Effect of doping (with cobalt or nickel) and UV exposure on the antibacterial, anticancer, and ROS generation activities of zinc oxide nanoparticles

Prashanth G K, P. A. Prashanth, Padam Singh, B. M. Nagabhushana, C. Shivakumara, Krishnaiah G M, H. G. Nagendra, H. M. Sathyananda & Vinita Chaturvedi

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In vitro antibacterial, antioxidant and cytotoxicity response of CuO nanoparticles prepared by lemon juice and citric acid fueled solution combustion synthesis

H.M. Sathyananda, P.A. Prashanth, B.M. Nagabhushana, G.M. Krishnaiah, H.G. Nagendra, M.S. Dileep, G.K. Prashanth

Abstract

This research work presents the synthesis, characterization, evaluation of the antimicrobial and anticancer response of CuO nanoparticles prepared by solution combustion method using citric acid and lemon juice as fuels. The X-ray diffractograms of both the samples revealed the monoclinic structure of CuO with the standard JCPDS [45-0937]. Surface morphology of the samples was studied by scanning electron microscopy and transmission electron microscopy. Antimicrobial studies revealed the bactericidal and fungal activity of CuO nanoparticles. Furthermore, to better understand the parameters that affect the interactions between our CuO and mammalian cells, and thus their biocompatibility, we have examined the impact of cell culture conditions as well as of material properties on cytotoxicity by blood haemolysis, The results showed the biocompatibility of CuO NPs. 2, 2-diphenyl-1-picrylhydrazyl hydrate assay studies indicated the antioxidant activity of the samples at varied concentrations. Cytotoxicity studies revealed the anticancer activity of CuO NPs against PC-3, HCT116, A549 and MDA-MB-231 cancer cells.

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In vitro antibacterial and anticancer response of MgO nanoparticles prepared by solution combustion synthesis

K.R. Mohana, P.A. Prashanth, B.M. Nagabhushana, G.M. Krishnaiah, H.G. Nagendra ,M.S. Dileep, G.K. Prashanth

Abstract

In the present work, solution combustion synthesis of MgO using lemon juice and citric acid as fuels has been carried out. A comparative analysis of the obtained samples has been conducted to understand the strategic advantages of using lemon juice over citric acid as the combustion fuel for the synthesis of MgO nanoparticles. Antibacterial studies were carried out against *Escherichia coli* and *Staphylococcus aureus* by well diffusion method. Minimum inhibitory concentration was determined by micro broth dilution technique. Anticancer activity of MgO NPs was tested against MDA MB-231 and HeLa cell lines by 3-(4, 5-dimethylthiazolyl-2)-2, 5-diphenyltetrazolium bromide assay. Haemolysis assay was performed to evaluate the biocompatibility of MgO NPs.

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How to Cite

Evaluation of structural, optical, and dielectric characterization of adipic acid crystals grown in aqueous solution of ʟ-alanine

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ABSTRACT

In this paper, adipic acid crystals were grown using slow evaporation method in aqueous solution of ʟ-alanine at room temperature. X-ray diffraction investigation shows that the crystal belongs to P21/n space group. EDAX study confirms the occurrence of elements in the crystal. The crystal is thermally stable up to 124 °C. Further, the grown crystals were exposed to Co-60 gamma radiations with different doses of 1 Mrad, 3 Mrad, and 5 Mrad at normal room temperature. After gamma irradiation, a small change in the intensity and a slight shift in the Powder X-Ray Diffraction (PXRD) peaks were seen. UV–visible analysis reveals an increase in reflectance after gamma irradiation. Increase in dielectric constant, dielectric loss, and AC conductivity was observed by dielectric studies. Second Harmonic Generation (SHG) efficiency of the crystal is 0.42 times that of the standard Potassium Dihydrogen Phosphate (KDP) crystal and is increased moderately up to the gamma irradiation dosage of 3 Mrad.

1 Introduction

Modern world depends on the development of science in many areas. The growth of nonlinear optical crystals has a considerable impact on optical communication, laser technology, and digital data storage technology [1]. Organic crystals are chemically pure and exhibit good optical nonlinearity and low scattering densities than inorganic crystals which have elevated melting point and high mechanical properties. The nonlinear response of the organic crystal is due to the asymmetric distribution of charge in the π-electron system. Amino acids show nonlinear optical (NLO) activity as all amino acids except glycine have chiral carbon atom, a proton-donating carboxyl group with a proton-receiving amino group, and crystallize in centrosymmetric space groups [2].

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TREATMENT OF POTABLE WATER SAMPLES USING ECO-FRIENDLY *PHYLLANTHUS EMBLICA* – A SOLUTION FOR WATER POLLUTION

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ABSTRACT

The problems of water pollution in the rich and the poor nations are different in various aspects. In this paper, the potable water samples were collected in and around typical distillery industry from Puliyamarathadi, Sangaramoorthy Patti, Muthalakam Patti, Varatharajan Puram, Kullapuram, Cement Road, Villapuram, Pottal Patti, Karisal Kulam, and Palrangapuram in Madurai district. The present study is mainly aimed to remove the TDS, water hardness and chloride from potable water using natural coagulants. The main objective of this research work is to collect and analyze the physico-chemical characteristics of the potable water samples, to assess the microbial population present in the samples, to remove the impurities from contaminated water samples using natural coagulants such as *Strychnos potatorum* L seeds and *Phyllanthus emblica* wood, to find the phyto-compounds present in the coagulants using GC-MS technique, to assess the antimicrobial activity of natural coagulants, and to identify the coagulant protein present in the plant material.

INTRODUCTION

In this study, plant based materials such as *Phyllanthus emblica* wood, and *Strychnos potatorum* L seed powder were used to remove the impurities from the water samples. It was observed that the treatment with the wood pieces of *Phyllanthus emblica* showed the higher reduction of impurities from the water than nirmali seeds and the optimum dosage was found to be 1g. The potable water samples were treated with different dosages of *Strychnos potatorum* seed powder. Among the dosages, higher reduction of impurities was observed in 0.4 g of seed powder. The active bio-compounds present in the plant materials were extracted with aqueous, methanol, chloroform and petroleum ether and qualitatively analyzed. The plant materials showed the presence of carbohydrate, saponin, tannin, alcohols, alkaloids, acids, esters, long chain hydrocarbons, steroids, amino acid and nitro compounds.

