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Different blood collection methods from rats: A review

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ABSTRACT It is essential for collection of blood samples from laboratory animals employed in wide range of scientific research. There is a no. of techniques available for blood sample collection from Rats/mice. The stress produced in animals during the blood collection may compromise with the research data which may invalidate the results. It is necessary that the blood sample collection is done by trained individuals so as to minimize the stress and other physiological reactions in the animals. This article reviews some of the common approved blood collection techniques for rats/mice.
Keywords: stress, mice, rat, blood collection techniques.

1. INTRODUCTION

In experiments and research works where impact of some substances on different parameters are to be tested, a mammalian model is required. Often mice/rats are used for this. The maintenance of rats, rearing, blood sample collection, disposal of deads and waste is a tedious and responsible task. For rearing and maintenance of rats the researchers should follow standard guidelines. Primarily an Animal Ethical Committee (AEC) should be formed, which sets and formulates standard guidelines for maintenance, rearing etc of models used in experiments. It is important to note that, if handled carelessly the blood collection procedures may stress the animal which may have impacts on the results and parameters under study. It is even more important that the personnel handling the mice/rat should learn the skills of handling and collection of blood so as to minimise the stress on rats during blood collection (Hoff, 2000). In this review we have tried to put light on various methods of blood collection techniques used around the globe; for this we have intensively reviewed the available literatures. The purpose of this review is to educate the young researchers who require handling mice/rats during their works which involves the collection of blood sample.

2. BLOOD SAMPLE COLLECTION TECHNIQUES

A. SAPHENOUS VEIN BLOOD COLLECTION

Blood sample collection from the lateral saphenous vein is relatively quick method of blood collection from all strains of rats. This technique does not require the rat to be anaesthetized (Table 1). Blood sample is taken from the saphenous vein which runs dorsally and laterally over the tarsal joint. The site is first shaved (hairs removed). The rat should be restrained (Hoff, 2000). This may stress the rat therefore the duration of restraint should be as minimum as possible. The hind limb should be immobilised in the extended position prior to blood collect. If the animal is difficult to handle, a mild anaesthesia should be given to animal (Van *et al*, 2001). A puncture is made with help of fine needle to collect the blood sample. The number of attempt to puncture the vein should not exceed three in one attempt. Blood flow can be stopped by pressing gently with finger above the puncture site and the animal should only be returned to the cage after the blood flow has stopped completely (LAREF, 2004).

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Full Length Research Paper

Effect of plant growth regulators on callus multiplication and *in vitro* plant regeneration in *Bacopa monnieri* L.

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Current investigation deals with the tissue culture studies on *Bacopa monnieri* which has very high morphogenic potential. Its leaf explants respond very readily to treatment with auxins and cytokinins. Indefinite number of plantlets were regenerated from leaf margin, without intervening callus on Murashige & Skoog (MS) medium supplemented with indole-3- acetic acid (IAA) and kinetin (KN). Green embryogenic callus with indefinite number of micro shoots were developed on naphthalene acetic acid (NAA) supplemented medium when 2,4-dichlorophenoxyacetic acid (2,4-D) grown stem-derived callus was sub-cultured. During present investigation, stem (internode, node) explants exhibited callus induction, whereas, leaf explant showed a tendency to regenerate shoot and/or roots. *In vitro* grown plantlets were transferred to polypots containing sterile cocopeat and then series of steps were carried out for acclimatization. Survival rate was 100% when acclimatized plantlets were transferred to soil. Micro-propagated plantlets were without any morphological abnormalities.

Keywords: *Bacopa monnieri*, callus, IBA, IAA, KN, 2,4-D, NAA, embryoids, acclimatization.

INTRODUCTION

Medicinal plants are the most important source of life saving drugs for the majority of the world's population. Many medicinal plant species with their bioactive molecules are disappearing at an alarming rate due to rapid agricultural and urban development, uncontrolled deforestation and indiscriminate collection of the plant materials by the plant based pharmaceutical companies. Farnsworth et al., (1985) have listed many medicinal plants in a Bulletin of World Health Organization. Blumenthal et al., 2006, have reported a steady growth in total sales of herbal supplements in the United States .

In a priority list of the most important medicinal plants, evaluated on the basis of their medicinal importance, commercial value and potential for further research and development, *Bacopa monnieri* was placed second according to a sector study by the Export-Import Bank of India,1997. According to an estimate, the annual requirement of the plant was projected to be about 12,700 tonnes of dry material, valued at approximately Rs. 15 billion (Ahmad 1993.)

Bacopa monnieri (L.) Pennell is also referred to as *Bacopa monniera*, Indian Pennywort (L.) Pennell, *Herpestes monnieria* L., *Gratiol amonnieria* belonging to the family Scrophulariaceae. It is commonly known as Water Hyssop, brahmi, jalbrahmi and nir- brahmi. The plant is used in the manufacture of various Ayurvedic drugs. In Ayurveda the plant is mainly known as " Brahmi", after Brahma, the creator God of the Hindu pantheon. It was around the 6th century A. Dthat *Bacopamonnieri* was initially mentioned in texts such as the Charaka Samhita, Atharva Veda and Susrut Samhita as

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PHYTOCHEMICAL SCREENING OF *IN VITRO* AND *IN VIVO* GROWN PLANTLETS OF *BACOPA MONNIERI* L

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ABSTRACT

Different types of extracts of *in vivo* and *in vitro* grown plantlets of *Bacopa monnieri* L. were qualitatively evaluated to identify the chemical constituents like saponins, alkaloids, resins, Quinones, tannins, phenols, flavonoids, coumarins, proteins and amino acids. Wild and fresh plantlets were collected and different parts of these plantlets were cultured on MS (Murashige and Skoog) medium supplemented with BAP (benzyle amino purine) + AdS (adenine sulphate)+citric acid to get micropropagated plantlets. One and half months old micropropagated plantlets as well as wild or field grown plantlets were taken for tap water washing, air drying, grinding and homogenizing to get fine powder. Cold extraction or solvent extraction methodology was followed to prepare extracts from plantlets. During current investigation methanol, ethanol and water were used as nonpolar and polar solvents. As chemical extraction, mainly depends on the type of solvents with varying polarity, it was investigated that saponins were highly present in water extract, 30% methanol and 30% ethanol extract, while saponins were not found in absolute methanol and ethanol. Standard procedures were used to identify the different constituents present in both the samples.

KEYWORDS: Ethanol, Extract, Methanol, Micropropagation, Reagents, Saponins, Water

INTRODUCTION

Bacopa monnieri L. Pennell family Scrophulariaceae, commonly known as Water Hyssop, Brahmi, Jal Brahmi and Nir-Brahmi, is a reputed drug of Ayurveda. It is used in traditional medicine for various nervous disorders (The Ayurvedic Pharmacopoeia of India1999). Traditionally, it was used as a brain tonic to enhance memory development, learning and concentration (Mukherjee DG and Dey CD 1966). Research on anxiety, epilepsy, bronchitis and asthma, irritable bowel syndrome and gastric ulcers also supports the Ayurvedic uses of Bacopa (Rajani M, Srivastava et al. 2004). Compounds responsible for the Pharmacological effects of Bacopa include alkaloids, saponins and sterols. The main constituents responsible for Bacopa's cognitive effects are some saponins, which include Bacosides A and Bacoside B. These are complex mixtures of dammarane type of triterpenoidal saponins (Mahato SB, et al. 2000). The bacosides aid in repair of damaged neurons by enhancing kinase activity and ultimately nerve impulse transmission (Singh H.K, Dhawan BN 1997).

Loss of cholinergic neuronal activity in the hippocampus is the primary feature of Alzheimer's disease. Bacosides appear to have antioxidant activity in the hippocampus frontal cortex and striatum (Bhattacharya S et al. 2000) and possesses anti inflammatory activity. Bacopa also gives anticancer effects, possibly due to inhibition of DNA replication in cancer cell lines (Elangovan et al- 1995) A recent *in vitro* study also demonstrated Bacopa extract's specific anti-microbial activity against– *Helicobacter pylori* a bacteria associated with chronic gastric ulcers (Goel R.K et al. 2003)

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Impact of Personality of Working Women on Marital Satisfaction

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Abstract

Personality traits denote inherited or acquired individual characteristics of thought, feeling and actions that include the psycho-physical, emotional, conscious and unconscious behavior pattern of a person. The major problem in marriage is adjustment to a mate. Interpersonal relationships play as important role in marriage like friendships. But after marriage, the interpersonal relationships are difficult to maintain compare to social life. To evaluate the impact of personality traits on marital adjustment this study was carried out among working women in organized sector. A total of 300 employed women from different professions, e.g. education, health and other services were selected from Ranchi, Hazaribag, Ramgarh and Bokaro district of Jharkhand. Marital relationship is shaped by the action and interaction of various external factors like income, education, type of work, household responsibilities, type of family and internal factors viz., background, interest, temperament, values. Results reveal that majority of the respondents had similar interests and values. There was significant difference in temperament between college teacher-clerk and school teacher-clerk. The respondent belonging to higher service and lower service had no significant difference with respect to similarities of interest and value. Additionally there was a significant difference in adaptability between doctor and clerk, officer and clerk, and school teacher and clerk. To achieve marital harmony one has to be rational, tolerant, cooperative and loving. Successful marriage depends mainly on flexibility, independence, sufficient emotional support and positive communication between the partners.

Keywords: working women, personality, marital adjustment, organized sectors

1. Introduction

In traditional society the women's role has been characterized by dependency, inferior social culture and suffering. The financial demands on the Indian families are rising due to high standard of living, increasing expenses on children's education etc. The process of modernization, industrialization and urbanization have changed the position of women and established the new roles and status for them. The emerging trend of educated married women's taking up employment is liable to affect her culture, personality, her marital and family relationship. This dual roles demand both time and energy. They have family and professional problem also as they go beyond their homes and deviating from their traditional role of wives that affect the interpersonal relations with their husbands. Behavioural influences are the most important factor on the quality of the marital relationship.

1.1 Temperament Interest and Value

Satisfaction level was found to be highest among those whose husbands helped in cooking and lower among those who did their cooking alone. Small family size, good health, adequate family income and grown up children were the main factor promoting satisfaction level of the working women in respect of their home role performance (Kaur and Punia, 1986). As self respect is more important, working women have to enter roles of two sets of overlapping responsibilities such as wife, mother and as earner that seems to be one of the major stress for them. For successful home maker one must possess domestic, economic, social and outdoor quality to create a real home from house.

