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Research Article

Biochemistry

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ISOLATION, CHARACTERIZATION AND OPTIMIZATION OF PROCESS VARIABLES FOR PARTIALLY PURIFIED IMMOBILIZED A-AMYLASE ISOLATED FROM INDIAN CHICKEN FEATHER

SHOBHA G[1], SHASIDHARA K.S[2] AND ANANDA S[1*]

[1]Department of Biotechnology, Sapthagiri College of Engineering (Affiliated to VTU), Bengaluru, India
[2]Department of Genetic and Plant Breeding, Agricultural College, Hassan, India

ABSTRACT

Immobilization of α-Amylase produced by a *Pseudomonas* sp isolated from Indian Chicken feather was studied. Partially purified enzyme with 486.77 IU and specific activity of 811.28 units mg (protein)$^{-1}$ was used for immobilization study. An easily available and inexpensive 3% Sodium alginate matrix with easy immobilization gel entrapment procedure was used for trapping the enzyme showed 555.5 IU activity. The optimization was carried out to study the catalytic properties which showed the optimum pH, temperature and substrate concentration at pH 7, 45^{0}C and 16mg, respectively. The reusability of the immobilized enzyme preparation showed its use in continuous starch hydrolysis for up to 10 cycles. This immobilized enzyme can be used as a replacement of commercial enzyme since it has shown same greater operational flexibility and enzymatic activity of the pure enzyme.

KEY WORDS: Chicken feather, Calcium alginate, Immobilization, *Pseudomonas* sp.

*Corresponding author

ANANDA S
Department of Biotechnology, Sapthagiri College of Engineering
(Affiliated to VTU), Bengaluru, India

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RESEARCH ARTICLE

Production of Biofuel from Micro Algae (*Chlorella pyrenoidosa*) Using Vertical Reactor System and Effect of Nitrogen on Growth and Lipid Content

C. Soumya*, H.A. Pruthvi Avadhani, R. Vidhya and Vinutha moses
Dept. of Biotechnology, Sapthagiri College of Engineering, Bangalore, Karnataka, India
sowmyac@sapthagiri.edu.in*; +91 9538819506

Abstract

This study deals to enhance the biomass concentration and lipid content in microalgae with one of the existing method. Microalgae, *Chlorella pyrenoidosa* was grown autotrophically in vertical bioreactor for greater efficiency. Under high light intensity, this reactor experiences less photo inhibition and under low intensity, a vertical orientation captures more reflected light. It requires less land area for installation. The *Chlorella* inoculated to vertical bioreactor showed increase in growth, also the effect of different concentrations of nitrogen source (0-0.4 g/L KNO_3) on growth and lipid content were studied. Eventually, as the nitrate concentration in the medium decreased, biomass production also decreased, however the lipid content increased. Moreover, at the same concentration of nitrate source, lipid tends to accumulate more in stationary phase in comparison to exponential phase. Highest lipid accumulation of 15% in the culture with 0.05 g/LKNO_3 was recorded. This is one-fourth of basal nitrogen source concentration. The present study emphasized that nitrogen starvation was an effective approach to enhance lipid for biofuel production.

Keywords: *Chlorella pyrenoidosa*, vertical bioreactor, nitrogen source, biofuel, biomass.

Introduction

Algae have been used as a renewable feedstock for biofuel production for many years. The efforts have not been fruitful on larger scale, thus far, since it belongs to a large group of simple photosynthetic organisms. The variety of industrial applications of algae makes it a favorite choice, such as, rapid growth, higher solar conversion efficiency than most terrestrial plants. It is harvested either batch-wise or continuously almost throughout the year. About, 50 years of research have demonstrated the ability of several micro algal species to produce several chemical intermediates and hydrocarbons which can be converted into biofuels. The three major macromolecular components chiefly obtained from micro algal biomass are lipids, carbohydrates, and proteins that can be converted into various biofuels such as alcohols, diesel, methane and hydrogen. Biodiesel is derived from organic oils, plants or animals by the process of Transesterification to obtain monoalkylesters (Demirbas, 2007). The biodiesel trans-esterification reaction is very simple:

Triglyceride + 3 Methanol ←Catalyst→ Glycerine + 3 Methyl Esters (Biodiesel)

Alkali such as potassium hydroxide acts as a catalyst in the equilibrium reaction where an organic oil or triglyceride can be processed into biodiesel (Chisti, 2007). The triglyceride is a fat, a complex molecule used by plants and animals for storing food energy. There is a high level of reductions of soot, sulphur, unburned hydrocarbon and polycyclic aromatic hydrocarbon emissions produced from diesel in comparison to biodiesel that do not give out harmful emissions (Brown *et al.*, 1993; Xu *et al.*, 2006). Minor modifications can be done in biodiesels and used as unblended or blended with fossil petroleum diesels to run engines (Ma and Hanna, 1999). Biodiesel have twice the viscosity of petroleum diesel resulting in improvement of engine life (Hankamer *et al.*, 2007). It is biodegradable and low toxic (Crookes, 2006; Schneider, 2010), like petroleum diesel biodiesel also undergo complete combustion than gasoline; hence produce a cleaner burn (Hagg, 2007). Algae show higher growth rate than food crops, thereby producing hundreds of times more oil per unit area than conventional crops such as rapeseed, palms, soybeans, or jatropha (Atabani *et al.*, 2012). Harvesting cycle of algae is 1-10 d, cultivation permits several harvests in a very short time-frame, a strategy differing from that associated with annual crops (Chisti, 2007). In addition, algae can also be grown on land unsuitable for terrestrial crops, including arid and land with excessively saline soil minimizing competition with agriculture, thus requiring lesser capital investment on land. Vertical reactor is the most efficient type of reactors for algal cultivation. Gas exchange, liquid flow and exposure of cells to light are greatly improved in a vertical air lift reactor. Using an air lift reactor helps in circulating the cultures without moving parts or mechanical pumping, hence reducing the potentials of contamination and cell damage occurring due to shear. The high and low intensities of light play major role, while high intensity of light causes vertical less photo inhibition in reactor and vertical orientation capture more reflected light under low light intensity.

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A Technical Review On Hyperthermia

D.Kaarthika[1], Saranya.D[2]

[1]8th sem, Department of Biotechnology, Sapthagiri College of Engineering, Bengaluru-57.

[2]Assistant professor, Department of Biotechnology, Sapthagiri College of Engineering (Affiliated to VTU), Bengaluru-57.