The GC-MS characterization of both the plant material showed the presence of bio active compounds have different important biological activities such as pharmacological, antibacterial, antifungal, antilisterial, antihypertensive, anti-inflammatory, urokinase, reductase activity on the nature of elemental composition. The potable water contaminated with pathogenic microorganisms and it was confirmed by the presence of microbes includes *Escherichia coli, Pseudomonas, Staphylococcus* and *Bacillus species*. Antimicrobial activity of the

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AUTOMATION OF GAS TUNNEL KILN USING RELAY LOGICS AND VARIABLE FREQUENCY DRIVES

👤 K. MAHESH ✉ ; 👤 S. INBASAKARAN ; 👤 J. LITHESH ; 👤 S. PRAVEEN

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Abstract

Automation is one of the major concerns in any industry today. Automation is encompassing virtually every Walk of life required right from agricultural to space technology. Plant Automation is the necessity for the Manufacturing industry to survive in today's globally competitive market .It relates to the working of the system at all times without any human intervention. In this paper we are designing a control circuit for the automation of Gas Tunnel Kiln (GTK) using relay logics and Variable Frequency Drives (VFD's) because the present doors and the movement of the transfer car in and out of the kiln are being operated manually and the temperature of the kiln is very high and hence manual operation is not

RESEARCH ARTICLE

RECYCLING OF BALLASTIC CIRCUIT TO FORM A NIGHT LAMP

Mahesh K., Abhijith V. Narayan, Biswadeep Moitra and Ashish Yadav

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Manuscript Info	*Abstract*
....	....
	This paper presents a single-stage high-frequency full-bridge electronic ballast circuit of a scrap CFL is reused for luminance LCD projector systems. The studied electronic ballast is found to have high conversion efficiency due to its single-stage circuit with zero-voltage switching features. A high-power factor can be achieved by using developed single-stage topology. The operation principles and design considerations are analyzed and discussed in detail. The night lamp circuit presented in this paper uses a serviceable electronic circuit enclosed in a base of 11-watt or 15-watt CFL.

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Introduction:-
Compact fluorescent lamp (CFL): "A compact fluorescent lamp (CFL), also called compact fluorescent light, energy-saving light, and compact fluorescent tube, is a fluorescent lamp designed to replace an incandescent lamp; some types fit into light fixtures formerly used for incandescent lamps. The lamps use a tube which is curved or folded to fit into the space of an incandescent bulb, and compact electronic ballast in the base of the lamp" [1] as shown in Fig 1.

"Compared to general-service incandescent lamps giving the same amount of visible light, CFLs use one-fifth to one-third the electric power, and last eight to fifteen times longer. Like all fluorescent lamps, CFLs contain mercury, which complicates their disposal" [1]

Fig.1:- Practical view of CFL.

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Corresponding Author:- Mahesh K.

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COMBINED IMPACT OF INTERNAL HEATING AND VARIABLE VISCOSITY ON THE ONSET OF BENARD-MARANGONI DOUBLE DIFFUSIVE CONVECTION IN A BINARY FLUID LAYER

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ABSTRACT

The present article is to examine the joint influence of internal heating and variable viscosity on the onset of double diffusive convective motion using perturbation technique. Linear stability analysis is performed and it is assumed that the upper surface of a fluid layer is deformably free and that viscosity dependency is believed to be exponential. The boundaries are known to be rigid, but permeable, and insulated to fluctuations in temperature. From results of an increasing the viscosity parameter, the system shows destabilizing effect and the system will be stabilized by that internal heat source power. It is also revealed the influence of double diffusive coefficients. The effect of the thermal diffusion is found to have a destabilizing reaction on the system, whereas the opposite reaction is noted with an increase of thermo-diffusion parameter.

KEYWORDS: Variable Viscosity, Internal Heat Source & Benard-Marangoni Convection

Original Article

1. INTRODUCTION

Dufour diffusion, also known as thermo-diffusion, and Soret diffusion, also known as thermal diffusion, is significant in both non-Newtonian and Newtonian heat convection and mass shifts and are often found in high-speed aerodynamics and chemical process engineering. Such findings are important in combining heat and mass transfer for the intermediate molecular weight gasses in binary's. Hurle and Jakeman (1971) demonstrated the thermosolutal convection induced by Soret using a methanol-water mixture, both experimentally and theoretically. Instead, using a salt solution, Caldwell (1970) extended the study, while Platten and Chavepeyer (1973) continued previous studies using a combination of water-ethanol. The linear stability of experimental thermal diffusion convection in an ethanol-water mixture was investigated by Knobloch and Moore (1988) under various boundary conditions with a focus on the Biot number. Taking into account the Soret interaction with other physical causes, the thermo capillary instability in a binary fluid at the start of convection was studied. (Bergeon et al. (1988), Slavtchev et al.(1991). Saravanan and Sivakumar (2009)). Chand and Rana (2015) recently studied the Soret effect in the presence of a vertical magnetic field in a nanofluid layer.

Some researchers assume that fluid has a constant viscosity or may possess temperature-dependent viscosity (viscosity decreases exponentially with temperature) which may affect the stability convection. Palm (1960) initiated the study of variable viscosity on a steady convection. Other researchers also studied the variable viscosity effects in different problems where Torrance and Turcotte (1971) and Stengel et al. (1982) studied in Benard instabilities and Slavtchev et al. (1999), Cloot and Lebon (1985) and Kozhoukharova and Roze (1999) in

International Journal of Advanced Trends in Computer Science and Engineering

Performance Evaluation of Laser Based FSO Communication System in Turbulent Atmosphere

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ABSTRACT

Laser based Free-space optical communication (FSO) is evolving as one of the key advancements in multi giga byte wireless communication. The turbulence in the atmosphere is the major degrading factor of FSO link. The weak atmospheric turbulent channel capacity of the link has been evaluated using the log normal distribution model. The performance of this model is evaluated based on refractive index turbulent strength parameter, link parameters such as length, operational wavelength of the input signal at the transmitter, receiver aperture and Scintillation Index. The closed form of average capacity of the channel has been derived and the capacity of FSO channel is measured at various turbulence levels. Subcarrier Intensity Modulation/SIM BPSK modulation technique is used in FSO link and error performance is evaluated.SIM BPSK modulation shows better performance as compared to NRZ-OOK in weak atmospheric turbulence.

Key words: Log Normal distribution, Free Space Communication (FSO),refractive index structure parameter, SIM BPSK Modulation.

1. INTRODUCTION

Free space optical communication (FSO)or optical wirelesscommunication, has become a well-known research subject in the present business and technical front because of the financial affordability, permission free and high data transmission rates. This rising innovation shows up as a promising expansion to earthly communication applications in contrast to its RF counterparts. Because of its small transmit beam range, the FSO transmission offers LOS connectivity and operates in both visible and IR ranges [1]. The essential rule of FSO employs line-of-sight communication technique.

