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Investigation of Pictographs – Special Reference to the Amajhola, Kanker District (C.G.)

1

Nitesh Kumar Mishra, Bhenu

Abstract

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Keywords: Rock art, tribes, tradition, ancestors, Amajhola, Prehistoric, pictograph, crisscross

Introduction

It is challenging to understand the human behaviour of early man. To make life easier, early man used organic and inorganic materials for their daily uses. The organic materials were degradable and erased over time, so it is difficult to search the shreds of evidence of those materials. However, inorganic material like stone tools is still scattered all over the surface. Stone tools are one of the significant materials used by prehistoric man, which have been discovered in various prehistoric sites in India.

Rock art is one of the magnificent arts of early man, which expresses the views of various aspects of human society like social, cultural, emotional, economic and human behaviour.

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Newly discovered rock art site of Virendranagar village (Balrampur district)

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Abstract

This research paper is related to the rock paintings of Virendranagar village. This village is located in Wadrafnagar block of Balrampur, which from geographical point of view was a center of habitation place of primitive man. This village is surrounded by mountains and forests and the river flowing through the village plays an important role in the survival of mankind. Through this research paper, the rock paintings located in Virendranagar village have been analyzed and documented. In this rock art site, mainly geometric designs and human figures have been depicted. The human figure depicted in this rock art is believed to be a depiction of the main deity of the Gond tribe. According to the people of Gond tribe, their ancestors used to reside here, they believe that the human figure is a depiction of their ancestral deity. In this research paper, a comparative study of the deities of Gond community has been done.

Keywords:expression,engraving,prehistoric,Deccan Trap,Gaurlata,Neolithic period,animal figurine, hunting scene, ritualistic scenes,Pashupati, Velakkanaar, Gond tribe and bullock cart

Introduction

Rock painting is one of the oldest arts of man.Man has painted rock paintings on rocks, cave walls and roofs to express his expression. To make rock paintings, humans used two methods, first by painting with natural colors and by engraving on stones.¹These arts have preserved their existence even in the present times. Even in today's scientific age, these ancient rock paintings force us to wonder that in today's era, the paint we apply on our houses lasts only for a maximum of 5 years whereas these rock paintings have been around for thousands of years. The chemicals that were used in that period are still shining today. These rock paintings also give a glimpse of the daily activities of that period, like hunting, dance, wild animals, human clothing, human musical instruments; their rituals etc.² Rock paintings are the only evidence of the prehistoric period which enables us to clearly understand the differences in different periods. If humans are hunting wild animals in the pictures, it reflects the period before animals were



3

Ethno archaeological study of rock paintings of Bastar region

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Abstract:

This research paper mainly describes the main features of rock paintings of Bastar, southern part of Chhattisgarh. The specialty of the rock paintings found in the Bastar division is that the feet and palms are mainly depicted in these paintings. The tradition of worshiping rock paintings by the tribes of Bastar region has been there for centuries. This research paper also describes the rock paintings and associated material scattered around the rock paintings. In this research paper, there is also a detailed description of the worship and festival related to the rock paintings by the tribes, such as the worships like Bagha Vida, Kollam and Pitar paksha, in which the pictures related to the rock paintings are still alive in the paintings of the tribes.

Keywords - Prehistory, Bagh Vida, Kolang, Pitar Paksha, Chitkul, Marka Pandum, Beeja Pandum, Hareli, Navai, Pola, Nawakhai, Charu, Dharni

Literary Review

Apart from being full of natural resources, Chhattisgarh has been the centre of human activities since time immemorial and their evidences are scattered all over the region. Chhattisgarh is the tribal dominated area. That's why a specific type of customs, culture, art, belief, food and lifestyle of tribes are found here. In the specific cultural activates, the forest, mountains, rivers and wildlife found in these area beautify its natural beauty. Attracted by these evidences many research scholars and experts have published their findings in the reports. The various research works of the scholars and experts are as follows - "Madhya Pradesh Avam Chhattisgarh Ka Puratava Ka Sandarbh Granth" (1974) had written by Rajkumar Sharma gives some rock shelter cave names of Bastar. The archaeology of Bastar region is a thesis written by Vivek Dutt Jha submitted to the University of Saugar in 1980. Michel Postel and Zarine Cooper, provide a good ethnic data or folk art data of tribes in the book of "Bastar folk art, shrines, figurines and memorials" 1999. He gave a data of tribal life and people in Bastar and their art form but they did not said about rock art in that area. Dutt sir did excellent work. He tries to give the whole archaeological information about Bastar. He covered Prehistoric to the historical period. Only he did not mention the rock art sites. In the book "Madhya Bharat ka Shell Chitra" 2009 having lot of contain about rock art of Chhattisgarh, unfortunately most of paper talk about Raigarh district and only to give information about rock art of Kanker. In 2010, Dr. Rajkumar Sharma has written a book title of Madhya Pradesh Evam Chhattisgarh ke Purattav ka Sandarbha Granth. This book writes in the Hindi language. It's a bibliography of both present-day states, Madhya Pradesh and Chhattisgarh. From page 198 to 222, Sharma mentioned name of the rock painting site with references. In this some sites belong to the Bastar region. Meenakshi Dubey Pathak and Jean Cloutes", "Powerful Images of Chhattisgarh Rock Art and Tribal Art", (2017), this book describes the detailed study of rock art of Chhattisgarh, which includes photography, analysis and comparative study with the tribal art.

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साहित्य, कला एवं संस्कृति का सृजन संवाहक (अंक 188 (जनवरी-मार्च, 2024)

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Newly discovered rock art site of Virendranagar village (Balrampur district)

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Eating Behaviour and Nutritional Status of the Tribal Population in India: An Overview

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KEYWORDS	ABSTRACT
Tribe, food behavior, Traditional Knowledge, Nutritional Status	A healthy existence depends on adequate nutrition, which is a basic human need. As a result of their economic, social and cultural activities, indigenous peoples have different dietary habits that vary throughout the world. The nutritional status of tribal groups is inadequate because they do not know about their food and the nutrients associated with it. Numerous factors influence their knowledge, including their level of education and their proximity to government institutions. However, they also have a strong traditional knowledge about their environment, food availability, health problems, etc. This paper is based on some studies and articles dealing with the traditional knowledge and food habits of the tribal groups. It also deals with the food available to the people in different places, the nutrients they get, their impact on health and the risk factors arising from nutritional deficiency. It also covers the details of research publications that have been published and analysed by specific time periods, groups and areas. The current review includes data from the research articles available on Google Scholar, Pub Med and J-Store. According to the research papers, we can say that the tribal community has a distinct knowledge about the availability of food in their environment.

Introduction

Nutrition is crucial for a healthy lifestyle. A nutritious diet is essential for optimal growth and development in childhood. The production and distribution of food are the two most important elements that influence nutritional intake. It is important to realise that food can provide many other health benefits in addition to providing nutrients. For this reason, the term " nutrition" and not "nutrients" should be defined. Consequently, the focus is on achieving optimal nutritional status, which can be achieved through a dietary approach. (ICMR 2011) For optimal growth, development and maintenance of an active lifestyle, proper nutrition from an early age is crucial.

The term nutrition can also be used to describe a person's diet or food preferences. A balanced diet is one in which regularly consumed meals provide all the required nutrients in the right amounts. The main goal of sustainable development is to improve diets to reduce hunger, increase food security, improve nutritional standards, promote sustainable agriculture, eradicate poverty and improve health. (SDG 2017)

Nutrition Programme for the Nation: In a strategy prepared by NITIAYOG, the goal of "Malnutrition Free India" or "Malnutrition Free India" has been set for the year 2022. The Central Government has made all efforts to ensure that there is no malnutrition among the young people of the nation. The

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Arun et al..

ETHNOLOGICAL MODEL OF BAIGA, PVTG TRIBE OF CHHATTISGARH

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ABSTRACT

The present research paper highlights several research results that confirm the association of health and illness with witchcraft and divine powers among the Baiga tribe. The tribe's traditional healer is considered a divine gift and trained healer, and they use many traditional knowledge-based herbs to treat various ailments. The evidence also suggests that the Baiga tribe has some superstitions, such as considering a particular color as auspicious or inauspicious for disease. The study of ethnology is necessary in all types of societies, simple and complex, to understand how they are affected by health, disease, and medical systems. It is essential to promote positivity and eliminate negativity through in-depth research of such folk medicine. The present research paper aims to contribute to this effort. The present research paper confirms that the Baiga tribe associate's health and illness with witchcraft and divine powers and considers their traditional healer as a gifted and trained healer. The use of various traditional herbs to treat ailments is also prevalent in the tribe. However, some superstitions are also present, such as specific colors being considered auspicious or inauspicious for disease. The study of ethnology is necessary in all societies to understand the impact of health, disease, and medical systems. It is crucial to study folk medicine in-depth to increase positivity and eliminate negativity. This research paper is one such effort towards achieving this goal.

Keyword- Ethnotherapy, Traditional Medicinal, Traditional Healing



ABSTRACT

Lead is an environmental pollutant that causes remarkable damage to various organs in the human body, especially the nervous system. Removal of lead by conventional methods is costly, and therefore, in the current scenario, biosorption using fungi is extensively explored as they provide good metal uptake systems. The present study evaluated the Pb (II) biosorption potential of endophytic fungi *Aspergillus flavus* SGE34. The fungal isolate was obtained from the root of an indigenous medicinal plant of the Chhattisgarh region named *Cleome viscosa* Linn. The biosorption potential of dead fungal biomass was optimized at different operating parameters like contact time, pH, and temperature. The maximum biosorption values were found at pH 6.0 with an equilibrium time of 150 minutes at 350C. The Fourier transform infrared spectroscopy study revealed that the pattern of new absorption bands, altered absorption intensity, and shift in wavenumber of functional groups was deduced, due to



Acknowledgement

The authors are grateful for the funds provided by DST, New Delhi in the form of DST-FIST (Sl. No. 270 for tenure of 2013-2018). We would like to acknowledge Pt. Ravishankar Shukla University, Raipur (C.G.), for providing a University Research Fellowship as financial assistance in carrying out the research work.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Additional information

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 Lead biosorption profiling of endophytic

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Zn Fortification Influential Impact on the Productivity of *Calocybe indica* Mycelium

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Abstract: *Calocybe indica* is an edible medicinal mushroom, preferably eaten for its culinary value. It was cultivated for its higher nutritional value, medicinal properties, and high polysaccharide content, especially glucan. Some particular minerals were enriched in food substitutes, an alternative to fighting against some targeted human ailments. Thus, mineral fortification is accessible in the submerged cultivation of mushrooms to produce bioactive compounds and fortified mushrooms. In this study, the submerged cultivation of *C. indica* was performed to make exopolysaccharides (EPS) using a supplemented medium of Zinc with varying concentrations. Thus, research revealed that the Zn fortification enhances the production of EPS and mycelial biomass after 21 days of incubation. The maximum mycelial biomass was $7.7133\pm0.30 \text{ g/L}$ (dry weight), and the highest $0.3853\pm0.006\text{EPS}$ was produced in the 175 mg/L mineral concentration, respectively. The present study revealed that the Zn supplementation gradually increased the mineral concentration and directly influenced the yield of mycelial biomass and EPS production. These EPS have various biological activities and can be helpful for fortified food or pharmaceutical product development in the medicinal and pharmaceutical sectors.

Keywords: Antioxidant, Fortification, Mycelial biomass, Submerged culture and Exopolysaccharides.

Introduction

C. indica, commonly known as a Milky mushroom, was first described by Purkayastha and Chandra in 1974. It belongs to the phylum Basidiomycetes and is a medicinal mushroom primarily consumed in West Bengal, India. Worldwide, it is recognized for the richness of its bioactive compounds (Balouiri et al., 2015; Ghosh et al., 2020). It is an umbrella-like mushroom and requires a hot, humid climate for its cultivation; the temperature is about 25°C-35°C, and the stem is cylindrical and has no rings (Purkayastha et al., 1974; Subbiah et al., 2015). The cultivation of C. indica generally takes place on wheat straw and paddy straw as the substrate, such as sorghum stalks, groundnut hulls, soybean straw, and coconut coir, which are also used for cultivation (Rathore et al., 2020; Kosre et al., 2021; Chouhan et al. 2022). Milky mushroom consists of carbohydrates up to 6.8%, proteins 2.75%, lipids 0.6%, fibres 1.67%, water 87% and minerals 0.5-1%, respectively (Gupta et al., 2012). The essential amino acids of *C.indica* consist of arginine, lysine, histidine, tryptophan, leucine, threonine, valine, isoleucine and methionine (Sumathy et al., 2015; Thejaswini et al., 2015). Therefore, it is used for cures or alternative food materials and combats many diseases like cardiovascular cancer and diabetes as it is rich in fibre, proteins and antioxidants (Balouiri et al., 2015). The polysaccharides of *C.indica* generally consist of rhamnose, arabinose, galactose, glucose xylose and mannose. However, β - glucan is known to present a massive amount in *C.indica* **RESEARCH ARTICLE**



Assessing the genetic diversity of *Buchanania lanzan* Spreng. (Chironji) using inter simple sequence repeat markers

Tripti Agrawal · A<mark>faque Quraishi</mark>

Received: 27 September 2023 / Accepted: 21 November 2023 © The Author(s), under exclusive licence to Springer Nature B.V. 2023

Abstract Buchanania lanzan Spreng, a member of the Anacardiaceae family, is a valuable tropical fruit tree native to India. This tree species possesses enormous pharmacological properties and socioeconomic significance but is underutilised due to inadequate genetic diversity and germplasm wealth resources data. The present investigation attempted to evaluate the diversity of nine accessions of B. lanzan obtained from three distinct geographical locations in the Chhattisgarh state of India using inter simple sequence repeat (ISSR) markers. Ten ISSR primers were used, of which eight ISSR primers produced remarkable bands selected for genetic diversity analysis. The ISSR primers produced a total of 127 loci, of which 63 loci exhibited polymorphism. On average, each primer yielded 7.87 loci. The maximum polymorphism was observed for primer BLA4 (77.77%), while primer BLA10 exhibited the lowest polymorphism (25%). An average 49.87% polymorphism was detected amongst nine accessions using eight ISSR primers. The Jaccard's similarity coefficient exhibited a range of values between 0.63 and 0.98. Genetic variability in B. lanzan accessions is low owing to low polymorphism percentage, although they belong to different agroclimatic regions of the Chhattisgarh state.

T. Agrawal · A. Quraishi (⊠) School of Studies in Biotechnology, Pt. Ravishankar Shukla University, Raipur, Chhattisgarh 492010, India e-mail: drafaque13@gmail.com **Keywords** Chironji · Genetic variability · ISSR marker · Primer · Tropical

Introduction

Buchanania lanzan Spreng is a valuable tree species known for its fruit and nut production, primarily found in the tropical forests of Asia. It is commonly known as the Almondette tree, and its vernacular name is Chironji in Hindi. The tree is often growing in the Sal dominating tropical deciduous forest areas inhabiting Shorea robusta, Madhuca latifolia, and Diospyros melanoxylon trees (Malik et al. 2012; Raj and Jhariya 2021). The tree is significant for its highly nutritious and valuable seeds enclosed in a hard fruit nut. Seeds have a sweet almond-like flavour and high neutraceutical, medicinal values. Parts of the tree, viz., root, bark, gum, leaf, fruit, and seed, bear various phytoconstituents having pharmacological and are used to treat blood disorders, fever, ulcers, burning sensations in body parts, diarrhoea, dysentery, asthma, and snake bite (Malik et al. 2012). The kernel and bark extracts are used as a tonic, to treat an intrinsic haemorrhage, and bloody diarrhoea. Kernel powder mixed with milk is an aphrodisiac that is also used to treat fever and burning sensations. The bark decoction of this plant species has been employed in the treatment of stomach pain, cough, and bronchitis, as documented by Mehmood et al. (2016). The fruit is a laxative, aphrodisiac, cures fever, ulcers,

PLANT TISSUE CULTURE



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Enhanced epicurzerenone production *via in vitro* elicitation of microrhizomes of *Curcuma caesia* Roxb.

Afreen Anjum¹ • Afaque Quraishi¹

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Abstract

Curcuma caesia Roxb. is a critically endangered herb belonging to the Zingiberaceae family with economic and medicinal importance associated with its rhizomes. The prime function of epicurzerenone (a sesquiterpene) is to eliminate reactive oxygen species and is, therefore, known to have antitumor properties. In the present investigation, *in vitro* elicitation of terpenes was carried out on microrhizomes of C. caesia using salicylic acid and jasmonic acid at 25.0 µM and 50.0 µM each for 30 and 60 d. The jasmonic acid treatment did not affect morphology of the cultures compared to the un-elicited cultures. The jasmonic acid treated had similar or less epicurzerenone area% than the un-elicited cultures (23.48%). Even the total terpenoids content was less in the jasmonic acid treated ones than the un-elicited cultures. However, phenolic content was higher than the un-elicited cultures in jasmonic acid treated. Among all the tested elicitations, cultures with 25.0 µM salicylic acid on the 60th day had the least fresh weight of microrhizomes. Gas chromatography-mass spectrometry analysis revealed epicurzerenone as the dominant sesquiterpene in all the elicited and un-elicited cultures on the 60th day. Salicylic acid at 25.0 µM level could elicit the highest accumulation of epicurzerenone (32.11%) compared to the other treatments, un-elicited culture (23.48%), and field-grown mother plant (12.43%). Biochemical studies during in vitro elicitation revealed that the protein, ascorbate, glutathione, and thiobarbituric acid reactive substances content increased significantly on the 60th day; similarly, the superoxide dismutase, ascorbate peroxidase, and guaiacol peroxidase activity also increased at the 30th day and then decreased at the 60th day in the 25.0 µM salicylic acid elicited cultures. These alterations in the biochemical parameters showed that treatment with 25.0 µM salicylic acid could induce a significant stress in the microrhizomes of C. caesia, which led to enhanced production of secondary metabolites, including terpenes (0.1649 mg abscisic acid equivalents g^{-1} dry weight) and phenols (0.1382 mg gallic acid equivalents g^{-1} dry weight).

Keywords Epicurzerenone · GC-MS · Glutathione · Jasmonic acid · Salicylic acid

Introduction

Elicitation is a process in which plants synthesized secondary metabolites by trace amounts of elicitors that help them survive, persist, and compete (Thakur *et al.* 2019). Elicitors stimulate the biosynthetic pathways leading to the enhanced production of commercially important secondary metabolites (Jaiswal *et al.* 2022). This method is simple, effective, and inexpensive for increasing the secondary metabolites of cultured plant cells. The composition and percentage of secondary metabolites vary widely depending on various

Afaque Quraishi drafaque13@gmail.com factors, such as the plant's health, growth stage, parts used, soil, climate, and harvest time (Biesalski *et al.* 2009).

Salicylic acid and jasmonic acid are essential endogenous signal molecules in the plant signal transduction network that control physiological processes like growth, differentiation, and metabolism (Liu *et al.* 2018). Salicylic acid plays a significant role in plant growth and development and helps plants tolerate abiotic stresses, such as metals, drought, and salinity (Zhang *et al.* 2015). Jasmonic acid is a natural growth regulator in higher plants and is involved in plant-pathogen interactions and abiotic stress tolerance. Salicylic acid and jasmonic acid are the commonly used elicitors. Stressors induce the production of reactive oxygen species (ROS), which accumulate in plant cells and cause oxidative stress. This oxidative stress, in turn, enhances the production of secondary metabolites and increases the antioxidant activity of the plant (Dumanovic *et al.* 2021).



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Allantoin: A Potential Compound for the Mitigation of Adverse Effects of Abiotic Stresses in Plants

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Abstract: Stress-induced alterations vary with the species of plants, the intensity and duration of the exposure, and stressors availability in nature or soil. Purine catabolism acts as an inherent defensive mechanism against various abiotic stresses and plays a pivotal role in the stress acclimatisation of plants. The intermediate metabolite of purine catabolism, allantoin, compensates for soil nitrogen deficiency due to the low carbon/nitrogen ratio, thereby maintaining nitrogen homeostasis and supporting plant growth and development. Allantoin accounts for 90% of the total nitrogenous compound in legumes, while it contributes only 15% in non-leguminous plants. Moreover, studies on a variety of plant species have reported the differential accumulation of allantoin in response to abiotic stresses, endowing allantoin as a stress modulator. Allantoin functions as signalling molecule to stimulate stress-responsive genes (P5CS; pyrroline-5-carboxylase synthase) and ROS (reactive oxygen species) scavenging enzymes (antioxidant). Moreover, it regulates cross-talk between the abscisic acid and jasmonic acid pathway, and maintains ion homeostasis by increasing the accumulation of putrescine and/or spermine, consequently enhancing the tolerance against stress conditions. Further, key enzymes of purine catabolism (xanthine dehydrogenase and allantoinase) have also been explored by constructing various knockdown/knockout mutant lines to decipher their impact on ROS-mediated oxidative injury in plants. Thus, it is established that allantoin serves as a regulatory signalling metabolite in stress protection, and therefore a lower accumulation of allantoin also reduces plant stress tolerance mechanisms. This review gives an account of metabolic regulation and the possible contribution of allantoin as a photo protectant, osmoprotectant, and nitrogen recycler to reduce abiotic-stress-induced impacts on plants.

Keywords: abscisic acid; allantoin; antioxidants; mutants; reactive oxygen species; ureide metabolism

1. Introduction

Environmental stresses are unpredictable, irregular, and ever-changing. Plants are exposed to several complex environmental variables, including temperature, radiation, precipitation, humidity, wind, and soil factors. When a plant experiences less/more than optimum environmental conditions (stress), either through climatic change or human interference, this ultimately affects its survival [1]. Abiotic-stress-induced injuries result in stress-specific responses through distinct modes, and irrespective of the type of stress factor plants elicits a universal response mechanism [2]. Plants can evoke a myriad of responses (morphological, physiochemical, and molecular) to oscillating environmental (stress) conditions [3]. In general, stress conditions stimulate the generation of reactive oxygen species (ROS) such as hydrogen peroxide (H_2O_2), singlet oxygen (1O_2), hydroxyl radical (\bullet OH), superoxide ($O_2^{\bullet-}$) anion, and cytotoxic compounds like methylglyoxal (MG), which disturbs cellular redox homeostasis [4]. The generation of ROS is unavoidable, even under optimal conditions. During normal cellular metabolism, plants can produce



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REVIEW ARTICLE



Mechanistic prospective and pharmacological attributes of guercetin in attenuation of different types of arthritis

Anita Bhoi¹ · Shradha Devi Dwivedi² · Deependra Singh² · S. Keshavkant¹ · Manju Rawat Singh²

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Abstract

Arthritis is a frequent autoimmune disease with undefined etiology and pathogenesis. Scientific community constantly fascinating quercetin (QUR), as it is the best-known flavonoid among others for curative and preventive properties against a wide range of diseases. Due to its multifaceted activities, the implementation of QUR against various types of arthritis namely, rheumatoid arthritis (RA), osteoarthritis (OA), gouty arthritis (GA) and psoriotic arthritis (PsA) has greatly increased in recent years. Many research evidenced that QUR regulates a wide range of pathways for instance NF- κ B, MAK, Wnt/ β catenine, Notch, etc., that are majorly associated with the inflammatory mechanisms. Besides, the bioavailability of QUR is a major constrain to its therapeutic potential, and drug delivery techniques have experienced significant development to overcome the problem of its limited application. Hence, this review compiled the cutting-edge experiments on versatile effects of QUR on inflammatory diseases like RA, OA, GA and PsA, sources and bioavailability, therapeutic challenges, pharmacokinetics, clinical studies as well as toxicological impacts. The use of QUR in a health context would offer a tearing and potential therapeutic method, supporting the advancement of public health, particularly, of arthritic patients worldwide.

