2$ where the $i^{th}$ vertex of $G_1$ is adjacent to every vertex in the $i^{th}$ copy of $G_2$.

**Definition: 2.6**

The product graph $P_2 \times P_n$ is called a **ladder** and it is denoted by $L_n$.

Example:

Ladder graph of $L_4$ is given below

# Comparative study of green synthesized silver nanoparticles using leaf and stem extract of *Pauzolziabennettiana* and its antimicrobial activity

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**Abstract**

Green synthesis of AgNPs was achieved by using the aqueous extract of dried leaf and stem of *Pauzolziabennettiana* and $AgNO_3$.The silver nanoparticles were characterized by using ultraviolet-visible(UV-Vis) spectroscopy and Fourier transform infrared(FT-IR) spectroscopy. The bioreduction of silver ions was observed by the colour change from pale yellow to dark brown. UV-Visible spectrum showed absorbance peak at 442nm for AgNps of leaf extract and at 428nm for AgNps of stem extract.Fourier transform infrared spectroscopy (FTIR) analysis revealed that the phenoliccompounds, tannins and other secondary metabolites in the aqueous extracts may act as capping agent for the nanoparticle synthesis. Topographies obtained from Atomic force microscopy displayed the surface morphology of the silver nano particles. The synthesized nanoparticles showed active against bacteria such as *P.aeroginosa, H.influenzae, S.aureus, S.pyogenes* and fungi like *Aspergillus sp., Fusarium sp.*

**Keywords**:*Pauzolziabennettiana*, green synthesis, silver nanoparticles,UV, FT-IR, AFM etc

# Synthesis and characterization of silver nanoparticles using seaweed *Sargassam tennerimum* and their antioxidant activity

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**Abstract**

Green synthesis of nanoparticle prevents the atmosphere from pollution and its application in various fields has become the favourite pursuit of all researchers. Recent studies have shown that several marine plants have the ability to perform as bio-factories for the production of nanoparticles. Green synthesis of (AgNPs) was achieved by using the aqueous extract of Sargassam tenerrimum and AgNO3. Reduction of silver ions into silver nanoparticles was observed as a result of the colour change from pale brown to dark brown. The synthesized nanoparticles have been characterized by UV-Vis spectroscopy, FTIR and AFM techniques. UV-Visible spectrophotometer showed absorbance peak in range of 406 nm. Infrared spectrometer (FTIR) analysis was carried out to determine the nature of the capping agents in leaf extracts. The synthesized silver nanoparticles of aqueous extract of Sargassam tenerrimum have shown good potential source of antioxidant.

**Keywords**: Green synthesis, *Sargassam tenerrimum,* Silver nanoparticles, UV, FTIR, AFM etc.

## 1. Introduction

The silver nanoparticles are the most concentrated interest for research due to its potential in applications like antibacterial [1,2], antioxidant [3], antifungal [4], anticancer [5,6], catalysis [7], drug delivery [8] and photo sensors [9]. This has promoted research in the good known activity of silver ions and silver-based compounds, including silver nanoparticles. The biological methods are now widely being used because in case of chemical methods, the chemicals used can be highly toxic and the products are not eco-friendly.

Seaweeds are large algae (macro algae) that grow in saltwater or marine environment. Recent works have proved that extracts from seaweeds species exhibit activity against human, animal and plant pathogens [10]. As, seaweeds are rich in various secondary metabolites including quinones, flavonoids, saponins, and terpenoids, which are involved in the stabilization or reduction of the nanoparticles [11]. The green synthesis of

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# The Explication of Reality: Contiguity in Marilynne Robinson's Housekeeping.

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*Abstract*- **Realistic fiction can be broadly defined as the faithful representation of reality and the literary technique used by the realistic authors to highlight the real life as fiction. It's a genre to narrate stories, which can happen to any regular folks especially-the bored housewives, petty government officials, poor spinsters or poor teenagers-living ordinary lives. Realism in novels is an aesthetic mode to break the classical demands of art to portray life, "as it should be" and highlight life "as it is". Housekeeping (1981), the novel of contiguity for realism by the American realistic writer, Marilynne Robinson, a nominated debut, for the Pulitzer Prize (2005), represent the ordinary middle class 'life. This novel is the blend of, the strengths and weaknesses of the realistic character, Ruth and not the conflict between good and evil. It is so disciplined and so full of the thoughts and reflections of Ruth who changes the sense of life rather than to concentrate in her own sense, like her younger sister, Lucille. Housekeeping is regarded as a classic among the realistic novels and was made into a film, directed by Bill Forsyth (1987) with which the author Marilynne Robinson was very much pleased. The language of realistic literature is presented in this research paper with reference to the American realistic writer, novelist, and essayist, Marilynne Robinson.**

## I. INTRODUCTION:

American realistic movement started from the late 19th to the early 20th centuries and accomplished a tremendous growth in industrialization, economy, sociality, and culture. These changes attempted to portray the exhaustion and the cultural abundance of the lives in the ordinary American homes, Writers of this age used the feelings, textures, and sounds of the nation to influence their imaginative fictions. They created new stories about the real ordinary characters, and kept themselves away from the romantic etymology. Introduction of the new term of what it means, to be in the present, came into existence in the world of literature and was cordially baptized as Realistic literature.

Exhibiting life as some people experience it, realistic fiction deals with many convoluted problems and situations dealing with family problems. At its core, a good realistic fiction novel is about people, their problems, and their challenges. The characters in the novel should be believable and their language and actions should be appropriate for the setting of the story and should be a mirror of the culture and social class in which they live. An author writing about the characters of the working class setting has a responsibility to use appropriate words, slang, phrases, and dialects. However, while realism prevails, people are still considered with sensitivity; a good author is always aware of the fine line between categorization and realistic, objective writing. Although readers learn a lesson or a value such as being accountable for one's actions or accepting the cultural, physical, or sexual differences of other people, good realistic fiction novels do not prove it as a lord over the specific moral and ethical beliefs. Rather, they provoke readers to learn the importance of moral and ethical behavior by drawing their own solutions after they consider the events and facts from their personal perspectives using their own moral and ethical judgments. Some realistic fiction is expected to include violence; in fact, the genre would be failing in its mission if some novels did not mirror the violence that many young people experience. However, violence should be used appropriately and to make a point—never just for sensationalism. To Elliot Aronson (born January 9, 1932) an eminent American psychologist a good book "recognizes[s] the depth of darkness within teenagers and yet also assumes[s] that readers have the intelligence and the imagination to deal with ambiguity" (p. 120). Due to the popularity of contemporary realistic fiction among young adults, many excellent books are published every year.

Housekeeping, Marilynne Robinson's first novel, is a modern classic which won a Hemingway Foundation/PEN Award and was also nominated for a Pulitzer Prize in fiction. This realistic novel presented a new gateway and a breakthrough introducing modernism, what it means to be in present. Written in an elegant, lyrical and evocative style, Robinson's work had explored the themes of coherence, consciousness, casualty communication among family, home, culture and the natural world. Housekeeping first articulated these themes in a singular memorable voice. It is a novel that elaborates the different lifestyles. Predominant, as represented by Lucille and the residents of Fingerbone, and eccentricity, as represented by Sylvie and Ruth. The dichotomy between steadiness and instability forms the central conflict of the novel. The young Lucille isolate herself from the less respectable family and Ruth along with Sylvie, reject domesticity to favors the freedom of traveling.

In Housekeeping, Robinson introduces us to two young adolescent girls: Ruth, the narrator, and her younger sister,

 