FSO communication system is preferred over the Radio Frequency counterparts. This is significantly because of the contrast in the transmission bandwidth. For FSO communication the atmospheric transmission range lies at par with the infrared bandwidth run from "700 nm to 1600nm". The transmission range for radio frequency signals lie between 30mm to 3 m. This huge proportion of wavelength prompts some intriguing contrasts between them such as huge modulation bandwidth, narrow beam

divergence, low power consumption, high data rate, license-free spectrum and high security. Adding to these advantages, FSO links are readily expandable while eliminating network size, small sized and light weighted. Also, FSO links can be easily and quickly deployed in places where optical fibres cannot be used [2].FSO communication provides a usable bandwidth which is10^5times more as compared to the RF counterparts. There is also an increase in the power received at the receiver in case of FSO systems due to the usage of narrower bandwidth. The narrow beam divergence of FSO systems has resulted in small size, light weighted and low power consumption systems. Hence, designers have the flexibility to design smaller systems having higher gain margin at a very affordable initial setup cost and reduced development time. FSO systems also provide license-free transmission and thereby, can be deployed in places where laying of optical fibres is practically not feasible. This also reduces the network size along with ready expandability [3].

FSO technology uses the atmosphere as a proliferating medium whose attributes are influenced by the weather and geographical location of the place, snow, rain, clouds, haze, fog, etc. The difference in the wavelength of the atmospheric particles and that of wavelength used in FSO communication systems leads to scattering phenomenon. These deteriorate the strength of the optical signal and act as a limiting factor for the deployable link distance. This leads to absorption and scattering [4]. The challenge for the FSO communication is turbulent induced fading or scintillation. Scintillation is due to non-homogeneities in the pressure and temperature of the atmosphere along the optical path. Therefore, for the reliable optical path this atmospheric turbulence plays an important role. Turbulence fading can be statistically modelled by "Log normal, Gamma-Gammaand Negative exponential models". Log – Normal model is widely accepted for weak turbulence in the atmosphere [5].

2. LOG-NORMAL WIRELESS OPTICAL CHANNEL MODEL

Estimation of the average feasible optical wireless channel capability due to signal amplitude variations and atmospheric turbulence can be calculated and based on the SNR value, atmospheric turbulences ranging from weak to moderate log-normal distribution model can be employed [5].

Real-time early detection of weed plants in pulse crop field using drone with IoT

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Abstract The real-time detection of parthenium weed plants in the pulse crop field was carried out using low altitude flying drone. A fully convolutional semantic segmentation model was proved to accurately perform object segmentation with higher time complexity. In this research, the LinkNet model with Resnet-34 was used for real-time detection of weed plants using a video feed from low altitude flying drones. Experimental results is proven that LinkNet-34 can detect overlapping and irregular shape weed objects at 0.86 mean pixel accuracy of 0.598 mean IoU at 0.217s. The processing speed was better compared to LinkNet and U-Net models. The detected weed images were stitched together to create a weed site map. The created map is automatically uploaded to google cloud for further site analysis.

Keywords: Deep learning, LinkNet, ResNet, Site map, U-Net, Unmanned aerial vehicle, Weeds

Introduction

Pulses are one of the major food crops feeding over 80% of the Indian population (Annual Report, 2017-18), eradicating malnutrition and providing a good amount of protein and better economic profit for the farmers. However, the yield of pulses, year after year, is going down due to the weeds in farmlands impeding the growth of pulse crops. Weeds in the farmlands have decreased pulse production by competing for light, nutrients, moisture in the pulse-field (Tshewang *et al*., 2016). In traditional farming, de-weeding is done by spraying pesticide/herbicides without distinguishing pulse crops with weeds. This methodology not only results in a waste of pesticide/herbicides, but it also causes environmental and health hazards for humans (Wiles, 2009). Smart site-specific weed management that reduces pesticide consumption by 50% and environmental pollution which increases crop yield resulting in economic

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A prior case study of natural language processing on different domain

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Article Info	ABSTRACT
	In the present state of digital world, computer machine do not understand the human's ordinary language. This is the great barrier between humans and digital systems. Hence, researchers found an advanced technology that provides information to the users from the digital machine. However, natural language processing (i.e. NLP) is a branch of AI that has significant implication on the ways that computer machine and humans can interact. NLP has become an essential technology in bridging the communication gap between humans and digital data. Thus, this study provides the necessity of the NLP in the current computing world along with different approaches and their applications. It also, highlights the key challenges in the development of new NLP model.

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1. INTRODUCTION

Naturally, human language is complex and to understand this language, a system must also know about corresponding grammatical rules, meaning and context, along with slang and acronyms utilized in the language. Natural language processing (NLP) is the mechanism which supports the computer machine by simulating the human capability to understand the language. NLP is the significant area in which by analyzing data, the system can extract the information from the contexts and provides the input information in several ways. Basically, it is a relationship among human language and computer machine, i.e. NLP operates machine understanding, analysis, generation or manipulation of natural language. However, natural language refers to analysis of text as well as audible speech, whereas machine captures or recognizes the meaning of input words in terms of structured output. NLP is basic element of artificial intelligence (AI). The initial goal of NLP is to provide such type of interaction so that nonprogrammers can produce useful information from computer machine. Such type of communication was popularized in the movie "A Space odyssey" in 1968. The NLP also has the ability to make insights from information contained in mails, video files and other unstructured content [1-4].

M. Maxson, said that, in future most of the useful information will be in unstructured form. The future BigData will be the combination of both structured and unstructured data and utilizing inherent data patterns that integrate from data itself and not from police imposed on data-sets by humans. It has been frequently noted that NLP predominantly is utilized to analyze, retrieve and summarize the pertinent data from large sets of data available. An exploration of NLP concept was introduced in 1950 when Turing-test on computer machine and intelligence was introduced [5]. It was able to exhibit intelligent behavior similar to, or non-differentiable from, that of a person. NLP need a combination of verbal and computational

Streaming Video Quality Assessment in Digital TV Streams under No-Reference Conditions

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Abstract:

Assessment of Video (Image) quality has always been a subject of great concern for people engaged in Entertainment Photography, Digital Television, Medical Imaging, Astronomical Imaging etc. The visual quality can have a tremendous amount of impact on the application at hand and establishing reliable methods to assess quality is of paramount importance. While quality assessment in the presence of reference images is an established discipline in the domain of Image Processing, such an assessment in the absence of reference is an extremely difficult task and remains an esoteric subject even today. In this paper, we research and formulate a fairly reliable mechanism of assessing perceptual video quality under no-reference conditions.

