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Moringa concanensis Nimmo extracts ameliorates hyperglycemia-mediated oxidative stress and upregulates PPARγ and GLUT4 gene expression in liver and pancreas of streptozotocin-nicotinamide induced diabetic rats

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ABSTRACT

The current study investigates the effects of ethanolic extract of *M. concanensis* Nimmo leaves (EEMCNL) with respect to its potent protective tissue damage, antioxidant properties in serum, liver and kidney, histopathological evaluation, and PPARγ and GLUT4 gene expression in liver and pancreatic tissue of Streptozotocin-Nicotinamide (STZ-NA) induced diabetic rats. Animals were divided into five groups (n = 5): control; diabetic; diabetic + EEMCNL; control + EEMCNL; and diabetic + glibenclamide. After 45 days of treatment with EEMCNL, MDA levels were significantly decreased in the diabetic-induced group when compared with the STZ-induced diabetic group ($P < 0.05$). The activities of serum enzymes AST, ALT, ALP, ACP and LDH were significantly decreased in serum and kidney, and increased in liver tissues of the EEMCNL-treated group as compared with the STZ-NA induced diabetic group ($P < 0.05$). The levels of total protein, urea, creatinine and uric acid observed in the diabetic group returned to normal by administration of EEMCNL (250 mg/kg) as relative to the STZ-NA induced diabetic group ($P < 0.05$). Furthermore, EEMCNL upregulated PPARγ and GLUT4 expression in liver and pancreatic tissue of the STZ-NA induced diabetic group rats. Taken together, these findings contribute to a better understanding of the hepatoprotective and renoprotective potential of EEMCNL against oxidative stress in the diabetic state, which was evidenced by the capacity of EEMCNL to modulate the antioxidant defence and to decrease lipid peroxidation in these tissues.

1. Introduction

Diabetes mellitus is a serious metabolic disorder. It is characterised by hyperglycemia which is associated with glucose intolerance, carbohydrate, fat and protein metabolism resulting from damaged pancreatic β-cells and/or insulin secretion/deficiency. Hyperglycemia is usually associated with several illnesses including polydipsia, polyurea, polyphagia, weight loss and reduced ability to fight infection. The long-term hyperglycaemic diabetic condition may lead to several complications including cardiovascular, neurological, renal and ocular diseases [1]. Insulin resistance causes increased glucose uptake and utilisation in skeletal muscle and adipose tissue due to reduced GLUT4 levels [2,3]. According to the World Health Organization (WHO), 422 million people are expected to develop diabetes mellitus in both developed and developing countries due to their lifestyle and food habits [4]. Hyperglycemia produces reactive oxygen species (ROS), which play a fundamental role in the complication of diabetes. The exact cellular and molecular mechanism of oxidative stress and pathogenesis of diabetes is still not fully understood. However, elevated glucose levels can increase non-enzymatic, auto-oxidative glycosylation, polyol and hexosamine pathways, as well as increased protein kinase C activity, leading to reductions in both inflammatory mediators and antioxidant defence. These pathways are mainly involved in ROS production in the diabetic state, which directly increase oxidative stress in various organs and tissues [5,6].

In addition to pancreatic β-cells, the increased amounts of glucose

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Review Paper:

Current Status of Brain Cancer - A Systematic Review

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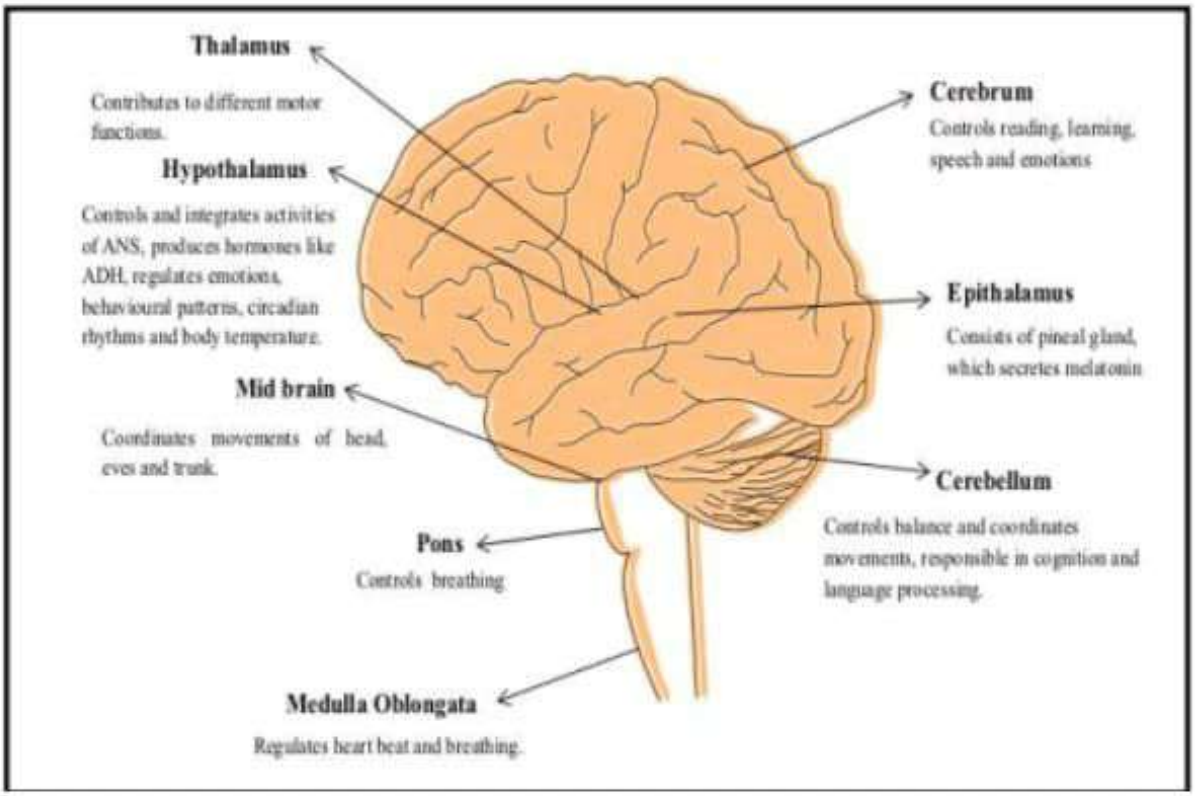
Abstract
The brain is the most important sensory organ in living organisms. In this review, we have discussed brain cancer, the seventeenth most common cancer occurring globally. This review discusses the most recent data about brain cancer, its types, risk factors, biomarkers, methods of diagnosis and its treatment.

Keywords: Brain, Glioma, Glioblastoma, Pituitary carcinoma, Metastatic brain carcinoma, MGMT, PTEN.

Introduction

The phrase "brain cancer" or "intracerebral nervous system malignancy" refers to a wide group of uncommon conditions that may be characterised in a number of ways based on their type, etiology, growth and developmental status (or stages of development)[18]. A neoplasm in the brain may be neoplastic in nature[17]. Brain tumour cells that are not malignant seldom penetrate healthy tissue surrounding them, have well-defined boundaries and develop at a sluggish rate. Meningiomas, pituitary adenomas and gliomas are examples of benign brain tumours. Malignant brain tumours, on the other hand, swiftly spread to other regions of the brain or spinal cord that are affected exhibit a lack of defined boundaries as well as rapidly proliferating cells. Astrocytomas, oligodendrogliomas and high-grade astrocytomas are examples of invasive brain tumours. According to how they and exhibit themselves, they are further divided into two types: primary and secondary brain tumours (metastatic). In its most basic form, a predominant brain tumour is a complicated collection of uncommon illnesses that begins in the brain.

In the case of secondary brain cancer, often referred to as metastatic brain cancer, the disease begins elsewhere in a portion of the body as well as continues to metastasis to the intracranial system as the disease develops. As per the WHO, CNS neoplasms are categorised based on the kind of their grade instead of their phase of development. The level of invasive brain cancer can also be used to distinguish it from other types of cancer. When it comes to brain tumours, the level is decided by the rate of malignant tumorigenesis. This may vary from low to high. The level is further split into four groups based on cell motility. They may also be classified according to their phase of evolution (0, 1, 2, 3, 4). Despite the fact that malignant tumours are few in stage 1, they should not penetrate adjacent cells. A rapid invasion of tumour tissues occurs in stage 2 and 3 and the tumour cells rapidly metastasize in stage 4. It would be in Asia, where the main threat of starving to death from brain cancer exists[18].



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HEAVY METAL TOLERANCE OF INDIGENOUS MICROSYMBIONTS OF ARACHIS HYPOGAEA

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ABSTRACT - In this article, the heavy metal tolerance ability of the isolated indigenous micro symbiont partner of *Arachis hypogaea* was gauged on the basis of specific growth rate of the strains multiplied in YEMA amended with various concentrations of heavy metals. The success of a research can be determined through the knowledge of screening strategies exerted for intense and effectual selection of influential rhizobial strain for intensified field performance by exploiting the resistance properties of *Rhizobium* for identification of competent strains with phytoremediation properties.