COX

ENM

E-ADA

Keywords Inflammation · Gout arthritis · Osteoarthritis · Psoriotic arthritis · Rheumatoid arthritis · Quercetin

Abbreviations

AIM2	Absent in melanoma 2
ADME	Absorption, distribution, metabolism, and
	excretion
ADA	Adenosine deaminase
AIA	Adjuvant-induced arthritic
ALP	Alkaline phosphatase
ASC	Apoptosis-associated speck-like protein con-
	taining CARD
CaC_2O_4	Calcium oxalate
CCL	C–C motif chemokine ligand
JNK	C-Jun N-terminal kinase
CD14	Cluster of differentiation14
CoPP	Cobalt protoporphyrin IX
CIA	Collagen-induced arthritic
C3	Complement protein 3
CFA	Complete Freund adjuvant

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ECM	Extracellular matrix
FLS	Fibroblst like synovium
GATA6	GATA transcription factor 6
GO	Gene ontology
GA	Gout arthritis
HO	Heme oxygenase
Н	Hydrogen
HIF-1	Hypoxia-inducible factor-1
iNOS	Inducible nitric oxide synthase
IL	Interleukin
KOA	Knee-OA
KEGG	Kyoto Encyclopedia of Genes and Genomes
LII	Limb idleness index
LOX	Lipooxigenase
LPS	Lipopolysaccharides
M1	Secretes pro-inflammatory cytokines
M2	Secretes anti-inflammatory cytokines
MMPs	Matrix metalloproteinases
MTX	Methotrexate
mPEG-PA	Methyl-poly(ethylene glycol)-l-poly(alanine)
MIA	Monoiodoacetate

Cyclooxygenase

Ectoadenosine deaminase

Electrospun nanofiber membrane



RESEARCH



Antibacterial Activity of CdTe/ZnS Quantum Dot-β Lactum Antibiotic Conjugates

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Abstract

β-Lactum antibiotics are broad class of antibiotics which kills bacteria by inhibiting the formation of peptidoglycan that constitutes the bacterial cell wall. The resistance that develops in bacteria for antibiotics led the scientific world to think about the future aspects for modifying the way through which antibiotics are acted on the bacteria and become lethal for them. In this consequence, the potential of latest marketed antibiotics e.g. Amoxiciline (I), ceftazidim (II) have been evaluated after being conjugated with quantum dots. The surface of quantum dots has been conjugated with antibiotics by carbodiimide coupling with the help of 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide (EDC) and N-hydroxysuccinimide (NHS) as conjugating agent between antibiotic and functionalized quantum dots. The antibacterial properties of QD-conjugated antibiotics have been determined by disc diffusion assay. The potency of QD-conjugated antibiotics has been estimated by determining their MIC₅₀ for the selected strain of Gram-negative (*Escherichia coli*) and Gram-positive (*Staphylococcus aureus*) bacteria. Minimum inhibitory concentration study, minimum bactericidal concentration and growth pattern analysis revealed that QDantibiotic conjugates showed slightly more prospective than pure native antibiotics against both Gram-negative (*Escherichia coli*) and Gram-positive (*Staphylococcus aureus*) bacteria.

Keywords β -Lactum antibiotics · QD-antibiotics conjugates · MIC₅₀ · Antibacterial Activity

Introduction

Since the invention of penicillin, β -lactam antibiotics have developed as the most essential spectrum of antibacterial agents [1, 2]. However, the experimental treatment and wide utilization of these agents have made the bacteria to

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generate various types of β -lactamases (β -Lases), which could prompt the spread of bacterial resistance [3-6]. Thus clinical viability of β -lactam antibiotics was negotiated. β-lactam antibiotics resistance has turned out to be a serious issue that encounters the human health [7-10]. Thus, progressively more demand has been put on pharmaceutical investigators and medical researchers to develop new antibiotics [11]. Some strategies have been accounted for disabling the bacterial resistance. One was to change the structure of β -lactam to reduce its sensitivity to the hydrolysis by β -Lases [12]. Another technique was to utilize double activity cephems; if bacteria have resistance to one of them, the other antibacterial agent would destroy them in another way [13–16]. Vergauwe and coworkers utilized reagents, for example, 3 clavulanic acid to inactivate the β -Lases [17]. In all these techniques, reagents added to conquer the bacterial resistance were organic compounds. Inorganic components were occasionally utilized as a part of the antimicrobial industry. Though, it is notable that inorganic nanomaterials are great antimicrobial agents. Currently, there were some research work reported, which Contents lists available at ScienceDirect



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Biovalorizing agro-waste 'de-oiled rice bran' for thermostable, alkalophilic and detergent stable α -amylase production with its application as laundry detergent additive and textile desizer

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ARTICLE INFO	A B S T R A C T
Keywords: a-Amylase Agro-waste Detergent	The current research was concerned with the use of abundant agro-waste 'de-oiled rice bran (DORB)' as a sus- tainable substrate to produce α -amylase followed by several targets like process parameter optimization for augmented production and immobilization. In addition, we have also focused on investigating the application of DORB_amy as an efficient laundry detergent additive and textile desizer. The best production was recorded at pH 8.0 at 37 °C after 96 h incubation with 1.5 % (<i>w</i> / <i>v</i>) maltose. The DORB_amy has optimum activity at pH 9.0 at 60 °C with a <i>K</i> _m and <i>V</i> _{max} of 0.31 mg/mL and 222.22 mg/mL/min respectively. The catalytic performance of DORB_amy was further enhanced after immobilization in 3.0 % calcium alginate beads with 61.95 \pm 0.17 % of operational stability after five continuous reaction cycles. The findings showed excellent performance of DORB_amy in cleaning starchy stains. The washing performance of enzyme and detergent together was better than their individual performance which increases the application of α -amylase as a laundry detergent additive. About 17.34 % weight loss or desizing was done by DORB_amy with an 8–9 TEGEWA rating. The reported biochemical features like thermostability, alkalophilic and detergent-stable nature of the DORB_amy make it industrially fit with great significance.

1. Introduction

The extracellular hydrolytic enzymes produced by a diverse group of microorganisms have vital importance in the biotechnology sector due to their countless applications. Since it is easier and faster to cultivate microorganisms than plants or animals, and it is easy to genetically modify the producing organisms to generate desired grades and quantities of enzymes, microbial enzymes proved to be economically advantageous. Hydrolytic enzymes have superior selectivity and can be used in mild reaction conditions than chemical catalysts, they are highly intriguing biocatalysts that have been the subject of much research [1,2]. Chemical catalysts have been surpassed by microbial enzymes nowadays. Microbial hydrolases like proteases, amylases, lipases, cellulases and pectinases have long-term applications in industries such as food, paper and pulp, feed, textile, detergent, pharmaceutical, leather, biopolymer and waste treatment [1,3]. One such hydrolase owing versatile application in starch-based industries is α -amylase which is the need of the hour.

Starch is an abundant polysaccharide and the ultimate reservoir of

energy for the organisms on earth. The demand for starch and its hydrolytic products is increasing in various industries, reinforcing the search for an efficient *a*-amylase enzyme. *a*-Amylase (endo-1, 4-*a*-D-Glucan glucohydrolase; E.C. 3.2.1.1) is an α -glucosidase widely used by industries to offer several vital applications [1,3]. It randomly cleaves the α -(1,4) glucosidic bonds of starch and other similar polysaccharides to release short-chain products like glucose, maltose and dextrin in α -anomeric configuration. Approximately 30 % share of the industrial enzyme market is dominated by α -amylases [3,4]. A lot of research and development is going on in searching for an efficient α -amylase for the detergent and textile industry that can withstand extreme conditions of temperature, pH and harsh chemicals.

On taking account of sustainability, the cheaper production medium is very significant for enzyme production. The use of agricultural byproducts including various crop residues like wheat straw, wheat bran, groundnut husk, corn straw, coconut coir and sugarcane bagasse for extracellular α-amylase production has grown rapidly in recent decades [3,4]. Agro-waste has many supremacies such as its diversity, easy availability, cost-effectiveness, environment friendliness and high

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Bioorganic Chemistry

Chitosan decorated magnetic nanobiocatalyst of *Bacillus* derived α -amylase as a role model for starchy wastewater treatment, detergent additive and textile desizer

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A R T I C L E I N F O	A B S T R A C T
Keywords: α-Amylase Immobilization Magnetic nanoparticles Nanobiocatalyst Starch	In this study, <i>Bacillus tequilensis</i> TB5 α -amylase from rice-milled by-products (rice bran and de-oiled rice bran) was successfully immobilized onto biologically synthesized magnetic nanoparticles fabricated with chitosan (MNP-Ch) and characterized <i>via</i> different biophysical techniques. Furthermore, the study emphasized incorporating this nanostructure framework (MNP@2mgchitosan_DORB-amy and MNP@3mgchitosan_RB-amy) to offer diverse applications, including enzymatic desizing, cleaning starchy stains, and treating synthetic starchy wastewater. An enzyme loading of > 90 % for both enzymes indicated increased binding sites due to the functional moieties of chitosan on the MNP. The K_m was 0.28 and 0.31 mg/mL for the immobilized and free forms of DORB-amy, respectively, and 0.18 and 0.27 mg/mL for the immobilized and free forms of RB-amy, respectively. A low K_m indicated an increased affinity of MNP-Ch-immobilized forms of enzymes toward the substrate. The performance of both immobilized enzymes improved at a wide range of pH and temperature, which may be attributed to the covalent binding of the enzyme on to the MNP-Ch. The nanobiocatalysts in the detergent act synergistically to fade the starchy stains. Furthermore, an 8–9 TEGEWA scale rating with > 11 % of starch removal was obtained through the biodesizing of starch-sized cotton fabric. The nanobiocatalyst efficiently decomposed starch and liberated 650–670 mg/L of reducing sugar from the synthetic wastewater, therefore offering promising opportunities for its exploration in a wastewater treatment plant. Thus, the study recommends the potential exploration of sturdy matrices like MNP to offer remarkable applications with maximum operational stability, easier recovery, and higher efficiency.

1. Introduction

Microorganisms have proven as a boon since time immemorial by aiding synthesis of bio-products like enzymes. The motivation to do this research was found because of the excellent potential of microorganisms in synthesizing application-based enzymes. Hydrolytic enzymes from microbial sources are the need of the hour due to their immense application in various sectors. α -Amylase (E.C 3.2.1.1 1,4- α -glucan-glucanohydrolase) is an α -glucanase which preferentially cleaves internal α -D-(1,4) glycosidic linkages of starch in a random manner to generate short chain α -anomeric product at random locations [1]. α -Amylase is the backbone of starch-based firms which accounts for about 30 % share of the whole enzyme market and the second most demanded enzyme after proteases [1,2]. It offers endless applications in food/bakery, biofuels, textile, detergents, textile, pharmaceuticals and wastewater remediation

[3,4].

Enzymes have numerous advantages including eco-friendliness, costeffectiveness, require mild operational conditions and high specificity. Despite having the aforementioned plus points, its solubility in the reaction mixture, a non-recovery and poor catalytic performance due to structural disruption at the extreme condition of pH and temperature limits its usage in industries [5–8]. Immobilization has proven to be the promising solution for all these shortcomings of free enzymes. Immobilization is an empiric technique of confining an enzyme in/onto a suitable support known as a matrix *via* several weak and strong interactions for enhancing its stability, reusability and recovery [7,9,10]. The main advantage of immobilization is that it reduces the cost of the entire production process because the enzyme prepared once can be used multiple times with even better catalytic efficiency [2,7,8].

The correlation between nature and nanotechnology has proven to

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Zn Fortification Influential Impact on the Productivity of Calocybe indica Mycelium

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Abstract: Calocybe indica is an edible medicinal mushroom, preferably eaten for its culinary value. It was cultivated for its higher nutritional value, medicinal properties, and high polysaccharide content, especially glucan. Some particular minerals were enriched in food substitutes, an alternative to fighting against some targeted human ailments. Thus, mineral fortification is accessible in the submerged cultivation of mushrooms to produce bioactive compounds and fortified mushrooms. In this study, the submerged cultivation of *C. indica* was performed to make exopolysaccharides (EPS) using a supplemented medium of Zinc with varying concentrations. Thus, research revealed that the Zn fortification enhances the production of EPS and mycelial biomass after 21 days of incubation. The maximum mycelial biomass was 7.7133 ± 0.30 g/L (dry weight), and the highest $0.3853\pm0.006EPS$ was produced in the 175mg/L mineral concentration, respectively. The present study revealed that the Zn supplementation gradually increased the mineral concentration and directly influenced the yield of mycelial biomass and EPS production. These EPS have various biological activities and can be helpful for fortified food or pharmaceutical product development in the medicinal and pharmaceutical sectors.

Keywords: Antioxidant, Fortification, Mycelial biomass, Submerged culture and Exopolysaccharides.

Introduction

C. indica, commonly known as a Milky mushroom, was first described by Purkayastha and Chandra in 1974. It belongs to the phylum Basidiomycetes and is a medicinal mushroom primarily consumed in West Bengal, India. Worldwide, it is recognized for the richness of its bioactive compounds (Balouiri et al., 2015; Ghosh et al., 2020). It is an umbrella-like mushroom and requires a hot, humid climate for its cultivation; the temperature is about 25°C-35°C, and the stem is cylindrical and has no rings (Purkayastha et al., 1974; Subbiah et al., 2015). The cultivation of C. indica generally takes place on wheat straw and paddy straw as the substrate, such as sorghum stalks, groundnut hulls, soybean straw, and coconut coir, which are also used for cultivation (Rathore et al., 2020; Kosre et al., 2021; Chouhan et al. 2022). Milky mushroom consists of carbohydrates up to 6.8%, proteins 2.75%, lipids 0.6%, fibres 1.67%, water 87% and minerals 0.5-1 %, respectively (Gupta et al., 2012). The essential amino acids of *C.indica* consist of arginine, lysine, histidine, tryptophan, leucine, threonine, valine, isoleucine and methionine (Sumathy et al., 2015; Thejaswini et al., 2015). Therefore, it is used for cures or alternative food materials and combats many diseases like cardiovascular cancer and diabetes as it is rich in fibre, proteins and antioxidants (Balouiri et al., 2015). The polysaccharides of C.indica generally consist of rhamnose, arabinose, galactose, glucose xylose and mannose. However, β- glucan is known to present a massive amount in C.indica



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Bioethanol Production by Immobilized Enterobacter Cloacae Using Different Matrices

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Abstract

Biofuels can be produced through the bioconversion of lignocellulosic substrates, which are derived from sustainable and renewable resources. One such biofuel, bioethanol, stands out as a viable alternative for transportation fuel, offering a sustainable approach to address the challenges posed by fossil fuels. The present study aimed to investigate the immobilization of *Enterobacter cloacae* cells for bioethanol production from rice husk hydrolysates. For this purpose, the biocompatible carriers such as Calcium alginate and activated charcoal beads were used for immobilization. The parameters of bioethanol fermentation, such as the incubation period in different carriers and the choice of a convenient carrier for efficient ethanol production were studied. The maximum bioethanol production of 10.8% was obtained in the 24 hour of the incubation period, with *Enterobacter cloacae* immobilized in Ca-alginate using a droplet method. However, after the second fermentation cycle, Calcium alginate beads got degraded and resulted in lower bioethanol production. The *Enterobacter cloacae* immobilized on activated charcoal also showed better production at 48 hour of 9.15% as compared to free cells (8.03%).

Keywords: Agro-waste; Bioethanol; Ca-alginate; Enterobacter cloacae; Immobilization

Introduction

The overuse and combustion of fossil fuels are severely impacting the environment by releasing carbon dioxide and other harmful gases, thus intensifying the greenhouse effect, global warming, and climate change. The transportation sector alone accounts for almost 40% of all fossil fuel usage, highlighting the urgent need to minimize CO2 emissions through advanced technology and reduce reliance on fossil fuels (Chacón-Navarrete et al., 2021). One of the most promising sustainable fuels that have gained significant attention worldwide is biofuels, as they are renewable, environmentally friendly, and do not interrupt the balance of the environment. Biofuels possess low carbon and sulfur emissions, which make them cheap and could eventually displace energy sources generated from petroleum. The usual natural process of fossil fuel generation takes hundreds or thousands of years, whereas biofuels are manufactured from biomass in a very short period of time. Biofuels from lignocellulosic waste are produced as a substitute for renewable sources of energy (Beliya et al., 2013; Takano and Hoshino, 2018). Among all the biofuels, bioethanol can be used in the transport sector mixed with gasoline or as an octane enhancer as ETBE (ethyl tertiary butyl ether, with 45% ethanol by volume and 55% isobutylene). Bioethanol can directly be used in vehicles as it has similarities with conventionally used fuels, with some modifications in the engine. Bioethanol and gasoline (5–10% by volume) can be used without modifying the vehicle engine. (Bušić et al. 2018).



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SHORT COMMUNICATION



19

Morphological and biochemical alterations during in vitro microrhizome formation of *Curcuma caesia* Roxb

Afreen Anjum¹ · Smriti Adil¹ · <mark>Afaque Quraishi¹</mark>

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Abstract

Curcuma caesia Roxb., a critically endangered herb in the Zingiberaceae family, can be conserved through microrhizomes, which are easily transported, germinate like seeds, and are independent of seasonal variations. The current investigation attempts to induce microrhizomes of this endangered herb for conservation purpose using high concentration of sucrose. To encourage the establishment of microrhizomes, six-month-old cultures of *C. caesia* were transferred to Murashige and Skoog supplemented with containing 8 mg L⁻¹ benzyladenine, 8 mg L⁻¹ kinetin, 100 mg L⁻¹ citric acid, 200 mg L⁻¹ adenine sulphate, and 2 mg L⁻¹ indole-3-acetic acid (standard medium). For this, standard medium was examined with sucrose concentrations of 3%, 6%, 9%, and 12%. The standard medium with 9% sucrose showed the highest rate of microrhizome formation (now referred as microrhizome production medium, MPM). During acclimatization, the survival rate of microrhizomes exceeded 90%. The physiology behind the microrhizome formation was also evaluated using enzymatic and non-enzymatic tests on days 0, 30, and 60 after inoculation. Superoxide dismutase activity, an enzymatic defence molecule, and total soluble sugar and ascorbate content, a non-enzymatic defence molecule, both increased in the MPM microrhizomes relative to the control [shoot multiplication medium (standard medium with 3% sucrose) at day 0]. Further, protein, 2-thiobarbituric acid reactive substances, and hydrogen peroxide content also increased. The biochemical results proved that 9% sucrose in MPM induces osmotic stress which eventually led to the formation of *C. caesia* microrhizomes, an in vitro storage organ.

Keywords Ascorbate · Black turmeric · Osmotic stress · Storage organ · Sucrose · Superoxide dismutase

Abbreviations

ANOVA	Analysis of variance
APX	Ascorbate peroxidase
CAT	Catalase
DAI	Days after inoculation
DMRT	Duncan's multiple range test
H_2O_2	Hydrogen peroxide
MPM	Microrhizome production medium
MS	Murashige and Skoog
ROS	Reactive oxygen species
SMM	Shoot multiplication medium
SOD	Superoxide dismutase
TBARS	2-Thiobarbituric acid reactive substances

Afaque Quraishi drafaque13@gmail.com Storage organ crops are now second to cereal crops in cultivation as they are a prime source of secondary metabolites used in medicinal and human health applications (Natarajan et al. 2019). An efficient method is required to produce storage organs, which could help increase their population and obtain a sufficient number of clones (Quraishi et al. 2017). Curcuma caesia Roxb., commonly known as black turmeric, is a tuberous rhizomatous herb belonging to the Zingiberaceae family. It is an endangered plant native to Central and North-East India. The rhizome is the only part used for the propagation of plants and also possesses pharmacological properties. The extract of C. caesia has been well-documented for its anticancer, anti-acne, anti-asthmatic, antiinflammatory, and antimicrobial properties, along with its potential in treating fever, diarrhea, skin disorders, rheumatic pains, typhoid, neurological and central nervous system disorders, as well as muscle and anxiety-related problems (Arya et al. 2022). This species has also been reported to have protective effects against Alzheimer's disease and other inflammatory bowel diseases (Benya et al. 2023). The plant has two storage organs: the rhizome and multiple root tubers,

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SHORT PROTOCOL COMMUNICATION





Low-temperature storage in dark condition improved the *in vitro* regeneration of *Plumbago zeylanica* synthetic seeds: a medicinally valuable species

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Abstract

Medicinal applications of *Plumbago zeylanica* and its metabolites on various diseases and low viability and inconsistent germination of its seeds are the reasons behind the loss of its genetic diversity. Hence, an efficient protocol for the short-term storage of *P. zeylanica* synthetic seeds, which is an overexploited medicinally valuable plant, was developed. Initially, *in vitro* culture was performed from nodal explants to develop synthetic seeds from its proliferated shoots. Murashige and Skoog (MS) medium augmented with 0.5 mg L⁻¹ 6-benzylaminopurine (BAP) resulted in the best morphogenetic response. Thereafter, the developed synseeds were stored for 2 wk at a temperature of 10 or 25°C in different conditions and further evaluated for regeneration. Higher re-growth rate (80%) and the identical morphogenetic response were recorded for the *P. zeylanica* synthetic seeds, which were stored at a temperature of 10°C in dark condition after its storage period. As per the available literature, this is the first report pertaining to *in vitro* low-temperature storage of synthetic seeds of *P. zeylanica* and can further be utilized for the conservation of elite clones for the study of medicinally potent species.

Keywords Cold storage · Encapsulation · In vitro conservation · Micropropagation · Synseed

Introduction

Plumbago zeylanica L. is an herbaceous species generally known as Chitrak, which is widely distributed across the subtropics of the world, more particularly southern and central India (Jain *et al.* 2018; Santra and Ghosh 2023). Previous reports have shown its medicinal and pharmacological impacts on hemorrhoids, rheumatism, and skin diseases, and it exhibited anti-cancer, anti-microbial, central nervous system stimulatory, and hepato-protective properties due to the presence of an important bioactive—plumbagin (Edwin *et al.* 2009; Sharma and Agrawal 2018; Zheng *et al.* 2023). These impacts cause an increase in market demand for the targeted species, resulting in constant overexploitation, which ultimately results in the loss of future genetic

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diversity (Mittal *et al.* 2010; Pandey *et al.* 2023). *P. zeylanica* propagation through seeds is not reliable due to low viability and inconsistent germination (Chaplot *et al.* 2006). Hence, in order to preserve *P. zeylanica*, an efficient *in vitro* conservation strategy is needed.

In comparison to field-grown plants, in vitro regenerated cultures required limited care for their conservation over time (Alzubi et al. 2019; Sota et al. 2023). However, tissue culture-grown plants need successive subcultures that are economically not feasible and may induce off-types via somaclonal variations (Quraishi et al. 2017). There are several efficient techniques to preserve elite germplasm of clonally propagated plants. Among them, the slow-growth conservation technique allows the conservation of plant materials for short to long periods of time (Reed et al. 2011) in a small area and at a low cost by slowing down the plant's physiological metabolism (Deepa and Thomas 2020; Lacerda et al. 2021). Production of synseeds is also one of the chief approaches for conservation and transportation with high germination and bears immense potential as a substitute for true seed (Jain et al. 2018). It can be defined as the artificial encapsulation of totipotent cells or tissues, which can grow under both in vivo and in vitro conditions



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RESEARCH ARTICLES







In vitro seed germination for the seedling rescue of *Buchanania cochinchinensis* (Lour.) M.R. Almeida - a valuable tropical forest tree

Tripti Agrawal¹ · Afaque Quraishi¹

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Abstract

Buchanania cochinchinensis (Lour.) M.R. Almeida is a tropical tree from the Anacardiaceae family. Because of the high nutritional value of its seeds and the medicinal properties of various parts, the tree species is socio-economically important. This tree is a rich source of phyto chemicals of great medicinal value in root, bark, leaf, fruit and seeds. This multifunctional tree serves as a vital economic resource for tribal people living in Indian forests by providing food, fuel, fodder, timber, and medicine. However, the tree is at serious risk of extinction due to a lack of natural regeneration capacity and overexploitation of natural habitat. The seeds are the major source of propagation of *B. cochinchinensis*, but the main constraint is the low germination frequency caused by hard shell and fungal infestation during germination. Traditional plant propagation methods like vegetative propagation are time-consuming and inefficient for this species. A need for alternative seed germination strategies for quality planting material is imperative. Therefore, seed germination was carried out in the current study under ex vitro as well as in vitro condition. The germination of 52% was observed in seeds germinated in the greenhouse with a low seedling conversion rate. Total soluble sugars were estimated from different parts of the B. cochinchinensis seedling; to investigate this low germination rate. The investigation revealed that the root part had the maximum soluble sugar, followed by cotyledons, and the dried kernels had the least. Therefore, in vitro seed germination was attempted with the insight that higher sugars in the early-stage seedlings might be responsible for a low germination rate due to fungal attacks. Murashige and Skoog medium at full and half-strength was used for seed germination, along with different sucrose concentrations- 0%, 1%, 2%, 3%, 4.5% or 6%. Half-strength MS medium fortified with 3% sucrose resulted in highest germination (96.60%) and seedling conversion (60%). Further, during acclimatization, in vitro seedlings survived at a rate of 80%, more than the ex vitro greenhouse-raised seedlings. This study proposed an efficient in vitro seed germination protocol for mass propagation of *B. cochinchinensis*, where the early-stage susceptible seedlings could be rescued from fungal attack.