ABSTRACT:
Hyperthermia has promising strategy to enhance apoptosis .The fundamental idea and the effects of heat on cancer cells are well known. However, the results obtained in therapy by hyperthermia (HT) alone have been only partially satisfactory. Treatment at temperatures between 40 and 44 °C is cytotoxic for cells in an environment with a low oxygen partial pressure and low pH, conditions that are found specifically within tumour tissues, due to insufficient blood perfusion. Under such conditions radiotherapy is less effective, and systemically applied cytotoxic agents will reach such areas in lower concentration than in well-per fused areas. Therefore, clinically it is preferred to use hyperthermia in combination with radiation therapy and chemotherapy. Hyperthermia can be applied by several methods: local hyperthermia by external or internal energy sources; regional hyperthermia by perfusion of organs or limbs or by irrigation of body cavities; and whole body hyperthermia. Which can be implemented by many heating methods, such as microwave, radiofrequency, laser and ultrasound. Number of studies have reported the combination of thermo-radiotherapy. Fortunately, phase II, III clinical trials have demonstrated that hyperthermia combination therapy is beneficial for local tumour control and survival in patients with high-risk tumours of different types. Consequently, much attention has been focussed on identifying agents among the conventional chemotherapeutics substances that can sensitise tumour cells to hyperthermia-induced damage with minimal effects on normal cells. In the review, we overviewed important mechanism of hyperthermia-induced apoptosis and the substance which can act as heat sensitizers' in cancer therapy.

KEYWORDS: Hyperthermia, radiotherapy, chemotherapy, microwave, ultrasound.

I.INTRODUCTION:

Heat are used in many cultures for almost any disease including cancer, first case of a patient with a breast tumor treated with hyperthermia was described more than 3,500 years ago. In 1866 a case was described where sarcoma disappeared after prolonged infection with a high fever causing bacteria. 1898 marked regression of carcinomas of the uterine cervix after local hyperthermia. Hyperthermia refers to an elevated body temperature(T_b) and is commonly categorized as mild (T_b=37.7-39.4 °C) to severe (T_b usually greater than 40 °C)[1]. Some degree of hyperthermia

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Research Article

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INVITRO INVESTIGATION OF ANTIBACTERIAL, ANTIOXIDANT ACTIVITY AND PHYTOCHEMICAL SCREENING OF STEAM DISTILLED FRUIT EXTRACT OF *TERMINALIA CHEBULA*

C.SOUMYA*[1], H.A.PRUTHVI AVADHANI[1], R.VIDHYA[2] AND VINUTHA MOSES[1]

[1]*Sapthagiri College of Engineering, Bangalore, Karnataka, India*
[2]*Sapthagiri Institute of Medical Science, Bangalore, Karnataka, India*

ABSTRACT

Nature has provided mankind with several plants which contain natural substances which cure diseases & promote health. Considering its medicinal property, extraction of oil from plant fruit materials of *Terminalia chebula* was used, as it proved to preserve the original qualities of the plant and also causes no degradation of the materials used. Steam Distillation process was used for the extraction of oil at lab scale using the available resources. The present study investigated, the phytochemical screening of *T chebula* extract, it revealed the presence of terpenoids, alkaloids,volatile acids and tannins .The antibacterial potential of fruit extract evaluated against clinical isolates showed the exhibition of antibacterial effect against all isolates. The antioxidant activity tested, showed a maximum inhibition in the range of 75-90% of 1mg/ml of extract and their IC_{50} value was found to be 620 µg/ml. The high content of total phenolic compound (440 µg GAE / mg of extract) revealed the antioxidant activity of the extract.

KEYWORDS: Steam distillation, phytochemical screening, anti microbial activity, anti –oxidant activity, *Terminalia chebula*

*Corresponding author

C.SOUMYA
Sapthagiri College of Engineering, Bangalore, Karnataka, India

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RESEARCH ARTICLE

BIOLOGICAL TRANSESTERIFICATION OF POULTRY WASTE TO BIODIESEL USING BACTERIA ISOLATED FROM CHICKEN FEATHER

Janhavi, S, Shobha, G*, Pallavi, P, Manya, K, Amrutha, V and Ananda, S
Department of Biotechnology, Sapthagiri College of Engineering, India

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Biodiesel, Chicken Feather, Lipase, Transesterificatio

ABSTRACT

With increase in consumption of poultry products, the waste products have been increasing in the poultry market. Disposing this waste has been a challenging task for the industry. As feathers contain 2-12% of fat, it can be used for producing biodiesel. Hence, using feathers as a source of biodiesel is also a solution to waste disposal. Lipase mediated Transesterification process for the production of biodiesel has been developed to overcome the chemical catalysts having several negative impacts on environment and downstream processing of by-products. This study aimed at, isolating bacteria from chicken feathers, extracting extracellular lipase and determining the efficiency in transesterifying the chicken fat from feathers into biodiesel. The data resulted from gas chromatography (GC) revealed the methyl esters of palmitic (C16:0), steric (C18:0), oleic (C18:1) and linoleic (C18:2) acids.

INTRODUCTION

Globally, the consumption of chicken meat has been continuously increasing. America, Asia and Europe have an approximate share of 38%, 37% and 18% respectively (Smutka *et al.*, 2012). Forecast stated, India's per capita consumption of poultry meat would be 2.2 kg per annum in 2014. This accounted for 16% rise since 2010, which also suggests a steady rise in consumption of poultry meat in India as per USDA International Egg and Poultry in India. Increase in consumption of chicken, increased feather waste production portraying a challenge to poultry industries to dispose waste produced. This waste can be used as source of raw material for producing biodiesel. The live bird weight comprises of feathers about 7-10%. These feathers contain 75-90% crude protein and 2-12% of fat (Kondamudi *et al.*, 2009).

Biodiesel can be produced from the extracted fat of chicken feathers by a process known as Transesterification. Most industries manufacturing biodiesel today, make use of chemical catalysts as they provide higher conversion rate of esters under low temperature, pressure conditions and also have short reaction time. However, the major drawback is the inability to obtain pure products and by-products using chemical catalysts thereby increasing economic investments into downstream processing (Lene Fjerbaek *et al.*, 2008; Kondamudi *et al.*, 2009; Kumar *et al.*, 2013). Biodiesel production using enzyme catalysts can be followed as it has several benefits including no soap formation, esterification of both free fatty acids and triglycerides in one step without need for washing, provision for higher quality glycerol, ability to handle large variation in quality of raw material and ability to work under milder conditions (Ghaly *et al.*, 2010).

MATERIALS AND METHODS

Chemicals

Media and chemicals for isolation and lipase assay like tributyrin, teen 20, ammonium sulphate, gum acacia, NaOH were of high grades and procured from Sigma and Hi-Media Laboratories, India.

Sample Collection

For the present study, chicken feather samples were collected from slaughter houses in Yeshwanthpur and Bone mill, Hesarghatta main road, Bangalore,India, in plastic bags for the isolation of lipase producing organisms and for the extraction of fat.