Keywords: Rhizobium; PGPR; Bioremediation; Micro symbiont

I. INTRODUCTION

Heavy metals discharged from industrial operations upon consequent accumulation in the environment cause drastic threat to the varied agroecosystems. Heavy metal ions at elevated levels are toxic and are excessively absorbed by roots, translocated to shoot and leads to destructive metabolism and reduced growth (Bingham *et al*., 1986; Foy *et al*., 1978). Giller *et al*., 1998 proposed that the impact of heavy metals is dependent on duration of exposure, dose and type of metal used. The maximal yield in symbiotic legume *Rhizobium* relationship, is identified to be possible only if there are favorable condition for both. Many reports indicate striking influence on microbial composition due to abnormal levels of heavy metals accumulation (Paudyal *et al*., 2007; Krujatz *et al*., 2012; Heckman *et al*., 1987; Broos *et al*., 2005) and directly or indirectly affects the health of plants including legumes like green gram, peanut and chickpea leading to impaired chlorophyll synthesis, inactivated protein synthesis, severe reduction in crop yields and loss of soil fertility (Feng *et al*., 2010; Bibi & Hussain, 2005; Semane *et al*., 2010; Moftah, 2000). Researchers have documented the effect of heavy metals on growth, genetic diversity, physiology and nodulation capacity of various strains of *R. leguminosarum* (Chaudhary *et al*., 2004; Chaudri *et al*., 2000; Shi *et al*., 2002; Ahemad & Kibret, 2014; Hirsch *et al*., 1993). Pereira *et al*., 2006 stated that *Rhizobium* is a sensitive species which acts as a good indicator of soils contaminated with metals. Cevheri *et al*., 2011 proved the hypothesis of suppressive action of heavy metals on rhizobial cells at higher concentrations when compared to low concentrations. Despite the negative impact of heavy metals on rhizobia, phytoremediation is possible in heavy metals accumulated soil (Ma *et al*., 2011). Many reports support that the heavy metal resistance of rhizobial cells could be plasmid mediated or some mechanism may confer resistance (Lakzian *et al*., 2002; Figueira *et al*., 2005; Purchase & Miles, 2001). Native rhizobial isolate conferring resistance to heavy metals is of potential importance in symbiotic association for remediation of the affected area. To execute their beneficial PGP traits under stress conditions, rhizobia possess key tolerance mechanism or pathways against abiotic stresses, heavy metals and pesticides for sustainable agriculture. Indigenous and native microbes might be more effective and competitive in combatting against the environmental stresses.

II. EXPERIMENT ON HEAVY METAL TOLERANCE STUDIES (STANIER *ET AL*., 1985)

This research deals with exploration of heavy metal tolerance ability of native rhizobial isolates obtained from *Arachis hypogaea*. This specific growth study to the observed stress parameter could lead to the selection of efficient isolates for agricultural practices contributing to phytoremediation.

A loop full of log phase culture of each strain was inoculated separately in flasks containing Yeast

PHYTOCHEMICAL SCREENING AND HPTLC FINGER PRINTING ANALYSIS OF *ALLIUM SATIVUM*

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Abstract: Garlic (*Allium sativum*) belongs to the Alliacae family, has potent biological activity and has the ability to stimulate an immunological response. The present study aimed to find out the secondary metabolites present in three different forms of garlic powder and to study the HPTLC fingerprinting analysis. The powdered garlic bulbs are subject to qualitative phytochemical analysis using various solvents and quantitative phytochemical analysis was performed on ethanolic extract of three different forms of garlic powder. Based on the results, HPTLC fingerprinting of alkaloids, phenolics, terpenoids were carried out for ethanolic extract of fresh garlic powder using CAMAG LINOMAT 5 instrument. The study revealed the presence of alkaloids, phenolics, terpenoids in the ethanolic extract of fresh garlic powder. The HPTLC fingerprinting profile developed for ethanolic extract paves the way to identify bioactive compounds and by isolating and identifying these compounds, new drugs can be formulated to treat various diseases.

Keywords: Garlic, phytochemical analysis, HPTLC, Alkaloids, Phenolics, Terpenoids

1. Introduction

Garlic (*Allium sativum* L.,) is said to be one of the first cultivated crops in the world due to its portability and long shelf-life. It can be dried and preserved for several months. Garlic is a common spicy flavoring agent or condiment used since ancient times. Garlic has been cultivated in many parts of the world for its distinct flavor and medicinal properties (Zargari, 1997). At the present time, the Allium family has more than 500 members which differ in appearance, color and taste but have similar biochemical, phytochemical and neutraceutical content. Plants of Allium genera were cherished to possess antibacterial and antifungal activities, and contain numerous phenolic and powerful sulfur compounds which triggered great interest (Rivlin, 2001; Griffiths *et al*., 2002). It is well known for its beneficial medicinal properties. (Thomson and Ali, 2003).