Keywords Anacardiaceae · Greenhouse · Propagation · Seedling conversion · Sucrose

Introduction

Buchanania cochinchinensis (Lour.) M.R. Almeida (Common name: Hindi- *Chironji*, English- Almondette) (Synonym: *Buchanania lanzan* Spreng.) is a deciduous fruit nut tree in India's tropical forests (Hiwale 2015). It is a tropical dicot tree of the Anacardiaceae family that is economically significant as Non-Timber Forest Product (NTFP)

Afaque Quraishi drafaque13@gmail.com and originated in Indian subcontinent (Avani et al. 2019). This tree has been reported in north, west, and central dry regions, predominantly in the forests of the Indian states of Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Maharashtra, Bihar, Jharkhand, Orissa, Andhra Pradesh, and Gujarat (Malik et al. 2010). It is indigenous to India and found throughout the Indo-Malaysian region (Foundation for Revitalisation of Local Health Traditions (FRLHT), Bengaluru, Karnataka, India). The tree is also found growing in Australia, the Pacific islands and tropical Asian countries (Siddiqui et al. 2016). The tree is a very common associate of Sal (*Shorea robusta*), Kaldhi (*Anogeissus pendula*), Teak (*Tectona grandis*), Salai (*Boswellia serrata*) and Mahua (*Madhuca longifolia*) in the forest dwellings (Malakar et

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Targeting Pathways and Integrated Approaches to Treat Rheumatoid Arthritis

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ABSTRACT: Rheumatoid arthritis (RA) is a chronic symmetrical systemic disorder that not only affects joints but also other organs such as heart, lungs, kidney, and liver. Approximately there is 0.5%–1% of the total population affected by RA. RA pathogenesis still remains unclear due to which its appropriate treatment is a challenge. Further, multitudes of factors have been reported to affect its progression i.e. genetic factor, environmental factor, immune factor, and oxidative factor. Therapeutic approaches available for the treatment of RA include NSAIDs, DMARDs, enzymatic, hormonal, and gene therapies. But most of them provide the symptomatic relief without treating the core of the disease. This makes it obligatory to explore and reach the molecular targets for cure and long-term relief from RA. Herein, we attempt to provide extensive overlay of the new targets for RA treatment such as signaling pathways, proteins, and receptors affecting the progression of the disease and its severity. Precise modification in these targets such as suppressing the notch signaling pathway, SIRT 3 protein, Sphingosine-1-phosphate receptor and stimulating the neuronal signals particularly efferent vagus nerve and SIRT 1 protein may offer long term relief and potentially diminish the chronicity. To target or alter the novel molecules and signaling pathway a specific delivery system is required such as liposome, nanoparticles and micelles and many more. Present review paper discusses in detail about novel targets and delivery systems for treating RA.

KEY WORDS: rheumatoid arthritis, causative factor, notch signaling, sirtuin, sphingosine-1-phosphate, neuronal signals, delivery system

I. INTRODUCTION

Rheumatoid arthritis (RA) is a chronic systemic autoimmune disorder that systematically affects the whole body. RA chronicity is manifested as destruction of cartilage lining by synovial capsule, the formation of pannus, morning stiffness, and intolerable pain particularly in cold conditions.¹ Globally, around 1% of the total world population suffer from RA.² The incidence of RA in women is two to three-times higher than men. At any age, RA can occur but it generally occurs at the age of 40–60 years in women while in men it is 60 years.³ Along with these, 40% of RA patients suffer from extra-articular symptoms such as glomerulonephritis, atherosclerosis, and small vascular vacuities. This deteriorates the quality of patient life both socially and economically which results

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Biovalorizing agro-waste 'de-oiled rice bran' for thermostable, alkalophilic and detergent stable α -amylase production with its application as laundry detergent additive and textile desizer

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ARTICLE INFO	A B S T R A C T
Keywords: α-Amylase Agro-waste Detergent	The current research was concerned with the use of abundant agro-waste 'de-oiled rice bran (DORB)' as a sus- tainable substrate to produce α -amylase followed by several targets like process parameter optimization for augmented production and immobilization. In addition, we have also focused on investigating the application of DORB_amy as an efficient laundry detergent additive and textile desizer. The best production was recorded at pH 8.0 at 37 °C after 96 h incubation with 1.5 % (<i>w</i> / <i>v</i>) maltose. The DORB_amy has optimum activity at pH 9.0 at 60 °C with a K_m and V_{max} of 0.31 mg/mL and 222.22 mg/mL/min respectively. The catalytic performance of DORB_amy was further enhanced after immobilization in 3.0 % calcium alginate beads with 61.95 \pm 0.17 % of operational stability after five continuous reaction cycles. The findings showed excellent performance of DORB_amy in cleaning starchy stains. The washing performance of enzyme and detergent together was better than their individual performance which increases the application of α -amylase as a laundry detergent additive. About 17.34 % weight loss or desizing was done by DORB_amy with an 8–9 TEGEWA rating. The reported biochemical features like thermostability, alkalophilic and detergent-stable nature of the DORB_amy make it industrially fit with great significance.

1. Introduction

The extracellular hydrolytic enzymes produced by a diverse group of microorganisms have vital importance in the biotechnology sector due to their countless applications. Since it is easier and faster to cultivate microorganisms than plants or animals, and it is easy to genetically modify the producing organisms to generate desired grades and quantities of enzymes, microbial enzymes proved to be economically advantageous. Hydrolytic enzymes have superior selectivity and can be used in mild reaction conditions than chemical catalysts, they are highly intriguing biocatalysts that have been the subject of much research [1,2]. Chemical catalysts have been surpassed by microbial enzymes nowadays. Microbial hydrolases like proteases, amylases, lipases, cellulases and pectinases have long-term applications in industries such as food, paper and pulp, feed, textile, detergent, pharmaceutical, leather, biopolymer and waste treatment [1,3]. One such hydrolase owing versatile application in starch-based industries is α -amylase which is the need of the hour.

Starch is an abundant polysaccharide and the ultimate reservoir of

energy for the organisms on earth. The demand for starch and its hydrolytic products is increasing in various industries, reinforcing the search for an efficient α -amylase enzyme. α -Amylase (endo-1, 4- α -D-Glucan glucohydrolase; E.C. 3.2.1.1) is an α -glucosidase widely used by industries to offer several vital applications [1,3]. It randomly cleaves the α -(1,4) glucosidic bonds of starch and other similar polysaccharides to release short-chain products like glucose, maltose and dextrin in α -anomeric configuration. Approximately 30 % share of the industrial enzyme market is dominated by α -amylases [3,4]. A lot of research and development is going on in searching for an efficient α -amylase for the detergent and textile industry that can withstand extreme conditions of temperature, pH and harsh chemicals.

On taking account of sustainability, the cheaper production medium is very significant for enzyme production. The use of agricultural byproducts including various crop residues like wheat straw, wheat bran, groundnut husk, corn straw, coconut coir and sugarcane bagasse for extracellular α -amylase production has grown rapidly in recent decades [3,4]. Agro-waste has many supremacies such as its diversity, easy availability, cost-effectiveness, environment friendliness and high

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Bioorganic Chemistry

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Chitosan decorated magnetic nanobiocatalyst of *Bacillus* derived α -amylase as a role model for starchy wastewater treatment, detergent additive and textile desizer

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ARTICLE INFO

Keywords:

α-Amvlase

Starch

Immobilization

Nanobiocatalyst

Magnetic nanoparticles

ABSTRACT

In this study, Bacillus tequilensis TB5 α-amylase from rice-milled by-products (rice bran and de-oiled rice bran) was successfully immobilized onto biologically synthesized magnetic nanoparticles fabricated with chitosan (MNP-Ch) and characterized via different biophysical techniques. Furthermore, the study emphasized incorporating this nanostructure framework (MNP@2mgchitosan_DORB-amy and MNP@3mgchitosan_RB-amy) to offer diverse applications, including enzymatic desizing, cleaning starchy stains, and treating synthetic starchy wastewater. An enzyme loading of > 90 % for both enzymes indicated increased binding sites due to the functional moieties of chitosan on the MNP. The K_m was 0.28 and 0.31 mg/mL for the immobilized and free forms of DORB-amy, respectively, and 0.18 and 0.27 mg/mL for the immobilized and free forms of RB-amy, respectively. A low K_m indicated an increased affinity of MNP-Ch-immobilized forms of enzymes toward the substrate. The performance of both immobilized enzymes improved at a wide range of pH and temperature, which may be attributed to the covalent binding of the enzyme on to the MNP-Ch. The nanobiocatalysts in the detergent act synergistically to fade the starchy stains. Furthermore, an 8–9 TEGEWA scale rating with > 11 % of starch removal was obtained through the biodesizing of starch-sized cotton fabric. The nanobiocatalyst efficiently decomposed starch and liberated 650-670 mg/L of reducing sugar from the synthetic wastewater, therefore offering promising opportunities for its exploration in a wastewater treatment plant. Thus, the study recommends the potential exploration of sturdy matrices like MNP to offer remarkable applications with maximum operational stability, easier recovery, and higher efficiency.

1. Introduction

Microorganisms have proven as a boon since time immemorial by aiding synthesis of bio-products like enzymes. The motivation to do this research was found because of the excellent potential of microorganisms in synthesizing application-based enzymes. Hydrolytic enzymes from microbial sources are the need of the hour due to their immense application in various sectors. α -Amylase (E.C 3.2.1.1 1,4- α -glucan-glucanohydrolase) is an α -glucanase which preferentially cleaves internal α -D-(1,4) glycosidic linkages of starch in a random manner to generate short chain α -anomeric product at random locations [1]. α -Amylase is the backbone of starch-based firms which accounts for about 30 % share of the whole enzyme market and the second most demanded enzyme after proteases [1,2]. It offers endless applications in food/bakery, biofuels, textile, detergents, textile, pharmaceuticals and wastewater remediation

[3,4].

Enzymes have numerous advantages including eco-friendliness, costeffectiveness, require mild operational conditions and high specificity. Despite having the aforementioned plus points, its solubility in the reaction mixture, a non-recovery and poor catalytic performance due to structural disruption at the extreme condition of pH and temperature limits its usage in industries [5–8]. Immobilization has proven to be the promising solution for all these shortcomings of free enzymes. Immobilization is an empiric technique of confining an enzyme in/onto a suitable support known as a matrix *via* several weak and strong interactions for enhancing its stability, reusability and recovery [7,9,10]. The main advantage of immobilization is that it reduces the cost of the entire production process because the enzyme prepared once can be used multiple times with even better catalytic efficiency [2,7,8].

The correlation between nature and nanotechnology has proven to

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REVIEW ARTICLE



25

A comprehensive report on valorization of waste to single cell protein: strategies, challenges, and future prospects

Sharda Devi Rajput¹ · Neha Pandey¹ · Keshavkant Sahu¹

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Abstract

The food insecurity due to a vertical increase in the global population urgently demands substantial advancements in the agricultural sector and to identify sustainable affordable sources of nutrition, particularly proteins. Single-cell protein (SCP) has been revealed as the dried biomass of microorganisms such as algae, yeast, and bacteria cultivated in a controlled environment. Production of SCP is a promising alternative to conventional protein sources like soy and meat, due to quicker production, minimal land requirement, and flexibility to various climatic conditions. In addition to protein production, it also contributes to waste management by converting it into food and feed for both human and animal consumption. This article provides an overview of SCP production, including its benefits, safety, acceptability, and cost, as well as limitations that constrains its maximum use. Furthermore, this review criticizes the downstream processing of SCP, encompassing cell wall disruption, removal of nucleic acid, harvesting of biomass, drying, packaging, storage, and transportation. The potential applications of SCP, such as in food and feed as well as in the production of bioplastics, emulsifiers, and as flavoring agents for baked food, soup, and salad, are also discussed.

Keywords Microbial protein · Microorganisms · Fermentation · Downstream processing · Food source · Green protein

Introduction

The global population is predicted to increase to nine billion by 2050. In light of the present pattern of food consumption, we may probably require 1250 million tonnes of dairy and meat products per year to fulfill the demand of animalderived proteins (Verstraete et al. 2016). In the future, requirement of additional proteins cannot be fulfilled with the existing food production strategies such as agriculture. However, the proteins are quite essential for cellular and metabolic activities and serves as a source of nitrogen for animals and humans to form their functional and structural components for survival. In recent decades, protein-calorie malnutrition (PCM) has been reported to affect children, resulting in poor mental growth and weak immunity (Junaid et al. 2020). The nutritional value of proteins depends on

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their constituent amino acids. Due to their inability to be synthesized by the cells, animal populations typically require essential amino acids (EAAs) from external food sources to achieve their daily demand (Junaid et al. 2020). Proteins derived from different fruits, vegetables, and typical grains are often out of reach of the average person; therefore, microbial protein can be an alternate source of food for economically deprived population worldwide. Hence, this is high time to concentrate on deriving alternate, innovative, affordable, and unconventional protein sources to satisfy the nutritional requirements of the growing population. In regard, single-cell proteins (SCPs), cultured meat, plant-based new proteins, macroalgae, seaweed, and insects are some of the examples of sources of alternate proteins. Production of SCP is one of such potential approaches.

Single-cell protein mainly consists of a dried mass of microorganisms with high protein content, carbohydrates, lipids, minerals, and vitamins. The term SCP was coined by Carol L. Wilson in 1966 to define microbial biomass products (Suman et al. 2015). It can be total biomass or proteins isolated from pure culture or a mixed culture of microbial populations such as bacteria, algae, and fungi. The SCP has countless significant advantages over other protein sources:

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ORIGINAL ARTICLE



Check for updates

Nano zinc oxide mediated resuscitation of aged *Cajanus cajan* via modulating aquaporin, cell cycle regulatory genes and hormonal responses

Rasleen Kaur¹ · Bhumika Yadu² · Nagendra Singh Chauhan³ · Arun Singh Parihar³ · S. Keshavkant¹

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Abstract

Key message Nanoparticle pretreatment improved the health of aged *Cajanus cajan* seeds viz., regulation of redox status, gene expression, and restoration of hormonal homeostasis.

Abstract Ageing deteriorates the quality of seeds by lowering their vigor and viability, and terminating with loss of germination. These days, nanotechnology has been seen to revolutionize the agricultural sectors, and particularly nano zinc oxide (nZnO) has gained considerable interests due to its distinctive properties. The aim of the present work was to decipher the possibilities of using nZnO to rejuvenate accelerated aged (AA) seeds of *Cajanus cajan*. Both chemically (CnZnO) and green (GnZnO; synthesized using *Moringa oleifera*) fabricated nZnOs were characterized via standard techniques to interpret their purity, size, and shape. Experimental results revealed erratic germination with a decline in viability and membrane stability as outcomes of reactive oxygen intermediate (ROI) buildup in AA seeds. Application of nZnO substantially rebated the accrual of ROI, along with enhanced production of antioxidants, α -amylase activity, total sugar, protein and DNA content. Higher level of zinc was assessed qualitatively/ histologically and quantitatively in nZnO pulsed AA seeds, supporting germination without inducing toxicity. Meantime, augmentation in the gibberellic acid with a simultaneous reduction in the abscisic acid level were noted in nZnO invigorated seeds than that determined in the AA seeds, suggesting possible involvement of ROI in hormonal signalling. Furthermore, nZnO-subjected AA seeds unveiled differential expression of aquaporins and cell cycle regulatory genes. Summarizing, among CnZnO and GnZnO, later one holds better potential for a revival of AA seeds of *Cajanus cajan* by providing considerable tolerance against ageing-associated deterioration via recouping the cellular redox homeostasis, hormonal signaling, and alteration in expression patterns of aquaporin and cell cycle regulatory genes.

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REVIEW ARTICLE



Role and uptake of metal-based nanoconstructs as targeted therapeutic carriers for rheumatoid arthritis

Shradha Devi Dwivedi¹ · Anita Bhoi² · Madhulika Pradhan³ · Keshav Kant Sahu² · Deependra Singh¹ · Manju Rawat Singh¹

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Abstract

Rheumatoid Arthritis (RA) is a chronic autoimmune systemic inflammatory disease that affects the joints and other vital organs and diminishes the quality of life. The current developments and innovative treatment options have significantly slowed disease progression and improved their quality of life. Medicaments can be delivered to the inflamed synovium via nanoparticle systems, minimizing systemic and undesirable side effects. Numerous nanoparticles such as polymeric, liposomal, and metallic nanoparticles reported are impending as a good carrier with therapeutic properties. Other issues to be considered along are nontoxicity, nanosize, charge, optical property, and ease of high surface functionalization that make them suitable carriers for drug delivery. Metallic nanoparticles (MNPs) (such as silver, gold, zinc, iron, titanium oxide, and selenium) not only act as good carrier with desired optical property, and high surface modification ability but also have their own therapeutical potential such as anti-oxidant, anti-inflammatory, and anti-arthritic properties, making them one of the most promising options for RA treatment. Regardless, cellular uptake of MNPs is one of the most significant criterions for targeting the medication. This paper discusses the numerous interactions of nanoparticles with cells, as well as cellular uptake of NPs. This review provides the mechanistic overview on MNPs involved in RA therapies and regulation anti-arthritis response such as ability to reduce oxidative stress, suppressing the release of proinflammatory cytokines and expression of LPS induced COX-2, and modulation of MAPK and PI3K pathways in Kuppfer cells and hepatic stellate cells. Despite of that MNPs have also ability to regulates enzymes like glutathione peroxidases (GPxs), thioredoxin reductases (TrxRs) and act as an anti-inflammatory agent.

Keywords Rheumatoid arthritis · Metallic nanoparticle · Targeting · Cellular uptake

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Introduction

Rheumatoid Arthritis (RA) is a chronic systemic autoimmune disorder. It is characterized by the destruction of bone and cartilage inflammation at a synovial site, leading to enhanced mortality disability and reduced quality of life. (Song et al. 2021; Devi Dwivedi et al. 2023) Out of 100,000 of the total population, 40 persons are affected by RA, more significant than 0.5 to 1%. It commonly starts at the age of 40 to 60 years (Zheng et al. 2021). According to the Global Burden of Disease 2010, the prevalence of RA in women is almost three times greater than in males which is usually one female in 28 and one male in 59. RA can develop at any stage of life. Women between the ages of 30 and 60 are more likely than males to acquire RA (Brennan-Olsen et al. 2017). Advancement in RA therapy was associated with the joint damage, inhibition, control the progression of disease



RESEARCH





Antibacterial Activity of CdTe/ZnS Quantum Dot-β Lactum Antibiotic Conjugates

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Abstract

β-Lactum antibiotics are broad class of antibiotics which kills bacteria by inhibiting the formation of peptidoglycan that constitutes the bacterial cell wall. The resistance that develops in bacteria for antibiotics led the scientific world to think about the future aspects for modifying the way through which antibiotics are acted on the bacteria and become lethal for them. In this consequence, the potential of latest marketed antibiotics e.g. Amoxiciline (I), ceftazidim (II) have been evaluated after being conjugated with quantum dots. The surface of quantum dots has been conjugated with antibiotics by carbodiimide coupling with the help of 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide (EDC) and N-hydroxysuccinimide (NHS) as conjugating agent between antibiotic and functionalized quantum dots. The antibacterial properties of QD-conjugated antibiotics have been determined by disc diffusion assay. The potency of QD-conjugated antibiotics has been estimated by determining their MIC₅₀ for the selected strain of Gram-negative (*Escherichia coli*) and Gram-positive (*Staphylococcus aureus*) bacteria. Minimum inhibitory concentration study, minimum bactericidal concentration and growth pattern analysis revealed that QDantibiotic conjugates showed slightly more prospective than pure native antibiotics against both Gram-negative (*Escherichia coli*) and Gram-positive (*Staphylococcus aureus*) bacteria.

Keywords β -Lactum antibiotics · QD-antibiotics conjugates · MIC₅₀ · Antibacterial Activity

Introduction

Since the invention of penicillin, β -lactam antibiotics have developed as the most essential spectrum of antibacterial agents [1, 2]. However, the experimental treatment and wide utilization of these agents have made the bacteria to

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generate various types of β -lactamases (β -Lases), which could prompt the spread of bacterial resistance [3-6]. Thus clinical viability of β -lactam antibiotics was negotiated. β-lactam antibiotics resistance has turned out to be a serious issue that encounters the human health [7-10]. Thus, progressively more demand has been put on pharmaceutical investigators and medical researchers to develop new antibiotics [11]. Some strategies have been accounted for disabling the bacterial resistance. One was to change the structure of β -lactam to reduce its sensitivity to the hydrolysis by β -Lases [12]. Another technique was to utilize double activity cephems; if bacteria have resistance to one of them, the other antibacterial agent would destroy them in another way [13–16]. Vergauwe and coworkers utilized reagents, for example, 3 clavulanic acid to inactivate the β -Lases [17]. In all these techniques, reagents added to conquer the bacterial resistance were organic compounds. Inorganic components were occasionally utilized as a part of the antimicrobial industry. Though, it is notable that inorganic nanomaterials are great antimicrobial agents. Currently, there were some research work reported, which



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Recognition of malathion pesticides in agricultural samples by using α -CD functionalized gold nanoparticles as a colorimetric sensor

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ABSTRACT

Handling Editor: A Campiglia Keywords: Malathion Colorimetric detection Plasmonic nanoparticles AuNPs/a-CD Agricultural samples

Herein, a rapid, precise alpha-cyclodextrin (α-CD) based gold nanoparticles (AuNPs) for selective detection of malathion pesticides has been reported. These are organophosphorus pesticides (OPPs), that can cause a neurological disease by inhibiting the activity of acetylcholinesterase (AChE). It is important to exploit a quick and sensitive approach for monitoring OPPs. Hence in the present work, a colorimetric assay for the detection of malathion has been developed as a model of OPPs from the environmental sample matrices. The physical and chemical properties of synthesized alpha-cyclodextrin stabilized gold nanoparticles (AuNPs/α-CD) were studied with various characterization techniques, including UV-visible spectroscopy, TEM, DLS and FTIR. The designed sensing system displayed linearity in the broad range of malathion concentrations, 10-600 ng mL⁻¹ with a limit of detection and the limit of quantification values 4.03 ng mL⁻¹ and 12.96 ng mL⁻¹, respectively. The application of the designed chemical sensor was extended to the malathion pesticide determination in real samples such as vegetables, which resulted in almost 100% recovery rates in all the spiked samples. Thus, due to these advantages, the present study established a selective, facile and sensitive colorimetric platform for the direct detection of malathion within a very short time (5 min) with a low detection limit. The practicality of the constructed platform was further executed by the detection of the pesticide in vegetable samples.

1. Introduction

Malathion is an organophosphate pesticide (OPPs) commonly used in agriculture to control boll weevils and fruit flies. This pesticide is classified as Class III (moderately toxic) by the Environmental Protection Agency (EPA), with evidence of carcinogenicity. The maximum residue limit (MRL) for this pesticide in foods has been set at 8 mg L^{-1} by the Food and Drug Administration [1]. OPPs are widely applied to improve agricultural products due to their effectiveness against pests destroying crops [2,3]. However, the improper use of OPPs may cause various environmental pollution, such as water and soil, which further lead to food safety issues. According to the World Health Organization (WHO) reports, approximately 1.5 billion children are suffering from diarrhea as a result of taking contaminated food per year, which directly results in more than 3 million deaths [4]. The toxicity of pesticides is directly proportional to their ability to inhibit the enzymatic activity of acetylcholinesterase (AChE). AChE is an important enzyme for the nervous system and it plays a very important role in the decomposition or degradation of acetylcholine [5]. The accumulation of acetylcholine may cause the failure of organs [6]. To confirm foodstuffs' safety, maximum residue limits (MRLs) of the pesticides have also been established. In this framework, the European Commission (EC) has established a general MRL of 0.01 mg/kg for pesticides in food, and also MRL is recognized for malathion 1 mg/kg by FAO in the fruits [7]. Consequently, there is a need to develop a sensitive method for the detection of OPPs.

The conventional analytical methods for the determination of malathion like enzyme-linked immune sorbent assay (ELISA) [8], surface-enhanced Raman scattering (SERS) technique [9], gas chromatography (GC) [10], colorimetric detection method and molecular imprinting technique [11,12] that have been applied for the determination of pesticides from the environmental samples. All these analytical techniques require sample pre-treatments, and are time-consuming, complicated and expensive to implement. Currently, because of the ease of use, the ability to perform on-site analysis, and to provide naked-eye visual detection, the colorimetric method has been found as a

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Dual-Mode Plasmonic and Paper-Based Colorimetric Assays for the Determination of Riboflavin in Green Leafy Vegetables and Whole Grains

Tikeshwari, <mark>Kamlesh Shrivas,</mark>* Sanyukta Patel, Monisha, Tushar Kant, Santosh Singh Thakur, Shamsh Pervez, Manas Kanti Deb, and Kallol K. Ghosh

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ABSTRACT: We developed plasmonic and paper-based colorimetric assays using poly(vinyl alcohol)-capped silver nanoparticles (AgNPs) to detect vitamin B_2 in food samples. Plasmonic colorimetry shifts the plasmonic band from 405 to 445 nm in the presence of B_2 , while the paper-based method changes the color of AgNPs from yellow to reddish yellow. B_2 levels were quantified with a smartphone-assisted RGB color detector app. Experimental and density functional theory investigations validated the selective riboflavin–AgNP interaction. The plasmonic assay detected B_2 in the range of $0.01-1.0 \ \mu g \ mL^{-1}$ with a detection limit of 0.008 $\mu g \ mL^{-1}$, while the paper-based assay detected in the range of $0.2-2.0 \ \mu g \ mL^{-1}$ with a detection limit of 0.09 $\mu g \ mL^{-1}$. Both methods had low relative standard deviations of 3.5% (plasmonic) and 4.7% (paper-based). The cost-effective, user-friendly, paper-based assay is particularly suitable for resource-limited settings, validated against high-performance liquid chromatography and Student's *t*-test for accuracy.