Keywords: *Perceptual Quality, Peak-Signal-To-Noise-Ratio, Kurtosis, Invariant Moments, Mean & Std. Deviation, Variance, Quality Index, Blockiness, Fourier Transform. Cosine Transform.*

Introduction:

Assessment of Video (Image) quality has always been a subject of great concern for people soaked in Entertainment Photography, Digital Television, Medical Imaging, Astronomical Imaging etc. Although the topic of image quality assessment has been around for more than four decades, there has, until recently, been relatively little published on the topic. Certainly this omission is not for lack of need or paucity of interest, since most image-processing algorithms and devices are, in fact, devoted to maintaining or improving the apparent quality of digitized images for human visual consumption. Traditionally, image quality has been evaluated by human subjects. This method, though reliable, is expensive and too slow for real-world applications. So this presentation is about *objective* image quality assessment, where the goal is to provide computational models that can automatically predict perceptual image quality. Perhaps the first notable

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Detection of 3 – Dimensional Superficial Landmarks by using Deep Neural Networks

Shagun Gupta, Shubham Mahajan, Anil Kumar Bhardwaj, CH. Vanipriya, Amit Kant Pandit

Abstract

Different functions are developed for superficial research to help acknowledgment of individual qualities, examination of race, individual confirmation for security business and another research fields. Accordingly, it's conceivable to distinguish the distinctions fit as a fiddle dependent on spot of nation and birth. Present examination dissects superficial shape utilizing checked three dimensional superficial pictures and researches approaches to remove superficial tourist spots from the three-dimensional superficial pictures. The location of the superficial milestone requires standardization of superficial scale and position in three-dimensional picture information to break down the superficial shape. In this manner, it's hard getting exact superficial milestones from three dimensional superficial pictures. Our technique breaks down the undertaking into the accompanying three sections: (a) transformation of information from the three-dimensional superficial picture to a two-dimensional picture, (b) extraction of superficial milestones from the three-dimensional picture utilizing Convolutional Neural Network (CNN) (c) reversal of distinguished superficial tourist spots two dimensional to three dimensional pictures. In tests, analyzes the exactness of superficial milestone recognition model.

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Title: **An efficient approach to preserve the network connectivity for prolonged lifespan of wireless sensor networks by cautiously removing the crossing edges using COLS**

Authors: R. Pallavi; B.C. Srinivas; G.C. Banu Prakash

Addresses: Department of Computer Science and Engineering, Sir M. Visvesvaraya Institute of Technology, Bengaluru, Karnataka, India ' Department of Computer Science and Engineering, Sir M. Visvesvaraya Institute of Technology, Bengaluru, Karnataka, India ' Department of Computer Science and Engineering, Sir M. Visvesvaraya Institute of Technology, Bengaluru, Karnataka, India

Abstract: In recent times, wireless sensor networks (WSN) have been widely used in various applications which have led to the deployment of enormous numbers of sensors leading to the complexity of the network. Extensive research has been carried out for monitoring these sensors for connectivity, coverage, load balancing, network structure etc. Study on these complex networks to maintain connectivity for longevity is a challenging task. WSN when modelled on graphs exhibit the properties of non-planarity. In this paper, we would like to propose an algorithm COLS to reduce a non-planar graph to a planar graph by removing the crossing edges carefully. The proposed algorithm preserves the topological structure without compromising QoS of the original network and finds its application as a load balancer on WSN. Experiments have shown that the algorithm accurately converts the graph on multi-dimension to a two-dimension without considering cross edges and the time complexity of the given algorithm is $O(n^2)$.

Keywords: wireless sensor networks; network connectivity; non-planar graph; planar graph.

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FOOD CLASSIFICATION AND CALORIE ESTIMATION USING COMPUTER VISION TECHNIQUES

Dhanalakshmi S[1], Harshitha S V[1], Mukeshwar varma D[1], and Mayuri P[2].

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Abstract: In today's world, the important thing that matters is health. people have become more health-conscious and are careful about their diet. To consume quantified food every day, automatic recognition of the food image helps. As of now, there are no applications that can recognize food and estimate their calories automatically. Our proposed system not only detects varieties of fruits & vegetables but also provides per serving calories of each food detected in a single image. To achieve this, we will take the input of the food image from the user. This food item is detected with the help of the CNN algorithm. In the next step, we do image segmentation with the help of morphological functions of OpenCV. After Segmentation, the Volume of the food is calculated. After this, with the help of formulas calories of the food are calculated.

Keywords: Automatic recognition, Convolution Neural Network, Morphological functions, OpenCV.

I. INTRODUCTION

According to the NIH, obesity is the second leading cause of preventable death. A million people die yearly due to obesity. Nowadays it is very difficult for a person to track the calories consumed by them. The intake of calories plays a very vital role in one's healthy lifestyle. Earlier the users used to track their calorie intake with the help of charts. These methods are very hectic to follow and lead to an unquantified meal diet. Having a meal which is quantified helps you reduce that extra fat. We came up with an idea to help the people track the number of calories that it takes in with the help of simple images of the food that is captured by the user instantly. There are various apps out there available. In those apps, the user has to manually input all the data. Computer vision is also used to estimate the amount of calories present. There are a lot of algorithms available for object detection. Each method has its advantages and disadvantages. In our project, we are using the CNN algorithm.

II. RELATED WORK

S. Jasmine Minija et al. (2017), proposed a method where they pick a stable segmented region from multiple such segmented regions. After all images are segmented, the global and local features area is obtained via feature extraction based on texture, local neighborhood pixel and color. Once classification is performed, calorie value is obtained and an accuracy of 97% was obtained.

Hong Liang et al. (2018), proposed a method where the volume of food is estimated by 3-D reconstructions through depth camera or planar image sequence. Food calorie estimation is done using the Deep-learning approach. Datasets used are Microsoft COCO and Pascal VOC for image recognition. The calorimeter R2 and RMSE are about 0.95 and 43 and MSE is 32. Updating food ingredients information to meet the needs of different users. And gather larger training sets to improve accuracy and speed is aimed in the future.