1.2 Adaptability in Marital Adjustment

Gutek *et al* (1991) and Bacharach *et. al.'s* (1991) perspectives suggest that time is a limited resource and the conditions of work and other contexts such as family may place competing demands on an individual's time. Personal factors of respondents at home and at work level, were more responsible for conflicts in both teaching and non teaching categories

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Many Voices, One Reality: 'All India Tribal Women Writers' Meet' in Ranchi

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Introduction

Tribes are generally perceived as people allergic to development, least of all, literary development. The idea of 'development' is itself prone to questions and various explanations, yet it becomes more lamentable when it comes to women. Past century has witnessed assertion of women rights and recognition of their position in variety of fields, in a big way, including tribal societies. In history, there is a strong wave of looking at the past events from women's perspective. Subaltern stream has done much service to this kind of history writing by bringing the perspective of the marginalised to fore. In Dalit narratives, that were re-written on the behest of Bahujan Samaj Party (BSP) in Uttar Pradesh, the martyrdom of Jhalkari Bai and Dalit women are being narrated as a tool to develop political consciousness at the grass root level. Myth and memoirs of Dalits in Indian Freedom struggle are employed for political mobilisation. This genre of hero worship is actively used through stories and symbols and has played a great role in Dalit assertion in North India (Narayan 2007).

In Jharkhand the history of tribal movement is being re-written and the stories of women heroes are constructed deliberately (Barla 2015) around the tribal movements in order to glorify past, especially in the context of the freedom movement, an event of great merit for dominant culture and present politics. This new wave of tribal assertion is seen in Jharkhand, the tribal state of India where the contributions of Fulo and Jhano (Chako 2017), sisters of Siddho and Kanho (leaders of Santhal rebellion of 1855), Maki Munda (Gupta and Basu 2012), wife of Gaya Munda, a close associate of Birsa Munda (leader of *Ulgulan* of 1899-1900), Devmani (participant of Tana Bhagat Movement) (Kumar 2008: 723-31)[1] and other women are being documented, and such similar attempts are visible in many parts of the country.

[1]When Jatra Oraon, the leader of the movement was arrested in 1914 with his seven close associates, Devmani of Batkuri led the movement and kept its flames alive and popularised this movement amongst the tribes.

SUSTAINABLE ENTREPRENEURSHIP & GLOBALIZATION

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Abstract
The National Crime Records Bureau of India reported in its 2012 annual report, that 135,445 people committed suicide in India, of which 13,755 were farmers (11.2%) of these, 5 out of 29 states accounted for 10,486 farmers suicides (76%) – Maharashtra, Andhra Pradesh, Karnataka, Madhya Pradesh and Kerala. As of 2017, farmer suicides have occurred in large numbers in Maharashtra, Andhra Pradesh, Telengana, Tamil Nadu, Madhya Pradesh, Bihar, Uttar Pradesh, Chhattisgarh, Orissa and Jharkhand.7 Today, India is facing twin problems of poverty & unemployment. In the absence of well-developed infrastructure of power, transport, roads, ports, railways, telecommunication; rural sector is facing far serious problem than urban sector. Thus policy maker should promote new ventures in rural sector that needs low level of capital. The available employment opportunity in rural sector can cater to only 5-10% of unemployed (Estimation Agro based entrepreneurship is one the best way to fight with the evil of unemployment, which in long run will fight with another evil, i.e- poverty. In this paper I have studied the problem of unemployment in India role of agro based entrepreneurship in meeting the challenge of unemployment in the globalized economy with the help of some case studies and potential of Indian agro products in global market.

Discussion

Problem of unemployment is very serious in India. But the problem is more serious in rural sector because more than 60% population is dependent on agriculture. So we can say agriculture is the backbone of Indian economy. The major employment opportunities are created by it. There are 6 lakhs (approx.) villages in India, Thus, it is essential to improve the agricultural growth rate, industrialization for which agricultural entrepreneurship required to be created, trained and motivated to use agricultural products as an industry to earn more profit for the development of the villages and employment of rural population. Thus, in new millennium, India needs well thought of policy, for development in emerging scenario of globalisation. It is very necessary to be internationally competitive and survive in markets. The new ventures will only be able to take up the challenge of emerging economic environment. Business of agro products is essentially a sustainable business practice. Agriculture based entrepreneurship will strengthen the Indian rural sector, control urban population growth and also minimize the industrial pollution. Agro based entrepreneurship is very acceptable mode of sustainable entrepreneurship. With 60 per cent of India's population still engaged in agriculture and allied activities, economists and policy makers often talk about the need for creating new work avenues and industries to shift a major segment of this population out of agriculture. India's rural As per BSE indeex unemployment rate was 7.15% and urban stood at 9.62% in 2016.1 Sustainable business, or green business, is an enterprise that has minimal negative impact on the global or local environment, community, society, or economy—a business that strives to meet the triple bottom line....It has made anenduring commitment to

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Bioremedial Efficacy of Nostoc Carneum Agardh in Industrial Effluents Treatment

Abstract

The present work was done as laboratory experiment to evaluate the efficacy of Nostoc carneum- a heterocystous, nonpoisonous cyanobacterium as bioremedial agent of waste water particularly from removal of some commonly available heavy metals in industrial effluents of Jharkhand. The effluents were collected in sterile glass bottles and transported in cold condition to the laboratory for physicochemical analysis viz. pH, BOD, COD, Chloride, Sulphate and Phosphate. 3 sets of Erlenmeyer flasks were used for the experimental setup. 1st set having waste water without medium and algae represents control. To the 2nd set 100% waste water was added along with 50 mL of BG-11 medium (BNM) and 2mL of Nostoc carneum. One more set having 100% waste water, along with Nostoc but without BNM represents 3rd set. All the Erlenmeyer flasks were maintained at the temperature 25±2°C under continuous white light (2200lux) under aseptic condition. The experimental set ups were illuminated properly to facilitate the cyanobacterial growth. Initial pH value of effluent was 7.80 which become 8.3, 8.43 and 7.81 on 30th day respectively in 1st, 2nd and 3rd setup. Chloride shows 11.58%, 23.27% and 5.06% reduction from initial value, similarly deviations in values of other parameters of all the 3 setups are described in detail in research paper.

Keywords: Nostoc carneum; Effluent; Aseptic; BG-11 medium

Research Article

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Introduction

Bioremediation is a technology of using microorganisms to reduce, eliminate or transformation of contaminants to benign products present in soils, sediments, water and air. It is not a new technology; it has been practiced by humankind since the beginning of recorded history [1]. Evidence of kitchen middens and compost piles data back to 6000BC and the more modern use of bioremediation began over 100 years ago with the opening of the first biological sewage treatment plant in Sussex UK in 1891. However the word "Bioremediation" is fairly new. Its first appearance in peer revised scientific literature was in 1987 [2]. Bioremediation is an alternative to traditional remediation technologies such as land filling or incineration. It works by either transforming or degrading contaminants to non hazardous or less hazardous chemicals, respectively known as Biotransformation and Biodegradation [3]. Although metals and radio nuclides cannot be biodegraded but microorganisms can interact with these contaminants and transform them into another state or increasing their mobility so that they can more easily be flushed from the environment. In some cases metal and radio nuclides are precipitated out leading to their immobilization.

In last 25 years, application of bioremediation has been increased because of rapid urbanization and industrialization [4]. Industries generate huge quantity of waste water and discharge them into river without predisposal treatment which in turn generate sequences of environmental and ultimately health problems. The industrial effluents contain several types of chemicals such as dispersants, leveling agents, acids, alkalies, carriers and various dyes, phenol, carbonates, alcohols, cyanide, heavy metals etc [5]. A release of these effluents into aquatic ecosystems alters the pH, increases the BOD and COD and gives the water intense colourations [6].

In general treatment of effluents includes physicochemical methods such as filtration, specific coagulation, use of activated carbon and chemical flocculation [7]. But due to high cost and intense experimental setup [8,9]; biological treatment methods are used which include various bacteria, fungi and cyanobacteria. Bioremediation is a natural, efficient, low cost and rapid degradation process and is therefore perceived by public as an acceptable waste treatment process. The role of algae in the removal of various kinds of inorganic and related substances has been studied by several workers during the last several years [10-14]. Algae serve as indicators of water pollution since they respond typically too many ions and toxicants [15]. Blue green algae are ideally suitable to play a dual role of treating waste water in the process of effective utilization of different constituents essential for growth leading to enhanced biomass production. The algal biomass can be utilized for various productive purposes. Therefore the present investigation was undertaken to study bioremedial efficacy of Nostoc carneum in reducing the pollution load from waste water.

Materials and Methods

Sample collection and its characterization

Industrial effluents were collected from a thermal power station situated in Jharkhand. Because of some confidential issues its

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A NEW CLASS OF PSEUDO CYCLIC ASSOCIATION SCHEME

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ABSTRACT

A class of pseudo cyclic association scheme is obtained on p^2 elements where p is a prime number, which is contained in a broad class of strongly balanced association schemes that seem to be related to H-matrices. Also from this class we have constructed an infinite series of 2- (p^2, $p^2(p+1)$, p^2-1, p-1, p-2) –design and a set of four Williamson type matrices of order p^2.

Keywords: *Association Schemes (AS), Pseudo Cyclic Association Scheme (PCAS), Block Circulant Matrix, Generalized Orthogonal Combinatorial Matrix(GOCM), Row and column regular GOCM.*

INTRODUCTION

Bose and Shimamoto [2] gave the first formal definition of AS and listed four types of ASs with two associate classes. Some series of ASs are those of Bose and Connor [3], Vartak [20], Ragavarao and Chandrasekhara rao [12]. Roy [13], Hinkelmann and Kempthorne [7], Kusumoto [8], Surendran [19] obtained series of higher class ASs which can be obtained from trivial schemes by iterated crossing and nesting. Yamamoto *et al.* [21] listed six infinite family of ASs the cyclic schemes, the factorial schemes, iterated nested schemes, hypercubic schemes, triangular type and square schemes. For a recent account of AS vide Baily [1]. Here we introduce a new class of pseudo cyclic association schemes (PCAS) which contains the family constructed here. In the construction of the family of PCAS the notion of GOCM [16] introduced by Singh *et al.* is used.