Isolation and screening of Lipase producing bacteria

For isolation of the lipase producing microorganisms, chicken feathers shredded into pieces and were soaked in sterilized water. It was then serially diluted and plated on Tween-20 media and observed for Zone of precipitation (Kumar *et al.*, 2012).Colony showing zone of precipitation on tween 20 media was selected and subjected on to sterile tributyrin agar media containing 10gms/l Tributyrin, 10gms/l Tryptone, 5gms/l NaCl, 5gms/l yeast extract and 17gms/l agar and incubated at 37^0Cand checked for zone of hydrolysis after 24 hr and 48 hr. Pure culture of these isolate was obtained by repeated streaking and maintained on nutrient agar slants (Kumar *et al.*, 2012; Prasad and Manjunath, 2012).

Identification of micro-organism

The isolate used for the study were selected on the basis of clear zone of hydrolysis on tributyr in agar media (TBA) and identified on the basis of biochemical characteristics according to Bergey's manual of determinative bacteriology.

Extraction and of partial purification of Lipase

Lipase was extracted from the production medium using coconut oil as the substrate, Olive oil 5%, peptone 5gm/l, yeast extract 5gm/l, glucose 5gm/l, NaCl 3gm/l and

* Corresponding author: Shobha, G
Department of Biotechnology, Sapthagiri College of Engineering, India

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Research Paper

Molecular docking studies of anti-cancerous candidates in *Hippophae rhamnoides* and *Hippophae salicifolia*

Talambedu Usha[a], Sushil Kumar Middha[b,f,✉], Arvind Kumar Goyal[c], Mahesh Karthik[d], DA Manoj[d], Syed Faizan[d], Peyush Goyal[e], HP Prashanth[f], Veena Pande[b]

[a]*Department of Biochemistry and Biotechnology, Maharani Lakshmi Ammanni College For Women, Bangalore, India;*
[b]*Bamboo Technology, Bodoland University, Assam, India;*
[c]*Department of Biotechnology, M S Ramaiah Institute of Technology, Bangalore, Karanataka, India;*
[d]*Department of Biotechnology, Bhimtal Campus, Kumaun University, Nainital, India;*
[e]*Ministry of Science, Govt. of India, New Delhi, India;*
[f]*Department of Biotechnology, Sapthagiri College of Engineering, Bangalore, India.*

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Abstract

Actinorhizal plants contain numerous antioxidants that may play a crucial role in preventing the formation of tumors. H-Ras p21, a member of the Ras-GTPase family, is a promising target to treat various kinds of cancers. An *in silico* docking study was carried out to identify the inhibitory potential of compounds of these plants against H-Ras by using Discovery Studio 3.5 and by using Autodock 4.2. Docking studies revealed that four compounds, isorhamnetin-7-rhamnoside, quercetin-3-glucoside-7-rhamnoside (present in *H. rhamnoides*), zeaxanthin, and translutein (present in *H. salicifolia*) significantly bind with binding energies -17.1534, -14.7936, -10.2105 and -17.2217 Kcal/mol, respectively, even though they slightly deviate from Lipinski's rule. Absorption, distribution, metabolism, excretion and toxicity (ADME/tox) analyses of these compounds and their stereoisomers showed that they were less toxic and non-mutagenic. Amongst them, isorhamntein-7-rhamnoside showed hepatotoxicity. Hence, these compounds can be further investigated *in vivo* to optimize their formulation and concentration and to develop potential chemical entities for the prevention and treatment of cancers.

Keywords: *Hippophae*, H-Ras, cancer, docking, Discovery Studio 3.5, *H. rhamnoides*, *H. salicifolia*

INTRODUCTION

Cancer is a complex disease that is characterized by aberrant cell division. It is caused by genetic variations and many environmental factors. It can invade vital organs and is a major harbinger of imminent patient death throughout the world[1]. Approximately 30% of the tumors are due to oncogenic mutations in any of the canonical *Ras* genes[2]. Ras belongs to the family of small GTPases, which are a group of enzymes that can bind to and hydrolyze guanosine triphosphate (GTP). Essentially, they work as molecular "on/off" switches. The guanosine diphosphate (GDP) bound conformation is the "off" state, and the GTP bound conformation is the "on" state that plays an important role in intracellular signaling which regulates processes such as cell proliferation, differentiation, cell apoptosis, and migration[3]. Hyperactivation of the Ras signaling pathway drives many cancers. The oncogenic mutations in many components of the Ras/MAPK

✉Corresponding author: Sushil Middha, Department of Biotechnology, Kumaun University, Nainital, India. Tel/Fax: +91-09886098267/+91-594-2248042, E-mail: sushil.middha@gmail.com.

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Reconfigurable filtering using FFT/IFFT for PLI and High frequency artifacts removal in Real Time ECG Signal

Prajna K B, Padmavathi C

Abstract— Heart related problems are increasing, as the life style of people is improving. ECG signal is an explicit representation of activity of the heart. Different heart related diseases and unusualness in the heart are detected by ECG signal. ECG signals are altered by various noise and artifacts, which degrades the quality of the signal, that affect the proper diagnosis and monitoring. Hence obligatory measures have to be taken remove the noises. Here reconfigurable FFT/IFFT filter is used, that can work as a comb filter or as a band-pass filter that can supress PLI and high frequency artifacts respectively. The main focus is to de-noise the ECG signal; and analysing the performance of the reconfigurable FFT/IFFT filter in ECG de-noising applications. Correspondingly, MATLAB and Verilog simulation results are established.

Index Terms— Reconfigurable FFT filter, PLI, High frequency artifacts, ECG signal, bradycardia, tachycardia, Holter moniter;

1 Introduction

HEALTH care is leading to new trends as the life style of the people is improving. Much of equipment have come ,that can be handled at home, with basic knowledge of the equipment, as result the patient need not stay for long in the hospital and cost of staying in hospital can also be reduced. Long term ECG monitoring can also be done at done with the help of portable ECG device Holter monitor.

These days people are suffering from a lot of diseases, especially heart related problems, irrespective of age group. ECG means Electro-cardio-graphic signals. ECG monitoring is most widely used for detection of many congestive heart failure diseases/ problems. Electrical activity of the heart produces a characteristic wave shape, which is called ECG. ECG signal is composed of 5 peaks P, Q, R, S, and T. P wave being the first part corresponds to depolarization of the atria during atrial systole. QRS complex is the second part, where Q corresponds to slight drop in voltage, R corresponds to a large hike in voltage, and S corresponds to large drop in voltage. This process of QRS generation takes place during Ventricular depolarization. The last part is of ECG signal is T wave which corresponds to repolarization, i.e., the relaxation phase [8]. Fig. 1 and Fig.2 show normal ECG signal and Electrical activity of heart.