Shaikh Mohd. Wasif et al. (2019), proposed a method where they have taken an image as input from the user. The image is then passed to faster R-CNN model. After image detection, they performed image segmentation. For image segmentation, they used grab cut algorithm. Segmentation of the image is then performed. For calorie estimation, they calculated the volume of the food item. The volume is then used to calculate the calories present in the food item. All the above modules are then integrated to make the software for calorie estimation using images of the food item. The accuracy obtained is 90%.

Yanchao Liang et al. (2017), proposed a deep learning method. In the dataset, both food volume and mass records are given. To estimate calories, it takes the top view and side view of the food. Every image has a calibration object which will be used to find out the scale factor of the image. Food(s) and calibration objects are detected by the object detection method called Faster R-CNN and each food counter is obtained by applying the Grab Cut algorithm. After that, they estimated each food's volume and calories.

S. Jasmine Minija et al. (2019), proposed an automatic method of food category recognition and calorie estimation using the BFC and IpCA-DBN. For automatic recognition, the features are extracted, for which the optimal segments are offered using the BFC. The features increase the robustness of the recognition, and the method consumes less time, which is applicable for assessing the diet in daily life. Bayesian Fuzzy Clustering (BFC)is the optimal clustering mechanism, and the main role of BFC is to generate the optimal segments from the food image. BFC is characterized using a set of unknown memberships, and prototypes. DBNs are the generative neural networks that consist of the multiple layers of Restricted Boltzmann Machines (RBM) with each layer holding the input and the hidden neurons and the hidden neurons constituting the output layer. Once the food category is recognized using the proposed IpCA-DBN, the calorie of the food is determined. The accuracy obtained is 96%.

Pallavi Kuhad et al. (2015) , proposed a method where the Category of tools is been considered, which uses image processing to recognize single and multiple mixed food objects, namely deep learning and SVM. Finger -based calorie measurement,

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An Efficient Big Data Analytics based Cloud System for Optimizing Web Page Discovery Techniques

S.Dhanasekaran, P.Vijayakarthik, A.Sivanesh kumar, B.S.Murugan, V.Vasudevan

Abstract

In recent days Internet plays vital role for many purpose such as sharing of information, Academic related activities, searching about meticulous topics and also for the customer entertainment. This system is planned to develop a search engine to assist the clients for discovering relevant web page from large amount of database. This web page searching system provides most relevant top ten results to the clients. By using this type of searching techniques user have to easily find the suitable information that they are looking for. In this research work big data analytics based navigation strategy is introduced in addition to cloud based computing. With the help of cloud computing technique the search engine can be able collect more information and at the same time information can be able to share to any part of the world. The big data analytics concept will be used to store infinite information in database. This will assist the client to discover most related search item.

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How to Cite

Modelling Simple and Efficient Data Transformation Scheme for Improving Natural Language Processing

Shruthi J, Suma Swamy

*Abstract***:** *The importance of natural language processing cannot be sided in the current era of communication and analytics where data is exponentially growing. Although, there has been various versions and schemes that has evolved in the past decade towards improving the performance of natural language processing, but still the problem towards precisely extracting the actual context is an open ended. Review of existing studies show a large scope of new work towards improving it. Therefore, this manuscript presents a unique simplified approach where natural language processing is carried out with a combined effort of syntactical and semantic based transformation scheme. The study is implemented using analytical methodology while the secondary motive of the work is also to balance the mining performance as well as optimizing storage performance too. The study outcome shows proposed scheme to excel better performance with respect to time duration in all the internal processes being involved for data transformation.*

*Keywords***:** *Natural Language Processing, Text Mining, Analytics, Context, Cloud*

I. INTRODUCTION

Natural language processing is one of the essential concept in artificial intelligence and it bears the entire potential concept associated with computer science as well as computational linguistic too [1] [2]. Therefore, it is a domain of engineering process with capability to infer the information just like human-based language by a computer system [3]. It is quite a challenging aspect to work on natural language processing as the conventional computer system is highly dependent on languages that are highly structured while natural languages are characterized by dependencies on various complex attributes associated to a specific language (e.g. dialects of specific region, frequent usage of slangs and social context [4]. At present, there is an exponential growth of data owing to outcome of mobile network and social network usage. This abnormal rise of data also gives rise to highly unstructured data which is computationally challenging task to organize and then process [5].

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Machine-based translation system is one of the frequently used applications in natural language processing. The efficiency of performing this translational task is basically assisted by natural language processing [6]. Sentiment analysis is another frequently used application where natural language processing is utilized [7]. Another significant application of the natural language process is summarization that is about the generating a meaning and logically correct compact form of information or the given document. It will also retain information associated with the emotional taints of the data used in it. Adoption of automatic summarization assists in curtailing the redundancy fact that is possibly generated from the diversified sources of information [8]. However, the application of classification of textual content is frequently used in natural language processing. The application associated with text classification assists in looking for the data that explicitly exists in the text given in natural language processing [9]. This approach assists in extracting the level of standard emotions that resides within every terms present in corpus of feedback or opinion shared by customers [8]. All these application are developed using various available libraries e.g. Apache OpenNLP, Natural Language Toolkit, Stanford NLP suite etc [9]. However, the domain of natural language processing is yet to see its superior accuracy. The primary challenge associated with the natural language processing is about domain specification. It is nearly impossible to render universality about the knowledge graphs. A simple example to cite this is to consider a phrase"*glad working in hospital*". In this sentence, the three critical terms "*glad*", "*working*", and "*hospital*". This phrase suggests a kind of profession, or job, or work. However, the phrase "*glad to see you*" represent a personal emotional statement of a user. Another simplified example is "*Im a skilled expertise working in Microsoft windows platform*" and "*Im a cleaner and I mop windows of Microsoft Office*". This two statements has entirely two different meaning but the context of this canot be differentiated either by any existing system not using any conventional text mining scheme. It will simply mean that a system of natural language process has many explicit dependencies apart from the data itself.

A closer look into these two segments of the statement will show that a machine is more likely to get confused about extracting the inference of the constraint associated with the statement. If the system is made to be dependent only on the knowledge graph than the probability of the machine to extract vague information is quite high. Another significant challenge associated with the natural language processing is to obtain the semantic information from the sentences.

Development of Ubiquitous Intelligent System For Sports Centers Using Artificial Neural Network And Machine Learning Approaches.