A series of non symmetric BIBDs are due to Bose [4], Srikhande [14], Sinha and Singh [15] Logan *et al.* [10], etc. Also some known infinite class consists of doubly Resolvable-BIBD (RBIBD) (p^n,p,1) for p a prime number and integer n>3 [5] and RBIBD (k(k+1), k, k-1) either k or k+1 is a prime power and k>3 [9]. It appears that a series of BIBDs from association schemes has not been constructed. In this note we construct a new series of PCAS's which yields a series of BIBDs.

Abbreviations: J_n is all ones matrix of order n, J_{mn} is m×n all ones matrix, I_n is the unit matrix of order n, $K_n = J_n - I_n$. Sometimes J_n, I_n, K_n will be abbreviated as J, I, K respectively.

First we define the following terms.

1.1Association Scheme (AS): A d-class association scheme with vertex set X of order v is a sequence of non-zero {0, 1}-matrices $A_0, A_1, A_2, \ldots, A_d$ with rows and column indexed by X, such that

(i) $A_0 = I$,
(ii) $A_i^T = A_i$ for all $i \in \{0, 1, 2, \ldots\ldots\ldots, d\}$
(iii) $A_0 + A_1 + A_2 + \ldots\ldots\ldots + A_d = J$,
(iv) A_iA_j lies in the real span of $A_0, A_1, A_2, \ldots, A_d$: $A_iA_j = \sum_{k=0}^{d} P_{ij}^{k} A_k$.
(v) (vide Godsil and Song [6]).

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Research Article

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Plant mediated synthesis of silver nanoparticles using *Punica granatum* aqueous leaf extract

Abstract

Punica granatum has been used for thousands of years to cure a wide range of diseases across different cultures and civilizations. The leaves of *Punica granatum* are used to calm stomach disorders, combat diarrhea, dysentery and hemorrhages, conjunctivitis etc. Recently the synthesis of nanoparticles mediated by plant leaf extracts for medicinal purposes is gaining grounds. Many workers have reported that the silver nanopartices synthesized by aqueous leaf extracts are medicinally more efficient as compared to the leaf extracts itself. Thus in this study we report the synthesis and characterization *Punica granatum* aqueous leaf extract mediated silver nanoparticles. For synthesis of the silver nanoparticles, the leaves of *Punica granatum* were collected and dried in shade and extracted in aqueous medium using Soxhlet extraction apparatus. The extract was used for synthesis of silver nanoparticles. The characterization of silver nanoparticles was done and the formation of silver nanoparticles was confirmed by change in the colour of solution from yellow to dark brown. The silver nanoparticles thus formed were subjected to UV-vis spectrophotometer, Scanning Electron Microscope (SEM), and Fourier-Transform Infra-red (FTIR) analysis for further characterization of the formed nanoparticles. Thus in this study we report the formation of silver nanoparticles in the range of 88.00 to 120nm and average size of particles were confirmed to be 98.93nm.

Keywords: nanoparticles, Ag, FTIR, SEM, UV-vis, *Punica granatum*

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Abbreviations: FTIR, fourier-transform infra-red; SEM, scanning electron microscope; UV-vis, ultra violet-visible spectroscopy; SPR, surface plasmon resonance

Introduction

Biology of plant mediated nanoparticles is an upcoming branch of nanotechnology. Nanobiotechnology refers broadly to a field of science whose theme is control of matter at atomic and molecular scale.[1] Synthesis of silver nanoparticles is of much interest to the scientific fraternity. Because of their wide range of applications. Silver nanoparticles are widely being used in cancer diagnosis and treatment as well.[2,3] Prior to the green synthesis, the nanoparticles were prepared by a variety of chemical and physical methods which were quite expensive and potentially hazardous to the environment which involved use of toxic and perilous chemicals that are responsible for various biological risks. The development of biologically-inspired experimental processes for the syntheses of nanoparticles is evolving into an important branch of nanotechnology.[4] A green method of synthesis of nanoparticles has several important applications in the field of biolabeling sensors, drug delivery systems, and filters. Nanoparticles possess antimicrobial activity and exhibit new physico-chemical properties which are not observed in polar or non-polar extracts of plants.[5]

Biological routes of synthesis of metal nanoparticles have been proposed by exploiting bacteria,[6] yeast,[7] fungi,[8] actinomycetes,[9] and viruses,[10] involved synthesis. The processes are not yet feasible for industry, and their pathogenicity and lab maintenance which require skilled technicians. Therefore the use of plant extracts for this purpose is potentiality advantageous over microorganisms due to the ease of improvement, the less biohazard and elaborate process of maintaining cell cultures.[11]

Punica granatum L., commonly known as pomegranate, is a fruit bearing deciduous shrub or small tree, native to Asia and belongs to family *Lathraceae*.[12] The leaves are shiny and about 7.6cm long.[13] Different parts of plants such as leaves, bark and fruit have medicinal significance.[14] *Punica granatum* has been used as traditional medicine in many countries for the treatment of dysentery, diarrhea, helminthiasis, acidosis, hemorrhage etc.[15] Numerous phytochemical constituents have been reported to be present in different parts of *Punica granatum* plant, which makes it medicinally important.[16] In this work we report the synthesis of silver nanoparticles, reducing the silver ions present in the solution of silver nitrate by the aqueous extract of *Punica granatum*. This method is faster and yields stable silver nanoparticles compared to other methods. The qualitative formations of nanoparticles were monitored by UV-vis spectroscopy. Also the silver nanoparticles formations were confirmed by reddish brown colour formation.[17,18]

Materials and methods

Preparation of plant extract

The fresh tender leaves of *Punica granatum* was collected from Ranchi district of Jhakrhand state of India. The leaves were washed with deionised water and disinfected with 0.1% $HgCl_2$ solution for 5minutes and dried in shade away from direct sunlight for 20days. The dried leaves were grounded to fine powder with the help of electrical grinder. 50g of the fine powder of leaf of Punica grantum was subjected to Soxhlet extraction using distilled water for aqueous extraction continuously for 72hrs. The obtained extract was concentrated after filtration, using rotary flash evaporator at 45°C. The extract was stored at room temperature in air tight bottles for further studies as per previously published standards.[19]

BALNEO RESEARCH JOURNAL

Hepatoprotective activity of *Punica granatum* leaf extract against Carbon Tetrachloride induced Hepatotoxicity in Rats

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Abstract

In the present study Hepatoprotective activity of aqueous leaf extract of Punica grantum on total protein, bilirubin, aspartate aminotransferase (AST), alanine transaminase (ALT) and alanine phosphatise (ALP) in CCl4 intoxicated rat were studied. Administration of CCl4 showed significant increase ($p<0.01$) in liver marker enzymes in serum namely AST (52.30±1.15 to 107.2±13.7 IU/L), ALT (146.63±5.79 to 206.2±28.82 IU/L), ALP (176.24±5.8 to 508.2±10.22 IU/L) , bilirubin (0.52±0.09 to 2.61±0.27 mg/dl) and significantly decreased total protein (9.57±0.17 to 5.2±0.085 mg/dl), when compared to normal. Aqueous extract of Punica grantum at 250 mg/kg and 500 mg/kg body weight showed significant increase in total protein (5.2±0.085 to 6.1±0.023; 6.5±0.033) as compared to CCl4 treated rats. The extract lowered enzyme levels which is designation of Hepatoprotective action of extract. The serum AST, ALT and ALP levels are reliable markers of liver function. Thus the present study concludes the aqueous leaf extract of Punica grantum to possess Hepatoprotective activity.

Key words: *alanine transaminase, alkaline phosphatases, CCl4, aspartate aminotransferase*

INTRODUCTION

Diseases like jaundice, cirrhosis and fatty liver are commonest liver diseases worldwide. In India numerous medicinal plants such as *Adhatoda vasica, Psidium guajava, Coccinia indica* etc... are employed for treatment of liver related disorders. *Punica granatum* is traditionally used medicinal plant in India. *Punica granatum* has been reported to possess antimicrobial, antioxidant and reducing power ability (Kumar *et al.*, 2015). Free radicals or oxidative injury now appears to be the fundamental cause behind a number of mammalian diseases (Parvathi *et al.*,2013). The mammals have a complex antioxidant system to combat the oxidative stress. However excessive reactive species derived from oxygen and nitrogen may still lead to oxidative damage to tissue organs. Oxidative stress has been considered as a conjoint pathological mechanism and it contributes to initiation and progression of liver injury (Sha *et al.*, 2015). Various plants are scientifically proven to posses Hepatoprotective activity, and the underlying mechanisms involve the antioxidant property of the plants (Kumar *et al.*, 2013a). Effects of antioxidants or free radical scavengers have been widely tested for the prevention and treatment of acute and chronic liver injuries. In some of the studies, antioxidants have shown beneficial effects, specially for prevention and treatment of liver injury (Kukongviriyapan *et al.*, 2013; Kumar *et al.*, 2014a). The present study was undertaken to investigate the Hepatoprotective activity of aqueous leaf extract *Punica grantum* leaf extracts in CCL_4 induced Hepatotoxicity in rats.

Materials and Methods:

Plant materials: The fresh tender leaves of *Punica grantum* was collected. The leaves were washed with deionised water and disinfected with 0.1% $HgCl_2$ solution for 5 min and dried in shade away from direct light for 20 days and ground to fine powder using electrical griender. The powder obtained was sieved and stored in air tight containers for future use (Kumar *et al.*, 2014b).

Preparation of leaf extracts: the fine powder of *Punica grantum* was made into thimble for loading in Soxhlet apparatus and extraction was done using distilled water. The extraction was continuously done for 72 hours. The extracts thus obtained were concentrated in vacuum rotary evaporator and extracts were kept in dessicator until used (Kumar *et al.*, 2014b; Dandapat *et al.*, 2014c)

Phytochemical screening: preliminary phytochemical screening were conducted on *Punica*

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HESSE'S *SIDDHARTHA:* AN EXPLORATION INTO INDIAN PHILOSOPHY

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Abstract:

Siddhartha, set in India, is subtitled an "Indic Poetic Work," and it clearly owes much to Indian religions. Hermann Hesse's novel Siddhartha is set in ancient India at the time of Buddha (563 B.C. 483 B.C.). We find the roots of Siddhartha's conception in his childhood. Hesse's parents had been in India as missionaries. His mother was born in India. However, the health of Hesse's father declined and the whole family had to shift to Calw. They joined the maternal grandfather of Hesse Dr. Gundert, a well-known linguist and a scholar in eastern philosophy. At this place, Hesse was brought up under the influence of Indian songs, books, and discussions about Indian and Chinese writings. The beautiful objects and pieces of art left a profound impression on Hesse's mind. Hence, in the novel Siddhartha, we find an influence of eastern philosophy. But the question of the exact nature of Hesse's debt to various aspects of Indian religion and philosophy in Siddhartha is quite complicated and deserves detailed discussion. This essay will discuss the elements of Hindu and Buddhist thought present in Siddhartha and make distinctions between them.