Garlic exhibits enormous pharmacological activities such as antioxidant, anticancer, hepatoprotective, hypoglycemic activity and lowers the blood cholesterol level which prevents cardiovascular disease. The anticancer properties of garlic are due to the rich content of bioactive constituents that target several key events involved in the progress of various diseases, including cancer(Padmini *et al.,* 2017). The term Phytochemical is often used to describe a large number of secondary metabolites found in plants. The phytochemical screening assay is a fast, simple, and economical procedure that gives the researcher to easily identify the different types of phytochemicals in an extract and an important tool in bioactive compound analyses (Rashmi Tambe *et al*., 2014).

Fingerprint analysis by high performance thin layer chromatography (HPTLC) is a valuable tool for the investigation of herbal products with respect to different aspects of their quality and It offers a better resolution of active constituents with reasonable accuracy in a short time (Patil *et al.,*2010). Hence the present investigation was done to study the qualitative and quantitative phytochemical screening of three different forms of garlic powder in different solvents like Aqueous, Ethanol, Methanol, Ethyl acetate, Chloroform. The present study also aims to analyze the HPTLC finger printing profile of alkaloids, phenolics and terpenoids for ethanolic extracts of fresh garlic powder.

2. Materials and methods

2.1. Collection of plant material and Preparation of garlic powders

Fresh garlic bulbs named as Singapore poondu were collected from Attuvampatti, the farmlands of the Kodaikanal area of Dindigul district of TamilNadu, India during the month of April. Three different forms of garlic powders were prepared for analysis. Fresh garlic powder was prepared by slicing garlic bulbs, dried in air and ground to fine powder. Boiled garlic powder was prepared by boiling the garlic at 60 C, dried and powdered into powder form. The garlic bulbs were sliced, shade dried for 3

Chapter 3
License Plate Recognition Based on K-Means Clustering Algorithm

V. R. Viju and Radha

Abstract The stolen vehicles are tracked by License Plate Recognition (LPR) system. In image processing technique LPR is used to identify vehicles by their license plates. LPR used in traffic and other various security applications. In this work, LPR tracking system using K-Means (KM) clustering algorithm and Optical Character Recognition (OCR) technique is discussed. LPR system includes pre-processing using median filter, KM segmentation, binarization of KM segmented image; characters are segmented by the license plate region and finally, characters are recognized by OCR technique. The LPR system is tested by different license plate images in different lighting conditions. The experimental research shows the better performance of the LPR system.

Keywords LPR · KM clustering · Binarization · OCR

3.1 Introduction

Vehicle system hacking based on LPR is discussed in [1]. The input license plate image is converted into gray scale then converted into binary image. Then the characters are extracted. K-Nearest Neighbor (KNN) is used for character recognition. Symmetry features for license plate classification is discussed in [2]. The license plate mage is explored by gradient vector flow for defining the symmetry features. The features are extracted by statistical features. SVM classifier is used for classification.

Detection and recognition of LPR characters in Indian vehicles is discussed in [3]. Initially the license plate image is preprocessed to remove illumination condition. Features are extracted by boundary analysis of character. The character segmentation is made by using horizontal and vertical projection of extracted license plate. KNN is used for the character recognition. System design for LPR by using edge detection and Convolution Neural Network (CNN) is discussed in [4]. The license plate is

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ANALYSIS STUDY ON HOW TO SECURE IoT SYSTEMS USING BLOCKCHAIN TECHNOLOGY

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Abstract

IoT is one of the blooming technology in the world around us. Using IoT, we can connect anything, access from anywhere and at any time, easily and efficiently. Aside from these advantages, IoT has some difficult issues on which there are a few shots for the programmers to gain admittance to the IoT frameworks through certain provisos. By utilizing these bugs, programmers can take the security of the clients and even can make hurt them. Thus, in my paper, I concentrate on securing the IoT systems using an efficient technology like the Blockchain technology. Along these lines, in this paper, I initially clarify about a diagram of the Blockchain innovation; at that point the execution of IoT utilizing Blockchain is talked about pursued by giving a model to the security of IoT utilizing Blockchain innovation.

Keywords: Internet of Things, Blockchain technology, Security, Smart Contract, Consensus.