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Abstract

Due to evolution in the field of sports ,individuals got interested and engaged in it and the requirement for sports center to help those individuals is in demand. Initially there was a single sport center to serve the people and it not enough to meet the increasing experience need. Thus, it was crucial point that service of sports has moved to intellectualization. This paper is structured as, firstly it tells drawbacks of traditional sports service system namely poor sharing of resources, slow transmission of information, poor flexibility of response which effects the induvial experience and growth of sports center services. With increase in the field of computer technology intellectual sports service system is been completed, which leads the subsystem to interconnect, interoperate and integrate the information, it also achieves the goal of resource sharing and function upgradation. By using this intelligent system and big data technology big data platform is built and to realize the prediction of the passenger flow which helps to provide the advance guidance plan, Support Vector Machine-Back Propagation(SVM-BP) neural network composite model is been used. Finally, it tells that with the help of empirical analysis , design of intelligent system is increase the service quality of culture center. This paper concludes with that it not only achieves significant increase in passenger flow but also with efficient way to increase the service sports cultural center which leads to intellectualization.

Keywords

Sports Culture Center, Big Data Technology, Intelligent System, SVM-BP Neural Network, Artificial Neural Network, Soft Computing

1. Introduction

With opening of sports and culture center, people who is having interest can make some time for sports and exercise through pre-booking or on-site booking thus gives them physical and mental relaxation ,which helps them to work and learn simultaneously. With increase in the standard of leaving style of people, traditional sport culture center service system is not enough to meet its requirements of people participation in sports [1] [2]. With the increase in the construction of sports culture service system has attracted people with keen interested in sports.

Intelligent service system has helped in monitoring, security, intelligent communication, mechanical equipment, live broadcast system scoring system, which effectively solves the problems like uneven distribution of space in cultural center, on time staff service, unreasonable real time pricing, etc., to make sure that it is operating and serving the people in need properly thus balancing its profit and loss [3].

Liang H T provide a design [4] for intelligent stadium system which provides an efficient and economic benefits for intelligent system by using the functionality of Internet Of Things(IOT) technology, thus fulfill the aim at designing the intelligent system for sports culture centers. By studying the power supply facilities in sports culture center Tian L and others [5] has designed new type of solar automatic lighting system, thus sports center culture system utilize sunlight at daytime and stores solar energy for lightning at night. The above design system uses renewable source of energy that is solar energy it is stable improvement in the construction of sports culture center. Research by Xiao Y H and others [6] on intelligent lightning control system for sports culture centre helped to take measures in lightning design, selection of lamp type and installation process to solve the glare problem.

CFD numerical simulation technology is been used to study the mechanical evacuation system, mechanical air supply system etc. which is basis for design of exhaust system by Fu Q et al. [7]. M. Nishioka T [8] and others have

Paper No: PU-SOE- CSE - 09

Predicting the Stages of Chronic Kidney Disease Using Machine Learning Approach

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Abstract

A condition due to which the kidneys cannot perform its regular function of filtering blood refer to Chronic kidney disease; nowadays people belongingto different ages are suffering and coherently increasedthe deathrate of related patients,premature of diagnosis. Kidney Diseasehas become a majorproblemin the general publicall over the world, as it damages the kidney. Kidney failureis measured by GFR (Glomerular Filtration Rate). In this research work, various supervised   machine   learningalgorithms are used to predict and classify Chronic Kidney Diseaseand non-Chronic Kidney Disease. The dataused forthis work has been collected fromthe machine learningrepositoryand on these datasetSVM, Navie Bayes, Decision Trees and K-NN models hasbeen applied. The system has shown better resultsin classifying Chronic Kidney Diseaseand non-Chronic Kidney Disease.The results of classifiersare compared. The study concludes that among all the classifiers, the SVM and Decision Tree have performed better thanother classifiers. Stage detectionis also done by using different attributes of the dataset and proposeda system to detectand identify the different gradesof chronickidney Disease.

Keywords:
Chronic Kidney Disease, Classification, Machine Learning, SVM, Decision Tree, and Prediction

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Correlation among hydrophobic aromatic and aliphatic residues in the six enzyme classes

Anindita Roy Chowdhury (Chakravarty), H.G. Nagendra and Alpana Seal

ABOUT

Abstract

Hydrophobic force as one of the fundamental forces contributes in folding of the primary sequence of amino acids into a functional three dimensional protein structure. Hydrophobic interactions of side-chains provide maximum stability to correctly folded proteins. Earlier, the authors identified the aromatic and aliphatic residues contributing maximum and minimum hydrophobicity in all the six enzyme classes. The present investigation examines the relative contributions towards hydrophobicity of the different hydrophobic amino acids in both aromatic and aliphatic categories. Notably in a sequence, inverse relationship between residues of similar hydrophobic strength both in aromatic and aliphatic categories seems to exist. This analysis is likely to provide insight for finer analysis of the enzyme molecule.

Keywords

hydrophobicity scale, enzymes, correlation between hydrophobic residues, residual plot, inverse relation

ORIGINAL RESEARCH

Discovery of anti-influenza nucleoside triphosphates targeting the catalytic site of A/PR/8/34/H1N1 polymerase

Nataraj Sekhar Pagadala [1,2] · Rakesh Bhat[3] · Jagadeesh Kumar D[4] · Abdolamir Landi[1,2]

Abstract

In an effort to develop potent anti-influenza drugs that inhibit the activity of influenza virus RNA-dependent RNA polymerase (IAV RdRp), a database of nucleoside triphosphates with ~800 molecules were docked with the homology model of IAV RdRp from A/PR/8/34/H1N1 strain. Out of top 12 molecules that bind with higher affinities to the catalytic site of IAV RdRp above and below the PB1 priming loop, only seven molecules decreased the transcriptional activity of the viral RNA polymerase with an IC_{50} in the range of 0.09–3.58 μM. Molecular docking combining with experimental study indicated that the molecules with linear chain are more effective in inhibiting IAV RdRp replication than the molecules with V-shaped and are cyclic in nature. A correlation between ΔG and $LogIC_{50}$ for these seven compounds resulted an R^2 value of 0.73. Overall, these newly developed seven nucleoside triphosphates lay a strong foundation for the future development of a new therapeutics that can satisfy the Lipinski's rule of five exhibiting high specificity to the catalytic site of influenza-A viruses.