Key words: *Hinduism, Buddhism, Samsara, Samanas, Moksha, Eastern Philosophy.*

Much of the current appeal of Hesse can be attributed to the fact that his writings invite his readers to identify their quests for an integral inner life with that endless struggle for self-realization in which the successive characters of his works are engaged. To a large extent Hesse achieves this effect by addressing himself to just those channels which communicate most directly with our deepest reactive processes-archetypal forms, the most basic personal and social conflicts, and universal philosophical and religious quests. As a conscious response to Hesse's appeal to our innermost selves, we seek, always realizing that we may never fully understand the vectored forces which converge within an artist to produce a dimensioned work of art, to produce a nomenclature for his methods, motifs, forms, and sources. None of his works seems to have been spared such analysis, least of all the *Siddhartha*. And for a number of obvious reasons, hardly a commentator on this work has failed to mention the close relationship which apparently exists between it and the principal religious philosophy of India.

"The wrings of Hermann Hesse, the German writer, have a deep and firm root in the Vedas, the Upanishads and in the Buddhism" (Timpe 349). In this contemporary worldly fringe, his writings compel to re-think and unveil the mystery of the self, urge to make a shift from periphery to centre to Know Thyself. His novel *Siddhartha* is a true critique of life and it explores the intrinsic flow to reach Enlightened State. In the novel, an inexorable search for truth is exhibited for creating a harmonious bond with the world. In pursuing the study of this novel, it seems worthwhile to notice Hesse's conception about the East, which is the sole basis of most of his literary art. In his autobiographical novel *The Journey to the East* Hesse states:

> For our goal was not only the East, or rather the East was not only a country an something geographical but it was the home and youth of the soul, it was everywhere and nowhere, it was the union of all times(24) .

"Hesse's confrontation with Indian culture was unreflected and preconscious" (Baumann1). It

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Research Article

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Synthesis and characterization of *Cuscuta reflexa* (Roxb.) aqueous extract mediated silver nanoparticles

Abstract

C. reflexa is a parasitic medicinal plant has been used for ailment of different diseases. Aqueous extract of *C. reflexa* has been used for the synthesis of SNPs .In present work synthesis and characterization of SNPs mediated by *C. reflexa* aqueous extract has been done. The synthesized SNPs showed SRP at 442.94nm. SEM image analysis provided the spherical shape of the SNPs. DLS analysis provided the synthesized SNPs were 169.10nm in diameter with -23mV zeta potential. FTIR spectroscopy provided the confirmation about synthesis of SNPs by representing various transmission peaks 3062.96cm^{-1} represented to O-H stretch for alcohol and phenol, 2735.06cm^{-1}, 2395.59cm^{-1}, 2063.83cm^{-1} represented to N-H stretches for primary and secondary amines, 825.53cm^{-1} for C-H stretch represented to vinyl group. Thus, *C. reflexa* extract can be used for synthesis of metallic nanoparticles for pharmacological studies.

Keywords: nanoparticles, characterization, shape, number

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Abbreviations: NPs, nanoparticles; NSMs, nanostructured materials; AgNPs/SNPs, silver nanoparticles; UV-vis, ultraviolet visible spectroscopy; SEM, scanning electron microscopy; DLS, dynamic light scattering; FTIR, furior transform infrared

Introduction

Nanoparticles (NPs) and nanostructured materials (NSMs) represent an active area of research with full expansion in many applications such as engineering, electronics, pharmaceuticals etc. NPs and NSMs have gained prominence in technological advancements due to their marvellous physicochemical characteristics such as melting point, wettability, electrical and thermal conductivity, catalytic activity, great adsorption capacity with liganda, stability in biological solution, light absorption and scattering resulting in enhanced performance over their bulk counterparts.[1,2]

But the principle of nanotechnology and it applications with pharmacology and medicine are different and they concern with NMs of diameter in the range of 1 to 100nm. In terms of pharmacology NPs and NSMs are defined as particulate dispersions or solid particles drug carrier and have the property to entrap, encapsulate or attach or insert the drug molecules into a nanoparticle matrix or insert the drug molecules in the core of nanoparticles.[3,4]

Recently, synthesis of different metallic nanomaterials such as copper, zinc, titanium, magnesium, gold, alginate and silver mediated by biological agents such as bacteria, actinomycetes, fungi, algae, extracts from plant and animal materials etc. have been used for eco friendly and green technology.[5,6] *Cuscuta reflexa* Roxb. Belongs to family Cuscutaceae a division of Convolvulaceae commonly known as Dodder or Akash bel is a parasitic climber plant without leaves has been used as traditional medicine in Ayurveda for treatment of eye and heart and other diseases for a long time.[7,8] It has also been reported *C. reflexa contains* different types of phytochemicals such as, cuscutin, amarbelin, betasterol, stigmasterol, kaempferol, dulcitol, myricetin, quercetin, coumarin and oleanolic acid which are associated with antispasmodic, heamodynamic, bradycardia, antisteroidogenic, antihypertensive, antiviral and anticonvulsant activities.[9,10]

The aim of present study dealt with the synthesis of silver nanoparticles using aqueous extract of *C. reflexa* and their characterization.

Materials and methods

Collection of plant material and preparation of extract

Fresh stems of *C. reflexa* were collected and brought to Department of Zoology, Ranchi University, Ranchi. Fresh stems of *C. reflexa* was washed by distilled water and then by absolute ethyl alcohol (99.8%) to avoid microbial contamination. The stems were dried in shade under room temperature, powdered and sieved. 50g of the fine powder was subjected to extractraction chamber of Soxhlet and 300mL distilled water was taken in boiling flask as extraction solvent for aqueous extraction. The extract obtained was filtered, concentrated and dried in rotary flask evaporator maintained at 45°C for proper dehydration and the dried extracts were stored in air tight containers at room temperature for further studies.[11]

Synthesis of nanoparticles

The synthesis of silver nanoparticles was done with slight modification of previous method of Dandapat et al.[12] Synthesis of nanoparticles were done by mixed 3mL (41mg/mL) of *C. reflexa* aqueous extract and 197mL of 0.1M silver nitrate (169.87g/mol) solution (i.e., 3.35g $AgNO_3$/197mL of distilled water) and incubated by using hot plate at 80°C and continuous stirring using magnetic stirrer bar, until the light yellow colour of the solution was changed to dark brown. Then the solution was cooled to room temperature and centrifuged at 15000rpm for 10 minutes. The supernatant was discarded and the pellet was washed with distilled water and was dried in the incubator at room temperature for characterization.

Characterization of nanoparticles

Characterization of synthesized silver nanoparticles were done by UV-vis spectroscopy, SEM photography, DLS analysis and FTIR analysis. UV-Visible spectra analysis was done by using Parkin Elmer Lambda-25 UV-Visible spectrophotometer. SEM was done

PERFORMANCE OF PUBLIC SECTOR UNDERTAKINGS: A STUDY

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Abstract

Public sector undertakings (PSUs) are the companies established, maintained and controlled by the Central Government of India having more than 51% stake in it. After the independence, the country was confronting with a variety of socio-economic concerns. India was mainly agriculture dependent economy with very poor industrial background. There was a huge gap between poor and rich. Undeveloped private sector was unable to invest in industrial sector. The type of problems faced by the country in all domains including economic, social obliged the Government of India to focus on public sector enterprises (PSEs) to empower self -dependent economic development. The basic objectives of starting public sector enterprises in India were mainly focused on Generate employment opportunities, Reducing gap between incomes of different people by redistribution of wages, to promote rapid economic growth, Improve essential infrastructure for economic development and to Support development of small and medium size enterprises (SMEs).

Objectives

The paper presented here critically analyses the performance of CPSEs and their subsidiaries for the financial year 2013-2018. It gives a detailed analysis of various aspects of CPSEs performance.

Research Methodology: It was a secondary data based research where most of the information has been gathered from official publications of government of India. Research articles published in leading newspapers, research journals etc. have also been used for collection and analysis of relevant information.

Key Words: Public Sector undertaking, 2014-18, sick public sector units

Introduction

A Public Sector Undertaking, known as PSU, is a company in which majority of the stake (more than 50%) is owned by the Government.... State Governments, in general, own fewer corporations than Central Government. Most of the State PSUs are mining and mineral extraction **sector**. PSUs strictly may be classified as central public sector enterprises (CPSEs) or state level public enterprises (SLPEs) The Ministry of Heavy Industries and Public Enterprises is an executive agency of the Government of India that administers 48 central public sector enterprises (PSEs) and assists them in their effort to improve capacity utilization and increase profitability, generate resources and re-orient strategies to become more competitive.

CHALLENGES FACED BY CHICK-BARAIK TRIBE OF JHARKHAND

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Abstract

The Chick-Baraik tribe is one of artisan's tribes who are mainly concentrated in the Sikarian-tand village of Tethaitanger block located at a distance of 10 km in the southwards direction from the district and block headquarters, Simdega, Jharkhand. The traditional occupation of Chick-Baraik has been weaving cloths of different types with the help of simple technology in their labor and supplies them to other tribes and local people as they were associated with the areas in which they live through jazzmani system. They receive payments in cash or in kinds or in both. At present there are arrivals of tremendous of new industries of textile with varieties of clothes into the market with a competitive advantage over handmade cloths. These clothes are cheap and easily attracted to villagers as they found to be more comfortable in use. This practice has affected the socio-political conditions of Chick-Baraik adversely. Therefore, for the betterment of socio-economic livelihood of Chick-Baraik tribe of Jharkhand, this study is an attempt to provide the possible solution of socio political dimensions of this competitive edge competition.