KEYWORDS: AgNPs/PVA, plasmonic colorimetry, paper-based colorimetry, vitamin B₂, leafy vegetables, grains

INTRODUCTION

Vitamins represent essential biomolecules that are crucial for the proper growth, development, and functionality of the human body. They can be categorized into two main groups based on their characteristics: water-soluble vitamins (including B₁ to B₁₂ and C) and fat-soluble vitamins (like A, E, D, and K). Among the water-soluble vitamins, riboflavin (also known as B_2) is particularly important. It is present in a variety of foods, including fruits, vegetables, meats, eggs, dairy products, grains, breads, and cereals. Riboflavin acts as a precursor for coenzymes such as flavin mononucleotide (FMN) and flavin adenine dinucleotide (FAD). These coenzymes play a vital role in various redox reactions by aiding the enzymatic electrontransfer process. The recommended daily intake of vitamin B_{2i} as indicated by the recommended daily allowance (RDA), is 1.3 mg day⁻¹ for men and slightly lower at 1.1 mg day⁻¹ for women. The insufficient intake of B_2 through diet may result in several disorders, including stunted growth in children, skin and mucosal diseases, lesions around the mouth, blurry vision, depression, anemia, and increased risk for cancer. Conversely, an excessive intake of B2 can lead to deoxyribonucleic acid (DNA) and tissue damage, as well as an increase in lipid peroxide production.^{1–4} As a result, measuring the levels of B_2 in food samples is extremely important.

A range of analytical techniques, including UV–vis,⁵ fluorescence,⁶ enzyme-linked immunosorbent assay (ELISA),⁷ electrochemical methods,⁸ high-performance liquid chromatography (HPLC),⁹ and liquid chromatography–mass spectrometry (LC–MS),¹⁰ are employed to measure the levels of B_2 in pharmaceutical and food samples. ELISA requires a

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Graphene-silver nano-ink for inkjet printing of paper electrode for electrochemical sensing of 4-nitrophenol

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HIGHLIGHTS

G R A P H I C A L A B S T R A C T

nocomposite

Potential (V)

- Printed paper electrode (PPE) with graphene (Gr)-silver (Ag) was used as electrochemical sensing for 4-nitrophenol (4-NP).
- Inkjet printer was employed to print formulated Gr-Ag NI on photo paper and sintered at 200 °C for 30 min to make electrode.
- Gr-Ag/PPE was used as a working electrode in cyclic voltammetry for 4-NP determination.
- Gr-Ag/PPE provides a low cost, decomposable, and user-friendly sensor for monitoring of 4-NP in environmental water sample.

ARTICLE INFO

Keywords: Inkjet printer Sensor Nanocomposite Nanoparticles

ABSTRACT

CV Respons

Here, an inkjet printed paper electrode (PPE) decorated with graphene (Gr)-silver (Ag) nanocomposite was exploited as an electrochemical sensing probe for analysis of 4-nitrophenol (4-NP) in environmental water samples. In this work, 4% Gr-Ag nanocomposite ink (NI) was prepared in ethanol, ethylene glycol, and glycerol in the ratio of 50:45:5, which possess surface tension and viscosity of 36 mN m⁻¹ and 11 mPa s, respectively. The office inkjet printer was employed to print formulated Gr-Ag NI on digital photo paper, followed by sintered at 200 °C for 30 min to make effective conducting tracks for the sensing of 4-NP. Gr-Ag NI-based PPE was used as a working electrode in cyclic voltammetry. The working principle of detection is based on the electrocatalytic reduction process of 4-NP on the electrode surface. A good linearity range of 3.125–100 μ M was observed, achieving a detection limit of 2.7 μ M to measure 4-NP. Thus, the developed PPE holds considerable potential and

CV Measurement using PPE/Gr-As

Paper Electrode and Resistivity Me

Reaction Mechanism

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ABSTRACT: During the summer and winter periods of 2019–2020, we conducted sampling of fine mode ambient aerosols in the western Himalayan glacial region (WHR; Thajiwas glacier, 2799 m asl), central Himalayan glacial region (CHR; Gomukh glacier, 3415 m asl), and eastern Himalayan glacial region (EHR; Zemu glacier, 2700 m asl). We evaluated the aerosol optical properties, which included the mass absorption coefficient, mass absorption efficiency, mass scattering efficiency, absorption angstrom exponent, single scattering albedo, as well as their simple radiative forcing efficiencies. We observed the highest absorption in the near ultraviolet–visible wavelength range (200–400 nm), with CHR showing the highest absorption compared to the other two sites, WHR and EHR, respectively. Across the wavelength range of 200–1100 nm, the overall contribution of black carbon to light attenuation was greater than that of brown carbon. However, brown carbon dominated the absorption in the near UV–visible wavelengths, providing evidence of its non-trivial presence over the Himalayan region. Additionally, we observed a positive radiative forcing (W/g), which leads to net warming at these sites. The findings of this ground-based study contribute to our understanding of



the light-absorbing nature of carbonaceous aerosols and their impact on the Himalayan glacier regions.

KEYWORDS: light-absorbing aerosols, carbonaceous matters, radiative forcing, Himalayan glacier, brown and black carbon

1. INTRODUCTION

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Keywords: Rice Straw, Polyaniline, RSC@PANI, Supercapacitor, Scalability, Low-cost.

Introduction

The growing energy consumption, depletion of natural energy resources, drastic climate changes and environmental concerns paradigm shift towards sustainable energy sources with green and clean energy storage systems. As the world strives for a transition to cleaner and more efficient energy sources, energy storage technologies play a key role in ensuring the reliability and sustainability of power systems for the next generation (Li et al., 2014; Olabi et al., 2022; Kasprzak et al., 2023). Among the various available energy storage devices, supercapacitors (SCs), also known as electrochemical capacitors or ultracapacitors, stand out as promising electrochemical devices that show higher power density than traditional batteries. Although SCs exhibit remarkable characteristics such as high power density and long cycle life but its large-scale energy storage system is hindered due to low energy density (Guan et al., 2012; Benoy et al., 2022; Karbhal et al., 2022). Despite this drawback, the exceptionally high power density of SCs renders them promising for integration in hybrid and heavy electric vehicles for high power supply. Due to its inherent characteristics, researchers are actively exploring diverse approaches to improve the energy density of SCs by employing a variety of electrode materials (Karbhal et al., 2021; Behzadi pour et al., 2023).



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1. Introduction

The determination of heavy metals, biomolecules, pesticides, volatile organic compounds (VOCs), drugs, and several other materials plays a vital role in clinical, environmental, and food safety applications. In clinical backgrounds, the exact exposure of biomolecules, such as proteins and genetic markers, is vital for diagnosing diseases, monitoring treatment efficacy, and ensuring optimal patient care. Environmental monitoring relies on the analysis of heavy metals and VOCs to assess pollution levels, identify sources of contamination, and protect ecosystems and human health. Pesticide analysis is essential in agricultural practices to ensure safe and sustainable food production while minimizing environmental impact. Additionally, in food safety, the identification of contaminants and nutrients is critical for ensuring the quality and safety of food products and safeguarding consumers' well-being. Overall, precise determination of these substances in different contexts is indispensable for public health protection, environ-

Progress in the design of portable colorimetric chemical sensing devices

Tushar Kant, *^a <mark>Kamlesh Shrivas,</mark> *^b Ankita Tejwani, ^b Khushali Tandey, ^b Anuradha Sharma^c and Shashi Gupta^c

The need for precise determination of heavy metals, anions, biomolecules, pesticides, drugs, and other substances is vital across clinical, environmental, and food safety domains. Recent years have seen significant progress in portable colorimetric chemical sensing devices, revolutionizing on-the-spot analysis. This review offers a comprehensive overview of these advancements, covering handheld colorimetry, RGB-based colorimetry, paper-based colorimetry, and wearable colorimetry devices. It explores the underlying principles, functional materials (chromophoric reagents/dyes and nanoparticles), detection mechanisms, and their applications in environmental monitoring, clinical care, and food safety. Noble metal nanoparticles (NPs) have arisen as promising substitutes in the realm of sensing materials. They display notable advantages, including heightened sensitivity, the ability to fine-tune their plasmonic characteristics for improved selectivity, and the capacity to induce visible color changes, and simplifying detection. Integration of NPs fabricated paper device with smartphones and wearables facilitates reagent-free, cost-effective, and portable colorimetric sensing, enabling real-time analysis and remote monitoring.

mental preservation, and maintaining high food safety standards.^{1–5}

Numerous analytical methods are utilized in diverse applications for identification and examination of metals, biomolecules, toxicants, and various other substances. For metal detection, methods such as atomic absorption spectroscopy (AAS),⁶ inductively coupled plasma-atomic emission spectroscopy (ICP-AES),7 ICP-mass spectrometry (MS),8 fluorimetry,⁹ and electroanalytical methods¹⁰ are commonly utilized. In the analysis of biomolecules, pesticides, drugs, and volatile organic compounds (VOCs) from environmental, clinical, food, and industrial samples, techniques like fluorimetry,¹¹ electroanalytical methods,12 high-performance liquid chromatography (HPLC),¹³ gas chromatography (GC),¹⁴ liquid chromatography-mass spectrometry (LC-MS),15 and gas chromatography-mass spectrometry (GC-MS)¹⁶ are widely used. The selection of specific methods depends on the nature of the substances being analyzed, the desired level of sensitivity and accuracy, and the particular application requirements. AAS, ICP-AES, ICP-MS, GC, HPLC, GC-MS, LC-MS, fluorimetry, and electroanalytical methods exhibit high sensitivity for detecting various chemical substances; however, they can be expensive, require trained personnel, and may not be applicable at the sample sources.

Among the analytical methods discussed, colorimetry, often referred to as spectrophotometry, distinguishes itself as a straightforward and easily accessible approach for identify-



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A novel composite electrode material has been synthesized using in-situ chemical polymerization of aniline over the surface of rice straw-derived carbon (RSC). The detailed structural characterization validates the effective incorporation of granular polyaniline (PANI) over the RSC surface. The supercapacitor performance of the RSC@PANI electrode was systematically investigated and achieved as high as specific capacitance of 408 Fg⁻¹ at a current density of 1 Ag⁻¹. Moreover, RSC@PANI shows 93% capacitance retention after 1000 cycles at a current density 10 Ag⁻¹. Apart from its outstanding electrochemical performance, the resulting RSC@PANI electrode exhibits exceptional characteristics such as scalability and lightweight properties. This study contributes valuable insights into the synthesis and characterization of RSC@PANI as a promising electrode material for supercapacitors.

Keywords: Rice Straw, Polyaniline, RSC@PANI, Supercapacitor, Scalability, Low-cost.

Introduction

The growing energy consumption, depletion of natural energy resources, drastic climate changes and environmental concerns paradigm shift towards sustainable energy sources with green and clean energy storage systems. As the world strives for a transition to cleaner and more efficient energy sources, energy storage technologies play a key role in ensuring the reliability and sustainability of power systems for the next generation (Li et al., 2014; Olabi et al., 2022; Kasprzak et al., 2023). Among the various available energy storage devices, supercapacitors (SCs), also known as electrochemical capacitors or ultracapacitors, stand out as promising electrochemical devices that show higher power density than traditional batteries. Although SCs exhibit remarkable characteristics such as high power density and long cycle life but its large-scale energy storage system is hindered due to low energy density (Guan et al., 2012; Benoy et al., 2022; Karbhal et al., 2022). Despite this drawback, the exceptionally high power density of SCs renders them promising for integration in hybrid and heavy electric vehicles for high power supply. Due to its inherent characteristics, researchers are actively exploring diverse approaches to improve the energy density of SCs by employing a variety of electrode materials (Karbhal et al., 2021; Behzadi pour et al., 2023).



Vaibhav Dixit, Rajiv Nayan, Shubhra Sinha, Suryakant Manikpuri, Manmohan L. Satnami, Kallol K. Ghosh, Manas Kanti Deb, Shamsh Pervez, I<mark>ndrapal Karbhal*</mark>

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Studies on the Interaction of Imidazolium Ionic Liquids with Human Serum Albumin

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Abstract

Imidazolium-based ionic liquids have emerged as promising bio-compatible solvents for biomolecules. The interaction of two imidazolium-based ionic liquids, namely 1-decyl-3-methylimidazolium tetrafluoroborate [Dmim][BF₄] and 1-butyl-3-methylimidazolium octylsulfate [Bmim][OS], with human serum albumin (HSA) have been investigated using UV-visible, fluorescence and fourier transform infrared spectroscopy. Stern-Volmer quenching constant (K_{sv}) and the binding affinity (K_a) value have been also calculated to reveals the molecular interactions between HSA and the imidazolium-based ILs. Additionally, we explored the thermodynamic feasibility of these interactions by calculating the Gibbs free energy (Δ G), entropy (Δ S), and enthalpy (Δ H). Hydrophobic interactions have been identified as exerting a more significant influence than hydrogen bonding in the interactions between proteins and ionic liquids. This implies that the hydrophobic characteristics of the ionic liquids play a pivotal role in the denaturation of proteins. Consequently, we conclude that the hydrophobic nature of the ionic liquids is essential for inducing interactions with proteins and potentially contributing to protein structure denaturation.

Keywords: Ionic liquid, Imidazolium ionic liquids, Serum albumin, Fluorescence, FTIR.



Graphical abstract

1. Introduction

Serum albumin, the predominant protein in the circulatory system, plays a crucial role in various physiological processes, including the transportation and binding of compounds like fatty acids, drugs, and hormones (Sindhu et al., 2022; Rawat and Bohidar, 2012; Egorova et al., 2017). The interaction of serum albumin with different molecules and solvents significantly



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A Review on Extraction, Identification and Application of 47 Pesticidal Active Phytoderived Metabolites

Reena Jamunkar^{1,*}, Deepak Sinha¹, Tarun Kumar Patle², Kamlesh Shrivas³

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Abstract

Bioactive compounds obtained from plants, microorganisms and minerals show some specific properties like insecticidal, herbicidal, repellent, antifeedant and toxicant activities called bio pesticide. They have specific modes of action against different pests. Due to their environmental eco-friendly nature, low cost, economic effectiveness, less pollution, and target specific quality they are in high demand in agriculture compared to chemical or synthetic pesticides. Extraction, purification, identification and characterization of these compounds from the plants materials are found always challenging. There are various types of traditional and non-traditional methods of extraction have been proposed such as maceration, distillation, ultrasonic-assisted extraction, soxhlet extraction, enzyme assisted extraction, microwave assisted extraction, accelerated solvent extraction, etc. have been reported for extraction of bioactive ingredients from plants complex matrix samples. The chromatographic separation techniques like thin layer chromatography(TLC), high performance thin layer chromatography (HPTLC), high performance liquid chromatography (HPLC) and gas chromatographic (GC) are used for their separation followed by the identification in order to determine their structure with the help of UV-Vis, fluorescence, NMR spectrometry, Fourier transforms infra-red spectrometry (FTIR) and mass spectrometry (MS). This review summarized the extraction procedure, formulation of biopesticide, structural identification and their application in agriculture.

Key words: Biopesticides, Synthetic Pesticide, Extraction, Identification, Formulation, Pesticidal Active Components.

1. Introduction

Pesticide is a chemical compound used to control harmful pests present in the soil and plants. Based on sources pesticides are categorized into chemical or synthetic pesticides and Biopesticides. Chemical pesticides contain various chemicals and polymers that act as carriers (Rakhimol et al., 2020). These carriers are specific for different pests. They are used to control weeds as herbicides, algae as algaecides, rodents as rodenticides, insects as insecticides, nematodes as nematicides, molluscs as molluscicides, termites as termiticides, mites as miticides, ticks as acaricides, fungi as fungicides, bacteria as bactericides etc. (Farooq et al., 2019). Synthetic pesticides are also classified based on active components present in them such as dichlorvos, organochlorines, diazinons, chlorpyrifos, diamides, carbamates etc. (Decool et al., 2024). Herbicides are used to control weeds to facilitate crop management by

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RESEARCH

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Antibacterial Activity of CdTe/ZnS Quantum Dot-β Lactum Antibiotic Conjugates

Sandeep K. Vaishanav² · Jyoti Korram¹ · Tikendra K. Verma⁵ · S. K. Jadhav³ · Rekha Nagwanshi⁴ · <mark>Manmohan L. Satnami¹</mark>

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Abstract

β-Lactum antibiotics are broad class of antibiotics which kills bacteria by inhibiting the formation of peptidoglycan that constitutes the bacterial cell wall. The resistance that develops in bacteria for antibiotics led the scientific world to think about the future aspects for modifying the way through which antibiotics are acted on the bacteria and become lethal for them. In this consequence, the potential of latest marketed antibiotics e.g. Amoxiciline (I), ceftazidim (II) have been evaluated after being conjugated with quantum dots. The surface of quantum dots has been conjugated with antibiotics by carbodiimide coupling with the help of 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide (EDC) and N-hydroxysuccinimide (NHS) as conjugating agent between antibiotic and functionalized quantum dots. The antibacterial properties of QD-conjugated antibiotics have been determined by disc diffusion assay. The potency of QD-conjugated antibiotics has been estimated by determining their MIC₅₀ for the selected strain of Gram-negative (*Escherichia coli*) and Gram-positive (*Staphylococcus aureus*) bacteria. Minimum inhibitory concentration study, minimum bactericidal concentration and growth pattern analysis revealed that QDantibiotic conjugates showed slightly more prospective than pure native antibiotics against both Gram-negative (*Escherichia coli*) and Gram-positive (*Staphylococcus aureus*) bacteria.

Keywords β -Lactum antibiotics · QD-antibiotics conjugates · MIC₅₀ · Antibacterial Activity

Introduction

Since the invention of penicillin, β -lactam antibiotics have developed as the most essential spectrum of antibacterial agents [1, 2]. However, the experimental treatment and wide utilization of these agents have made the bacteria to

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generate various types of β -lactamases (β -Lases), which could prompt the spread of bacterial resistance [3-6]. Thus clinical viability of β -lactam antibiotics was negotiated. β-lactam antibiotics resistance has turned out to be a serious issue that encounters the human health [7-10]. Thus, progressively more demand has been put on pharmaceutical investigators and medical researchers to develop new antibiotics [11]. Some strategies have been accounted for disabling the bacterial resistance. One was to change the structure of β -lactam to reduce its sensitivity to the hydrolysis by β -Lases [12]. Another technique was to utilize double activity cephems; if bacteria have resistance to one of them, the other antibacterial agent would destroy them in another way [13–16]. Vergauwe and coworkers utilized reagents, for example, 3 clavulanic acid to inactivate the β -Lases [17]. In all these techniques, reagents added to conquer the bacterial resistance were organic compounds. Inorganic components were occasionally utilized as a part of the antimicrobial industry. Though, it is notable that inorganic nanomaterials are great antimicrobial agents. Currently, there were some research work reported, which







(Review Article)

<u>Computational Studies in Dermo-cosmetics: In silico Discovery of Therapeutic Agents Targeting a Variety of</u> <u>Proteins for Skin Diseases</u>

Pp: 657-688

Author(s): Lamiae El Bouamri, Mohammed Bouachrine and Samir Chtita* DOI: <u>10.2174/0115680266337405240926114604</u>

Published on: 09 October, 2024







Prominent Perspective on Existing Biological Hallmarks of Alzheimer's Disease

Author(s): Namrata Singh*, Srishti Sharma, Kallol K. Ghosh, Bhanushree Gupta and Kamil Kuca*

Volume 24, Issue 13, 2024

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Abstract

Biomarkers are the most significant diagnosis tools tending towards unique approaches and solutions for the prevention and cure of Alzheimer's Disease (AD). The current report provides a clear perception of the concept of various biomarkers and their prominent features through analysis to provide a possible solution for the inhibition of events in AD. Scientists around the world truly believe that crucial hallmarks can serve as critical tools in the early diagnosis, cure, and prevention, as well as the future of medicine. The awareness and understanding of such biomarkers would

Pages: 14

provide solutions to the puzzled mechanism of this neuronal disorder. Some of the argued biomarkers in the present article are still in an experimental phase as they need to undergo specific clinical trials before they can be considered for treatment.

Keywords: <u>Alzheimer's disease</u>, <u>biomarkers</u>, <u>β-amyloid peptide</u>, <u>tau protein</u>, <u>neurodegenerative diseases</u>, <u>diagnosis</u>.

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Graphical Abstract	



Basic and Advanced Logical Concept Derived from Surface Enhanced Infrared Spectroscopy (SEIRS) as Sensing Probe for Analysis of Chemical Species: A Brief Review

Shubhra Sinha, <mark>Manas Kanti Deb</mark>*, Indrapal Karbhal, Suryakant Manikpuri, Rajiv Nayan, Babita Markande

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Abstract

The worldwide concern for environmental pollution, climate change and health hazards caused by various pollutants has significantly increased in the recent past. Various techniques have so far been employed for sensing applications of such organic as well as inorganic pollutants. Amongst the different techniques, surface enhanced infrared spectroscopy (SEIRS) is a powerful tool which is utilized for label-free and unambiguous identification of molecular species. SEIRS overcomes the limitations of the conventional infrared spectroscopy and has emerged as a potential technique with high surface sensitivity by enhancing the signals by many folds and also facilitates new studies from the fundamental aspect to applied sciences. The current review is dedicated to a comprehension of the SEIRS technique to provide a critical overview of its application as sensing probe for analysis of chemical species. The major features of Fourier transform infrared spectroscopy and SEIRS have been critically discussed.

Keywords: Vibrational Spectroscopy; FTIR; SEIRS; Pollutants; Functional Group.

Graphical Abstract





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Applications of different adsorbent materials for the removal of organic and inorganic contaminants from water and wastewater – A review



Dharini Sahu^a, Shamsh Pervez^a, Indrapal Karbhal^a, Aishwaryashri Tamrakar^a, Archi Mishra^a, Sushant Ranjan Verma^a, Manas Kanti Deb^a, Kallol K. Ghosh^a, Yasmeen Fatima Pervez^b, Kamlesh Shrivas^a, Manmohan L. Satnami^a

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ARTICLE INFO

Keywords: Water Wastewater treatment Adsorption Adsorbents Removal methods Nanomaterials Ions Heavy metals Pesticides Dyes

ABSTRACT

Increasing wastewater production is posing a threat to the safety and cleanliness of the water. Adsorbents have been used in various industries to remove contaminants from wastewater. In this review, naturally occurring and laboratory–synthesized adsorbents, their past and recent advancements, and future wastewater treatment strategies are comprehensively described. Nanomaterials (NMs) have been extensively used as adsorbents due to their high surface area, porosity, low density, and chemical stability. For effective implementation, the adsorption capacity of NMs is optimized. Compared to larger counterparts, nanomaterials have been found to have higher adsorption rate constants, making them more effective adsorbents. The adverse effects associated with the synthesis and application of these adsorbents are discussed. This review also addresses some significant issues concerning these adsorbents, which could impact future research and practical applications of nano adsorbents for water safety.