Keywords RNA-dependent RNA polymerase · Catalytic site · Docking · Nucleoside triphosphates

Introduction

Influenza is a highly contagious airborne life-threatening viral infection causing recurrent outbreaks of humans responsible for respiratory diseases and death. It was estimated during 2017–2018 that there were 959,000 hospitalizations and 79,400 deaths (CDC 2018) alone in the United States related to influenza illness. Moreover, WHO estimates that 3–5 million people suffer from the disease every year with death rate ranging between 290,000 and 650,000 due to influenza epidemics (Influenza (Seasonal) 2018) worldwide (Sherman et al. 2019). Of note, previous epidemiological studies on pandemic A/H1N1 during the year 2009 clearly showed that the severity of influenza was not so high in individuals effected with HIV compared with HIV-negative patients (Martinez et al. 2011; Perez et al. 2010). This clearly shows that influenza remains a major target for vaccine and antiviral treatment and prophylaxis. One of the causes of the severity of the disease is due to influenza replication and transcription played by viral RNA-dependent RNA polymerase (RdRp) which is composed of three subunits i.e., polymerase basic1 (PB1), polymerase basic 2 (PB2), and polymerase acidic (PA) (Fodor 2013; Resa-Infante et al. 2011). Both PB1 and the N-terminus of PB2 form a large central cavity for catalytic mechanism of influenza-A virus (IAV) viral replication (Hengrung et al. 2015; Pflug et al. 2014; Reich et al. 2014). The priming loop of (a β-hairpin structure) PB1 thumb domain protrudes into the central cavity and supports the sugar base of the first NTP during de nova initiation (Reich et al. 2014; Appleby et al. 2015; Butcher et al. 2001; Tao et al. 2002). Moreover, primer-independent replication on the viral RNA (vRNA) template was also initiated by the priming loop (Te Velthuis et al. 2016). However, no drug exits presently in the market that blocks the entry of putative NTP and inhibits the initiation of vRNA priming loop occupying to the catalytic site of IAV RdRp. Apart from the catalytic site, IAV RdRp contains multiple sites for potential antivirus

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Superparamagnetic hematite nanoparticle: Cytogenetic impact on onion roots and seed germination response of major crop plants

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Abstract: Augmented escape of nanostructures to the ecosystem has necessitated the comprehensive study of their impact, especially on plants. In the current study, hematite nanoparticles were prepared by employing garlic extract and checked for their cytogenetic effect on onion roots and germination characteristics of five agricultural crops (*Vigna radiata*, *Triticum aestivum*, *Trigonella foenum-graecum*, *Cicer arietinum* and *Vicia faba*) in the concentration range of 20–100 mg/L. Onion roots exhibited an increased mitotic index till 60 mg/L dosage, beyond which trend decreased marginally. Percentage of aberrant chromosomes reported for 100 mg/L exposure was very low (3.358 ± 0.13%) and included common defects such as clumped/sticky metaphase, ring chromosomes, laggards, spindle abnormality, chromosome bridges etc. Moreover, comet assay, DNA laddering experiment and electron micrograph study confirmed negligible damage to onion roots. Seed germination study indicated a positive response in different agronomic traits (germination index, root length, fold change in weight and vigour index) up to 60 mg/L, beyond which either negative or neutral effect was observed. However, none of the samples showed 50% inhibition in germination index; highest being 33.33% inhibition for *V. faba*, compared to the control. In brief, biogenic hematite nanoparticles caused insignificant phytotoxicity and were likely assimilated as iron source at lower dosage.

1 Introduction

Recent years have witnessed an increase in extensive research and applications of iron oxide nanoparticles (IONPs) in various fields, such as environmental remediation, manufacturing industries, health care sector, sensor technology, photocatalysis, reaction catalysis etc. [1–3]. This enormous use of IONP has raised concerns about their chance to escape or deliberate release to the environment [3, 4]. Possible routes for environmental ingression of IONP can be through the agricultural application, in-situ dye/heavy metal adsorption, degradation of organic pollutants or waste liberated from industries, research institutes, health care firms etc. [5]. Although iron is one of the most common elements on earth and is required for vital functioning of living beings, elevated level of iron or presence of artificially designed iron oxide particles is likely to affect the organisms as well as the environment, adversely [6]. As a reason, National Institute for Occupational Health and Safety (NIOSH) has drafted a permissible exposure level of 14 mg/m^3 over a period of 8 h work/day for IONP [7]. Furthermore, nanoscale particles may also undergo some alterations in their composition or physical state, catalyse secondary reactions when exposed to surroundings and raise concerns of biomagnification [5, 8, 9]. Hence, it is very important to study the eco-toxicity and overall safety of nanoparticles prior to practical application.

Plants are the major food producer, render global food security and constitute 80% of total biomass across all the taxa in biosphere [10]. Additionally, they are distributed strategically in the biosphere and can directly interact with nanoparticles present on land surface, water bodies and atmosphere. Therefore, they are considered as idyllic candidates for examining the impact of nanoparticles. Nanoparticles, normally come in contact with plant roots through root tips and rhizoderm, while access to the shoot is through epidermis, cuticle and other apertures (stomata, hydathodes, lenticels) [5, 8]. Effect of nanoparticles on plants has been found to be advantageous in some, while negative impact has been observed in others. Tripathi *et al.* [11] have reported mitotic abnormality and decrease in growth traits in various plant species exposed to silver nanoparticles having wide size distribution. Zinc

nanoparticles resulted in improved germination characteristics as well as biomolecule synthesis for *Brassica napus*, while mixed effect was reported for ZnO nanoparticles on *Solanum melongena* [12, 13]. Likewise, α-Fe$_2$O$_3$ nanoparticles were found to improve iron availability in peanut plants, promote chlorophyll synthesis in soyabean while reduced root conductivity (26%) was noticed in *Helianthus annuus* [14–16]. Hence, it is evident that plants respond distinctly to particular nanoparticle. Effect on plants has been typically found to depend on specific characteristics of nanoparticle, e.g. composition, size, shape, concentration, stability, synthesis route, presence or absence of coating agent etc. [5, 8]. Nanoparticles are applied to the plant system by either embedding in the soil or as additive to sterile water or soft gel.