Key words: Vulnerability, Development, looms, readymade, technology.

Introduction

The Chick-Baraik is the only community who practices weaving for other tribal communities. Prof. Vidyarthi has mentioned only four Artisan tribal communities in the Jharkhand - the Lohra, the Karmali, the Mahali, and the Chick-Baraik. Chick-Bariak is under the way of transition.

Statement of the problem

As the available literature reflects, there is no much studies conducted on social status of Chick bariak. In spite of various schemes implemented for the development of social conditions of weaving communities yet there is no much improvement seen. They faced more vulnerability especially due to weak organizational structure, administrative failures, financial disincentive, poor infrastructure, decentralized looms, poor marketing etc. Thus the present study aims at exploring the social profiles of the weaving community to examine their status in Simdega district of Jharkhand

Objectives of the Study

1. To study the social conditions prevailing among the handloom weavers with an objective to find out there place in the society.
2. To provide the possible solution for the betterment of the handloom weavers and find out there social status and living condition.

Data and Methodology:

To fulfill the objectives of the study primary data has been collected from the respondent weavers. Both qualitative and quantitative technique of research has been used in the study. Interviews have been qualitatively analyzed and interpreted. The Study was mainly conducted in Sikaria-tar village of Simdega district of

COMPLEMENTARITY OF QUALITATIVE HIGHER EDUCATION AND SKILL INDIA MISSION: AN EVALUATION IN THE LIGHT OF OPPORTUNITIES AND CHALLENGES

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Abstract

Quarter one of 2018 has showed that India's GDP is growing at a rate of 8.1% p.a. and forecasts suggests that if all goes well the India will remain World's fastest growing economy for quite sometimes. However, growth rate can sustain and further accelerate if India succeeds in harnessing its potentials well. Demographic Dividend can be a game changer but it requires proper nurturing. It will be helpful in enhancing production capacity and increasing productivity only if people are well trained in such a manner that they remain enthusiastic to learn and innovate for the country. Qualitative higher education is the means which can lead to the attainment of such ends. However, the recent ranking of World universities does not figure any Indian university in top hundred lists. Several factors are responsible for such a dismal performance and they all must be addressed in some rational preference orderings. National Skill Development Mission popularly called Skill India Mission has been launched by the Indian Government in July 2015 to achieve the goal of student empowerment and transformation of quality in higher education as they are complementary in nature and the success of one is the success of the other too. This paper discusses theoretical models of quality evaluation in higher education and attempts to integrate it with skill India mission. The paper by evaluating the current status, opportunities and challenges of Skill India mission has tried to analyse the achievements of the twin goals- increasing the quality in higher education and the success of skill India mission.

Key Words: Quality Higher Education, Skill, Transformation, Student Empowerment.

1. Introduction

India at present is the fastest growing economy in the world. The Global posturing as an emerging economy, big consumer market economy, stable economy has helped the county to grow faster. Improvement in ease of doing business ranking, reforms in labour laws, work culture in offices, and several Government programmes like Stand Up and Start Up India, Make in India, etc. have attracted significant amount of FDI and foreign investors which has a role in solving the problem of scarcity of capital in the country. However, the capital can be productive only if combined with the efficient labour force. India is fortunate, as it is experiencing a Demographic Dividend and hence there is no problem with the supply of labour force but as we check the quality of labour force we find that it is still a challenging task even after seventy years of Independence. This raises concerns over the way education is imparted in the country, particularly higher education as it has a direct link with the quality of labour force entering the labour market. India's higher education system is the third largest in the world, next to the United States and China. However it is disappointing that not even a single Indian University is in World top hundred lists.

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Research Article

Nutritional, Hypoglycemic, and Haematinic Potentiality of Edible Mushroom *Pleurotus tuber-regium* (Rumph. ex Fr.) Singer

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ABSTRACT

Mycochemical composition, calorific value, the antioxidant activity of *Pleurotus tuber- regium* was analyzed and impact of *P. tuber- regium* extract on rat model especially glycemic, vitamins and blood parameters were explored to validate its medicinal importance. Mycochemical screening showed the presence of biochemicals such as phenols, flavonoids, proteins, carbohydrates etc. The extract showed good antioxidant activity (33.62% total antioxidant activity equivalent to 21.30 µg ascorbic acid). The extract showed dose -dependent hypoglycaemic activity by significant decreased average blood glucose level at high dose (100.62 ± 1.04mg/dL) compare to control (124.40 ± 1.45 mg/dl.), haematinic activity by elevation of hemoglobin (14.75 ± 0.24 g/dL) at a high dose of extract compared to control (11.66 ± 0.21 g/dL). *P. tuber-regium* extract elevated vitamin B12 of rats at high dose of extract (449.60 ± 3.12 pg/mL) compared to control (420.00 ± 2.86pg/mL). *P. tuber-regium* extract showed a positive response to hypoglycemic, haematinic, and vitamin level of the body and posses high calorific value. Hence *P. tuber-regium* can be used as good fodder, medicinal and nutritional supplement.

Keywords: Vitamin, mycochemicals, medicinal, antioxidant, diabetes

Introduction

In recent decades population explosion and its burden is directly associated with burden of noncommunicable diseases especially chronic and nonchronic disease such as diabetes, renal, cardiovascular, respiratory, cancer and conditions associated with malnutrition [1]. Worldwide in past two decades more than 57 million deaths occurred, and more than 29 million deaths occurred due to noncommunicable diseases in a developing country [2]. Diabetes and malnutrition are two major factors in developing countries related to morbidity and approximately 6 million people die every year due to diabetes [3, 4]. It has been estimated and reported by WHO that, worldwide every year about 11 million death of population below 10 years age occurs due to nutritional deficiency diseases and disorders [5]. One of the major causes of diabetes is the production of free radicals (reactive oxygen and nitrogen species) impart deleterious effects and one of them is diabetes [6].

The leading causes of deficiency diseases in developing countries are due to low nutrient quality of food and deficiency to minerals, vitamins, and other nutrient proteins, fats [7]. In recent decades, annual population growth rate as well as the burden of disease in developing countries of the Middle East and Sub-Saharan Africa, Latin America, South Asia and Southeast Asia increasing continuously due to poverty, improper education, insufficient medicine and medical facility etc. [8]. The population growth in India for last 30 years have been increasing at the rate of 2.3% per year [9], and an emerging drastic environmental imbalance will lead wider spectrum of health risks, resource fulfilment such as nutritional diet, proper supply of medicine, etc. [10, 11].

Traditionally mushrooms have been used as

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Improvement of renal profile in Gentamicin-induced Nephrotoxicity in albino wistar rats by edible macrofungi *Dacryopinax spathularia* and *Schizophyllum commune*

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Abstract
The present work has been taken to assess the pharmacological efficacy of two edible macrofungi *Dacryopinax spathularia* and *Schizophyllum commune* in the improvement of renal profile of Gentamicin-induced nephrotoxicity in albino wistar rats. The intraperitoneal administration of gentamicin 80 mg/Kg Body Weight per day had resulted in alterations in renal function and renal damage which was reflected by abnormal and significant (p=0.05) increase in renal function parameters of blood like Urea, Creatinine, Uric Acid and Blood Urea Nitrogen (BUN). On administration of high dose (500 mg/Kg BW) of *D. Spathularia* extract to the nephrotoxic group of rats the concentration of urea, creatinine, uric acid and BUN significantly decreased from 104.26±7.45 to 76.27±7.24, 1.17±0.43 to 0.68±0.47, 3.68±1.34 to 2.58±0.56 and 48.72±4.36 to 31.14±3.76 respectively, in comparison to the nephrotoxic group of rats. On the other hand, the administration of high dose (500 mg/Kg BW) of *S. commune* extract to the nephrotoxic group of rats resulted into significant (p=0.05) decrease in the concentration of urea, creatinine, uric acid and BUN, from 104.26±7.45 to 51.42±6.15, 1.17±0.43 to 0.62±0.14, 3.68±1.34 to 2.36±0.74 and 48.72±4.36 to 28.65±3.85 respectively, in comparison to the nephrotoxic group of rats. The results also revealed that *S. commune* extract showed comparatively more efficacy in the renal profile improvement of nephrotoxic rats in comparison to the *D. spathularia* extract.

Keywords: *Dacryopinax spathularia*, Gentamicin, Macrofungi, Nephrotoxicity, Oxidative stress, Schizophyllum commune.

INTRODUCTION

Kidneys or Renal organs are paired organs carrying out many vital physiological functions in the body like maintaining the homeostasis, excretion of waste products, maintaining the pH, regulation of blood pressure, secretion of some active compounds etc. Therefore any serious nephropathological condition may cause serious health problems and may prove fatal for the individual. Gentamicin is an aminoglycoside, frequently used as antibiotic drug against gram negative bacterial infections, which may include bone infections, meningitis, pneumonia, urinary tract infections, sepsis etc. (Gilbert, 2005). However, on the other side of its medicinal uses, gentamicin causes dose-dependent serious adverse effects on renal functions and accounts for 10-15% of all cases of acute renal failure (Morales *et al.*, 2010; Ramhariya, 2015). Gentamicin binds with the acidic phospholipids of the plasma membrane of the cells of proximal renal tubules and accumulate there (Rodrigues *et al.*, 2014). It can enter into the cells of proximal renal tubules and bind with intracellular organelles and also it can alter the mitochondrial respiration (Erdem *et al.*, 2000). The gentamicin-induced nephrotoxicity is a complex phenomenon mainly characterized by the abnormal levels of some biochemical parameters of blood plasma like Urea, Creatinine, Uric acid and BUN (Blood Urea Nitrogen), associated with renal tubular necrosis leading to progressive deterioration and renal failure (Cuzzocrea *et al.*, 2002). Previous studies have suggested that the gentamicin-

A Study on Employment and Skill Development through bamboo sector in Jharkhand

Rajni Singh[1]

Abstract

The poverty in Jharkhand is estimated at 46%; however 60% of schedule caste and schedule tribes are still below poverty line. Hence, it may be said that agroecological and social factors are main causes for poverty in Jharkhand state. The present study has been envisaged to analyze the growth prospect of bamboo sector through skill building amongst rural people. The State Forest Development Corporation and various institutes are found involved in the physical and financial development of bamboo. The process of plantation, upbringing and making various products out of the versatile bamboo is being done. Lack of good knowledge, suitable training and proper guidance are the cause of the sluggish behaviour of this sector. Through this paper an attempt has been made, whether the 'emperor grass' will serve the purpose of poor man's timber, in eradicating poverty and will it be wisely known as green gold of future. Hence, the study.