1. Introduction

The scarcity of clean water and the contamination of existing water sources has become a global issue, necessitating the development of new technologies for water and wastewater treatment in order to prevent adverse impacts on human health and the environment [1]. Population and industrial growth across the world have caused a major crisis of clean water availability for potable use [2]. Out of the Earth's entire freshwater supply, only a small fraction (1%) is easily accessible for human use. The majority of this vital resource is trapped in glaciers and polar ice caps (69%) or lies underground (30%) (Fig. 1). According to

WRI (2023) [3], India is one of the countries that are experiencing high levels of water stress. Approximately 75 million population in India lack access to clean drinking water, representing the highest percentage of any Asian nation [4]. Groundwater and surface water are in high demand for domestic, industrial, and agricultural purposes. However, the rate of groundwater pumping is much higher than its replenishment capacity [5,6]. Surface water is also polluted by anthropogenic activities and natural processes [7]. These surface water pollutants leach into groundwater, creating a serious problem of safe water usage [8,63]. Wastewater contains pollutants such as heavy metal ions, non-metallic salts, acids, bases, dyes, aromatic phenols, pesticides, pharmaceuticals,

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Abbreviations: AC, Activated Carbon; AgNP, Silver Nanoparticle; BMTTPA, 2,5–Bis (Methylthio) Terephthalaldehyde; BOD, Biochemical Oxygen Demand; BPA, Bisphenol–A; BP–AC, Banana Peel-Activated Carbon; BTEX, Benzene, Toluene, Ethylene, and Xylene; C-AC, Commercial Activated Carbon; CaFu, Calcium Fumarate; CBZ, Carbamazepine; CH, Chitosan; CMC, Carboxymethyl Cellulose; CMX, Chloroxylenol; CNT, Carbon Nanotube; COD, Chemical Oxygen Demand; COF, Covalent–Organic Frameworks; CTF, Covalent Triazine Framework; DMTP, Dimethoxyterephthaldehyde; DWCNT, Double-walled carbon nanotube; G, Graphene; GO, Graphene Oxide; HAP–Al, Hydroxyapatite/Alginate; IC, Indigo Carmine; IL, Ionic Liquid; KMS, $K_{2x}Mn_xSn_3-_xS_6$; MB, Methylene Blue; MLD, Million Liter Per Day; MNP, Magnetic Nanoparticle; MOF, Metal–Organic Framework; MOP, Mercapto Orange Peel; M–RGO, Magnetic- Reduced Graphene Oxide; MWCNT, Multi-walled carbon nanotube; NMs, Nanomaterials; NPs, Nanoparicles; NPT, N–Phenylthiourea; PAH, Poly Aromatic Hydrocarbon; Ppy, Polypyrrole; rGO/RGO, Reduced Graphene Oxide; RHA, Rice husk activated; RhB, Rhodamine B; ROS, Reactive oxygen species; SNF, Silica Nano fiber; SNP, Silica NanoparticleSingle-walled carbon nanotube; TAPB, Tris (4–Aminophenyl) Benzene; THF, Tetrahydrofuran; TOC, Total Oragnic Carbon; TPB, Triphenyl Benzene; VOC, Volatile Organic Compund; β–CDP, β–Cyclodextrin Polymer

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Applications of different adsorbent materials for the removal of organic and inorganic contaminants from water and wastewater – A review



Dharini Sahu^a, Shamsh Pervez^{a,*}, <mark>Indrapal Karbhal^a</mark>, Aishwaryashri Tamrakar^a, Archi Mishra^a, Sushant Ranjan Verma^a, Manas Kanti Deb^a, Kallol K. Ghosh^a, Yasmeen Fatima Pervez^b, Kamlesh Shrivas^a, Manmohan L. Satnami^a

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Desalination and Water Treatment



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Applications of different adsorbent materials for the removal of organic and inorganic contaminants from water and wastewater – A review



Dharini Sahu^a, Shamsh Pervez^{a,*}, Indrapal Karbhal^a, Aishwaryashri Tamrakar^a, Archi Mishra^a, Sushant Ranjan Verma^a, Manas Kanti Deb^a, Kallol K. Ghosh^a, Yasmeen Fatima Pervez^b, Kamlesh Shrivas^a, Manmohan L. Satnami^a

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ARTICLE INFO

Keywords: Water Wastewater treatment Adsorption Adsorbents Removal methods Nanomaterials Ions Heavy metals Pesticides Dyes

ABSTRACT

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Nanomaterial-enabled portable paper-based colorimetric and fluorometric devices: Progress in point-of-care diagnosis



Khushali Tandey^a, Kamlesh Shrivas^{a,*}, Anuradha Sharma^b, Tushar Kant^c, Ankita Tejwani^a, Tikeshwari^a, Manas Kanti Deb^a, Shamsh Pervez^a, Kallol K. Ghosh^a

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ARTICLE INFO

Keywords: Portable paper device Colorimetric Fluorometric Biomolecules Point of-care diagnosis

ABSTRACT

This review paper comprehensively explores recent advancements in the development of colorimetric and fluorometric paper-based analytical devices (PADs) for rapid point-of-care diagnosis of specific disease biomarkers. The paper elucidates the principles of colorimetry and fluorometry, focusing on their application in the detection of various biomolecules. Notably, metal nanoparticles (NPs) and quantum dots (QDs) emerge as versatile sensing probes in these platforms. The fabrication of nanomaterials (NMs) on paper substrates is extensively discussed, covering techniques such as dip-coating, drop-casting, wax printing, inkjet printing and screen printing. The integration of PADs with portable devices is explored, including gray scale and RGB measurements using desktop scanners, smartphones and color detector apps for enhanced colorimetric and fluorometric analysis. The application of PADs with metal NPs for the detection of a wide array of biomolecules is highlighted. The versatility of these devices is demonstrated in detecting nucleic acids, proteins, amino acids, bio thiols, urea, uric acid, antigens, antibodies, glucose, creatinine, bilirubin, vitamins and bacteria. The potential for point-of-care diagnosis in diverse healthcare settings is underscored, emphasizing the simplicity, cost-effectiveness and rapidity of these paper-based diagnostic platforms. This review provides an overview of the NMs-enabled colorimetric and fluorometric PADs, offering insights into the fabrication techniques, integration with portable devices and diverse applications in the field of biomarker detection. The amalgamation of metal nanoparticles and quantum dots with paper-based devices holds promising prospects for advancing point-of-care diagnostics of specific disease biomarkers.

1. Introduction

Essential to human physiology and overall health, biomolecules such as vitamins, proteins, amino acids, nucleic acids, carbohydrates and lipids play integral roles, influencing diverse physiological processes in the body. The identification of biomolecules like proteins, glucose and nucleic acids in clinical samples enhances the specificity of diseasespecific biomarkers. The development of on-site methods for analysis of vitamins, metabolites and lipid profiles allows for immediate assessment of nutritional status and metabolic health. These advancements in point-of-care diagnostics empower healthcare professionals to make timely decisions, facilitating efficient patient management and improving overall healthcare outcomes [1–3].

Furthermore, biomarker detection is a critical aspect of clinical

https://doi.org/10.1016/j.ccr.2024.215919 Received 8 February 2024; Accepted 27 April 2024 Available online 12 May 2024 0010-8545/© 2024 Elsevier B.V. All rights reserved. analysis for disease diagnosis, prognosis and treatment monitoring. Protein and bio thiols biomarkers, for example, can indicate the presence of specific diseases or conditions and their quantification aids in disease staging and progression assessment [4]. Nucleic acid biomarkers, especially in the form of genetic mutations or expression patterns, are fundamental for identifying genetic disorders or predicting treatment responses [5]. The determination of biomarkers such as urea and uric acid provides insight into renal function and potential kidney disorders. Antigen-antibody analysis aids in diagnosing infections and autoimmune diseases. Glucose monitoring is crucial for managing diabetes and detecting metabolic disorders. Creatinine levels indicate kidney health and muscle function, while bilirubin assessment helps diagnose liver conditions. Vitamin levels offer insight into nutritional status and deficiency-related diseases. Bacteria detection aids in

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ABSTRACT

This review paper comprehensively explores recent advancements in the development of colorimetric and fluorometric paper-based analytical devices (PADs) for rapid point-of-care diagnosis of specific disease biomarkers. The paper elucidates the principles of colorimetry and fluorometry, focusing on their application in the detection of various biomolecules. Notably, metal nanoparticles (NPs) and quantum dots (QDs) emerge as versatile sensing probes in these platforms. The fabrication of nanomaterials (NMs) on paper substrates is extensively discussed, covering techniques such as dip-coating, drop-casting, wax printing, inkjet printing and screen printing. The integration of PADs with portable devices is explored, including gray scale and RGB measurements using desktop scanners, smartphones and color detector apps for enhanced colorimetric and fluorometric analysis. The application of PADs with metal NPs for the detection of a wide array of biomolecules is highlighted. The versatility of these devices is demonstrated in detecting nucleic acids, proteins, amino acids, bio thiols, urea, uric acid, antigens, antibodies, glucose, creatinine, bilirubin, vitamins and bacteria. The potential for point-of-care diagnosis in diverse healthcare settings is underscored, emphasizing the simplicity, cost-effectiveness and rapidity of these paper-based diagnostic platforms. This review provides an overview of the NMs-enabled colorimetric and fluorometric PADs, offering insights into the fabrication techniques, integration with portable devices and diverse applications in the field of biomarker detection. The amalgamation of metal nanoparticles and quantum dots with paper-based devices holds promising prospects for advancing point-of-care diagnostics of specific disease biomarkers.

1. Introduction

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Essential to human physiology and overall health, biomolecules such as vitamins, proteins, amino acids, nucleic acids, carbohydrates and lipids play integral roles, influencing diverse physiological processes in the body. The identification of biomolecules like proteins, glucose and nucleic acids in clinical samples enhances the specificity of diseasespecific biomarkers. The development of on-site methods for analysis of vitamins, metabolites and lipid profiles allows for immediate assessment of nutritional status and metabolic health. These advancements in point-of-care diagnostics empower healthcare professionals to make timely decisions, facilitating efficient patient management and improving overall healthcare outcomes [1–3].

Furthermore, biomarker detection is a critical aspect of clinical

analysis for disease diagnosis, prognosis and treatment monitoring. Protein and bio thiols biomarkers, for example, can indicate the presence of specific diseases or conditions and their quantification aids in disease staging and progression assessment [4]. Nucleic acid biomarkers, especially in the form of genetic mutations or expression patterns, are fundamental for identifying genetic disorders or predicting treatment responses [5]. The determination of biomarkers such as urea and uric acid provides insight into renal function and potential kidney disorders. Antigen-antibody analysis aids in diagnosing infections and autoimmune diseases. Glucose monitoring is crucial for managing diabetes and detecting metabolic disorders. Creatinine levels indicate kidney health and muscle function, while bilirubin assessment helps diagnose liver conditions. Vitamin levels offer insight into nutritional status and deficiency-related diseases. Bacteria detection aids in









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1. Introduction

Dopamine (DA) is a neurotransmitter found in the human brain and belongs to the catecholamine family.1-3 Inside the human body, DA is produced in the hypothalamus, ventral tegmental area and substantia nigra of the brain.^{2,3} DA plays a vital role in the human body as it is related to the renal, cardiovascular, hormonal and central nervous systems.3 It is also one of the major modulators of the functioning of the human body. High dopamine levels induce cardiotoxicity, leading to hypertension, heart failure, etc.,2-4 whereas low levels can cause major neurological diseases, such as parkinson's disease, schizophrenia and alzheimer's disease.5 DA also holds social importance as it plays an important role with respect to human behaviour and habits.6 The direct precursors of DA are L-DOPA, *p*-tyramine and *m*-tyramine, whereas the administrative precursor of these three is L-tyrosine (Tyr).7 Other than these functions, DA acts as a precursor of epinephrine and norepinephrine.7,8

Tyr is a non-essential aromatic amino acid, which is synthesized from phenylalanine in the brain.⁹⁻¹¹ Tyr is a primary constituent of proteins and is important for maintaining the nitrogen level in the human body.¹⁰ It is minimally present in fruits and vegetables and hence can be balanced by the intake of

Au@Ag nanoparticles: an analytical tool to study the effect of tyrosine on dopamine levels

Angel Minj,^a Sushama Sahu,^b Lavkesh Kumar Singh Tanwar^a and Kallol K. Ghosh^b*^a

The neurotransmitter dopamine (DA) plays important roles in the human body, including regulatory functions, movement, memory and motivational control. The direct intake of DA is impossible as it cannot cross the blood-brain barrier (BBB) efficiently. Notably, L-tyrosine works as a precursor of DA in the human brain. Herein, we report an analytical method that strongly supports the hypothesis that the intake of tyrosine (Tyr)-rich food enhances DA levels. For this analysis, citrate-coated gold-core silver-shell nanoparticles (Au@Ag NPs) were synthesized. The interaction of DA with the Au@Ag NPs was investigated using multiple spectroscopic techniques, and different thermodynamic parameters were evaluated to assign the binding mechanism. Real sample analysis with Tyr-rich food was also conducted to study the effect of Tyr on DA levels. Analytical studies were performed to verify the outcomes of the present work. The limit of detection of the Au@Ag NPs-DA system for Tyr was found to be 1.64 mM. This study can contribute to development in the fields of medicine and pharmaceuticals, particularly in regard to neuromedicine. One of the major advantages of this investigation is that it will fuel research interest in the supplementation of neurotransmitters and help categorize Tyr as a dietary precursor of dopamine.

wheat, meat and dairy products. Tyr has a crucial influence on neurotransmitters, hormones, pigments and some proteins.¹¹ Importantly, Tyr is the biochemical precursor of the neurotransmitter DA, epinephrine and norepinephrine.12 DA is primarily produced from Tyr via the tyrosine-hydroxylase enzymatic reaction, which forms L-DOPA as the intermediate.13 Thus, Tyr can be potentially applied as nutritional and pharmaceutical supplementation to maintain DA levels.¹⁴ It is necessary to quantify the amounts of DA and Tyr in the body and food samples as they should be present in the human body in specific quantities.¹⁵ In this context, nanoparticles (NPs) have been successfully used to quantify the amount of Tyr and DA using analytical approaches. This has helped researchers to look ahead of conventional methods, such as HPLC, gas chromatography, and chemiluminescence, for the detection of DA and Tyr.16,17 Tyr along with NPs has successfully been explored as a sensor, inhibitor, adsorbent and drug carrier.¹⁷ Previously, Tyr-based AgNPs have shown great antibacterial activity and biocompatibility with mammalian epithelial cells.18 While DA cannot cross the blood-brain barrier (BBB),19 NPs have made this possible by loading and delivering it to the targeted site.²⁰ Tyr-functionalised NPs have also been used for targeted drug delivery in the human body.21

Besides monometallic nanoparticles, bimetallic nanoparticles (BMNPs) have attained great attention as they exhibit intriguing optical, electrical, and magnetic properties due to the synergistic effect of the constituent metals.²¹ Their synergistic effect results in improved properties of BMNPs compared with

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PAPER



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Inner-filter effect of nitrogen-doped carbon quantum dots-MnO₂ nanotubes for smartphoneintegrated dual-mode sensing of glutathione and captopril⁺

Ankita B. Kujur,^a Manmohan L. Satnami, ^b *^a Yogyata Chawre,^a Pinki Miri,^b Akash Sinha,^{ab} Rekha Nagwanshi,^c Indrapal Karbhal,^a Kallol K. Ghosh, ^b ^a Shamsh Pervez ^b ^a and Manas Kanti Deb ^a

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1 Introduction

After their discovery, carbon quantum dots (CQDs) have massively gained attention and been studied by researchers. In contrast to conventional semiconductor quantum dots, they are easy to synthesize using low-cost precursors. Their synthesis also includes some green and environmental friendly approaches.^{1,2} In addition to this, they possess many properties like good photostability,³ high quantum yield,⁴ water solubility,⁵ low toxicity,⁶ good biocompatibility.⁷ Enhancement of the photoluminescence of the CQDs is assisted by nitrogen doping. The decision to choose nitrogen as a dopant over other heteroatoms (phosphorus, sulphur, nitrogen-phosphorus codoped, nitrogen-sulphur co-doped)⁸⁻¹¹ in the core of the carbon quantum dot is that it offers a suitable atomic size for doping into the carbon framework and the electronegativity assists in the favourable interaction with carbon atoms and the accessible lone pair of electrons of the nitrogen atom enhances the electronic properties.¹² Functional groups such as the amino group act as reactive sites for controlled nucleation and growth of carbon dots.13 Nitrogen atoms participating in the cyclic core of carbon dots also influence their PL properties. For instance, the pyrrolic N can alone participate in protonation and enhance the fluorescence.¹⁴ Moreover, pyridinic N leads to an increase in the cyclic imines which enhance the conjugated system and improve the PL intensity.15 It is the only N atom capable of transferring protons to the conjugated system because its lone pair electrons can pair with protons. This proton transfer benefits radiative recombination.16 The graphitic N alters the electronic energy level which corresponds to optical transitions.¹⁷ It aids in surface functionalization as well as in improving quantum yield.18 Many electrophotochemical applications of CQDs such as light-driven

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Research papers

PANI-grafted boron, nitrogen co-doped carbon fiber: An outstanding, high-performance supercapacitor electrode

Rajiv Nayan^a, Shubhra Sinha^a, Vaibhav Dixit^a, Manmohan L. Satnami^a, Kallol K. Ghosh^a, Shamsh Pervez^a, Manas Kanti Deb^a, Kamlesh Shrivas^a, Manish K. Rai^a, Sandeep G. Yenchalwar^b, Kundan Wasnik^c, Sandesh R. Jadkar^b, Indrapal Karbhal^{a,*}

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ARTICLE INFO

Keywords: Carbon fiber Polvaniline BNCF-PANI Supercapacitor Co-doping Energy storage

ABSTRACT

The rapid development of wearable electronic devices demands light-weight, flexible, high performance and ecofriendly supercapacitors. However, an efficacious design and fabrication of a steady structure for the same is still a challenge. Herein, a novel composite of polyaniline (PANI) grafted Boron, Nitrogen co-doped cotton derived carbon fiber (BNCF) has been synthesized via in-situ chemical polymerization. The detailed structural characterization confirms the successful incorporation of granular PANI over the BNCF surface. The supercapacitor performance of the as-synthesized BNCF-PANI electrode was investigated as electrode material for supercapacitor and the capacitance was achieved as high as 370 F g^{-1} at a current density of 1 A g⁻¹. Moreover, BNCF-PANI based electrode exhibited the energy density of 12.8 Wh kg⁻¹ at current density of 1 A g⁻¹ and power density 2500 W kg⁻¹ at current density of 10 A g⁻¹.

1. Introduction

Carbon fibers (CFs) are strong, lightweight, stiff materials which enable enhanced performance of the same in automotive, defense, semiconductors, aerospace, adsorbents, energy storage, sensors and many more [1]. This wide applicability arises due to phenomenal properties of CFs such as their dimensional stability, biocompatibility, thermal tolerance, low density, high tensile strength, fatigue resistance, excellent creep resistance, and most importantly easy surface functionalization. In the most recent past, CFs and activated CFs (ACFs) have withdrawn great research attention as appreciable adsorbents for CO₂ capture from thermal power plants, hydrogen storage, supercapacitor, battery electrodes, sensors etc. Moreover, their fibrous structure holds promising advantages over the other granular or powdered materials [2,3].

CFs are the most extensively employed electrodes due to their wellknown physical as well chemical properties such as cost effectiveness, comparatively inert electrochemistry, ease of processability, controllable porosity, electrocatalytic active sites and most importantly, its wide availability in a gamut of forms including fibers, sheets, tubes,

aerogels and composites etc. Recently, due to their fabulous surface areas of up to $500-3000 \text{ m}^2\text{g}^{-1}$, CFs have been considerably employed in energy storage devices as electrode materials for supercapacitors (SCs) [4]. SCs, also known as ultracapacitors, are attractive energy storage devices in the form of flexible and wearable electronics, owing to their high-power characteristics and long cycle life [5].

It is noteworthy, that, in the present times of depleting fossil fuels, changing climatic patterns and uneven energy distribution lately has brought up the need for the development of alternate energy storage systems to meet the never-ending demands of energy around the globe [6]. Furthermore, the development of hybrid electric vehicles, as well as the rapidly growing portable electronic device market, has also led to the demand for alternative eco-friendly high-power energy resources [7]. Therefore, in order to satisfy these increasing demands, the development of deformable and flexible electrochemical capacitors has attracted tremendous attention in the past few decades [8]. This eventually has led to swift progress in the field of electronic technology thereby opening new pathways for the development of faster and smaller electronic devices, wherein SCs serve promising applicability [1].

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Research papers

PANI-grafted boron, nitrogen co-doped carbon fiber: An outstanding, high-performance supercapacitor electrode



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Research papers

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ARTICLE INFO

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RESEARCH



Antibacterial Activity of CdTe/ZnS Quantum Dot-β Lactum Antibiotic Conjugates

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Abstract

β-Lactum antibiotics are broad class of antibiotics which kills bacteria by inhibiting the formation of peptidoglycan that constitutes the bacterial cell wall. The resistance that develops in bacteria for antibiotics led the scientific world to think about the future aspects for modifying the way through which antibiotics are acted on the bacteria and become lethal for them. In this consequence, the potential of latest marketed antibiotics e.g. Amoxiciline (I), ceftazidim (II) have been evaluated after being conjugated with quantum dots. The surface of quantum dots has been conjugated with antibiotics by carbodiimide coupling with the help of 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide (EDC) and N-hydroxysuccinimide (NHS) as conjugating agent between antibiotic and functionalized quantum dots. The antibacterial properties of QD-conjugated antibiotics have been determined by disc diffusion assay. The potency of QD-conjugated antibiotics has been estimated by determining their MIC₅₀ for the selected strain of Gram-negative (*Escherichia coli*) and Gram-positive (*Staphylococcus aureus*) bacteria. Minimum inhibitory concentration study, minimum bactericidal concentration and growth pattern analysis revealed that QDantibiotic conjugates showed slightly more prospective than pure native antibiotics against both Gram-negative (*Escherichia coli*) and Gram-positive (*Staphylococcus aureus*) bacteria.

Keywords β -Lactum antibiotics · QD-antibiotics conjugates · MIC₅₀ · Antibacterial Activity

Introduction

Since the invention of penicillin, β -lactam antibiotics have developed as the most essential spectrum of antibacterial agents [1, 2]. However, the experimental treatment and wide utilization of these agents have made the bacteria to

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generate various types of β -lactamases (β -Lases), which could prompt the spread of bacterial resistance [3-6]. Thus clinical viability of β -lactam antibiotics was negotiated. β-lactam antibiotics resistance has turned out to be a serious issue that encounters the human health [7-10]. Thus, progressively more demand has been put on pharmaceutical investigators and medical researchers to develop new antibiotics [11]. Some strategies have been accounted for disabling the bacterial resistance. One was to change the structure of β-lactam to reduce its sensitivity to the hydrolysis by β -Lases [12]. Another technique was to utilize double activity cephems; if bacteria have resistance to one of them, the other antibacterial agent would destroy them in another way [13-16]. Vergauwe and coworkers utilized reagents, for example, 3 clavulanic acid to inactivate the β -Lases [17]. In all these techniques, reagents added to conquer the bacterial resistance were organic compounds. Inorganic components were occasionally utilized as a part of the antimicrobial industry. Though, it is notable that inorganic nanomaterials are great antimicrobial agents. Currently, there were some research work reported, which

QOS and Congestion Aware Routing Protocols with Data Aggregation Technique for WSN'S Assisted IoT

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Abstract: A wireless sensor network (WSN) has the potential to be a heterogeneous network, contingent upon its specific application. The energy constraint is a crucial concern within the field of WSN. In a WSN, the use of energy-aware routing protocols is crucial, however, those that just take into account energy parameters often struggle to effectively manage excessive energy consumption. The emergence of congestion in network nodes causes an increase in packet loss and energy usage. The routing algorithms should attempt to balance the load among the sensor nodes and maximize energy efficiency in order to extend the network lifetime. One of the best methods for agglomerating data across sensor nodes effectively is clustering. Frequent CH rotation in clustered networks is the key issue. In this study, we offer an energy-efficient data aggregation & congestion-aware routing method (EDCAR), which takes into account both energy optimization and congestion as two key characteristics during data aggregation in order to maximize network longevity, CH stability, and energy-efficient data aggregation. In this study, a method for choosing the cluster head of a WSN using the grey wolf optimization method is proposed. It takes into account a variety of criteria, including the node's energy level, degree, distance to the sink, distance within the cluster, and priority factor. In order to perform the efficiency requirements of a scalable WSN, collision-aware routing employing the seagull optimization method is also devised.Reduced energy usage at each node is achieved by the suggested collision-aware routing. When choosing congestion-free relays, the proposed seagull optimization method calculates fitness using queue length and network quality. The experimental data demonstrate that the proposed EDCAR scheme increases the network lifetime when compared to the current energy-efficient data aggregation systems.

Keywords: WSN, Energy efficiency, Data aggregation, Congestion occurrence, Grey wolf optimization, Network lifetime.

1. Introduction

The majority of tiny, affordable sensor nodes that make up WSNs are tiny [1]. The primary responsibility of the nodes is to produce various sorts of data and transfer them through single- or multi-hop data transmission methods to the Base Station (BS). Target tracking [2], combat monitoring, environmental monitoring, and other areas, where it is impractical to replenish the battery power of sensor nodes are only a few examples of where WSNs are utilized. As a result, the primary restriction in WSN that determines the network lifetime is the power consumption of sensor nodes. Sensing [3], computing and wireless communication are the three major functions of a sensor node. Communication in sensor nodes uses more power than sensing and processing combined.

Therefore, a variety of routing methods are implemented in WSN to reduce transmission to ultimately minimize power [4]. In a WSN, the base station, which is often in the center of the network, receives a flood of data from the sensor nodes. The data packet must travel a long distance if the sensor node is distant from the base station, which increases power consumption [5]. The bottleneck zone, which is a sensor area near the base station that experiences intense traffic, accelerates the battery drain on the node. As a result, the bottleneck zone's nodes experience quicker node death, which impacts network connection and longevity.

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Design and Execution of Routing Protocols to Enhance Network Lifetime for IoT Systems: A Scoping Review

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Abstract: These days, the IoT based research and application has been increased to a wider extent because of its huge range of application and advantages. Moreover, the minimum complexity in deploying various areas of practical life, especially for environments which are considered very crucial such as e-health, smart home application and smart cities. Things equipped in smart cities are intractable by means of Internet and generally, these things are deployed by means of wireless environment. There exist numerous routing protocols which could assist wireless and IoT based networks. When coming to nature of IoT networks, being resource constraint and conservative means of routing does not suit them in an advanced manner. This current review focus on an overview of IoT systems and will provide the significance of routing protocols in lifetime enhancement of IoT networks. Moreover, this review will explore the noteworthy contributions of existing works with regard to IoT system's performance and lifetime enhancement.

Keywords: IoT, smart home, wireless environment.