I. INTRODUCTION

Internet of Things is an emerging environment where smart devices are able to interconnect and communicate without the intervention of the humans. Internet of Things is expected to connect billions of devices in the upcoming era. Keen gadgets are viewed as the fundamental main thrusts of the IoT applications [1]. Brilliant gadgets not just expect data to be change among themselves yet in addition fills in as remote IoT administrations to the Internet. These information can be collected at different levels. IoT applications are rich in communication and thus we face challenges on ensuring the security and privacy. But there is no general standards or measures available to ensure such security. Hence the integration of Blockchain technology in IoT was proposed and implemented.

Blockchain innovation is currently getting a lot of consideration from programming researchers since it has been made. Fig 1 [2] demonstrates the fundamental mainstays of Blockchain innovation in the web world. All things considered, it can change and streamline the worldwide foundation of the innovations associated with one another through web. It has for the most part two fields that will be affected by it which are:

- Making a de-centralized structure, it evacuates the richness of focal servers and gives shared affiliation.
- It can make a thoroughly clear and open to all database, which could pass on straightforwardness to the association and races.

ANALYSIS ON CLOUD SECURITY STORAGE TECHNIQUES

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Abstract - Cloud computing is a lot of specialized IT services that are offered to a client through a network system as pay-per-use approach and with the capacity to scale up or down their service necessities. As a matter of fact, cloud computing services are provided by an outside supplier who claims the framework. It offers such a large number of advantages to the cloud client incorporates versatility, strength, adaptability, productivity and redistributing non-core activities. Even though the potential gains achieved from the cloud computing, the organizations are delayed in tolerating it because of security issues and difficulties related with it. Security is one of the significant issues which hamper the development of cloud. Numerous organizations and institutions are utilized cloud computing innovation yet significant security issues are how the data keep secured and safe. This paper discusses about the distinctive cloud data storage security methods and examines the issue of the information security.

Keywords: cloud storage, Cloud security storage, Security Storage Methods.

I.INTRODUCTION

Distributed storage is a remote stage that uses an exceptionally virtualized, multi-inhabitant framework to give ventures versatile capacity assets that can be provisioned progressively as required by the association. This administration is offered by a wide cluster of distributed storage suppliers. Distributed storage utilizes a profoundly virtualized framework to give adaptable capacity assets that can be provisioned in a pre-characterized way or provisioned powerfully as required by the association. Ventures are progressively embracing distributed storage alternatives since they need greater limit, flexible limit and a superior method to oversee capacity costs after some time. The growing amount of enterprise data and cloud data are proving too difficult for IT departments to manage using their data center alone. Not surprisingly, enterprises are supplementing what they have with cloud data storage in the form of private cloud, public cloud or both. Among the benefits, the capability to leverage cloud storage pricing, which offers great budget flexibility.

II. NEED OF SECURITY IN CLOUD COMPUTING

The number of ventures moving their applications and information to the cloud has been expanding reliably. Various investigations proposed that the cloud platforms give ventures an increasingly secure outlet for putting away applications and information. But no venture can use the advantages of cloud computing without guaranteeing the security of its product applications and information. They need strong security solutions that meet the recurrence and speed of cloud sending. Likewise, they should use the most recent security apparatuses and implement propelled security conventions to take-out the disastrous effect of focused security assaults. There are also a number of reasons why enterprises must focus extensively on cloud security [1].

CERTAIN SUBORDINATION RESULTS FOR GENERALIZED SECOND ORDER POLYLOGARITHMS BY CONVOLUTION

V. AGNES SAGAYA JUDY LAVANYA, M.P. JEYARAMAN, AND H. AAISHAFARZANA

ABSTRACT. We propose to study certain convolution product of the generalized polylogarithm function, $H_f(a, b; z)$. The structure under consideration is studied for various geometric properties by means of subordination. Also relevance to the known results are pointed out.

1. INTRODUCTION

Let $\mathcal{H}(\Delta)$ denote the class of analytic function in the open unit disc, $\Delta = \{z \in \mathbb{C}; |z| < 1\}$ and S be the class of univalent in Δ. For $a \in \mathbb{C}$ and $n \in \mathbb{N}$, consider

$$\mathcal{H}[a, n] = \{f \in \mathcal{H}(\Delta); f(z) = a + a_n z^n + a_{n+1} z^{n+1} + \cdots, z$$

with $\mathcal{H}_0 = \mathcal{H}[0, 1]$ and $\mathcal{H}_1 = [1, 1]$. We denote by $\mathcal{A}$ the class of analytic functions in $\mathcal{H}[a, 1]$, normalized by the condition $f(0) = 0 = f'(0) - 1$ and

$$f(z) = z + \sum_{n=2}^{\infty} a_n z^n, \ z \in \Delta \tag{1.1}$$

Given two functions f and $g \in \mathcal{H}(\Delta)$, we say that f is subordinate to g in Δ, and write $f \prec g$ if there exist a Schwarz function w analytic in Δ with $w(0) = 0$ and $|w(z)| < |z|$ for all $z \in \Delta$, such that $f(z) = g(w(z))$ for $z \in \Delta$. In particular, if g is univalent in Δ, we have the following equivalence $f(z) \prec g(z)$, $z \in \Delta \Leftrightarrow f(0) = g(0)$ and $f(\Delta) \subset g(\Delta)$.