Keywords : Bamboo, Employment, Rural people, Skill development.

Introduction

Jharkhand state, carved out from Bihar state in 2000, is well known as it is rich in mineral resources and poor in agricultural production. More than 75% of work force is engaged in agriculture, but generates only 20% of state's GDP. About 45% area is under non-agricultural use and 32% is culturable wastes which are unsuitable for agricultural production and only 23% area is under cultivation. Despite the abundance of industrial production, rural population has not benefited and majority are earning their livelihoods through agriculture. During last ten years agriculture could not grow in the state as per expectations, resulting higher rural poverty.

The poverty in Jharkhand is estimated at 46%; however 60% of schedule caste and schedule tribes are still below poverty line. Different steps have been actively taken by the big business house like Tata. As per ANI, 21 June 2011, Bamboo makes Jharkhand tribals stay busy at home. As reported by the news agency the adivasis of Jharkhand have been forced to migrate seasonally to states like Punjab, Assam and Bengal in search of livelihoods and stay away from home for three months in a year. They have found a homegrown answer to the periods of unemployment or under-employment, this answer has come through another homegrown item, bamboo.

The bamboo is a group of woody grass and regarded as "Emperor" among the grasses. Commonly known as poor man's timber, bamboo is a type of flowering plant that belongs to the family poaceae (grasses) and sub-family bambusoidae. Bamboo is one of the most exploited plants on the planet because its cultivation doesn't require too much effort. In India, it grows abundantly almost all over the country, except in Kashmir Valley, and represented by 20 genera and 136 species. On the basis of genetic diversity of bamboo, India is second richest country after China. The annual production of bamboo in India is about 4.6 million tonnes; about 1.9 million tonnes is used by the pulp industries. The economic impact of the agroforestry-based bamboo system may influence general economic development considerably. In India, more than 50% of total bamboo species occur in North Eastern States. The forest of bamboo covers 10.3 million hectare which contributes 12.8% of total forest area of country (Rai and Chauhan, 1998).

In North Chotanagpur, natural bamboos occur within dry bamboo brakes (Champion and Seth, 1968) spread over most of the district. Outside the forest, large scale cultivation is practiced in

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TOXICITY OF SILVER NANOPARTICLES LOADED WITH *Pleurotus tuber-regium* EXTRACT ON RATS

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The aim of the work was to provide synthesis and characterization of silver nanoparticles loaded with *P. tuber-regium* extract and to assess their acute toxicity and haemotoxicity activity on rats. Acute toxicity of silver nanoparticles was studied by up-and-down-procedure and haemotoxicity was analyzed by differential red bload cell (RBC) count. UV-visible spectroscopy analysis provided peak at 463.9 nm. Scanning electron microscopy analysis showed nanoparticles of 60.8 nm to 94.9 nm in size and spherical in shape. X-ray diffraction analysis showed 125.7 nm average sizes of the silver nanoparticles. Dynamic light scattering analysis provided the average diameter 71.4 nm and zeta potential of −11.2 mV of the synthesized nanoparticles. Fourier transform infrared spectroscopy analysis showed major transmission peaks at 3295.6 cm^{-1} corresponds to O-H stretch for alcohol and phenol 1602.2 cm^{-1} corresponds to N-H and C=C stretch for primary amine and conjugated alkene. Acute toxicity test showed no mortality, gross behavioural changes and decreased body weight. Significant increase in total RBC ($4.30 \pm 0.05 \times 10^6$/μL), phenotypic coefficient of variation paked cell volume (PCV: 26.46 ± 0.01%) and total white blood cell WBC ($8.12 \pm 0.27 \times 10^3$/μL) was observed in 400 mg/kg extract dose treatment group compared to control group. Thus, synthesized silver nanoparticles loaded with *P. tuber-regium* aquous extract had no acute toxic, haemotoxic effect but they showed dose dependent haematinic and immune modulation activity.

Key words: nanoparticles, health, mushroom.

In recent decade along with the globalization entire human population have been facing major problems such as climate change, poverty, invasion and increase rate of diseases, disorders and drug resistant pathogens, infection, etc. [1, 2]. Therefore, greater attention and effort has been paid to develop new therapeutics having least side effect with high efficacy to fight against challenges related to heath issues and sustainable development [3]. Crude or isolated substances of medicinal plants and fungi origin are getting more importance and wide range of recent research interest for the development of new drugs, but delivery and efficacy of synthetic and many herbal drugs is often limited because of site or target specific action of therapeutic molecules and they require few modifications such as changing the molecular structure of the drug or their proper distribution by incorporation in carrier system etc.[4, 5].

Recently nanotechnology has been extensively explored as a broad area in the field of modern pharmacology and medicine. Nanotechnology concerns the size of matters in the range between 1nm to 100 nm of drug, natural or synthetic polymer loaded

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Structure and dielectric studies of (1-x)$Ba_{0.06}(Na_{0.5}Bi_{0.5})_{0.94}TiO_3$-$xBa(Fe_{0.5}Nb_{0.5})O_3$ lead-free ceramics

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Abstract

In this work, the effects of $Ba(Fe_{0.5}Nb_{0.5})O_3$ (BFN) addition on the structure and dielectric behaviour of $Ba_{0.06}(Na_{0.5}Bi_{0.5})_{0.94}TiO_3$ (BNBT) ceramics have been reported. The lead-free (1-x)BNBT-xBFN (where $0 \leq x \leq 1.0$) solid-solutions were synthesized by traditional ceramics fabrication technique and sintered at temperatures up to 1325 °C. The X-ray diffraction peaks of the compounds of the entire series were indexed. It is found that the crystal structure of the obtained solid solutions changed from rhombohedral (R3c) to cubic (Pm3m) with an increase in BFN content. The Fourier transformed infrared and Raman spectra also confirmed the formation of solid-solutions. SEM studies were carried out to evaluate the purity and microstructure of the fabricated ceramics. The dependence of phase transition broadening, phase transition temperature and dielectric parameters with compositional changes were also studied.

Keywords: *perovskites, lead-free ceramics, microstructure, dielectric constant, impedance*

I. Introduction

Lead-based ceramics are widely used in the electronics industry for various electronic, microelectronic, electro-optic and magneto-electric devices [1]. Most of the products end up in a landfill within a few months or years as they have a short service life. Attempts to recycle lead in electronic products had mostly been unsuccessful [2]. The disposed lead in the environment has subsequent effects on the ecosystem which needs to be addressed. Most leading electronic manufacturers have prioritized their search for alternatives to lead-containing ceramics. In recent years, complex perovskites with Fe as one of the components having nominal chemical formula $A(Fe_{1/2}B_{1/2})O_3$ (A = Ba, Sr and Ca; B = Nb, Ta and Sb) have lured researchers because of their giant dielectric (10^3–10^5) response over a wide temperature and frequency interval [3–7]. Reaney *et al.* [8] for the first time reported the structural studies of $Ba(Fe_{1/2}Na_{1/2})O_3$ (BFN). Saha and Sinha [9] reported that BFN possesses a partially disordered perovskite structure exhibiting ferroelectric relaxation, characterized by a broad dielectric transition. Raevski *et al.* [4] reported that the high values of the dielectric permittivity in BFN and similar ceramics can be accounted to the Maxwell-Wagner mechanism. Afterwards, continuous efforts had been made to study the dielectric behaviour of BFN [5,10–14]. Ke *et al.* [15] demonstrated that with suitable sintering conditions the value of dielectric permittivity (ε_r) of BFN can be increased above 10^5. The microwave synthesis of BFN powder and its dielectric properties had been studied by Charoenthai *et al.* [16] for the first time by microwave synthesis technique. They obtained pure perovskite phase having cubic symmetry with average particle size in the submicron range. The reported dielectric constant and dielectric loss at 300 °C and 1 kHz was ~30000 and 0.6. Eitssayeam *et al.* [17] studied the ferroelectric and pyroelectric properties of $0.8PbZr_{0.52}Ti_{0.48}O_3$-$0.2BaFe_{0.5}Nb_{0.5}O_3$ ceramic system and quoted the remanent polarization and coercive field of 0.8PZT-0.2BFN ceramics to be 21 μC/cm^2 and 6.4 kV/cm, respectively. Chung *et al.* [18] studied the fluctuations in the dielectric behaviour of BFN

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Electronic States in a Doubly Eccentric Cylindrical Quantum Wire

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Abstract

Electronic states of a single electron in doubly eccentric cylindrical quantum wire are theoretically investigated in this paper. The motion of electron in quantum wire is free along axial direction in a cylindrical quantum wire and restricted in annular regions by three different parallel finite cylindrical barriers as soft wall confinement. The effective mass Schrödinger equation with effective mass boundary conditions is used to find energy eigenvalues and corresponding wavefunctions. Addition theorem for cylindrical Bessel functions is used to shift the origin for applying boundary conditions at different circular boundaries. Fourier expansion is applied after addition theorem to get wavefunctions in analytical form. A determinant equation is obtained as a result of applications of effective mass boundary conditions which roots gives energy of various electronic states. The lowest root gives ground state energy. The variation in ground state energy with eccentricity is obtained numerically and presented graphically. Electronic states in massive wall confinement and hard wall confinement is further obtained as limiting behavior of the states obtained in soft wall confinement. The knowledge of electronic states in such cylindrical hetrostructures semiconductor material can lead to improve the efficiency of many quantum devices.

Keywords: Doubly eccentric quantum wire; Addition theorem; Effective mass Schrödinger equation; Soft wall confinement; Bessel functions.