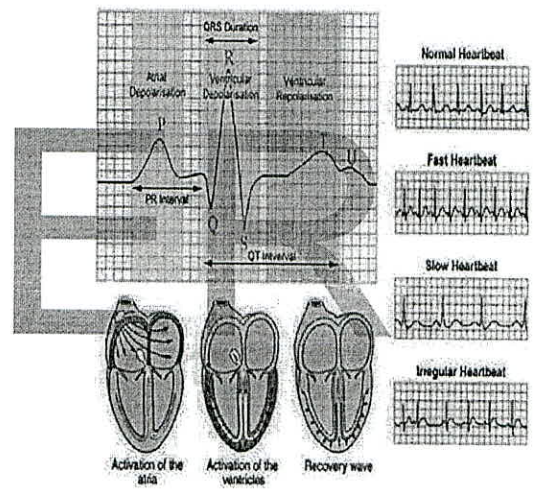

Fig.1 Normal ECG signal (*Source Google*)

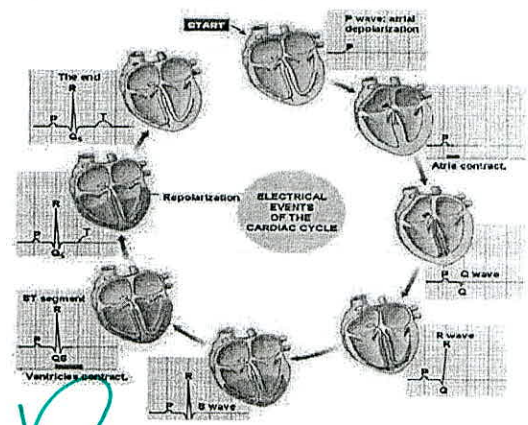

Fig.2 Electrical activity of the heart (*Source Google*)

- *Prajna K B is currently working as a Teaching Assistant in Alliance College of Enginerrring and Design ,Alliance University, Bangalore,India, PH-9886052528 E-mail: prajnakb295@gmail.com*
- *Padmavathi C is currently working as an Assistant Professor in Alliance College of Enginerrring and Design, Alliance University, Bangalore, India, PH-9066658565. E-mail: padmavathic87@gmail.com*

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DESIGN AND IMPLEMENTATION OF SEEDING AND FERTILIZING AGRICULTURE ROBOT

Shivaprasad B S[1], Ravishankara M N[2], B N Shoba[3]

[1]4th sem M.tech (VLSI Design & Embedded System), [2]Assosiate Professor, [3]Associate Professor
Department of Electronics and communication Engineering
Sapthagiri College of Engineering, Bangalore, 560057.

Abstract

In modern globalization, many technologists are trying to update a new development based on automation which works very rigidly, high effectively and within short time period. The progressive invention in agriculture system is becoming an important task especially because of rising demand on quality of agriculture products and declining labor availability in rural farming areas. The designed system is seeding and fertilizing agriculture robot using microcontroller. The aim of the designed system is to seeding, fertilizing and soil ph, temperature, moisture, humidity checking. The robot is controlled by remote. The designed system involves navigation of robot to the destination successfully and does the above functions. The direction of the robot is controlled via remote. The robot and the remote system are connected through internet system. 6 DC motors are used for navigation of the robot. The speed of the DC motors is controlled using controller. The solenoid is used to control seeding and fertilizing.

1. Introduction

India's record of progress in agriculture over the past four decades has been quite impressive. The agriculture sector has been successful in keeping pace with rising demand for food. The contribution of increased land area under agricultural production has declined over time and increases in production in the past two decades have been almost entirely due to increased productivity. - Contribution of agricultural growth to overall progress has been widespread. Increased productivity has helped to feed the poor, enhanced farm income and provided opportunities for both direct and indirect employment. The success of India's agriculture is attributed to a series of steps that led to availability of farm technologies which brought about dramatic increases in productivity in 70s and 80s often described as the **Green Revolution** era 1]. The major sources of agricultural growth during this period were the spread of modern crop varieties, intensification of input use and investments leading to expansion in the irrigated area. In areas where 'Green Revolution' technologies had major impact, growth has now slowed. New technologies are needed to push out yield frontiers, utilize inputs more efficiently and diversify to more sustainable and higher value cropping patterns". At the same time there is urgency to better exploit potential of rain fed and other less endowed areas if we are to meet targets of agricultural growth and poverty alleviation. Given the wide range of agro ecological setting and producers, Indian agriculture is faced with a great diversity of needs, opportunities and prospects.

Future growth needs to be more rapid, more widely distributed and better targeted. These challenges have profound implications for the way farmers' problems are conceived, researched and transferred to the farmers. "On the one hand agricultural research will increasingly be required to address location specific problems facing the communities on the other the systems will have to position themselves in an increasingly competitive environment to generate and adopt cutting edge technologies to bear upon the solutions facing a vast majority of resource poor farmers".

The robotic systems play an immense role in all sections of societies, organization and industrial units. The objective of the project is to develop a microcontroller based system that helps in on-farm operations like seeding and fertilizing at pre-designated distance and depths with all applicable.

Traditional Sowing Methods

Traditional methods include broadcasting manually, opening furrows by a country plough and dropping seeds by hand, and dropping seeds in the furrow through a bamboo/meta funnel attached to a country plough (Pora). For sowing in small areas dibbling i.e., making holes or slits by a stick or tool and dropping seeds by hand is practiced. Multi row traditional seeding devices with manual metering of seeds are quite popular with experienced farmers.

2. Proposed system

The measurement of the moisture of soil, temperature of soil and ph value of soil, performing of the seeding and fertilizing in agriculture field is designed in the agriculture Robot. Instead of using line follower, obstacle detecting sensor in the proposed system camera is used for live streaming. Agriculture robot can be control by the internet using raspberry pi. Live steaming can see by computer by typing ip address of raspberry pi and password then it can be control the robot by pressing controlling key in the system. Rhex rover robot is replaced by the wheeled robot.

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Efficient Brightness Preserving Enhancement Algorithm for Images in Consumer Electronic Devices

Varshini K.
M.Tech. Student, Department of ECE, Sapthagiri College of Engineering, Bangalore, India
Agalya P.
Associate Professor, Department of ECE, Sapthagiri College of Engineering, Bangalore, India
B. N. Shobha
Associate Professor, Department of ECE, Sapthagiri College of Engineering, Bangalore, India

Abstract:
Image enhancement improves the image quality so that the resultant image is better than the original image for a specific application or set of objectives. Image enhancement is the task of applying certain alterations to an input image so as to obtain a more visually pleasing image. A simple and effective enhancement method, the Histogram Equalization (HE) technique has its major disadvantage of hampering the mean brightness of the image. So, it is not likely to use HE in consumer electronic products. The main objective of this paper is to propose an efficient enhancement algorithm for images in consumer electronic devices which will produce a vivid colored enhanced image with better PSNR. In this regard, a novel technique which is a modification of Minimum Mean Brightness Error Dynamic Histogram Equalization (MMBEDHE) has been proposed.