Let $\psi : \mathbb{C}^3 \times \Delta \to \mathbb{C}$ and h an univalent function in $\mathbb{U}$. If p is analytic in Δ and satisfies the second order differential subordination

$$\psi(p(z), zp'(z), z^2 p''(z); z) \prec h(z), \text{ for } z \in \Delta, \tag{1.2}$$

then p is called a solution of the differential subordination. The univalent function q is called a dominant of the solutions of the differential subordination, or more simply a dominant, if $p \prec q$ for all p satisfying (1.2).

A dominant $\tilde{q}$ that satisfies $\tilde{q} \prec q$ for all dominants q of (1.2) is said to be the best dominant of (1.2)

Let us consider the generalized second order polylogarithm function

$$G(a, b; z) = \sum_{n=1}^{\infty} \frac{(a+1)(b+1)}{(n+a)(n+b)} z^n, \ a, b \in \mathbb{C}\backslash\{-1, -2, \dots\} \tag{1.3}$$

2010 *Mathematics Subject Classification.* 30C45.

Key words and phrases. Differetial subordination, Convex functions, Convolution, Second order polylogarithms, Differential operator.

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A comparative study on multi criteria decision making methods.

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Abstract

Multi criteria decision making methods are widely used in many fields of research including engineering, production, medicine etc. There are several methods proposed so far to solve these problems. In this paper we have made a comparative analysis under intuitionistic fuzzy environment between the existing methods namely: TOPSIS, VIKOR, and TODIM which are pre dominantly used in many fields. The objective of this paper is not to determine which method is the best one but to find out the different ranking order of alternatives, and the reason behind them.

1. Introduction:

In recent years, multi criteria decision making has been extensively used in many fields such as engineering, production, supplier selection etc. Multi criteria decision making methods in the process of identifying the best alternative from all the feasible alternative. Wide range of methods can be applied for solving MCDM Problems. There is no appropriate solution for this problem. Often, different methods can give us different ranking of alternatives the inconsistency in results occurs of the following reason which are listed they are

1) Algorithm for selection of preferred alternative differ.
2) Techniques use criteria weights differently in their calculations.
3) Algorithm attempt to scale the objectives, thus affecting the weights already chosen.
4) Algorithm introduce additional parameters that affect selection of preferred alternative.

Of the many MCDM methods, five methods are commonly used. Simple additive method (SAW), Weighted product method (WPM), Analytical hierarchy process (AHP), Techniques for order preference by similarity to ideal solution (TOPSIS), a compromise ranking method (VIKOR), TODIM is a recently developed MCDM method which is used widely nowadays other methods such as ANP, PROMETHEE are also used.

In 1965 Zadeh introduced the concepts of fuzzy sets. Atttansov and gargov presented the concept of Intuitionistic fizzy sets. In 1981 Hwang and yoon suggested a method of technique for order preference by similarity to ideal solution (TOPSIS) method to identify the best alternative among the available alternatives by finding the shortest distance from positive ideal solution and fastest distance from the negative ideal solution. The preference ranking organization methods for enrichment evaluation (PROMOTHEE), proposed by Beans & vuicke (1985) which is based on the comparison of each alternative with each other considering the deviations that alternatives show according to each criterion. VIKOR (Vlse kriterijumska optimizalija I kompromisno Resenje) was proposed by opricovic in 1998 which rank the alternatives according to the value of three scalar quantities (S_i, R_i & Q_i) that have to be calculated for each option. The ELECTRE method (ELimination Et Choix Tradrisant la REalite) was proposed by Roy which ranks the relation between the alternatives taken two at a time. T It was proposed by Gomes and Lima with discrete data. Later it was extended by Fan et al to the fuzzy environment. Krohling et al presented the extension of TODIM to the interval valued intuitionistic fuzzy environment. Due to some complexity and the uncertainty, it is impossible to consider all the aspects of the problem. Therefore, the DM's provide us their knowledge and preference. It may be a bias one. In order to overcome this, a specific and considerable weight must be assign to each DM's. Also, however in fuzzy environment, time, pressure, lack of data and limited information DM's cannot provide a weight for each criteria. Quande Qin proposed the TODIM based multi criteria decision making with triangular intuitionistic fuzzy numbers in which they have

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A NOVEL SCORE FUNCTION ON INTUITIONISTIC FUZZY SETS AND ITS APPLICATION TO MULTI CRITERIA GROUP DECISION MAKING PROBLEM

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Abstract

In this paper, a new score function on intuitionistic fuzzy sets (IFs) was proposed which can overcome the drawbacks of the existing score functions. Also multi criteria group decision making method was discussed based on the proposed new score function.