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1. Introduction

The semiconductor hetrostructures are very useful in construction of many quantum devices like quantum laser where active medium is a quantum wire or dot. A lot of properties of quantum wire has been studied. Optical properties of a cylindrical quantum wire has been investigated theoretically to study variation of absorption coefficient and refractive index [1,2]. Binding energies of impurity in quantum dot structures have been studied as function of geometry [3]. Effect of shape and size on electron energy spectrum

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THEOSOPHY & SCIENCE

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The age of the Earth, Anthropology, Science and Theosophy have been shown to be in corroboration.[1] Theosophy believes that everything in the world is orderly phenomena unless they have faith in this fact. The Theosophical Research centre has published a transaction discussing the possible links in the occult and orthodox science approaches to the study of the physical matter.[2] Integration of science, ethics, aesthetics and religion through their relation to the conscious being of man has been discussed by Theosophy.[3] Theosophy has a rational element in it which has to be integrated with scientific knowledge,[4] and which a well defined methodology is needed.[5] The need for effective study of those aspects of science and Theosophy which can be regarded as valid knowledge has been stressed by modern scientists. [6] &[7] **Annie Besant** has defined science as God manifested as knowledge.[8] Previous to Theosophy it was conceived that Science and Religion are antagonistic to each other. But the views of the great scientists are in consonance with religion. **Albert Einstein**, the originator of the theory of Relativity says, "I believe in God..... who reveals himself in the orderly harmony of the universe. I believe that intelligence is manifested throughout all Nature. The basis of scientific work is the conviction that the world is an ordered and comprehensible entity and not a thing of chance.[9] Religion and science are considered to be two sides of the same thing. Once let science again be the material side of Religion" said Annie Besant.[10] **Sir Artheir S. Edington** wrote, "The old atheism is gone.....Religion belongs to the realm of spirit and Mind and cannot be shaken.[11] **Einstein** has also observed, "Religion without science is blind, and

science without religion is lame."

According to Theosophy there is a difference between the science of the East and the West. According to **Annie Besant**, ".....There is a profound difference between the science of the East and of the West..... One begins from the pole of spirit, the other begins from the pole of matter; so that one, as it were; comes downwards, and the other claims upwards, one starts from Purusha the other climbs up from Prakriti."[12] The spiritual world is the true reality, not the material world, and this fact has now been recognized by the scientists. According to J.B.S. Haldane, "The material world, which has been taken for a world of blind mechanism, is in reality a spiritual world seemed very partially imperfectly. The only real world is the spiritual world..... The truth is that, not Matter, not Force, not any physical thing but Mind, personality, is the central fact of the Universe."[13] Theosophical Science believes that world does not consist of matter only. It is not only science of our physical earth, but consists of both the super physical as well as physical. [14]

"There", says Annie Besant, "Opens before you, immense vistas of life, for glory and then, when that vision of yours, you can follow your living dead into the realms of the heavenly world.[15] This extended knowledge of super

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A STUDY OF THE GRANITIC ROCKS OF THE ICHADAG AREA IN RANCHI PLATEAU IN EASTERN INDIA

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ABSTRACT

The Ichadag area forms the northern extremity of Ranchi plateau in the Chotanagpur region of eastern India and is dominated mainly by the Precambrian lithounits. It is represented by a vast expanse of granitic rocks with metasedimentaries and amphibolites occurring in close association. The Precambrian metamorphites and the associated granitic rocks of the region have been subjected to repeated tectonism and associated metamorphism.

The metasedimentaries in the area are the remnants of argillaceous, arenaceous and calcareous primary rock materials, which have been subjected to various phases of tectonism and metamorphism and they comprise of biotite schist, biotite- muscovite schist, phyllites, quartzites, calc- silicate rocks, crystalline limestone etc. The granitic rocks of the study area include granite gneisses, anatectic granites, migmatites, pegmatites and associated quartzo-felspathic veins. They differ widely in mineralogy, texture and field relationship.

The granite gneisses possess an alternations of lepidoblastic and granoblastic fabric, whereas nonfoliated granites are typically hypidiomorphic and crystalline in nature.

The granites of the Ichadag area are peralumineous, their silica percentage lies between 70 – 74% and CaO % is less than 3.7%. The geochemical study of these granitic rocks establishes their S-type lineage. There are enough indications that points towards the contribution of pelitic schists in generation of anatectic melt for the evolution of granitic rocks of the study area.

INTRODUCTION

The Ichadag area forms an important segment of the Chotanagpur Granite Gneissic Complex (CGGC), which bears the signature of the various tectonic, intrusive and metamorphic activities and is composed essentially of Precambrian rocks. The predominance of granite gneisses has imparted a more common nomenclature for this region as CGGC. The present area of study forms the northern segment of Ranchi plateau and is a depository of almost all representative lithounits of CGGC. The study area occupies the southeastern and southwestern sections of Survey of India Toposheet number 73 E/6 and 73 E/10 respectively. It is located at the boarder of Ranchi and Hazaribagh districts of Jharkhand. The area is almost rectangular in shape lying between the latitude 23° 32' to 23° 36' N and longitude 85° 25' to 85° 32' E.

The Ichadag area is a vast expanse of granitic rocks occurring in association with amphibolites and metasedimentaries. The granitic rocks are the type representatives of CGGC. In the present project, emphasis has been given to the problem of compositional variations in the granites and their petrogenesis.

GEOLOGICAL SETTING

The Geological investigation of the area reveals that the Ichadag area represents a highly metamorphosed and deformed terrain in the CGGC. The lithounits are composed of pelitic metasediments, confirmably interlayered belts of quartzites, and small isolated exposures of calcareous metamorphites, ambhibolites and different variants of granites. The granitic rocks and metamorphites constitute the bulk of the area. The granitic rocks include granite gneisses, grey and pink granites, pegmatites, migmatites and associated quartzo-felspathic veins. The various metamorphites are represented by biotite schists, biotite-muscovite schists, phyllites, calc silicates and crystalline limestones, quartzites and amphibolites.

The area is a hilly and densely forested terrain, thus it is very difficult to get the exposures of different lithounits, and their contact is also obscure. However the same can be studied in nala cuttings and streams flowing in the area. Large numbers of stone chip quarries have also come up in the area, which

A COMPARATIVE STUDY OF HOME LOANS FINANCING BY PUBLIC AND PRIVATE SECTOR BANKS IN RANCHI DISTRICT

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Abstract- Every citizen of the country dreams of having his own house. Home is a basic need of a human being; it is an important facet of economic development. The dream home is not very far away with home loan, which will fulfill the dream into reality. The demand for home loans has increased manifold in the last decade. There are number of housing finance companies and banks offering cheap home loans at a low interest rate. The home loan schemes offered by both public and private sector banks are very competitive. Our study aimed at comparative analysis of home loans schemes offered by public sector and private sector banks in Ranchi. The paper also examined the satisfaction level and problems faced by customers while availing home loan. For this purpose we have taken four commercial banks in Ranchi district namely SBI, BOI, HDFC Bank and ICICI Bank. It includes two public sector banks and two private sector banks. In the research methodology a sample size of 200 respondents has been taken through random sampling. For the study we have collected both primary data as well as secondary data. Finally the whole research was carried out in a systematic way to reach at exact result. The whole research and findings were based on the objectives.

Keywords: Home Loans, Public Sector Banks, Private Sector Banks, Customers.

Introduction: A home loan is a long term commitment which is critical. The demand for home loans has increased manifold in the last decade. The reason for this growth is not hard to see, changing mindset with globalization and integration with the developed economies, where mortgages rule the roost, income tax sops in the Union Budgets and substantial rise in the income-generating capacity of Indian youth. So, the present scenario of home loans shows good amount of growth and is heading for a bright future. There are number of banks and housing finance companies offering cheap home loans at a low interest rate. The home loan schemes offered by both public and private sector banks are very competitive. Mostly people prefers public sector banks for home loans, especially because they believe that it is more secure bank and interest rate is lower. On the other hand the private sector banks are coming daily in our country and the preference of younger population is changing because of services & facilities provided by them. And the most important thing is that the customer should know about each and every term related with Home Loans before applying for a Loan. There are different types of home loans tailored to meet customer needs like Home Purchase Loans, Home Improvement Loans, Home Construction Loans, Home Extension Loans, Home Conversion Loans, Land Purchase Loans; Bridge Loans &Mortgage Loans offered by public and private sector banks.

Advantages of home loans-

The various benefits of home loans arising to the customers are:

- Help in owing a home
- Tax benefits of home loans
- Attractive interest rates
- Long term loan
- Repayment schedule on the basis of Earning Capacity of the borrower
- Facility of joint loan

And the advantages to the bank offering home loan are also profitable. Moreover, since the larger part of this loan is given against mortgages of personal properties, the

Maternity Entitlements in India: Women's Rights Derailed

Jean Drèze Reetika Khera Anmol Somanchi *

April 7, 2021

Abstract

Maternity benefits of at least Rs. 6,000 per child are a legal right of all Indian women under the National Food Security Act, 2013. In practice, a large majority are still deprived of maternity benefits. A recent survey, conducted in six states of north India, brings out that pregnant women's basic needs for nutritious food, proper rest and health care are rarely satisfied. Among women who had delivered a child during the 6 months preceding the survey, about half said that they had been eating less rather than more during pregnancy, and nearly 40 per cent complained of a lack of rest at that time. The figures are much worse in states like Uttar Pradesh, where, for instance, one third of the same women had not had a single ante-natal checkup. Average weight gain during pregnancy was just 7 kg over nine months in this sample, down to 4 kg in Uttar Pradesh. Aside from poor nutrition, lack of rest appears to be a major factor of low weight gain during pregnancy. There is an urgent need for better recognition of the special needs of pregnancy, provision of maternity benefits in accordance with the law, and better support for pregnant women including quality health care.

*Affiliations: Department of Economics, Ranchi University (jaandaraz@riseup.net); Indian Institute of Technology, Delhi (reetika@riseup.net); independent researcher (anmol.smnch@protonmail.com). We are grateful to Kanika Sharma for helpful comments, to Chaupal in Ambikapur (Chhattisgarh) and Sanjana Patro for help with the training and debriefing workshops, and to Shyamasree Dasgupta, Sachin Jain, Rajkishor Mishra, Sangeeta Sahu, Sulakshana Nandi and Gangaram Paikra for their guidance in specific states. This study has also benefited from earlier work in collaboration with Aarushi Kalra and Aditi Priya.