Keywords: *HE, PSNR, MMBEDHE*

1. Introduction

The goal of image enhancement is to process an image so that the outcome is suitable than the original image for a spe application. This improves the visual interpretability for human viewers and also increases the actuity of information contained w the image. Digital color image enhancement, preserving brightness is an emerging research issue in the field of digital i processing for consumer electronics. Histogram Equalization (HE) is the most reliable, acceptable and commonly applied algorith perform image enhancement. HE also flattens and stretches the dynamic range of image histogram resulting in overall image cor enhancement. In HE, frequently occurring gray levels in the image dominate other gray levels with lower frequency of occurr This results in loss of brightness of the original image. HE is not used in consumer electronics like television, digital camera and v surveillance as it considerably changes the brightness of an input image and it results in undesirable artifacts in the output image apply the image enhancement techniques in consumer electronics, it is recommended that the image enhancement techniques sh be able to maintain the original brightness of the input image in the output image.

In the early researches, there were several attempts on image contrast enhancement to overcome these difficulties.

Bi Histogram Equalization (BBHE) proposed by Kim et al [1] in which image histogram is divided into two parts based on the n value. Dualistic Sub – Image histogram Equalization (DSIHE) [3] method decomposes the images aiming at the maximization o Shannon's entropy of the output image. Recursive Mean Square Histogram Equalization (RMSHE) and Minimum Mean Square Bi – Histogram Equalization (MMBBHE) are the extensions of BBHE.

In all these methods, the brightness preservation was not robust as they were capable of preserving the brightness only to a cer extent. An innovative solution for image enhancement called Minimum Mean Brightness Error Dynamic Histogram Equaliza (MMBEDHE) has been developed by M.F. Hossain et al. This method is based on minimization of the mean brightness error whi used in consumer electronics. MMBEDHE considers two properties: Preservation of brightness and improvement of PS MMBEDHE applies Dynamic HE to partition the input histogram into sub – histograms in order not to contain any dominating pa them. The advantages of MMBEDHE are overall contrast enhancement and very low computational load. So, it is validated t superior to other brightness enhancement techniques mentioned above. Most of the existing image enhancement methods suffer f lack of brightness preservation, produce more brightness errors and need more memory for the enhancement of color image consumer electronics [6].

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Polypropylene Capacitors with High Crystalline Segmented Offer Increased Energy Density

R. SHIVAKUMARA SWAMY[1], Dr. V. VENKATESH[2], and Dr. K. N. RAVI[3]

[1]Asst. Professor, Dept. of EEE Acharya Institute of Technology, Soldevanahalli, Bangalore - 560107, India

[2]Professor, ECE Dept. & Principal Channabasaveshwara Institute of Technology, Gubbi,Tumkur - 572216, India

[3]Professor & HOD, Dept. of EEE Sapthagiri College of Engineering, Hesaraghatta, Bangalore - 560090, India

ABSTRACT: The component of choice for many more DC Filter, energy storage and similar applications for the 21st century is High crystalline segmented metallized polypropylene capacitors are. With the introduction of higher crystalline and higher temperature dielectric, the size of segmented metallized polypropylene capacitors were reduced at least 33 percent while increasing the life expectancy and reducing the costs over previous designs. Higher temperature operation of at least 110°C is also accomplished with this material type. Capacitors are now manufactured using the combined segmented and high crystalline metallized polypropylene technology that allow denser power system packaging and lower manufacturing costs than other capacitor choices.

KEYWORDS: Polypropylene Capacitors, Energy Density.

1 INTRODUCTION

Film capacitors are known to have performance traits superior to other capacitor types. These traits include lower heat dissipation and longer life. For applications requiring large capacitance values in DC applications, aluminum electrolytic capacitors were often chosen over film types because film capacitor volumetric efficiency was not sufficient. Film capacitors are now produced using high crystalline segmented polypropylene that offer energy densities acceptably close to those achieved with aluminum electrolytics.

Most of the size improvements prior to the late 1990's focused on metallization techniques with the greatest improvements in large DC film capacitor banks from segmented polypropylene. This revolution reduced volumes by over 50%. The 21st century brought high crystalline polypropylene with another volumetric improvement of 33% due to increased voltage capabilities. The additive effects of these improvements are large film capacitors in many voltage levels less then one third the size of product produced in the early 1990's.

Polypropylene has become the dominant dielectric for metallized film capacitors. This is due to the large amount of film required to justify any volume manufacturing of a dielectric film and the advantagous dielectric properties of biaxially oriented polypropylene (BOPP) film typically used in capacitors. BOPP has a higher dielectric strength than a major alternative film, PET. This is believed to be because the crystalline phase is aligned in the plane of the film. This puts the electric field in the direction of low conductivity. [1].

The advances in metallization techniques that have been previously adopted included the use of heavy edge metallization. This is where the body is made lighter in metallization to increase voltage capability while the edge remains heavier to maintain current handling capability. Segmented film was subsequently adopted with the major improvements in segmented patterns and deposition processes in the 1990's. Segmented film involves dividing the film capacitor into many

Corresponding Author: R. SHIVAKUMARA SWAMY

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057

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Situational Analysis of Distributed System and its Effectiveness in Area of Power System

G.Raghavendra
Associate. Prof: Dept of Electrical & Electronics Engg.
R R Institute of Technology
Bangalore, India

Manjunath Ramachandra, Ph. D.
Senior domain specialist
Philips Innovation Campus, Nagavara, Bangalore
560045

ABSTRACT
With the rising need of the power supply in the various part of the world along with growing usage of power driven devices, the area of power sector is on constant look out of an effective solution. In this arena, distributed power system has evolved as a great boon to the cater up the needs of the power supply and thereby avoid the occurrences of the power outage. Compared to the conventional power generation system, distributed generation system reduces the cost as well as complexities that occur in power generation and transmission network. This paper performs the situational analysis of the existing system of the distributed power system and reviews some of the frequently adopted techniques along with the brief discussion of existing system to extract the research gap in this area. The outcome of the study will assist the researcher to have better visualization of the contribution of the past studies.