1 INTRODUCTION

Pioneering advancements in WSN and IoT inhibit controlling and monitoring of industrial automation process devoid of human intrusion. IoT applications in WSN also possess advanced benefits such as

- improving production
- dropping routine checks
- refining of safety standards
- declining the necessity of labor and cycle times

While in real time based industrial automation, wired kind of WSNs is not sustainable (Kumar and Kumar, 2018). This is because the wired supply is not portable and there exist possibility of tripping threats (Kharrufa et al., 2019; Sankar et al., 2020). In IEEE 802.15.4 which is deliberated as an ideal environment where transmission error happens rarely, the sensor networks agonizes from precarious unreliability concerns. Default MAC parameter setting advised by IEEE 802.15.4 standard is the major reason behind this problem (Gezer and Okdem, 2020). For the purpose of continuous health monitoring and supervision several kinds of IoT applications are developed. Non-invasive wearable devices such as wristbands and belts are extensively deployed in IoT healthcare applications for assembling physical parameters. These kinds of devices form a wireless sensor network usually termed as Body Area Networks (BAN) (Elappila et al., 2020). "G.9959" protocol is established by "ITU" for providing high dynamic data rate with three channels

(George and Kulkarni, 2019; Machado et al., 2013). A unique channel allocation scheme over "MAC layer" by using "G.9959" protocol is advanced by ITU and its inquiry is executed in terms of fragmentation overhead. A packet delivery system is suggested in order to sustain the features of network coding for attaining greater efficiency. An assessment is made by conducting analysis among the disbursed energy and the bandwidth (Kumar et al., 2019; Sackey et al., 2020). Sensors are disseminated everywhere for managing the surrounding environment in IoT. These kinds of entities are effortlessly susceptible to many levels of security threats. Latter could end in severe problems in medical fields where a minute security constraint may threaten patients' lives (Souissi et al., 2019; Sankar et al., 2020; Sennan, 2019).

Newly there be present an amassed technological shift in the direction of a decentralized network of interrelated objects comprising "Intelligent" decision making and data collection facilities (Sadrishojaei et al., 2022; Adil, 2021). This technological shift is termed as Internet of Things (IoT). Incredible openings for new applications through wide collection of segments are signified (Li and Kara, 2017; Santiago and Arockiam, 2017). Diverse energy efficient and green systems in conventional WSN and IoT centered constrained networks are observed. Numerous classification based approaches are well discussed and an inventive energy saving methodology is presented (Kharrufa et al., 2017; Sennan et al., 2021). The limits of the prevailing classification works are addressed and it affords a common and thorough category that builds alltogether in a combined and up-to-date classification view



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Enhanced ACO based clustering algorithm for QoS in WSN enabled IoT

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Abstract:

Various sensor nodes whose deployment is done in a random way are included in Wireless sensor networks (WSN) within a region for gathering the information out of the respective atmospheres as well as forwards it towards the Base Station (BS). Constrained sources of energy are allotted to the WSN nodes. The consumption of energy of nodes must be reduced for obtaining the enhanced lifetime of the network. Clustering is referred as a technique that reduced the consumption of energy in WSNs. By transmitting the gathered data to the sink through the Cluster Head (CH) nodes located within the clustered networks, the energy of the node can be saved. In WSNs, fault tolerance is a significant issue to consider. The entire data communication system can be rendered inoperable by the failure of just one cluster head. Within the scope of this research, a cluster-based routing method with fault tolerance is provided. The purpose of this study is to present an innovative technique for increasing tolerance of failure and data accumulation in clustered WSN by making use of backup CHs and improving the relay node selection mechanism by modifying ACO. The selection of the backup cluster head is what allows for fault tolerance in this case (BKCH). The method can be broken down into two distinct stages. In the first step, the network is categorized into clusters; in the second step, CHs and BCHs are chosen from the pool of candidates. Communication within the cluster takes place between the member nodes and the CH nodes. Aggregator nodes (AG) are utilised for the purpose of inter-cluster communication, and the modified ACO is utilised to determine which node serves as the most effective relay between CH and AG. When compared with other energy-conserving protocols, this technique uses less energy while increasing fault resilience and PDR.

Keywords: WSN, IoT, Data aggregation, Modified ACO, Cluster head selection, Fault tolerance.

1. Introduction

In the 21st century, WSNs play an important part [1]. WSN is capable of running an enormous number of applications that are becoming increasingly important. In order to physically collect useful data from a region and then send it to sink nodes via wireless links, an implementation of low-cost, battery-energized sensor nodes is carried out in the region. This deployment takes place physically. Direct or indirect sensor-sink communication occurs. Energy resources that are limited are distributed among the nodes in WSNs that are responsible for representing the most significant problems. By taking into account important aspects including energy efficiency, reliable self-association, clustering, and routing protocols, guaranteeing desirable network functionalities, it is possible to save energy while also extending the lifespan of the network. This achieves an extended lifetime for the network. Similar to how WSNs exhibit some imperfections because to their own restricted buffering features and computing sources.

ORIGINAL RESEARCH



JSO-based enhanced energy efficient LEACH protocol for IoT-perception layer

Aamir Hasan¹ · V. K. Patle¹

Received: 19 June 2023 / Accepted: 26 October 2023 / Published online: 11 January 2024 © The Author(s), under exclusive licence to Bharati Vidyapeeth's Institute of Computer Applications and Management 2023

Abstract Enhancing energy efficiency remains a significant challenge within the Internet of Things (IoT) Perception Layer. The majority of research efforts concentrate on clustering methods to optimize energy usage and prolong the network's stability period. In recent times, bio-inspired algorithms that rely on population-based techniques have proven effective in addressing various optimization-related challenges. This paper proposes a JSO-based Enhanced Energy Efficient LEACH (JSO-LEACH) Protocol for the IoT-Perception Layer to optimize energy consumption in IoT devices. Clustering is established based on the distance between nodes. The boundary of a node is validated using JSO, and the checkpoint is set according to the position of the feeder node. The routing table is updated based on checkpoint calculations. This technique monitors the energy levels of all nodes in the network while they communicate with each other. Nodes are further classified into three phases based on their residual energy. The final results show better performance of the proposed JSO-LEACH Protocol as compared with other existing protocols. The proposed JSO-LEACH-based approach consumes an average of 24.6686 J, with an average packet delivery ratio of 66.5538%, an average packet loss ratio of 33.4461%, an average delay of 21.4838 ms, an average throughput of 8594.38625 kbps, and an average overhead of 17,204.5 packets, respectively. This study emphasizes the importance of energy-efficient protocols in the context of IoT and highlights the unique approach

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¹ School of Studies in Computer Science and IT, Pt. Ravishankar Shukla University, Raipur, India of the JSO-LEACH protocol in addressing the limitations of traditional protocols.

Keywords Wireless sensor network · Energy consumption · Internet-of-Things · Jellyfish search optimization · Network lifetime

1 Introduction

The Internet of Things is organized into three distinct layers: the perception layer, the network layer, and the application layer. The perception layer is made up of a collection of interconnected devices that are able to sense their surroundings, identify things, collect data, and share that data with other interconnected devices via communication networks [1]. This layer is composed of several sensor devices. From the perception layer, data is sent along to the application layer by the network layer, according to the capabilities of the device and the limitations of the network. Last but not least, the application layer is in charge of processing the data that was sent down from the network layer [2]. In the Internet of Things, wireless sensor networks (WSNs) serve as the "cells" that gather and distribute data. This enables the creation of intelligent applications that are aware of their surrounding context. These sensor network devices are true facilitators in the Internet of Things in terms of metrics such as longevity, energy efficiency, reduced cost, and interface to resources since they make use of a variety of power sources and are able to keep them operational for an extended period of time [3].

WSN's unstable network routes make energy efficiency studies difficult. As networks grow, the quantity of data collected requires greater energy, causing sensor nodes to die early. Energy-efficient routing algorithms are being

Role and importance of Information Communication Technology (ICT) and Internet of Things (IOT) in Higher Education

Gomed Kumar Pathak¹, Dr. V.K. Patle²

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Abstract- Technology, including the Internet of Things (IoT), plays a pivotal role in the development of individuals and various sectors, including higher education. The adoption of Information and Communication Technology (ICT) and the integration of IoT devices in higher education have transformed the learning and teaching process, creating an innovative and enhanced learning environment. Many universities have embraced the integration of technologies, recognizing the benefits it brings.

Technology plays the most important role in the development of an individual as well as for any sector or economy. The adoption of ICT is the process of transforming higher education and provide students, academician an innovative learning environment to enhance the learning and teaching process. The integration of technologies into education system has been encouraged by several universities. There are many students who can't afford higher education due to high fees structure of universities so technologies help them to get higher education through e-learning. As technologies change the scenario of higher education, mostly students and academician shifted offline to online mode. Awareness level of ICT and continuous development of the ICT tools for educational implementation is must for the ICT enabled learning to grow in higher education. Educators are required to be aware of the effective use of ICT which ensures the high level of mental development of the students so that their mental growth is not disturbed because it is easy to represent the content applying visual technology but that does not let the student-run his mind for conceptualization. That is why proper training programs focusing especially on these issues are required to be conducted by the respective authorities. The research article mainly focuses upon all these issues and challenges and proposes effective solutions.

Index Terms— Information Communication Technology (ICT), Higher education, Internet of Things (IoT) and Development.

I. INTRODUCTION

ICT in education is a dynamic mode that harnesses information and communications technology to effectively support, enhance, and optimize the delivery of information and knowledge, enabling a more engaging and efficient learning experience.

The advancement of education technologies and the development of digital content tools have revolutionized the landscape of higher education, making personalized learning accessible to a wider audience. The integration of Information and Communication Technologies (ICTs) in learning has demonstrated several advantages, as supported by research and practical evidence (source: https://blog.linways.com/role-of-ict-in-higher-education-in-the-21st-century/).

One significant advantage of technology, including IoT, in higher education is the opportunity it provides for students who may not be able to afford traditional higher education due to high fees. Technologies like elearning platforms and IoT-enabled educational tools enable these students to access higher education remotely, breaking down financial barriers and promoting inclusivity.

As technology, including IoT, continues to shape the landscape of higher education, there has been a shift from offline to online modes of learning. This transformation calls for a high level of awareness and continuous development of ICT tools and IoT-enabled solutions to ensure effective implementation in

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सारांष अनादिकाल से वनस प्रष्न है वन सम्पदा व में महत्वपूर्ण भूमिका अर्थव्यवस्था में भी मह रूप में विभिन्न प्रकार	प्पदा भारतीय जनजातीय अथ हे प्रत्यक्ष और अप्रत्यक्ष रूप र निर्वाहन किया है। लघुवनोपर त्वपूर्ण भूमिका निभाते हैं। स की जड़ी–बूटियों, तेंदू पत्ता	र्वियवस्था का प्रमुख आधार रही है। जहाँ तक भारत से आर्थिक विका ने भारतीय अर्थव्यवस्था की दषा और दिषा आर्थिक समृद्धि की ओर ले ज वन्य क्षेत्र न केवल राजस्व की प्राप्ति होती है बल्कि यह जनजातिय दियों से वन जनजातियों की शरण स्थली रहे हैं जिनसे वह लघुवनोप , माहुल पत्ता, महुआ, चिरौंजी, षहद, गोंद, एवं विभिन्न प्रकार की लव
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प्रतिषत जनजाति वनोपज विपणन मध्यस्थ द्वारा करते है वनोपज विपणन मध्यस्थ द्वारा करने वाले जनजातियों में से 7 प्रतिषत जनजाति संतुष्ट नहीं है एवं 20.95 प्रतिषत जनजाति मध्यस्थ से संतुष्ट है एवं काई स्कवेयर परीक्षण से परिकत



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Impact of anganwadi services towards Atmanirbhar Bharat in Chhattisgarh (Special reference to Janjgir-Champa District)

Archana Sethi

Abstract

The study aims to assess the use of the Chhattisgarh government program "Mukhyamantri Mahtari JatanYojana" by pregnant and nursing women, focusing on their awareness, satisfaction, and barriers to using services under the Integrated Child Development Scheme (ICDS), using a quantitative methodology and descriptive survey strategy. The Anganwadi Services in (Janjgir Champa district) Chhattisgarh, India, provide essential services to pregnant and nursing women, including IFA, calcium, deworming pills, and health check-ups. However, only a small percentage of nursing moms and pregnant women consume supplemental nutrition. Despite this, 92.5% of pregnant and factating women receive health education and undergo health checks. The Mahtari Jatan Yojana Service performance is mediocre, requiring further oversight

Key Words: Nutrition, Anganwadi, Demographic, Descriptive statistics

1. Introduction

The Indian government launched the largest Integrated Child Development Services (ICDS) to enhance child and maternal health, particularly for pregnant women. The program provides supplemental nutrition and health care to children and mothers, ensuring their wellbeing. A study was conducted in rural areas to evaluate the nutritional status of ICDS recipients in Janjgir Champa district. Pregnant and nursing mothers receive daily meals and education on nutrition and health, while clinics monitor their well-being during pregnancy and breastfeeding.

Objectives of the study

This study aims to evaluate the utilization of Chhattisgarh Government program as well as the utilization of Anganwadi services by pregnant and lactating mothers in rural areas, as well as the various barriers to using Anganwadi services.MahtariJatan Mukhyamantri Yojana" by the lactating and pregnant women in the study area.

Statement of the issue: An experiment to determine whether "Mukhyamantri Mahtari Jatan" is effective Yojana" on mothers' awareness of and use of ICDS services in chosen villages, Janjgir Champa neighborhood.

H1 There is a significant difference between the pre and post-test level of knowledge and utilization on ICDS services among mothers in study group.

H2 - There is a significant difference in post-test level of knowledge and utilization on ICDS services

H3 There is a relationship between the utilization and knowledge of mothers on ICDS services in among mothers in study group and control group.

H4 - There is a significant association between the post-test level of knowledge and utilization on

ICDS among mothers with selected demographic variables in study group and control group.

Assistant Professor, S.o.S in Economics, Pt. Ravishankar Shukla University, Raipur (C.G.)

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Millets "The shri ann": A study of production of coarse cereals status in India's Agriculture Production.

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AGRICULTURE AND FOOD MARKETS IN INDIA



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Millets "The shri ann": A study of production of coarse cereals status in India's Agriculture Production.

Bhumika Sharma * Archana Sethi **

ABSTRACT

Millets are one of the oldest foods estimated to have been cultivated since 8000. The word millets is Millets are the French word 'Mille 'which means thousands, which can be interpreted to mean that derived dul of millets is equal to thousands of grains, millets are also popularly known as "Nutri cereals' because of their nutritional content. Information obtained from various authentic websites like RBI etc. That in the initial 20 to30 years the area of production of coarse cereals remain stable 30 to 50 lakh hectares. In 2021-22, the growth rate was 1% less but the productivity rate remained positive in 2021-22 the growth rate was 6%. It is clear from above study that coarse grains have an important place in agricultural products, the export and export income from coarse grains is increasing every year in India's export. India is the leader in the production of coarse grains in the world. Not only millets have many healthy properties, but it also better in terms of cost and environment friendly than the production of other grains, but the grains are not included in the consumption habits of people as much as other grains can be deal with , for this it is necessary to promote their benefits and methods of use as much as possible among the people, the efforts made by the government should be further accelerated, if it is again to become a major part of Indian food , if this become a part then there will be a lot of economic & social benefits

Keywords: Millets, Food Grains, Coarse cereals, Agriculture Production.

Introduction

Millets are one of the oldest foods estimated to have been cultivated since 8000. The word millets is derived from the French word 'Mille 'which means thousands, which can be interpreted to mean that one handful of millets is equal to thousands of grains. millets are also popularly known as "Nutri cereals" because of their nutritional content.

There are different types of millets, different types of millets are produced in different countries, the major are produced in India are pearl millets (Bajra), Finger Millets (Ragi), Sorghum (Jowar), little millets (Samai), Kodra (Kodo) etc , on and health benefits of these grains the government of the country presented these grains as a brand in the last few years in the budget of 2024 they were called 'shri Ann' or Super Food .It is due to India 's efforts that the united nations declared 2023 as the International year of Millets .Millets were featured in the recent G-20 summit held in Delhi Sep 23.

Objectives of the study:

- To study about the area production, productivity (yield) of coarse cereals /millets in India since 1951 to 2022.
- To find out the CAGR (compound annual growth rate) of millets in India since 1951 to 2022.
- To study the relationship between Total Food Grain production and Total Coarse Cereals . production of India since the period of 1951-to 2022.
- To study the present status of millets production in different states of India. .
- To study present status of India Global context of production of millets. .
- To study the status of consumption of coarse cereals /millets in India and Annalise the . problem and solution.

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Impact of Public Expenditure on Education in Chhattisgarh

Archana Sethi

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Abstract

This paper objective to investigate the correlation between public spending on education and the growth of the state of Chhattisgarh. Time-series data spanning from 2000 to 2021 was utilised. Public expenditure has several effects in economy. It can increase economic growth. It can increase social welfare. It is directly expected education is helps Positive Social change of citizen. The result shows that total public expenditure and Education expenditure is highly and statistically significant on economic growth indicator such as GER and DOR in primary level in Chhattisgarh.Public expenditure helps in achieving equitable distribution income and promote growth and welfare. The findings indicate that total public spending and education spending have a statistically significant and positive impact on economic growth indicators like the state's Gross Enrollment Ratio (GER) and the percentage of primary school dropout children (DOR) at the primary level. Education is directly expected to contribute to citizens' positive social transformation. The study's findings show that public spending on education and economic growth are correlated over the long term. Over time, there is a found unidirectional causal relationship between public education spending and Gross State Domestic Product (GSDP).

Keywords: Economy, Public Expenditure, GER, DOR. State economy, Education,

Introduction

After reviewing the literature, it was found that several scholars have examined the connection between public spending and the expansion of various national and international economies, but only a small number of these analyses have been conducted at the state level. This study will pay particular attention to the economy of the Chhattisgarh state to disclose the spending and growth patterns of the state since its founding and to show the relationships between factors that make sense. Additionally, the study will provide a road map for other states that were created on November 1 of the same year as Chhattisgarh.

Since its establishment on November 1, 2000, the economy of Chhattisgarh State has seen a growing growth trajectory (Figure 1.1). The data is shown in Table 1 that is provided below, as well as in Figures 1 and 2, which show that the state's total expenditure and its gross state product have been increasing over the past 20 years. It increased to Rs. 47862.29 of GSDP and Rs. 9291.53 for government expenditure in 2005, with growth rates of 85.18% and 69.82%, respectively, in the first five years of its inception from Rs. 25846.16 crore and Rs. 5471.48 crore of overall government expenditure.

Objectives of the research



भारतीय जनांकिकीय लाभांश

अर्चना सेठी

अर्थशास्त्र अध्ययनशाला ,पं. रविशंकर शुक्ला विश्वविद्यालय

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सारांश

भारत को जनांकिकीय लाभांश का लाभ उढाने और अविश्वनीय आर्थिक विकास प्राप्त करने के लिए ऐसे विभिन्न पहलू है जिस पर भारत को कार्य करने की आवश्यकता है। भारत में 25 वर्ष की आयु वाले लोग कुल जनसंख्या का 50 प्रतिशत है तथा 35 वर्ष की आयु वाली जनसंख्या 65 प्रतिशत है। जनसंख्या का इतना बडा हिस्सा राष्ट्र के विकास में महत्वपूर्ण भूमिका निभाता है भारत को कौशल ,शिक्षा और स्वास्थ्य नीतियों में अधिक निवेश करके अपने युवाओं को सशक्त बनाने की आवश्यकता है।भारत मेंजनांकिकीय लाभांश 2018 से शुरु हुई है जो 2035 में अपनी चरम पर होगा और यह 2055 तक प्राप्त होगा। भारत को जनांकिकीय लाभांश का लाभ उढाने के लिए प्रभावी शिक्षानीतियों को लागू करके और स्वास्थ्य सेवाओं की पहुंच पर ध्यान देने और लैंगिक अंतर को भी कम करने की आवश्यकता है। परिवार नियोजन , बाल स्वास्थ्य ,शिक्षा और लैंगिक समानतामें निवेश लंबी अवधि के लिए जनांकिकीय लाभांश में सुधार के लिए कुछ महत्वपूर्ण कदम है। आज आवश्यकता है कि शिक्षा ,स्वास्थ्य पर निवेश बढाया जाये। अनुसंधान एवं कौशल विकास पर निवेश बढाया जाये। जिससे जनांकिकीय लाभांश का लाभ प्राप्त हो सके।

शब्द कूंजी : जनांकिकीय लाभांश, प्रजनन दर ,मानव संसाधन, आश्रित जनसंख्या।

प्रस्तावना

पूर्व राष्ट्रपति डा अब्दुल कलाम ने कहा था हमारे पास युवा संसाधन के रुप में अपार संपदा है और यदि समाज के इस वर्ग को सषक्त बनाया जाये तो हम बहुत जल्द महाशक्ति बनने के लक्ष्य को प्राप्त कर सकते है। यदि वर्तमान भारत की जाए तो यह दुनिया का सबसे युवा देश है। जनसंख्या के आंकडों के अनुसार भारत में 25 वर्ष की आयु वाले लोग कुल जनसंख्या का 50 प्रतिशत है तथा 35 वर्ष की आयु वाली जनसंख्या 65 प्रतिशत है।जनसंख्या का इतना बडा हिस्सा राष्ट्र के विकास में महत्वपूर्ण भूमिका निभाता है इसी कारण पूरा विश्व भारत को उम्मीद की नजर से देख रहा है। किसी भी देश के युवा सबसे कियाशील वर्ग होता है अतः यह उम्मीद की जा रही है कि भारत 2025 तक विश्व की चौथी बडी अर्थब्यवस्था बन जायेगी। तब विश्व की सकल घरेलू उत्पाद में भारत का योगदान 6 प्रतिशत होगा। भारत में अगले कुछ दशकों में अपनी आश्रित जनसंख्या (0.14 और 60 आयु वर्ग) की तुलना में अपेक्षाकृत बड़ी कार्यशील आयु जनसंख्या (15 और 59 वर्ष के बीच की आयु) होगी। यह युवा उभार वर्ष 2035 में अपने चरम पर पहुंच जायेगा। विश्लेषक युवा वृद्धि के इस दौर को एक उछाल मानते है। जिसके दौरान मानव पूंजी की प्रचुरता का उपयोग देश के विकास को बढावा देने के लिए किया जा सकता है।कोल और हूवर 1958।

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رتان ومتار (Coc care Joan) ج	ाजनांदगाँव जिला में कृषि व	ग्रामीण विकास : ए	क विश्लेषणात्मक	अध्ययन
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टिकी रही। कृषि ए	वं ग्रामीण क्षेत्र का विकास औ	र उन्नति किसी भ	ो राष्ट्र या समाज	की प्रगतिका सूचक
यही कारण है कि	पहली व तृतीय पंचवर्षीय योज	जना में कृषि और ' चरी चरीन के चरी	गंचवी व छटवी प न नामिल निज्जा	विषीय योजना में ग्राम
ावकास का प्राथामव छोध पत्र राजनांदर	्ता दा गइ। अतः शाधकीय 1ाँव जिले में कृषि विकास त	का दृष्ट स कृषि ग्रामीण विकास क	व ग्रामाण ।वकास ो स्थिति का तिष्ठ	महत्वपूर्ण क्षत्र ह। प्रस् नेषणात्मक अध्ययन पर

करता है। कृषि विकास की स्थिति का अध्ययन करने के लिए कृषि से संबंधित विभिन्न घटकों जैसे-भूमि उपयोग, जोत का आकार, उत्पादन व उत्पादकता, द्वि-फसली क्षेत्र रबी फसल, सिंचाई व सिंचाई गहनता के शामिल किया गया है। ग्रामीण विकास के अध्ययन में ग्रामीण विद्युतीकरण, शैक्षणिक एवं स्वास्थ्य अधोसंरचना ग्रामीण बैंकिंग इत्यादि घटकों को अध्ययन में शामिल किया गया है। जिला में शुद्ध बोया गया क्षेत्र में में वुद्धि https://www.researchgate.net/publication/390743217_Rajnandgaon_Jila_me_Krishi_awam_Grameen_Vikaas_Ek_Vishleshnatmak_Addhyayan

A Study on Economic Status and Constraints of Handicraft Artisans in Chhattisgarh

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Abstract- The handicrafts are an important source of income for rural areas. Handicrafts hold enormous potential as they are essential to both the millions of artisans who already exist in the country and the growing number of newcomers entering the craft sector. The handicraft sector faces many challenges to cope with the current economic environment due to the advancement and development of technology. The present study examines the key marketing and financial constraints faced by handicraft artisans in Bastar and Kondagaon districts of Chhattisgarh. With the decline in demand and sales of handicraft products, artisans' incomes are also falling, forcing them to take up additional income-generating work by artisans. This study also attempts to identify the other sources of income as artisans in Bastar and Kondagaon districts of Chhattisgarh state. The study is based on primary data collected from 120 handicraft artisans of Bastar and Kondagaon districts of Chhattisgarh state.

Keywords: Handicraft, Artisans, Marketing Constraints, Financial Constraints, Source of Income.