Keywords: Intuitionistic Fuzzy Sets (IFS), Multi criteria group decision making (MCDM), Score function.

1. Introduction

Zadeh [13] in 1965 introduced the concept of fuzzy sets. Later it was extended to intuitionistic fuzzy set by Atanassov [1] in which the membership was characterized by degree of membership and degree of non-membership. Atanassov and Gargov [2] introduced the concept of internal valued intuitionistic fuzzy sets (IVIFs). In recent years, MCDM has been used in various fields. In [11] Wu and Chen presented an MCDM method which was based on intuitionistic fuzzy sets (IFS). Many scoring functions are existing to rank the alternatives. Some of them are proposed by, Chen &Tan [4], Kharal [5], Lin et al [6][7], Liu & Wang [8], Wang et al. [9]. In this paper, we have proposed a new score function which can overcome the drawbacks of the existing score functions [4,5,6,7,8,9], also a MCGDM approach was explained using the new proposed score function. Acomparative analysis of the existing score information & the proposed score function was also made to analyze the drawback of the existing method.

This paper is organized as follows: Section 2 explains the basic concepts of IFVs. In section 3, we discussed briefly the existing score functions. In Section 4, we propose a new score function of IFVs and with the example, we analyze the drawback of the existing score function with the proposed one. Finally, an MCDM approach was explained using proposed score functions.

2. Preliminaries

Definition 2.1: Intuitionistic fuzzy set

Let X be a non-empty set, then $A= \{<x, \mu_A(x), \gamma_A(x)>, x\epsilon X\}$ is an intuitionistic fuzzy set, where $\mu_A(x)$ is the membership degree of x belongs to X and $\gamma_A(x)$ is the non-membership degree of x belongs to X, such that $\mu_A: X \rightarrow [0,1], \gamma_A: X \rightarrow [0,1]$ and $0 \leq \mu_A(x)+\gamma_A(x) \leq 1$, for all $x\epsilon X$.

For convenience, we write Intuitionistic fuzzy value as $A=<[a,b]>$ where a is the degree of membership and b is the degree of non-membership.

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Cellular manufacturing problem - A graph theoretic approach

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Abstract
The cell formation problem which arises in cellular manufacturing can be formulated in graph theoretic terms. The input for a cellular manufacturing problem consists of a set X of m machines and a set of Y of p parts and an $m \times p$ matrix $A = (a_{ij})$, where $a_{ij} = 1$ or 0 according as the part p_j is processed on the machine m_i. This data can be represented as a bipartite graph G with bipartition X, Y and m_i is joined to p_j if $a_{ij} = 1$. Let $G_1, G_2, \ldots, G_k$ be nontrivial connected subgraphs of G such that $V(G_1), V(G_2), \ldots, V(G_k)$ forms a partition of $V(G)$. Then $\pi = \{G_1, G_2, \ldots, G_k\}$ is called a k-cell partition of G. Any edge of G with one end in G_i and the other end in G_j with $i \neq j$ represents an inter cellular movement of a part. One of the objectives in cellular manufacturing problem is to minimize the inter cellular movements of parts. Let $\beta(G, \pi)$ denote the number of edges in G with one end in $V(G_i)$ and other end in $V(G_j)$. Let $\beta(G, k) = min_\pi \beta(G, \pi)$, where the minimum is taken over all k-cell partitions π of G. In this paper we propose a graph theoretic algorithm using Depth-First-Search to solve the cellular manufacturing problem for the case when $k = 2$. Comparison of the results that we have obtained with solutions obtained by other known algorithms shows that our algorithm gives a better solution.