Keywords
Distributed Power System, Distributed Generation, Power Transmission

1. INTRODUCTION
In the area of power generation and supply, distributed network plays a vital role to captivate the dynamic power requirements of the customers. Basically, the power generation system is categorized into centralized and decentralized system. The centralized generations are basically adopted in the industrialized nations where the massive amount of power is generated from natural gas, nuclear, coal, and various plants. However, when it comes to transmission over an extended area, it requires more energy to make up for transmission as well as distribution losses. Although centralized generation has some of its advantage but it cannot cater up the growing demands of the electricity over geographic area. Unfortunately, the literatures have never recognized distributed generation for any formal definition until now [1]. Technically, distributed generation refers to generation of power at the point of consumption. The advantage of using distributed generation is that when the system generates power on the precise location of consumption (decentralized) and not centrally, than it can significantly eliminates the cost, inter-dependences, complexities, as well as inefficiencies associated with the distribution and the transmission system [2]. The importance of the distributed generation of power supply can be elaborated taking the increasing demands of population in our country India. From the last 5 years, India still requires higher demands of electricity with the rise of urbanization and production houses. Even at present, there are various remote parts of India, where either there is no electricity or persistent load shedding exceeding more than intolerable hours sometimes. Because of such scarcity, the cost of electricity went high in our country. Provided quality power supply in such areas is not possible from centralized power system but it requires highly decentralized power supply system. This is because distributed generation has some of the significant advantages [3] as follows:

1.1 Easy Customization
Distributed Generation (DG) is much easier to modify, re-design as well as substitute a smaller module allocated to the unique portion of the power system. Tailoring the supply delivery module in usual load voltages are quite easy as paralleling the desired number of standard power modules required for a specific need.

1.2 Efficient Maintenance
Using DG system, it is quite efficient to perform localization as well as isolation of faults as compared to the efficient parallel system, hot swapping with minimum downtime.

1.3 Standardization
The primary goal of the DG system is to provoke the availability of the standardized modules as well as designs for catering up the power demands of various applications. Hence, better standardization in DG system leads to effective development time as reduced engineering cost.

1.4 Packaging
DG system uses effective and modernized hardware system for high power processing that drastically reduces the greater dimension of the conventional hardware used in power supply system.

1.5 Greater Reliability
DG system offers greater extent of reliability owing to its advanced design of the distribution system. Even with increased used of components in power supply system, DG system offers minimized stress in both thermal as well as electrical component leading to be better reliability.

1.6 Efficiency
DG system offers better reduction in internal resistance as the load voltages reduces and that's why it becomes much more efficient to generate high current with optimal voltage as per the requirement of the customers. It also supports the power demands of the distributed units with massive voltages too.

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Finite Element Analsis of a Diesel Engine Connecting Rod

Ramesh .N. G[1*]

[1] Asst. Professor, Dept of Mechanical Engg, Sapthagiri College of Engineering, Bangalore-57
rameshng87@gmail.com

Abstract

The connecting rod forms an integral part of an internal combustion engine. It acts as a linkage between piston and crank shaft. The main function of connecting rod is to transmit the translational motion of piston to rotational motion of crank shaft. The function of the connecting rod also involves transmitting the thrust of the piston to the connecting rod. Connecting rod used in automotive engines is a critical component which comes under the influence of different types of loads in operation. Fatigue loading is one of the prime causes contributing to its failure. Failure and damage are also more in connecting rod, so stress analysis in connecting rod is very important. In this study, detailed load analysis was performed on connecting rod, followed by finite element method in Ansys . In this regard, in order to calculate stress in different part of connecting rod, the total forces exerted connecting rod were calculated and then it was modeled, meshed and loaded in Ansys software. The maximum stresses in different parts of connecting rod were determined by analysis.

Keywords: Connecting rod, FEA, Fatigue analysis, Stress concentration factor, Ansys.

Introduction

The internal combustion engine is an engine in which the combustion of a fuel (normally a fossil fuel) occurs with an oxidizer (usually air) in a combustion that is an integral part of the working fluid flow circuit. In an internal combustion engine (ICE) the expansion of the high-temperature and high-pressure gases produced by combustion apply direct force to some component of the engine. The force is applied typically to pistons, turbine blades, or a nozzle. This force moves the component over a distance, transforming chemical energy into useful mechanical energy. Some of the important components of the internal combustion engine are Cylinder, piston, piston rings, connecting rod, crankshaft etc.

Conversion of the piston's reciprocating motion into the rotational motion of the crankshaft is the major function of the connecting rod. Since the connecting rod has two ends, one of its ends is connected to the piston by the piston pin, and the other end moves in a circular shape or revolves with the crankshaft and is separated in a way that it allows it to get clamped around the crankshaft as shown in figure 1. There are different type of loads acting on connecting rod during operation, i.e. axial compressive load, bending loads and inertia loads due to reciprocating masses.

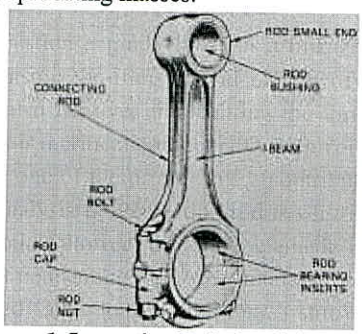

Figure 1 Connecting Rod of an I.C. Engine

Problem definition and methodology

The diesel engine connecting rod is a high volume production critical component. It connects reciprocating piston to rotating crankshaft, transmitting the thrust of piston to the crankshaft. Every engine requires at least one connecting rod depending upon the number of cylinders in the engine. For the analysis of I.C. engine connecting rod the most critical area is considered and accordingly

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A EXPERIMENTAL APPROACH ON GASIFICATION OF CHICKEN LITTER WITH RICE HUSK

B.S.Dayananda[1] , S H Manjunath[2] , Girish K.B[3], L.K.Sreepathi[4]

Associate Professor, Department of Mechanical Engineering, Sapthagiri College of Engineering, Bangalore, India[1]

Professor, Department of Mechanical Engineering, Sapthagiri College of Engineering, Bangalore, India[2]

Associate Professor, Department of Mechanical Engineering, Sapthagiri College of Engineering, Bangalore, India[3]

Professor , Department of Mechanical Engineering, Jawaharalal.Nehru.National.College of.Engg, Shimoga, India[4]

Abstract: In India, the poultry industry is growing at a faster rate. The increase in the demand for chicken meat and eggs has led to the faster growth of the poultry industry. Poultry farms are largely located in rural areas which face scarcity of power. The energy requirements of poultry farms or the poultry industry can be met by utilizing the energy content of the chicken litter through energy conversion technologies. The fluidized bed gasification technique is right choice to utilize chicken litter as energy source. In this paper, a discussion on gasification of chicken litter for different proportions of rice husk is made and was found that the blend of 30% RH and 70% CL was found to yield best quality producer gas.

Key words: Chicken litter, Rice Husk, Gasifier, Fluidized bed Gasification.

I. INTRODUCTION

In India, the poultry industry is growing at a faster rate. The increase in the demand for chicken meat and eggs has led to the faster growth of the poultry industry [1]. India occupies the third position in the world in chicken meat production and the ninth position in egg production [2]. These industries produce a large amount of waste. It has been estimated that 10,000 birds can produce around 137 tons of dried litter per year [3].