Degree of phytotoxicity can be determined on the basis of different endpoints, such as genetic changes (alteration in chromosome number or shape, decrease in mitotic index, DNA shear damage, DNA unfolding), altered enzyme activity (decrease in amylase activity, higher expression of enzymes responsible for defence against oxidative stress), change in metabolic activity (photosynthetic rate, protein expression), effect on seed germination, measurement of ROS (reactive oxygen species) generation, analysis of morphological changes (abnormality in cell structure, change in root diameter) etc. [5, 17]. Among the various methods used to assess phytotoxicity, *Allium cepa* test and seed germination study are typical. *A. cepa* is a common agricultural cultivar which possesses a stable chromosome number ($2n = 24$). Any chromosomal changes on exposure to foreign agents can be easily visualised in roots exposed to mutagens. Multiple roots are generated in very small time interval (3–4 days), which can be analysed to get statistically significant and reliable results [18]. Additionally, entire protocol is uncomplicated, has good sensitivity and does not require specific technicalities. Another common plant toxicity test is checking impact of nanoparticles on seed germination which is an important stage of plant growth [17]. Different parameters analysed for the purpose are percentage germination, germination kinetics, root and shoot length, plant vigour, biomass, etc. [19]. Comet assay and electron microscopic

Multi-objective solution with PSO algorithm for minimization of torque ripple and speed settling time by using solar-fed 11,9 and 3-level multi-level inverter with vector control of induction motor

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Article Info	ABSTRACT
	The 11,9 & 3-level cascaded multi-level inverter is fed with vector control of induction motor. The speed performance of the machine is dependent on the PI controller used for speed control. Regulation of speed can go till 5% is allowable. If the PI controller parameters are not optimal the speed error gets increase. The torque ripple can be reduced by using the multilevel inverter. More than that the PI controller output is related with torque. So, the problem is formulated with reduction of settling time of speed and torque ripple. The Multi-objective Particle Swarm Optimization (MPSO) algorithm is used to solve the problem. And the performances are compared with PI controller and PSO-PI control of vector control drive. MATLAB is used to solve the entire system.

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1. INTRODUCTION

In recent days the speed control of the induction machine needed to be faster and accurate for many sensitive applications. The vector control of induction machine provides better control over speed. The problem in vector control is settling time. To improve the settling time many researches are carried out. In [1] the 5-level cascaded multilevel inverter is used for pumping load. The PI controller is replaced with fuzzy based PSO algorithm in [2] for improving stability. Only type-2 fuzzy is used in [3,4]. PSO tuned PI controller is used in [5] for PMSM machine and in [6] GA-PSO is used for the speed and current control for vector control of induction motor. PSO based online vector control is also carried out in [7]. The vector control of three stage multilevel inverter is discussed in [8]. To reduce the harmonics multilevel inverter is used in vector control technique in [9]. Many new types of inverters are used to control the motor and which are discussed in [10-25].

In this paper Photo-Voltaic (PV) fed cascaded multilevel inverter with 11,9 &3 level and the speed control of induction motor with vector control using MPSO optimized PI to minimize the settling time and reduce the torque ripple is proposed.

Enzyme profiles of green gram seeds pre-treated with the herbal drug '*Kokilaksha'* followed by restoration of conditions favouring germination

Mamtha, M., Priya Mohan., Mrinalini Menon

Abstract— Treatment of green gram seeds with Kokilaksha (also termed as the HST – K drug) over a 24 – 120 hour period reduced growth parameters such as water imbibition, appearance of radicle, plumule, etc apart from inhibiting different enzymes including amylase and alkaline phosphatase. This was described as a cost-effective means for initial identification of potential antiproliferative compounds, whose therapeutic efficacy could be further studied. Extending the scope of this study, we sought to explore whether treatment of the seeds with HST-K for a shorter duration of time, say 24 hours would suffice for irreversible inhibition. Thus, in our present study, green gram seeds were treated with the 1:5 and 1:10 v/v diluted HST-K drug for 24 hours after which they were transferred to distilled water for 120 hours. Amylolytic and alkaline phosphatase activities in these seeds were restored to the extent of 35.6±0.6% and 32.4±4.6% respectively, vis-à-vis controls following treatment with the 1:5 diluted HST-K drug. In respect of both enzymes, pre-treatment with the 6.3-fold diluted HST-K drug followed by transfer to distilled water yielded restoration of 50% activity . These observations strengthen the view that the duration of exposure and related parameters deserve to be explored as part of the K-drug's efficacy studies against human disorders wherein amylase and alkaline phosphatase are overexpressed.

Index Terms— assay,green gram, growth inhibition, irreversible, K-drug

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1 INTRODUCTION

The herbal drug formulation Kokilaksha (termed as the 'K'-drug or HST-K drug; Patent No.GB2454875 dt.20th Nov, 2007) derived from *Asteracanthalongifolia* prevented sprouting in green gram (Murthy et al, 2011), besides altering amylolytic and alkaline phosphatase activities in a dose dependent fashion (Deepthi and Menon, 2015). This approach had been used as a cost-effective method for the identification of compounds having anti-proliferative properties as a step towards exploring their anti-cancer potential (Kumar and Singhal, 2010 ; Murthy et al, 2011).

It may be pointed out in the above studies (Kumar and Singhal, 2010 ; Murthy et al, 2011; Deepthi and Menon, 2015), germinating green gram seeds had either been continuously exposed to the drug for 24-120 hours (Deepthi and Menon, 2015) or the observations themselves as a whole had been confined to 24 hours (Kumar and Singhal, 2010 ; Murthy et al, 2011).

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Mamtha,M and Priya Mohan are masters degree holders from MS Ramaiah Institute of Technology Bangalore and the University of Nottingham, UK, respectively.
Presently Mamtha is working as senior research associate at Infiniti Research, Bangalore, while Priya Mohan is currently pursuing a degree in Drug Regulatory Affairs from Massachusetts College of Pharmacy and Health Science. This work was carried out during their Bachelors program in Biotechnology Engineering at the Sir M Visvesvaraya Institute of Technology (Sir MVIT) Bangalore, under the guidance of Dr.Mrinalini Menon, Associate Professor, Dept. of Biotechnology,Sir MVIT Bangalore;
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These observations stimulated us to explore whether the inhibition of germination in green gram by HST-K drug was irreversible. Therefore we undertook the present study wherein seeds were treated with different concentrations of the HST-K drug for 24 hours, at the end of which they were transferred to distilled water that had been used as the control in all our previous studies. Observations were based upon the parameters used by us in our previous studies namely:-

- Seed weight and onset of morphogenesis.

- Specific activity profiles of amylase and alkaline

  phosphatase

2 MATERIALS AND METHODS

All chemicals were either obtained from standard manufacturers such as Sigma, Hi-Media and Merck or were of analytical/reagent grade, while the *Kokilaksha*formulation (Patent No.GB2454875 dt.20th Nov, 2007), was obtained from the Herbal Science Trust Bangalore. Seeds of *Phaseolus radiatus* (green gram) were obtained from the local markets.

2.1 Drugs used

The K-drug formulation was diluted 1:5 v/v and 1:10 v/v with distilled water as previously described by Murthy et al, 2011. As observed by us, previously, the pH of all these solutions was found to be 6.5-7.0 (Deepthi and Menon, 2015).

2.2 Seed treatment

Green gram seeds (0.5 gms) were treated with different