INTRODUCTION

The handicrafts market will witness remarkable growth with an expected CAGR of 8.87 during 2022-2027. This growth is expected to increase the market size by \$407.15 billion. Several factors, including the need for reduced capital investment, increased travel and tourism, and greater government support and funding, play a key role in the future of the craft. In this comprehensive analysis, we examine the key marketing constraints faced by artisans in Bastar and Kondagaon districts of Chhattisgarh. Before the British era, the trade of artisans was flourishing, the sales of their products were also high and their socio-economic situation was also very good. Handicrafts were their only source of income, and the artisans generally devoted their entire working time to producing handicrafts. However, during the British era and the Industrial Revolution around the world, crafts lost their

identity and importance, resulting in a decline in demand for their handicraft products, resulting in low sales and therefore low production and income. Therefore, during this time, the artisans start looking for a new source of income in order to survive. The present study also tries to find out the source of income other than of handicraft artisans of Bastar and Kondagaon district of Chhattisgarh state. An important factor of the handicraft market is the minimum capital investment required to start a handicraft business. The handicrafts market faces a significant challenge in the form of a lack of managerial capabilities among manufacturers. Many handicraft producers often lack essential managerial skills, including workplace management, market research, inventory control, and sales promotion. This deficiency poses a barrier to the promotion of artisan handicrafts. Access to business development service providers (BDSPs) is limited for handicraft manufacturers, as they frequently operate on tight budgets and in isolation from urban businesses. This lack of access to managerial resources, coupled with a shortage of understanding regarding the needs of foreign exporters, constrains market growth during the forecast period.

1.1 Review of Literatures

Kumar, Dilip and PV, Rajeev (2014) Marketing Challenges of Handicraft Retailers in Changing Environment: - The article is divided into five parts, with the first part discussing the importance of craftsmanship and marketing in the changing environment of the retail industry and covering various aspects of retail stores. Upadhyay, Manali and Jain, U.C. (2018) Managerial Challenges of Handicraft Industry: An Indian Perspective: - The article throws light on the problem and different issues related to handicraft industries and marketing challenges in India. crafts have huge potential as it is important to maintain the existing pool of million artisans across the country. The craft sector plays an

Difference in Poverty Measurement between Income based and Deprivation-based approach: A study in Kamar Tribe of Chhattisgarh

Kapil Kumar Chandra * Sunil Kumar Kumeti ** B. L. Sonekar ***

Abstract

The present paper is attempted to investigate the difference and discrepancy between the income-based and deprivation-based poverty measurement in poverty of Kamar tribes of Chhattisgarh. Two international poverty measurement approach is considered for poverty measurement of Kamar tribes, first income-based measurement developed by World Bank and second, Multidimensional Poverty Index developed by United Nation Development Program (UNDP). Research study is based on primary data of 100 household collected from 8 village of 2 block of Gariyaband district of Chhattisgarh State. Results shows that 93% Kamar peoples are poor in income-based poverty whereas, 42.4% Kamar peoples are poor in deprivation-based poverty measurement. A difference of 50.6% is found in the measurement of poverty by both the poverty measurement approach and this discrepancy is more in income-based poverty as compare to multidimensional poverty measurement. The study also reveals that health facilities, ccoking fuel, sanitation and housing conditions are the major contributor in the poverty of Kamar Tribes.

Keywords: Multidimensional Poverty Index, Income-based Poverty, Kamar Tribe

Introduction

Poverty, a global phenomenon and biggest hurdle in the path of development. It is a challenge for economists, policymakers, and even government to understand it. Every developing country faces poverty as a big challenge. The effort which governments are taking in different nations to eradicate poverty in rural and urban areas are really appreciable but to reach tribal areas is a big challenge in itself. There are various measures of poverty, however, two international approach of poverty measurement, First income based developed by World bank and second Deprivation based multidimensional poverty index developed by United nation development Program is popularly famous in poverty measurement. But researcher and policy makers are always debate between income-based and deprivation-based poverty measurement because of difference or discrepancy in the results of both the measures.

Sen (1992) in his book "Inequality Re-examined" written that poverty is not due to lack of income but it is deprivation in basic human capabilities. Income poverty seems poverty as a result of inability of the individual or family to congregate their basic needs (world bank, 2000). Still most of the nation developed or developing nation like India consider and using income or consumption expenditure of the people's to measure poverty (Santos and Alkire,2011). There is negative relationship between income and multidimensional poverty (Wang et.al,2016). There are some other literature studies which argues that the poverty is due to experience of various deprivations and non-monetary measure is complementary to monetary measure for measuring poverty (Alkire and Santos, 2010; Nishimwe-Niyimbanira, R,2019; Salgotra et.al.,2020; Wang, X.,2022; Roy & Chakraborti, 2023)

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Trade of Handicraft Products through E-commerce in Bastar District of Chhattisgarh: Issues and Challenges

Neelima Singh Thakur Research Scholar, School of Studies in Economics, Pt. Ravishankar Shukla University, Raipur

Sunil Kumar Kumeti

Assistant Professor, School of Studies in Economics, Pt. Ravishankar Shukla University, Raipur

Abstract

The handicrafts are an important source of income for rural areas. It employs more than six million artisans, including many women and members of socially disadvantaged groups. Today, craftsmanship contributes significantly to exports and job creation. The craft holds enormous potential as it is vital to both the millions of artisans already in the country and the growing number of newcomers entering the craft industry. Each handcrafted item has a story that tells the craftsman's inspiration or enthusiasm in making it. This study is based only on primary data collected from the artisans of Bastar districts of Chhattisgarh. The study attempted to determine the level of digitalization of handicrafts in Bastar district and the challenges faced by artisans in adopting modern technology and e-commerce for trade.

Keywords: Handicraft, Artisans, Ecommerce, Trading, Challenges, Digitalization. **1. Introduction**

There was a time when traditional crafts flourished, but today they are threatened with



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In Achieving Zero Hunger Goal: A Study on Goal 2 Zero-hunger and Collective efforts of India

Gaurav Jain * Archana Sethi **

with starvation and malnourishment. Despite the largest rationing also focusing on the country's with starvation and malnourishment. Despite the largest rationing plan for food distribution, with start as conditions like not eating twice a day, especially during the 75th anniversary of the source. India is tackling hunger through the government's Poshar Abbie fices precatious tackling hunger through the government's Poshan Abhiyan 2.0 initiative, aiming and the government's Poshan Abhiyan 2.0 initiative, aiming and food nutritious and healthy for women, children, and the entire population. Problems such as studies, endered, endered, and the entire population. Problems such as studies, studies, and the entire population. Problems such as studies, studies, and anemia have been addressed and efforts are ongoing to lower the rate. Door-tostunning, and families receive sukha-ration and a noon meal. Research and medical data in a security, manufacturing, and distribution.

Mords- Poverty, Poshan Abhiyan 2.0, Food security, sustainable agriculture, Zero Hunger,

moduction: - "A two-time meal is what a man all need". The bread (Roti) of two times is obtained fortune or hard work. A man works day and night to quench his hunger. India has the 2nd population in the world, standing at around 1.4 billion people. Feeding 1.4 billion stomachs is is population recting 1.4 officer stomaches is ind security" focus to an agenda that promotes "nutrition security" instead. The drive to reduce in the world has largely relied on crops such as wheat and rice that provide calories. But an arease in calories alone is not good enough. Improved diets and good health require bolstering mbon (M.S. Swaminathan, 2014) Here is a developing economy with a GDP of 160.06 trillion mes in 2022-23 (PBI 2023), Fastest-growing nation in the world. We landmarks have achieved so in the fields of science, technology (digital yug of India), roads, and electricity meetivity that are getting better and stronger. But The triple burden of malnutrition-the coexistence i indemourishment, micronutrient deficiency, and over nutrition manifest in overweight and testy-is a growing challenge all over the world (Gomez et al. 2013). To satisfy hunger, food is massary; the matter is to have nutrition in it. Nutrition has the power to empower present and future mations. We are Celebrating 75 years of independence (Azadi ka Amrit Mahotsav) in India. Hunger In is still questionable in our people's bucket lists. India put a massive effort together to tackle and there SDG goal 2: reducing hunger to zero by 2030. Here are some outlooks that show we are on a and path to achieving the target. Since the green revolution, India has become self-sufficient in food reduction. India has made tremendous strides over the last six decades in reducing hunger. Hunger The reduced by increasing the production of cereals, and farmers in India have done this, but at the of losing soil fertility, environmental degradation, bio-diversity affected, water table downs, and are chemical fertilizer uses for more productivity. With more production, nutrition's getting less in Scientists, agriculturists, economists, and research and development teams of various nations into this, and to overcome this situation, new technologies have been made according to the need tot only enhance productivity but also take care of the soil, from the increasing use of chemical liver to bio fertilizer. Here are some Indian perspectives on achieving the second goal of zero Lager.

Marketh Scholar, S.o.S in Economics, Pt.Ravishankar Shukla University, Raipur, And Scholar, S.o.S in Economics, Pt.Ravishankar Shukla University, Raipur, Mathant Professor, S.o.S in Economics, Pt.Ravishankar Shukla University, Raipur,



A Comparative Study of Socio-Economic Status on PVTGs of Chhattisgarh

Dr. Kapil Kumar Chandra^{*} Dr. Sunil Kumar Kumeti^{**}

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Abstract : Tribal communities are often identified by some specific signs such as primitive traits, distinctive culture, geographical isolation, shyness to contact with the community at large and backwardness. Along with these, some tribal groups have some specific features such as dependency on hunting, gathering for food, having pre-agriculture level of technology, zero or negative growth of population and extremely low level of literacy. These groups are called **Particularly Vulnerable Tribal Groups (PVTGs)**. The social and economic position is very important factor to understand the status of living it is responsible for the education, health, occupation, income, family effluence, caste, social participation, social position, political position of Individual, family or group. The present research study is on five Particular Vulnerable Group of tribes of Chhattisgarh namely Baiga, Pahadi Korwa, Kamar, Abujhmadiya and Birhor tribes which measure and compare Socio-Economic Status in Udai Pareek SES Scale of these PVTGs. Research study is based on primary data of 400 household collected from 40 villages of 10 blocksof 7 district of Chhattisgarh State. Results shows that there is difference in socio-economic status of these PVTGs, according to occupation, material possession and social participation of the family the SES of Kamaar is better than the other PVTGs followed by Baiga, Abhujhmadiya, Birhor and Pahadi Korwa.

Keywords: Particularly Vulnerable Tribal Groups, Socio-Economic Status, Udai Pareek SES Scale.

Introduction - The social and economic position is very important factor to understand the status of living it is responsible for the education, health, occupation, income, family effluence, caste, social participation, social position, and political position of Individual, family or group. Tribal communities are often identified by some specific signs such as primitive traits, distinctive culture, geographical isolation, shyness to contact with the community at large and backwardness. Along with these, some tribal groups have some specific features such as dependency on hunting, gathering for food, having pre-agriculture level of technology, zero or negative growth of population and extremely low level of literacy. These groups are called Particularly Vulnerable Tribal Groups (PVTGs). Chhattisgarh is a home of 5 out of 75 PVTGs, listed by central government of India namely Abujhmadiya, Baiga, Birhor, Kamar and Pahadi Korwa whose total population is 1,84,985 constituted in 49,080 Percentage Share of family Baiga (50.05%), Pahadi Korwa (22.79%), Kamar (15.12%), Abujhmadiya (9.75%), Birhor tribes (2.29%) family living in 53 blocks of 18 districts. Sex ratio of tribals in Chhattisgarh is 1020, Baiga (989), Pahadi Korwa (984), Kamar (15.12%), Abujhmadiya (1040), Birhor tribes (1022) respectively. Literacy rate of Chhattisgarh is 70.3 whereas Literacy rate of tribals is 59.1, Baiga (53.97%), Pahadi Korwa (%), Kamar (47.7%), Abujhmadiya (29.88%), Birhor tribes (47.98%) respectively. There is gap of 11.2 % in states literacy rate and tribals literacy rate. It shows that poor education facilities are being made available to these PVTGs.

The discussion above revealed that there is some confliction and difference in the Socio-economic status of these PVTGs. This paper tries to measure and compare the Socio-Economic Status of these PVTGsof Chhattisgarh statein Udai Pareek SES Scaleto find the difference and confliction in values of Socio-Economic Status. In the end this paper gives suggestions to policy makers, governments and researchers through they can increase the socioeconomic status significantly.

Literature Review

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Kispotta, Seraphinus (2014)The government programmes are almost nil except MNREGA, in spite of many developmental programmes, the economic standards of the tribal'sis still very low and need of joint efforts and better



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	PRAGATI KRISHNAN



Modelling and Forecasting Foodgrains Production and Productivity in India using ARIMA Models

Pragati Krishnan * Ravindra K Brahme +*

ABSTRACT

ABSTRACT Forecasting is an important tool to estimate the area, production and productivity of any crop in new Forecasting is an important tool to estimate the toresting the future figures and autoregressive integrated future. There are several methods available in a new processing of any issues, events or variables moving average (ARIMA) is one of their out-of-processing of allocing it. Such is the case for outmoving average (ARIMA) is one of files structure affecting it. Such is the case for variables requires an in-depth understanding of the orderlying factors affecting it. Such is the case for forecasting annual productivity of apricultural crops. Crop acreage estimation and crop yield forecasting are two components, which are crucial for proper planning and policy making in the agriculture sector of the components, which are crucial for project plan for production and productivity of the foodgram country The present study was conducted to India for the year 1950 to 2023 based on the estimation which includes race, whet, cereals and pulses in India for the year 1950 to 2023 based on the estimation of suitable ARIMA model. The analysis of ACF & PACF of differenced series revealed that ARIMA (0,1.2) was the most suitable model for forecasting of both the foodgrains production and productives based on the diagnostics, such as ACT, PACF, etc. The selected ARIMA model predicted an increase in production of foodgrains in the next seven years from 3252.14 lakh tons in the year 2024 to 3477 % takh tons in 2023. Similarly, the selected ARIMA model predicted also indicated an increase in productivity of foodgrains in the next seven years from 2491.82 kg/hectares in the year 2024 to 2653 % kg/hectares in 2023 respectively.

Keywords: ARIMA, ACF, food grains, forecasting, PACF

I. Introduction:

The structure of Indian economy was mostly a closed, regulated and protectionist economy, even after independence, in almost all sectors until 90's. As a result of which, the performance of various sectors and growth rate of the economy have experienced various obstacles and interruptions over the years (Pradhan, 2012). However, the economy had a major structural shift during 1990s, whereby India pata one step forward to be a market based open-economy by adopting liberalization and globalization polices. The policies facilitated the economy to grow, on an average, over 7% per annum since 1994 (Basu, 2004). Forecasting is an important tool to estimate the area, production and productivity of an crop in near future. There are several methods available for foresting the future figures and autoregressive integrated moving average (ARIMA) is one of them (Sharma et al,2018). Moreover, Pradhan (2012) urged that forecasting of any issues, events or variables requires an in-depth understanding of the underlying factors affecting it. Such is the case for forecasting annual productivity of agricultural crops. Crop acreage estimation and crop yield forecasting are two components, which are crucial for proper planning and policy making in the agriculture sector of the country (Hemavathi & Prabhakaran, 2018). They further point out that Rice is among the three leading food crops of the world, with maize and wheat being the other two and it is one of the most important cereal crops of India. Likewise, wheat is the second most important cereal crop in India after rice and it is severely affected with abiotic factors e.g., Rainfall, humidity and other environmental factors and biotic stresses such as diseases and pest infestation which also indirectly depends upon environment (Singh et al .2016).

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Government Expenditure of Social Sectors and its impact on the Economic Growth of Chhattisgarh

Abstract

Vikram* Pragati Krishnan** **Ravindra K Brahme *****

Since the 19th century, the liaison between economic growth and government spending has been explored, debated and discussed by many. Social sector expenditures, including education, health, shelter, nutrition and social protection/social security, are productive. The establishment and enhancement of social security systems by governments and access to basic social services for all should form an important component of policies for social development. The aim of the present study is to make an empirical study of the relationship between government expenditures on social sectors of Chhattisgarh at disaggregated level and Gross State Domestic Product (GSDP) during a twenty three time period (2000-21 to 2022-23). The study highlights the existence of a long-term relationship among GSDP, education expenditure, and health expenditure, emphasizing the interdependence and equilibrium among these variables despite their individual non-stationary behavior. The Vector Error Correction Model (VECM) employed captures both the long-term equilibrium relationships and shortterm adjustments among these factors, providing a nuanced understanding of their dynamics. The study's implications offer a strategic roadmap for policymakers in Chhattisgarh. Keywords: Cointegration, gross state domestic product, public expenditure, social sectors, unit roots

Introduction

Since the 19th century, the liaison between economic growth and government spending has been explored, debated and discussed by many (Wagner, 1883; Keynes, 1936; Ram, 1986; and so on). Accordingly, in a country, the government spending either is being stimulated due to increase in the economic activities or it stimulates the economic activities (Bhavsar & Samanta, 2023). Over the years the economic activities of the government vis-à-vis public expenditure have grown both relatively and absolutely in all the states of the Indian union. A predominant objective of public expenditure policy is sustained and equitable economic growth. Public expenditures have played an important role in physical and human capital formation over a period of time. Appropriate public expenditures can also be effective in boosting economic growth even in the short run. Therefore, the effect of public expenditure on economic growth may be a comprehensive indicator of public expenditure productivity. The two components of such an indicator should be measureable: the contribution of public expenditures to economic growth, and the efficiency with which these expenditures yield their output (Lhoungu, et al, 2016). Jaman (2019) opined that Social sector expenditures, including education. health, shelter, nutrition and social protection/social security, are productive. The establishment and enhancement of social security systems by governments and access to basic social services for all should form an important component of policies for social development. The aim of the present study is to make an empirical study of the relationship between government expenditures on social sectors of Chhattisgarh at disaggregated level and Gross State Domestic Product (GSDP) during a twenty three time period (2000-21 to 2022-23).

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Bibliometric Analysis on Millennium Development Goals (MDGs) with Emphasis on "Poverty and Hunger"

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Abstract

Millennium development goals (MDGs) are the United Nations Development Programmes (UNDP) initiative launched in the year 2000 with eight objectives and twenty-one milestones to be achieved by 2015. Thus, it is a global agreement and collaborative action. (Hulme, 2009) Poverty is not a new concept, rather it is found in every sphere of life; not only this, it also stirs a lot of misgiving; and as a result, it has a very devastating effect on its victims. Henceforth, the principal threshold of the paper is to exhibit a sketch on the work done on "Millennium Development Goals" through its bibliometric analysis. Therefore, the paper highlights a descriptive-quantitative analysis of the concept of Millennium Development Goal- 1 A for the last twenty-one years, i.e., 2000-2021 and SciVerse Scopus was used to collect the research publications on MDGs. The results of the study show that the Mediterranean Journal of Social Sciences (MJSS) has contributed plenty of publications on the theme "Millennium Development Goals" and "Poverty and Hunger". With respect to most contributing authors, the Author Fukuda-Parr S has got the maximum number of the papers and also had the highest h-index. Further the keyword mapping results emphasised that in all the seven clusters - "Millennium Development" is the predominant word followed by child mortality, maternal mortality, drinking water, sanitation, environmental sustainability etc.

Keywords: Bibliometric analysis, Child mortality, Hunger, Maternal mortality, Millennium Development Goals, Poverty, SCOPUS.

1. Introduction

Millennium development goals are the United National development Programmes (UNDP) initiative launched in the year 2000 with 8 objectives and 21 milestones to be achieved by 2015. The Millennium Development Goals (MDGs) is a global agreement and collaborative action (Hulme, 2009)¹ mark an epochal event and hailed as an effective method of global mobilisation to accomplish a set of key social priorities all around the globe (Sachs, 2012)². Furthermore, the MDGs sheds light on the widespread public attention in the sphere of poverty and hunger, health, unaddressed needs towards schooling, gender inequality, and environmental deterioration. As it is evidences that the importance and relevance of MDGs are increasing in the present era, it becomes indispensable to analyse and accumulate the past, present and futuristic literature, on the millennium development goals.

Poverty is very difficult to define, because different people have different perceptions on it. This means the fact that; what may be termed as poor may not always be seen as poor by the other people. Poverty is not a new concept, rather it is found in every sphere of life; not only this, it also stirs a lot of misgiving; and as a result, it has a very devastating effect on its

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Econometric modelling and forecasting of groundnut production and productivity in India using ARIMA Model

Ram Prasad Chandra * Ravindra Brahme **

ABSTRACT

Groundnut is the largest oilseed produced in the world and stands third largest oilseed in India. The aim of this study was to model groundnut production and yield in India, using data from the period 1970-71 to 2021-22 in India an effort to forecast groundnut production and productivity amounts between the years 2022-23 to 2039-40 by using Autoregressive Integrated Moving Average (ARIMA) models. The Box Jenkins ARIMA methodology has been used for forecasting. The diagnostic checking has shown that ARIMA (0, 1, 2) and ARIMA (0, 1, 2), is the most appropriate model among twenty studied ARIMA models; and so for forecasted the groundnut production and yield amounts for the next 18 years. We forecasted that annual amount of groundnut production and yield obtained in the year 2022-23 was 93.136 lakh tonnes and 1850.777 kg/hectare respectively, and it reached to 119.459 lakh tonnes and 2488.912 kg/hectare respectively in the year 2039-40 with a significant acceleration for groundnut production and yield. Forecasting results of the ARIMA (0, 1, 2) and (0, 1, 2) illustrated an increasing trend in the amount of groundnut production & yield, and they might help to determine a better policy for increasing groundnut production in India.

Keyword: Groundnut, Forecasting, ARIMA, AIC, BIC, GPY

JEL Code: C12, C22, C52. C53

INTRODUCTION

Agriculture is back bone of the Indian Economy. Groundnut is the largest oilseed produced in the world and stands third largest oilseed in India. Groundnut is important oilseeds crop and oil content material of the seed varies from 44-50%, relying on varieties and agronomic conditions. Groundnut is additionally of price as a rotation crop (Mohapatra et al., 2018; Kumar et al., 2020). India is one of the second largest producers of oilseeds in the world and occupies an important position in the Indian agricultural economy. It is one of the most important food and cash crops of our country. While being a valuable source of all the nutrients, it is a low-priced commodity. Groundnut is also called as wonder nut and poor men's cashew nut. Groundnut is one of the most important cash crops of our country. It is a low-priced commodity but a valuable source of all the nutrients. The major groundnut producing countries in the world are India, China, Nigeria, Senegal, Sudan, Burma and the United States of America (Borkar, 2016; Saranyadevi, 2022). It is estimated that nine oilseeds namely groundnut, rapeseed-mustard, soybean, sunflower, safflower, sesame, Niger, castor and linseed, accounted for an area of 28.8 million hectares with the production of 35.9 million tonnes and yield 1247 kg/ht. in FY 2020-21 and in which groundnut cultivated area 6.01 million hectares, production 10.2 million tonnes and yield 1703 kg/ht. in FY 2020-21.

Attention has been given to the univariate time series Auto-Regressive Integrated Moving Average (ARIMA) Models, which is principally due to World of Box and Jenkins. Yule and Walker proposed the Autoregressive Moving Average (ARMA) model, and Box and Jenkins proposed the method (ARIMA) model afterward (Box and Jenkins, 1976; Saranyadevi, 2022). Among the stochastic ARIMA types are robust, effective and famous as they can correctly describe the found facts and can make forecasts with minimum forecast error (Aarekar and Reddy, 2017; Hemavathi and Prabakaran, 2018).

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Government Expenditure of Social Sectors and its impact on the Economic Growth of Chhattisgarh

Abstract

Vikram* Pragati Krishnan** Ravindra K Brahme ***

Since the 19th century, the liaison between economic growth and government spending has been explored, debated and discussed by many. Social sector expenditures, including education, health, shelter, nutrition and social protection/social security, are productive. The establishment and enhancement of social security systems by governments and access to basic social services for all should form an important component of policies for social development. The aim of the present study is to make an empirical study of the relationship between government expenditures on social sectors of Chhattisgarh at disaggregated level and Gross State Domestic Product (GSDP) during a twenty three time period (2000-21 to 2022-23). The study highlights the existence of a long-term relationship among GSDP, education expenditure, and health expenditure, emphasizing the interdependence and equilibrium among these variables despite their individual non-stationary behavior. The Vector Error Correction Model (VECM) employed captures both the long-term equilibrium relationships and shortterm adjustments among these factors, providing a nuanced understanding of their dynamics. The study's implications offer a strategic roadmap for policymakers in Chhattisgarh. Keywords: Cointegration, gross state domestic product, public expenditure, social sectors, unit roots

Introduction

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Stochastic models for coffee production and productivity Forecasting in India

Ram Prasad Chandra Ravindra Brahme ** Suresh Kumar Patel ***

Abstract

Agricultural production and productivity forecasts are useful for farmers, policy makers and industries. In the present study, an auto-regressive and moving average model (ARIMA) has been applied for modelling and forecasting of annual coffee production and productivity in India. The augmented Dickey-Fuller (ADF) test has been used to test the stationarity of time series. The appropriate ARIMA model has selected based on the minimum Akaike information criterion (AIC). The residuals of the fitted models were diagnosed for the possible presence of autocorrelation and white noise effects, and Forecasts models are continuously increasing over the forecast period.