Rice husk is an assured bi-product of agricultural production, mainly available in developing countries, as paddy is their primary food product. The husk produced after extraction from paddy is presently utilized for heating and the rest is used in poultry farms for spreading over the beds [4]. The large quantity of husk obtained from rice industries is utilized as building material, for making panel boards and doors, whereas its thermal and physical properties reveal that it can be utilized as an energy source [5]. The annual output of world energy from rice husk is 1.2×10^9 GJ. Nearly 90,000 rice mills are operating in India, which can produce 10 -20 tons of husk per hour. India alone can produce 22 million tons of rice husks per year. Nearly 100 million tons of rice husk are produced worldwide, 90 percent of it being accounted from developing countries [6, 7]. In the poultry farms, the waste is usually available in the form of a mixture of chicken litter, rice husk, saw dust, etc. This waste has to be disposed of in proper manner. Composting is one way of disposal of chicken litter. If the composted litter is scattered across the fields and as a result, mixes with water, nitrate contamination of water results. The consumption of such water by human beings leads to cancer, lung diseases, etc [8]. Hence chicken litter cannot be utilized as a fertilizer. Poultry farms are largely located in rural areas which face scarcity of power. The energy requirements of poultry farms or the poultry industry can be met by utilizing the energy content of the chicken litter through energy conversion technologies. The energetic value of chicken litter ie., 10,256 kJ/kg indicates that the chicken litter can be utilized as an energy source. [9]. Anaerobic digestion is one method of converting chicken litter into energy. The high Ph value of chicken litter decreases the rate of producer gas production from the digester. Hence it is not advisable to utilize chicken litter as an energy source in the anaerobic digestion process [10]. The high moisture content, the high ash content and the low ash fusion temperature renders the fluidized bed gasification technique the right choice to utilize chicken litter as energy source [11]. In this regard an experimental study on gasification of chicken litter with rice is made in a fluidized bed gasifier.

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The Effect of Heat Treatment on the Dry Sliding Wear Behaviour of Grain Refined and Modified Al-7Si-0.45Mg Reinforced with B_4C

Dr.M.H.Annaiah[1], Dr.A.S.Ravindran[2], Dr.C.N.Chandrappa[3]

Professor and Head, Department of Automobile Engineering, Acharya Institute of Technology, Bangalore, Karnataka, India[1]

Professor and Head, Department of Mechanical Engineering, Atria Institute of Technology, Bangalore, Karnataka, India[2]

Professor, Department of Automobile Engineering, Acharya Institute of Technology, Bangalore, Karnataka, India[3]

ABSTRACT: In this research paper, Grain refined and modified Al-7Si-0.45Mg cast through liquid metallurgy and reinforced with B_4C was heat treated (T_6). The heat treatment consists of solutionising alloy/composites at 540°C for 9 hours, quenching in water at 70°C and ageing for 5 hours at 180°C. The wear studies were carried out on both heat treated and untreated alloy/composites as per ASTM standards. A quantum enhancement in wear resistance was observed in heat treated alloy/composites compared to alloys/composites without heat treatment. The improvement in wear resistance may be attributed to the change in microstructure due to Grain refinement and modification, uniform distribution of hard particles of Boron Carbide in the matrix and spherodisation of Silicon particles due to Heat treatment.

KEYWORDS: Heat Treatment, Boron Carbide, Dry sliding Wear.

I. INTRODUCTION

Aluminium-Silicon alloys and their composites are known for their excellent combination of characteristics namely, low density, excellent castability, formability, good mechanical properties, cryogenic properties and good machinability. Aluminium and its alloys have wide range of applications particularly in automobile, aerospace and marine sectors on account of their light weight, good surface finish, resistance to wear and corrosion high strength-to-weight ratio. As components with complex geometriescan be produced cost effectively, they find enhanced utility particularly in Aerospace sectors. Reduction in weight due to low density leads to increased load capacity, increased mileage, reduced pollution of environment and higher profits to the manufacturers. The low melting temperature, ease of handling, easy formability, has led to increased demand for aluminium alloy/composites components.

II. MATERIALS

Grain refined and modified Al-7Si-0.45Mg were cast in pre- heated permanent mold in the form of cylindrical rods of diameter 25 mm and length 300 mm. They were further heat treated (T6).Test specimens for hardness and wear were obtained by machining the rods and tested as per ASTM standards.

III. METHODOLOGY

a. Microstructure

Microstructure specimens were prepared as per standard metallurgical procedures, etched in etchant prepared using 90 ml water, 4 ml HF, 4 ml H_2SO_4 and 2g C_r0_3 and photographed using Optical Microscope.

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A Review of Mechanical Characterisation of Friction Stir Welded Magnesium Alloys

Dr.C.N.Chandrappa[1], Dr.M.H.Annaiah[2], PhaniBhushan.M.V[3]

Professor, Department of Automobile Engineering, Acharya Institute of Technology, Bangalore, Karnataka, India[1]

Professor and Head, Department of Automobile Engineering, Acharya Institute of Technology, Bangalore, Karnataka, India[2]

Professor, Department of Mechanical Engineering, Amrutha Vishva Vidyapeetam, Bangalore, Karnataka, India[3]

ABSTRACT: Welding is a process of joining similar metals by the application of heat and pressure. Welding process is used commonly to get the advanced properties of the metals like Mild steel, Aluminum, Copper, Magnesium etc. Among these metals Magnesium has the lowest density (1.78 g/cm^3) and it has good mechanical properties like high strength to weight ratio, good damping capacity, and good corrosion resistant compared to Mild steel. But Magnesium is highly flammable which requires gas shielding to prevent the oxidation, which forms Magnesium oxide, an undesirable compound. Friction Stir Welding, a Solid State Welding process uses the heat developed by the rotating tool, due to the friction the heat developed is used to join the metals, where the weld zone temperature zone is comparatively lower than conventional welding .The retention of the mechanical characteristics is achieved in FSW process. But problems in FSW like Pin, Tunnel and Flash defects are produced in weld zone. These problems and Weld quality, microstructure, mechanical characteristics of the weld zone can be controlled by varying the FSW parameters such as Tool rotational speed, Tool traverse speed, Tool Axial force, Tool shoulder to tool pin diameter ratio, tool profile etc. In this project we are going to study the effects of these parameters in Friction Stir Welding of Magnesium alloys.

KEYWORDS: Friction Stir Welding, Tool traverse speed, Tool Axial Force, Tool shoulder to tool pin diameter ratio.

I. INTRODUCTION

Magnesium is sixth abundant material in nature. It is the potential candidates to replace the aluminum alloys in many structural applications owing to some of their own unique properties. Normally, magnesium has the poor corrosion resistance. To increase the corrosion resistance zinc and aluminum is added in the magnesium. It is considered as a advanced materials in terms of energy and environmental pollution.