Keywords : Cellular manufacturing problem, Exceptional elements, Bipartite graph, Depth-First-Search

1. Introduction

Cellular manufacturing is an application of the principles of group technology in manufacturing. The input for a cellular manufacturing problem consists of a set X of m machines, a set Y of p parts and an $m \times p$ matrix $A = (a_{ij})$, where $a_{ij} = 1$ or 0 according as the part p_j is processed on the machine m_i. Those parts which require a similar manufacturing process are grouped into a family, called a part family. Given a part family, a group of machines is identified for manufacturing the parts of the family and the part family along with the corresponding group of machines is called a cell. Thus a cell is a small scale, well-defined production unit within a large factory, which has the responsibility for producing a family of parts. Cellular manufacturing problem is to design cells in such a way that some measure of performance is optimized. We confine ourselves to the problem of minimizing the number of part movements from one cell to another cell. Cell formation problem in cellular manufacturing system is a NP-hard problem (Solimanpur et al., 2010). Many authors have proposed several approaches for this problem such as mathematical programming (Boctor, 1991), neural network (Guerrero et al., 2002), graph-theoretic approach (Rajagopalan and Batra, 1975), genetic algorithm (Venugopal and Narendran, 1992), Boolean matrix approach (Venugopal and Narendran, 1993) and clustering approach (Wei and Kern, 1989).

We start with a few basic concepts in graph theory which are used in this paper. For any finite set S, the number of elements in S is called the *cardinality* of S and is denoted by $|S|$. We consider only finite graphs $G = (V, E)$ where V is the vertex set of G and E is the edge set of G. If S is a nonempty subset of V, then the subgraph of G with vertex set S and edge set consisting of all those edges of G with both ends in S is called the *subgraph of G induced by S* and is denoted by

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SHORT-RUN PROCESS CONTROL BASED ON FUZZY APPROACH

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Abstract

Statistical Quality Control (SQC) receiving increasing attention from quality controller as a key to meeting the needs of customer. SQC embedded in the graphical and statistical analysis of process data for the purpose of understanding, monitoring and improving process performance. In SQC, Statistical Process Control (SPC) is a powerful collection of problem-solving tools useful in achieving process

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POTENTIAL USE OF INDIGENOUS RHIZOBIAL BIOFERTILIZERS FOR CULTIVATION OF GROUNDNUT PLANT – A SHORT MINI REVIEW

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Abstract: - Soil, an unpredictable environment may not produce intended results of plant growth promotion. Moreover, the effect of PGPR in crop productivity varies under laboratory, greenhouse and field trials. Various abiotic and biotic stress factors influence the effectiveness and survival of PGPR since unfavorable growth conditions in the field are expected in the normal functioning system of agriculture. Unlike local strains, foreign strains may not be adapted to the local soil, climatic conditions or prevailing environmental status in the field. For a promising path forward, a rational strategy of identifying local native rhizobial strains with high SNF properties is the timely need. Specific identification of potent isolates based on "additive hypothesis" with traits of phosphate solubilization, dinitrogen fixation, ACC deaminase, antifungal activity, IAA and siderophore biosynthesis and stress tolerance would be highly valuable. PGPR applications under both natural and controlled soil environments has significantly increased the yield of crops, which makes PGPR to be advantageous as a means of promoting plant growth. As a technology readily accessible by the farmers, further research contributing to investigation on PGPR'S capacity to mitigate various stress factors for the successful use of rhizobacteria with varied applications, such as phytoremediation, bio fertilization is the need of the hour to establish the native potent strains in the already existing community of soil microorganisms.

Keywords:
Rhizobium, BNF, Native strains, PGPR, Stress tolerance, Groundnut cultivation, Tamil Nadu

I. INTRODUCTION

The world's population is set to grow considerably over the coming years. Over the next four decades, the world's population is forecast to increase by two billion people to exceed nine billion people by 2050 (Godfray *et al.*, 2010). Recent FAO estimates indicate that to meet the projected demand, global agricultural production will have to increase by 60 percent. Agriculture plays a vital role in India's economy (Alexandratos, 2012). The Indian food industry is poised for huge growth, increasing its contribution to world food trade. Thirty-two percent of India's total food market is contributed by the food processing industry making it one of the largest in the country bagging the 5th rank in terms of production, consumption, export and expected growth. India aspires to double its farm income by 2022. Intensification of production can be associated with significant dismissive environmental effects, including groundwater pollution, soil erosion and a loss in biodiversity. A large proportion of land area in India shows continuous soil degradation due to overgrazing, expanding population and deforestation.

II. CHALLENGES FACED IN AGRICULTURE SECTOR

The greatest challenge of today's agriculture is to meet the food demands of doubling growing population and simultaneously restore the natural resources. Uncontrolled population growth in developing countries accelerated the imbalance between human needs and sustainable use of land. Conventional agriculture practices and the growing population led to an increasing demand of chemical fertilizers (Mahanty *et al.*, 2017). Though chemical