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SYNTHESIS, CHARACTERIZATION AND IN VITRO ANTIFUNGAL EVALUATION OF TRANSITION METAL COMPLEXES DERIVED FROM *N'*-SUBSTITUTED-4-METHYLPIPERIDINE-1-CARBOTHIOHYDRAZIDES

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ABSTRACT

Series of coordination complexes of Cr(III), Ni(II) and Zn(II) with various *N'*-substituted-4-methylpiperidine-1-carbothiohydrazides (**6a-f**) have been synthesized and characterized quantitatively and qualitatively by UV-visible spectroscopy, FTIR spectroscopy, ^{1}H NMR studies; microelemental analysis; electrical conductance values and magnetic susceptibility measurements. The metal complexes displayed greater antifungal activity than corresponding ligands and the order of their activity was found as [M(salmpth)(Py)] > [M(fmpth)$_2$] > [M(talmpth)$_2$]. The greater antifungal activity of metal complexes was found due to decrease in polarity of metal ions while coordinating with ligands during chelation process. The algacidal effect of few ligands *viz.* H_2salmpth, Hfmpth and Htalmpth and its chromium(III) complexes were also studied.

Keywords: Synthesis, Transition Metal Complexes, N'-Substituted-4-methylpiperidine-1-carbothiohydrazides, Antifungal Activity, Algacidal Effect.

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INTRODUCTION

Modern coordination chemistry involves various types of strategically designed and functionalized ligand systems. Among them, *N'*-substituted-4-methylpiperidine-1-carbothiohydrazides are a salient class of Schiff base ligands in coordination chemistry due to the dual coordinating sites (N and S) as potential donors.[1-5] Moreover, the coordination compounds of transition metal ions with bidentate ligands having N and S as donor sites are considered significant due to similarity with redox-active metalloenzymes.[6-10] Furthermore, the potential of Schiff base ligands has urged the researchers to undertake them as an elite ligand.[11,12]

The synthesis of Schiff base ligands and their corresponding metal complexes in a controlled manner becomes an important strategic pathway.[13-16] In this study, we chose readily available, low-cost and potential organic molecules as precursors to synthesize the new Schiff base ligands and their metal complexes. The unique advantage of these Schiff base ligands is the change in their ligation behavior depending on the metallic systems and the stoichiometry.[17,18] Therefore given above said advantages, we had synthesized, characterized the novel Schiff base ligands (*N'*-Substituted-4-methylpiperidine-1-carbothiohydrazides, (6a-f) and their corresponding complexes of Cr(III), Ni(II) and Zn(II) (7a-z). These Schiff base ligands (6a-f) and potential metal complexes were subjected to antifungal evaluation and algicidal effect.

EXPERIMENTAL

Materials and Methods

The chemicals and solvents were procured from Sigma-Aldrich, USA and Merck KGaA, Darmstadt, Germany and employed without any purification.

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یافته‌های نوین در علوم زیستی
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انتشارات دانشگاه خوارزمی

فعالیت محافظت کبدی نانوذرات نقره سنتز شده با استفاده از عصاره آبی برگ انار در برابر سمیت کبدی القا شده در موش صحرایی

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چکیده. عصاره برگ انار از زمان بسیار قدیم در داروهای سنتی استفاده می‌شده است. از این عصاره به سبب دارا بودن خواص آنتی‌اکسیدانی استفاده می‌شود. سنتز نانوذرات سبز یک زمینه نوظهور است که دامنه کاملا متفاوتی را برای فرمولاسیون‌های دارویی گشوده است. توسط بسیاری از کاربران گزارش شده است که نانوذرات سبز داروهای موثرتری در مقایسه با عصاره‌های ساده آن‌ها هستند. بنابراین، به منظور ارزیابی این گمانه زنی‌ها، کار حاضر برای ارزیابی فعالیت محافظت کبدی نانوذرات نقره سنتز شده با استفاده از عصاره برگ آبی گیاه انار در مقایسه با عصاره آبی انجام شد. پس از مسمومیت با CCl_4، در مقایسه با گروه کنترل میزان بیلی‌روبین سرم به طور معنی‌داری افزایش یافت ($p<0.05$) و سطح پروتئین کل به طور معنی‌داری کاهش یافت ($p<0.05$). علاوه‌براین، فعالیت آلکالن فسفاتاز، فعالیت آسپارتات آمینوترانسفراز و فعالیت آلانین ترانس آمیناز به طور قابل توجهی افزایش یافت ($p<0.05$). موش‌های مسموم شده با CCl_4 با عصاره برگ آبی و نانوذرات سنتز شده تحت تیمار قرار گرفتند. نتایج به وضوح برای عصاره آبی انار از محافظت کبدی را نشان داد زیرا پروفایل کبد توسط سمیت CCl_4 تغییر یافته و به مقادیر کنترل طبیعی رسیده است. علاوه بر این، نانوذرات سنتز شده با استفاده از عصاره آبی برگ انار نسبت به عصاره آبی میوه انار به عنوان ماده محافظت کننده کبد موثرتر بودند.

واژه‌های کلیدی. ALP، ALT، AST، CCl_4، بیلی‌روبین، پروتئین توتال، پروفایل کبدی

Hepatoprotective activity of Silver Nanoparticles synthesized using aqueous leaf extract of *Punica granatum* against induced hepatotoxicity in rats

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Abstract. *Punica granatum* leaf extracts have been used since time immemorial in traditional medicines. It is used for its antioxidant properties. Green nanoparticle synthesis is an emerging field which has opened an entirely different scope for medicinal formulations. It has been reported by many users that the green nanoparticles are more effective medicines as compared with their simple extracts. Thus, in order to evaluate these speculations, the present work was undertaken to assess the hepatoprotective activity of silver nanoparticles synthesized using aqueous leaf extract of *Punica granatum* in comparison with the aqueous extract. After CCl_4 intoxication the serum bilirubin total increased significantly ($p<0.05$) and the total protein level decreased significantly ($p<0.05$) as compared with the control group; in addition, alkaline phosphatase activity, aspartate aminotransferase activity and alanine transaminase activity increased significantly ($p<0.05$). The CCl_4 intoxicated rats were treated with aqueous leaf extract and synthesized nanoparticles, the results clearly revealed that the aqueous extract of *Punica granatum* showed hepatoprotective effect, as the liver profile altered by CCl_4 toxicity, recovered to normal control values. Moreover, the nanoparticles synthesized using aqueous leaf extract of *Punica granatum* were comparatively more effective as hepatoprotective agent than the aqueous extract of *Punica granatum*.

Keywords. ALP, ALT, AST, bilirubin, CCl_4, liver profile, total protein

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Riemann's Xi function and an Equivalent of Riemann Hypothesis

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Abstract
In this manuscript we denote by $\sum_{\Re(\rho)>\frac{1}{2}}$ a sum over the possible non trivial zeros of Riemann zeta function (or over the zeros of Riemann's xi function) with real part greater than $\frac{1}{2}$, where the zeros of multiplicity k are counted k times. We prove a result which extends that of Balazard et al.[1] as follows

$$\frac{1}{2\pi}\int_{\Re(s)=\frac{1}{2}} \frac{\log|2\,\xi(s)|}{|s|^2}|ds| = \sum_{\Re(\rho)>\frac{1}{2}} \log\left|\frac{\rho}{1-\rho}\right|$$

and the Riemann Hypothesis is true if and only if

$$\frac{1}{2\pi}\int_{\Re(s)=\frac{1}{2}} \frac{\log|2\,\xi(s)|}{|s|^2}|ds| = 0$$

Keywords: Riemann zeta function, Riemann xi function, Riemann Hypothesis, Jensen's formula, Gamma function.
Mathematics Subject Classification: 11M26, 11M06, 11M32

1 Introduction

The Riemann zeta function, $\zeta(s)$ is defined as the analytic continuation of the Dirichlet series

$$\zeta(s) := \sum_{n=1}^{\infty} \frac{1}{n^s}$$

which converges in the half plane $\Re(s) > 1$. The Riemann zeta function is a meromorphic function on the whole complex s-plane, which is holomorphic everywhere except for a simple pole at s = 1 with residue 1. All the non trivial zeros of the Riemann zeta function lie in the critical strip $0 < \Re(s) < 1$. The Riemann Hypothesis states that all the non trivial zeros of the Riemann zeta function lie on the critical line $\Re(s) = \frac{1}{2}$. The Riemann xi function is defined as

$$\xi(s) = \frac{1}{2}s(s-1)\pi^{-s/2}\Gamma\left(\frac{s}{2}\right)\zeta(s)$$

$\xi(s)$ is an entire function whose zeros are the non trivial zeros of $\zeta(s)$ (see [2]). Further $\xi(s)$ satisfies the functional equation (see [2])

$$\xi(s) = \xi(1-s)$$

Balazard et al.[1] in 1999 proved an equivalent of the Riemann Hypothesis using Jensen's formula and the theory of Hardy spaces.

Hormonal profile and haematological parameters of Wistar albino rats treated with methanolic and aqueous leaf extracts of Schleichera oleosa

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Research Article

Keywords: Schleichera oleosa, haematological parameters, hormonal parameters, testosterone

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ORIGINAL RESEARCH

A note on series equivalent of the Riemann hypothesis

Shekhar Suman · **Raman Kumar Das**

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Abstract In this manuscript we denote by $\sum_\rho$ a sum over the non trivial zeros of Riemann zeta function (or over the zeros of Riemann's xi function), where the zeros of multiplicity k are counted k times. We prove a result that the Riemann Hypothesis is true if and only if

$$\sum_\rho \frac{1}{|\frac{1}{2}-\rho|^2} = \frac{\xi''(\frac{1}{2})}{\xi(\frac{1}{2})}$$

Keywords Riemann zeta function · Riemann xi function · Riemann Hypothesis · Hadamard product

Mathematics Subject Classification 11M26 · 11M06 · 11M32

1 Introduction

The Riemann zeta function, $\zeta(s)$ is defined as the analytic continuation of the Dirichlet series

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which converges in the half plane $\Re(s) > 1$. The Riemann zeta function is a meromorphic function on the whole complex s-plane, which is holomorphic everywhere except for a simple pole at s = 1 with residue 1. The Riemann Hypothesis states that all the non trivial zeros of the Riemann zeta function lie on the critical line $\Re(s) = \frac{1}{2}$. The Riemann xi function is defined as

$$\xi(s) = \frac{1}{2}s(s-1)\pi^{-s/2}\Gamma\left(\frac{s}{2}\right)\zeta(s)$$

$\xi(s)$ is an entire function whose zeros are the non trivial zeros of $\zeta(s)$ [2]. Further $\xi(s)$ satisfies the functional equation [2]

$$\xi(s) = \xi(1-s)$$

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