Constituents of AZ31B alloys

Al	-	2.5 - 3.5%
Zn	-	0.7 - 1.3%
Mn	-	0.2 – 1.0%
Mg	-	balance%

Mg alloys are having low melting temperature around 650^{0}c.in the conventional Welding process the mg material is melted and solidified. In the time of melting the proper gas shielding is required because the Magnesium oxide is having explosive in nature. So the magnesium alloys have to be welded without reaching the melting temperature. Problems in Conventional Welding were: Hot Cracking .Wide range of Heat Affected Zone, Retention of parent Metal

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Spectroscopic Method for the Determination of Drugs Containing Phenol Group by Using 2, 4- Dinitro Phenylhydrazine

Roopa Kothathi Papanna[1]*, Jayanna bidarur Krishne gowda[2], Padmarajaiah Nagaraja[3]
1. R & D centre, Bharathiar university, Coimbatore - Tamilnadu.
2. Department of chemistry, B.N.M. Institute of technology, Bangalore.
3. Department of studies in chemistry, University of Mysore, Manasagangotri Mysore.

ABSTRACT

A spectroscopic method has been proposed for the determination of two phenolic drugs; Phenylephrine hydrochloride and Pyridoxine hydrochloride. The method is based on the oxidation of 2, 4- Dinitro phenylhydrazine and coupling of the oxidized product with drugs to give intensely colored chromogen. Under the proposed optical condition, Beer's law was obeyed in the concentration range of 2.5 - 30 μg $mL^{-1}$and 5 – 20 μg mL^{-1} for Phenylephrine Hydrochloride and Pyridoxine Hydrochloride respectively. The limit of detection (LOD) and limit of quantification (LOQ) were 0.3, 1.95 μg mL^{-1} and 0.95, 0.64 μg mL^{-1} in the same order. No interference was observed from common pharmaceutical adjuvants. The suggested method was further applied for the determination of drugs in commercial pharmaceutical dosage forms, which was compared statistically with reference methods by means of t- test and F- test and were found not to differ significantly at 95% confidence level. The procedure is characterized by its simplicity with accuracy and precision.

Keywords: 2, 4- Dinitro phenylhydrazine, Phenylephrine hydrochloride, Pyridoxine hydrochloride and Spectrophotometry.

*Corresponding Author Email: roopakp@sapthagiri.edu.in
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Dynamic Channel Allocation Technique for Distributed Multi-radio Multi-channel Multi-path Routing Protocol in Wireless Mesh Networks

Shreenidhi.P.L [1], Ranganath H R[2], Puttamadappa C[3], Basavaraju T G[4]
[1]Research Scholar, BGS Research Foundation, SJB Institute of Technology, Bangalore
[2]Department of Information Science and Engineering, Sridevi College of Engineering and Technology, Tumkur
[3]Department of Electronics and Communication Engineering, Sapthagiri College of Engineering, Bangalore
[4]Department of Computer Science and Engineering, Government SKSJ Technological Institute, Bangalore

Abstract:Wireless Mesh Networks (WMNs) have gained main attraction in providing flexible network services and support to the end users. There are many efforts seen to design robust routing protocol for WMNs and solutions are proposed to standardized channel allocation techniques. There are various approaches dedicated to maximize the network though put and minimize network interface. Existing multi radio multi channel routing protocols utilize only single channel situation and static channel allocation degrades the performance of the WMNs. The challenge is to allocate channel without link interference and to improve end-to-end throughput efficiency in multipath routing for WMNs. In this paper, we propose a dynamic channel allocation technique is proposed for multi path routing protocol for WMNs. Dynamic channel allocation is used to avoid the inter-flow and intra-flow channel competition and interference. The protocol establishes and maintains multiple channel dimensional disjoint points changing frequently and each data flow is separated into multiple paths. NS2 simulations are carried out for the evaluation of the performance of the proposed channel allocation technique and compared with popular routing protocols of Mesh Networks Ad hoc On Demand Distance Vector Routing Protocol (AODV) and Hybrid Wireless Mesh Protocol (HWMP). The simulation results show that proposed dynamic channel allocation technique achieve better adaptability with less overhead and interference. The multipath routing show increase end-to-end throughput significantly.

Keywords- **Wireless Mesh Networks, Dynamic Channel Allocation, Multipath Routing, AODV and HWMP.**

I. Introduction

Wireless Mesh Networks (WMNs) [1] has become very popular and important in wireless technology and industry fields. WMNs are believed to be a promising technology to offer high bandwidth for wireless access to the Internet. The fixed wireless mesh routers and gateways are highly connected each other in a ad hoc manner in WMN. The normal wireless devices are connected for communication services where mesh routers are equipped with functionalities of IEEE standard series [2]. Mesh router performs the role of data aggregator and also role of relay data gateways. WMN gateways are devices with high bandwidth that can provide internet connections to routers. Data flows can be formed in multi-hop manner from wireless devices through each mesh routers to the gateways, or to other mesh routers and devices in other areas. There are many efforts seen to maximize the network throughput in a multi channel multi radio wireless mesh networks. The approaches of the currently available solutions are based on the static or dynamic channel allocation schemes. Multi-radio wireless mesh networks (MR-WMNs) are being increasingly deployed to provide affordable Internet access on large residential areas. MR-WMNs allow the supported mesh clients (MCs) to access the Internet gateway by multi-hop packet forwarding over the mesh routers (MRs), which can be equipped with multiple radio interfaces [3]. There is a need of hybrid multichannel multi-radio wireless mesh networking architecture where each mesh node has both static and dynamic interfaces.

Multi-channel technique can significantly avoid transmission competition and collision in the same channel. There is no interference among orthogonal channels because they use non overlapping frequency bands. Routing protocols assigning diverse channels to each hop of data flow can reduce intra-flow channel interference and competition therefore can improve end-to-end throughput times. Wireless devices are able to equip more radios which are working in a specified channel. The data is switched and transmitted in specified when radio with antenna is used. This makes transmission full duplex and also provides more efficient routing. Multi-path routing strategies are also designed to split and transmit data through two or more different paths to destination simultaneously. However, multi-path routing cannot achieve times of throughput as we expect since inter-/intra-flow channel competition and interference. Therefore it is required to develop multi-channel and multi-path routing protocol in WMNs.

There are two approaches for channel allocation, static and dynamic approach [4]. Each interface of every mesh router is assigned a channel permanently in case of static channel allocation. An interface is allowed to switch from one channel to another frequently in dynamic channel allocation. Static channel allocation interface does not allow switch the channel and have lower overhead. They completely depend on the stable and predictable traffic patterns in the network. In case of static approach, the required exact traffic profile is known in advance and statistical traffic pattern are assumed. In dynamic approach there is always frequently switching of channel takes place and thus have a higher overhead than static approach. This is approach is more suitable when there is frequent change in network traffic and also traffic is unpredictable. In real time environment, the traffic profile is very complex and