Keyword: Time Series Analysis; Stochastic model; Forecasting; ARIMA; AIC; BIC

JEL Code: C12, C22, C51, C52, C53

Introduction

Since then the journey of Indian coffee production is a long one dating back almost 400 years, it holds a very special place in historic taste. This unique journey has started from the hands of Yaman, who handed over seven magical beans to Bababudan, who planted it in the Chandragiri Hills of Karnataka. This magical beginning paved the way for coffee with the aroma, taste, flavour and acidity we experience today (Gopinath et al., 2019). Coffee is one of the most popular drinks in the world. Coffee from India is the best shade-grown light coffee in the world. Among plantation crops, coffee has contributed significantly to the Indian economy during the last 50 years (Naveena et al., 2017). It holds a notable place in the list of beverages due to its stimulating intensity, and among all the coffee producing regions, India is the only country where coffee is grown in shade. Indian coffee holds a great place in all the countries due to its flavour, aroma, soft and lower acidic nature (Prabha et al., 2021).

In India, traditional coffee growing States are Karnataka, Kerala and Tamil Nadu. Some of the nontraditional areas are Andhra Pradesh, Odisha and North Eastern Region including Assam, Meghalaya, Manipur, Arunachal Pradesh and Tripura. The three traditional areas together accounted for 79.7 per cent of area and 96.2 per cent of coffee production. The major coffee growing areas in India are Hassan, Chikmagalur and Coorg in Karnataka, Wayanad, Idukki and Nelliyampathy in Kerala, Shevaroys, Palani, Pulneys and Nilgiri hills in Tamil Nadu (Coffee Board of India, 2023). Both (Arabica and Robusta) the varieties of coffee has been more or less equal in its area, production and productivity under traditional areas except Tamil Nadu. Tamil Nadu is the one of the State which has more production of Arabica coffee comparing with Robusta Coffee (Prabha et al., 2021). Since every Indian coffee grower spends his entire time in coffee production, it is no miracle or wonder that India produces extraordinary variety of coffee and exports it to different parts of the world over 150thyears (Gopinath et al., 2019). Coffee production and productivity are incessant rising in India respectively 3195 lakh tonnes and 767 kg hectare in FY 2018-19. In FY 2020-21, 3340 lakh tonnes and 790 kg/hectare which is increase to respectively 3420 lakh tonnes and 797 kg/hectare in FY 2021-22.

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Literature Review

(Gopinath et al., 2019) used monthly time series data from the period 2010 - 2015 in India is an effort to forecast coffee production amounts between the years 2015 and 2025 by using Autoregressive Integrated Moving Average (ARIMA) models. In the study, ARIMA (2, 1, 1) was found to be the most appropriate model among ten studied ARIMA models in forecasting the coffee production amounts for the next 11 years. (Naveena et al., 2017) developed a hybrid model for the Price of Robusta Coffee in India with Hybrid ARIMA-ANN methods; and suggested that hybrid model of ARIMA and ANN is the best model for Robusta coffee price projection.(Yashavanth et al., 2017) used Vector autoregression (VAR) model for forecast the monthly wholesale prices of Arabica coffee in three different coffee consuming centres in India, viz. Bengaluru, Chennai and Hyderabad; and used of monthly data series period of January, 2001 to March, 2014. Finally, in this study, VAR (2) was found to be the most appropriate model among other models in forecasting the coffee price for the next 10 month. (Prabha et al., 2021) studied the coffee trend in area, production and yield in India from 1985-2000. He founded that the best fitted ARIMA (1, 1, 1) model for Arabica coffee and ARIMA (1, 1, 0) model for Robusta coffee forecasting.

We documented a detailed literature on predicting the various data series from 1985 to 2015. The academicians carried study on forecasting of coffee prices, production and seeds. A few studies are available of forecasting of coffee production and productivity in India and no study are available for period from 2023 to 2035. Therefore, there is a gap and motivated us to undertake study on forecasting the coffee production and productivity in India. This paper is structured as followed: In Section 1 introduction is given about the coffee production and ARIMA model with present's detailed review of literatures. Section 2 provides research methodology (objectives of the study, research design and data collection, Section 3 econometric modelling of the study, Section 4 Result and discussion and Section 5 provides respectively conclusion and references.

Methodology

Objective of the Study

The Objectives of this research are as follows:

5. To test the stationarity of the time series data compiled for the study, i.e., Coffee production and productivity.

6. To identify the order of difference at which the time series would become stationary.

7. To perform the model estimation, i.e., ARIMA (p, d, q) and diagnostic checking.

8. To forecast the future values of Coffee production and productivity using the estimate ARIMA model.

Research Design

In order to fulfil the above objectives of the study, exploratory research design and stochastic time series model have been adopted. Exploratory research interprets the already available information and emphasizes on the analysis and interpretation of the available secondary data. Sigma square, AIC, BIC, RMSE, MASE and MAE model are being used for selecting the best ARIMA model and predicting the time series.

Data Collection

The time series data of coffee production and productivity in India has collected from the official website of the Reserve Bank of India - Database (rbi.org.in) for the period of 1971 to 2022 (52 observations). At this range of data, the researcher has tried to forecast the future values for the period of 2023 to 2035 (13 Observations).

The Box-Jenkins Methodology (BJ) Step 1- In the first phase of the study, the time series data selected for the study is collected from the series is seen, which shows whether the series is checked at the table whether the series is checked at the table of the series is checked at the series is Step I- In the first phase of the study, the time series data series is seen, which shows whether the reliable source, after which a graphical presentation of the series is checked at the level, and if and it is stationarity of the series is the first difference of the series is checked at the level of the series is checked at the series is checked at the level of the series is checked at the series is checked reliable source, after which a graphical presentation of the series is checked at the level, and if the series is showing a trend or not. After this, stationarity is checked at the first difference, and if the series is showing a trend or not. After this, stationarity of the checked at the first difference, and if the is no stationarity at the category level, then stationarity is checked at the first difference, and if the checked is no stationarity at the category level, then stationarity is checked at the first difference, and if the checked at the category level, then stationarity is checked at the first difference, and if the checked at the category level, then stationarity is checked at the first difference, and if the checked at the category level, then stationarity is checked at the first difference, and if the checked at the category level, then stationarity is checked at the first difference, and if the checked at the category level, then stationarity is checked at the first difference, and if the checked at the category level, then stationarity is checked at the first difference, and if the checked at the category level, then stationarity is checked at the first difference. is no stationarity at the category level, then stationarity is becomes continues till this continues in no stationarity of the series at the first difference, then this process continues till this continues in no stationarity of the series at the first difference, then series becomes stationary at the first difference. no stationarity of the series at the first difference, then the series becomes stationary at the first difference, the series becomes stationary at the first difference with the series becomes stationary. By the way, most of the series with the help of which the model is selected. the series becomes stationary. By the way, most of the series becomes with the help of which the model is selected. After the series is stationary, the correlogram is seen, with the help of which the model is selected.

After the series is stationary, the correlogram is the model (p, d, q) selected in the first phase of the study, the equation of the model (p, d, q) selected in the first phase of the selected model with Step II- In the second phase of the study, the equation of the parameters of the selected model with the is derived, and then the equation is formed by writing the parameters of the selected model with the

step III- In the third phase of the study, a diagnostic check of the residuals of the selected model (Step III- In the third phase of the study, a diagnostic encourcelation (ACF and PACF), white noise, n d, q) is carried out in the second phase, in which the autocorrelation (ACF and PACF), white noise, n d, q) is carried out in the second phase, in which the data the tests after diagnostic testing of the residuat and Ljung-Box test is done of the selected model. If all the tests after diagnostic testing process of the and Ljung-Box test is done of the selected model. If the the forecasting process of the selected model (p, d, q) are found to be significant, then the forecasting process of the selected to be significant. of the selected model (p, d, q) are found to be significant to the residuals of are not found to be significant model is done, and if all the tests after diagnostic test of the residuals of are not found to be significant. then All the process is started again from the first phase of the study.

Step IV- In the fourth stage of the study, after diagnostic testing of the residuals of the model selected in the third stage, all the tests are found significant, and thus the model constructed is termed "BLUE". Thereafter the forecasting process of the selected model is completed, and then reporting of the model is done.

Figure 1 The Box-Jenkins methodology consist of following four steps (Gujarati, et al., 2015).



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Econometric Models

To selecting the best fitted ARIMA model, many statistical tools are being applied, viz., Root mean square error (RMSE), Mean absolute percentage error (MAPE), Mean absolute error (MAE), Akaike information criterion (AIC), Schwarz (Bayesian) information criterion (SIC) and Ljung-Box test (Draxler, 2014; Tofallis, 2015).

Modelling of Time Series Data

To introduce several ideas, some old and some new (Gujarati et al., 2015), let us work with the Coffee production and yield time series data for the India. A plot of this time series has given in figure 2 part (a) Original series and part (b) first difference (DCOFFEE_P and DCOFFEE_Y); recall that COFFEE_P and COFFEE_Y in level from is nonstationary but in the (first) differenced from it is stationary. If a time series is stationary, we can model it in a variety of ways.

An Autoregressive (AR) Process

Let Y, represent the at time t. If we model Y, as,

$$(Y_{t-\delta}) = \alpha_1 (Y_{t-\delta}) + u_t$$

Where: δ = the mean of Y and u_i = an uncorrelated random error term with zero mean and constant variance σ^2 (i.e., it is white noise), then we say that Y_i follows a first-order autoregressive (AR1) process. We consider this model,

$$(Y_{t-}\delta) = \alpha_1 (Y_{t-1}-\delta) + \alpha_2 (Y_{t-2}-\delta) + u$$

Then we say that Y_t follows a second order autoregressive (AR 2) process. That is, the value of Y at time t depends on its value in the previous two times depends, the Y values being expressed around their mean value δ . In general we can have,

$$(Y_{t-\delta}) = \alpha_1 (Y_{t-1} - \delta) + \alpha_2 (Y_{t-2} - \delta) + \dots + \alpha_p (Y_{t-p} - \delta) + u_t$$
 Eq. (3)

Where, $Y_i = p^{th}$ - order autoregressive process.

A Moving Average (MA) Process

The AR process is not only mechanism that may have generated Y. suppose we model Y as follows:

$$Y_t = \mu + \beta_0 u_t + \beta_1 u_{t-1}$$

Where: $\mu = \text{constant}$, u = white noise stochastic error term. Thus, we say that Y follows a first-order moving average (MA 1) process. But Y follows the expression,

$$Y_{i} = \mu + \beta_{0}u_{i} + \beta_{1}u_{i-1} + \beta_{1}u_{i-2}$$

Then it is an MA (2) process. More generally, is an MA (q) process. In short, a moving average process is simply a linear combination of white noise error terms.

 $Y_{t} = \mu + \beta_{0}u_{t} + \beta_{1}u_{t-1} + \beta_{1}u_{t-2} + \dots + \beta_{q}u_{t-q}$

An Autoregressive and Moving Average (ARMA) Process

Of course, is it quite likely that Y has characteristics of both AR and MA and is therefore ARMA. Thus, Y follows an ARMA (1, 1) process if it can be written as:

$$Y_i = \theta + \alpha_1 Y_{r-1} + \beta_0 u_i + \beta_1 u_{i-1} + u_i$$

Where: θ = constant, μ = white noise stochastic error term.

An Autoregressive Integrated Moving Average (ARIMA) Process

ARIMA is a linear regression model for time series forecasting and it uses its own lags as predictors. Any 'non-seasonal' time series that exhibits patterns and is not a random white noise can be modelled

Eq. (1)

Eq. (2)

Eq. (4)

Eq. (5)

Eq. (6)

Eq. (7)

with ARIMA models. An ARIMA model is characterised by 3 terms: p, d, q (Box and Jenkins, 1978; Gujarati et al., 2015).

Where: p = the order of the AR term

q = the order of the MA term

d = order of differencing required to make the series stationary (I).

ARIMA Model Identification for Coffee Production and Productivity

In general, a non-stationary series will be made stationary after differencing 'd times' and is said to be In general, a non-stationary series will be made stationary directionary, d=0 and the ARIMA models integrated of order 'd', denoted by I(d). If the original series is stationary, d=0 and the ARIMA models integrated of order d', denoted by I(d). If the original series is balance study, i.e., COFFEE p and reduce to ARMA models. The time series data used for the present study, i.e., COFFEE p and reduce to ARMA models. The time series data used for the provide provide the p COFFEE_Y has become stationary after the 1 of det difference) for ARIMA (p, d, q) model. To differencing the series, it is necessary to adopt d=1 (first difference) for ARIMA (p, d, q) model. To differencing the series, it is necessary to adopt a (q') (in MA) in the model, we should check the get the appropriate numbers for p' (in AR) and q' (in MA) in the model, we should check the Correlogram after first difference in time series (figure 3 and figure 4). Since there are no significant spikes of ACF and PACF, the residuals of the selected ARIMA model are white noise and there is no spikes of ACT and FACT, the residual of the AR (p) and MA (q). Model convinces all the norms (comparatively lowest value of AIC and comparatively low values of MAPE, MAE and RMSE), hence this model has been considered to be the best predictive model, which has been used to forecast the future values of the time series, viz., DCOFFEE_P and DCOFFEE_Y. Table 3 shows that selected best fitted ARIMA model with parameters, and table 4 provides the estimation results of various parameters of AR (p) and MA (q) of the ARIMA model for production and yield. Using these values, the best fit ARIMA (p, d, q) model for predicting the time series DCOFFEE_P and DCOFFEE_Y has been identified. The prediction equation for this models can be written as below: The equation for coffee production-

 $Y_{t} = \theta + \alpha_{1}Y_{t-1} + \alpha_{1}Y_{t-2} + \beta_{1}u_{t-1} + u_{t}$

The equation for coffee productivity-

 $Y_{t} = \mu + \beta_{0}u_{t} + \beta_{1}u_{t-1} + \beta_{1}u_{t-2} + \beta_{1}u_{t-3} + u_{t}$

Based on the estimation results of ARIMA (2, 1, 1) and (0, 1, 3) model (intercept and regression coefficients), the functional form of the time series forecasting model may be presented as follows (given table 4):

Model for Coffee Production-

 $Y_t = 0.0268 - 1.6363Y_{t-1} - 0.7568Y_{t-2} + 0.6963u_{t-1} + u_t$

Model for Coffee Productivity-

 $Y_{t} = 0.0053 - 1.1353u_{t-1} + 0.8302u_{t-2} + 0.5307u_{t-3} + u_{t}$

Results & Discussion

Descriptive Statistic

In table 1 shows that descriptive statistics of original series of coffee production & yield (CPY), which mean are respectively 2163.57 and 772.33, median are 288.60 and 799.00, standard deviation are 869.38 and 127.53, skewness are -0.15 and -0.69, and kurtosis are 1.55 and 2.69 respectively. J-B test value are 4.76 and 4.45, and p-value are 0.092 and 0.108. It show that selected series is normally distributed.

Table 1 also presents that descriptive statistics of stationary series of coffee production & yield, which mean are respectively 45.45 and -0.33, median are 50.00 and 2.00, standard deviation are 361.86 and 171.40, skewness are -0.14 and -0.02, and kurtosis are 3.92 and 3.88 respectively. It is clear that the first order differenced data series is more stable about the zero mean and the series is stationary with

Eq. (8), and

Eq. (9)

Eq. (10), and

Eq. (11)

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once differenced. J-B test value are 1.97 for coffee production and 1.67 for coffee yield, and p-value are 0.374 and 0.436 respectively. It is show that selected series are follow a normal distribution.

Unit Root test (ADF test)

The results of Augmented Dickey-Fuller (ADF) unit root test at level and 1storder difference given in table 2. Table 2 presents that the calculated t-statistics value of CPY at level are respectively = -2.527 and -2.827 and p-value are respectively = 0.3140 and 0.1946; thus series is not stationary, than we go through 1st differenced. Table 2 shows1st order difference series CPY, calculated t-statistics value are respectively = -17.718 and -8.288 and p-value are respectively = 0.0000 and 0.0000; which are smaller than critical values at 1%, 5% and 10% levels of significance. Hence, we fail to accept the null hypothesis for unit root. It means the series DCOFFEE_P and DCOFFEE_PY is not containing the unit root and thus it is stationary. The graphical presentation of figure 2 part (a) represent plot of original data series and part (b) represent plot of stationary data series. Figure 3 and figure 4 represent the plot of Correlogram (ACF and PACF coefficients) of the stationary series DCOFFEE_P and DCOF

Statistics	Coffee P	roduction	Coffee Yield		
	Original series	Stationary series	Original series	Stationary series	
Mean	2163.57	45.45	772.33	-0.33	
Median	2188.60	50.00	799.00	2.00	
Std. Deviation	869.38	361.86	127.53	171.40	
Skewness	-0.15	-0.14	-0.69	-0.02	
Kurtosis	1.55	3.92	2.69	3.88	
Jarque- Bera (JB)	4.76	1.97	4.45	1.67	
Prob.	0.092	0.374	0.108	0.436	

Table 1 Descriptive Statistics of Original and Stationary series of Coffee Production and Yield

Source: Authors calculation using EVies12

Table 2 Results of Augmented Dickey-Fuller test (level and 1st difference)

Variable	Series a	at level	Series at 1 Order difference		
	t-Statistics	Prob.	t-Statistics	Prob.	
Coffee Production	-2.527	0.3140	-17.718	0.0000	
Coffee Yield	-2.827	0.1946	-8.288	0.0000	

Source: Authors calculation using EVies12

Table 3 Appropriate model selection criterion

Variables	Models	σ²	Adj p2	SER	AIC	BIC	RMSE	MAPE	MAE
		10 50 80			1			La Miller	E HARRY

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Production	ARIMA (2, 1,	0.0172	0.6487	0.1383	- 0.9967	0.8073	007.09	21.6248	512.42
Yield	1) ARIMA (0, 1,	0.0192	0.6313	0.1459	- 0.8792	- 0.6898	201.92	25.3100	173.09
	3)						101		4

607.00

日、シンを

Source: Authors calculation using EVies12 r Coffee Production and Productivity

able 4 Para	meters Est	imation for		MA (2)	MA (3)	Intercept	I
Parameters	AR (1)	AR (2)	MA (1)				Likeli
			Coffee Prod	uction (2, 1,	1)	Provine le	-
		0.7568	0.6963	T -		0.0268	
С	-1.6363	-0.7508	0.2307	-	-	0.0101	30.416
Std. Error	0.2149	0.1/84	0.2507			0.0112	
Prob.	0.0000	0.0001	0.0041				
Sigma Squar	$re(\sigma^2) = 0.01$	7273 ; AIC	= -0.996720	15075			
The second second	8		Coffee YI	ela (0, 1, 3)	1	0.0052	-
- 1		-	-1.1353	0.8302	-0.5307	0.0053	
ad Error		-	0.1452	0.1696	0.1840	0.0050	27.421
Stu. Entit		-	0.0000	0.0000	0.0060	0.3000	
Prob.	•		0.07027	260881			
Sigma Squar	$e\left(\sigma^2\right)=0.0$	19215; AIC	= -0.8/92/	200001			

Source: Authors calculation using EVies12

Table 5 Results of the Ljung-Box test

Models	leg	χ^2 Stat.	Prob.
ARIMA (2, 1, 1)	24	17.260	0.695
ARIMA (0, 1, 3)	24	18.053	0.646

Source: Authors calculation using EVies12

Table 6 Results of the Jarque-Bera test

Variable	Models	JB test	Prob.
Coffee Production	ARIMA (2, 1, 1)	0.333	0.846
Coffee Yield	ARIMA (0, 1, 3)	2.328	0.312

Source: Authors calculation using EVies12

Diagnostic Checking

Autocorrelation and Residual Diagnostic

We use automatic ARIMA forecasting for selection of models and among the tentative models presented in the previous section, ARIMA (2, 1, 1) model for production with AR (1) = -1.6363, AR (2) = -0.7568, MA (1) = 0.6963, Intercept (θ) = 0.0268, σ^2 = 0.0172, Adjusted R²= 0.6487, Standard Error of Regression (SER) = 0.1383, AIC = -0.9967, BIC = -0.8073, RMSE = 607.09, MAPE = 21.6248, MAE = 512.42 and log likelihood = 30.416; ARIMA (0, 1, 3) model for yield with MA (1) = -1.1353, MA (2) = 0.8302, MA (3) = -0.5307, Intercept (θ) = 0.0053, σ^2 = 0.0192, Adjusted R² = 0.6313, Standard Error of Regression = 0.1459, AIC = -0.8792, BIC = -0.6898, RMSE = 201.92, MAPE = 25.3100, MAE = 173.09 and log likelihood = 27.421 has been identified as the best model for forecasting (given table 3, table 4). But, before forecasting the time series using the tentative model, it is necessary to perform diagnostic checking to avoid over fitting the ARIMA model. As part of diagnostic checking:

- ARIMA model parameters, viz., lowest value of Sigma square (σ² Volatility) and Standard error of regression, highest values of Adjusted R-square and the lowest values of the AIC, BIC, RMSE, MAPE and MAE criterions is chosen as the best fitted model for PY (given table 3).
- The Ljung-Box test result for coffee production and yield respectively ARIMA (2, 1, 1) and (0, 1, 3) are shows insignificant at 5% level of significance (given table 5).
- After fitting the appropriate ARIMA model, the goodness of fit can be estimated by plotting the ACF of residuals of the fitted model. If most of the sample autocorrelation coefficients of the residuals lie within the limits (±1.96/√N), where N = the number of observations, then the residuals are white noise indicating that the model fit is appropriate (Reddy, 2000).
- The following figure 7 and figure 8 gives the autocorrelation test of the residuals for CPY. The
 null hypothesis for this test is there no autocorrelation in residual and p-value is insignificant which
 indicates that there is no autocorrelation. Hence, it can be summarised that the residuals are not
 correlated with each other or in other words, it can be said that the residuals obtained from the
 model are independent from each other.
- The Jarque-Bera test result for coffee production and yield respectively ARIMA (2, 1, 1) and (0, 1, 3) are shows insignificant at 5% level of significance (given table 6). It is clear that series are follow normal distribution.
- Figure 9 and figure 10 represent of residual graphs of coffee production and yield respectively. Residual graphs are shown same trend actual and fitted data series.
- Here, the goodness of fit of the ARIMA (2, 1, 1) and (0, 1, 3) model can be checked through Correlogram of residuals. Normally, a flat Correlogram with insignificant spikes is most ideal (figure 7 and figure 8). So we got for forecasting the above models (table 7, figure 11 & figure 12).

Figure 2 Representation of graph Original and Stationary series of CPY



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	Partal Correlation		Autocorrelation	Partial Correlation		
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	1 11 1	18	1 1 1	1 11	18	
11.	1 1 1	119	4 1 1		19	
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111	1 1 1	21		1 . 1 .	21	
	1 . 1 .	22	111		22	
111	1 . 1 .	23	111		23	
111	1 . ()	24	111	1	24	

Figure 3 Correlogram of CP; Figure 4 Correlogram of CY

Figure 5 ARMA Graph for model selection CP; Figure 6 ARMA Graph for model selection CY

Akaike Information Criteria (top 20 models) 0.90 0.92 0.94 0.96 -0.98 1.00 (2,4)(0,0) (3,3)(0,0) (4,2)(0,0) (4,0)(0,0) (4,1)(0,0) (2,1)(0,0) (2,0)(0,0) (0,3)(0,0) (0,0)(1,1) (1,2W0,0) (0'0)(2'2) (2,2)(0,0) (3,1)(0,0) (2,3)(0,0) (0,4)(0,0) (1,3)(0,0) (3,2)(0,0) 10.01(5.5) (3,0N0,0) Akaike information Criteria (top 20 models) - 74 - 76 -.78 - 80 - 82 54 36 56 - 10 (4,0%0,0) (2,2%0,0) (3,1)(0,0) (0,4)(0,0) 10'0%0'11 1.4 \$0.03 10'031'1) (4, 2 × 0, 0) (0'0)(1'+) (0'0NC'1) 1.980.01 10.0%0,U 13, 1 #0.01 D DAT D (0 OK1 (1.0×0.0) (1.1×0.0) D. Sen. CI -

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Figure 8 Autocorrelation test of Cp

Ascometation

Partial Correlation



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Figure 9 Representation of residual graph of CP; Figure 10 Representation of residual graph of CY











Forecasting of Selected ARIMA models

Forecasting Results of ARIMA models

The research study was based on yearly value of coffee production and coffee yield, and covering the period of 1971 to 2035 (65 observations); of which 52 observations ranging from 1971 to 2022 were historical data and 13 observations ranging the period of 2023 to 2035 is forecasted (given table 6) and figure 11 and figure 12 exhibits the forecasting results of ARIMA (2, 1, 1) for coffee production and ARIMA (0, 1, 3) model for coffee yield respectively, which is regarded as the best fit model for forecasting the future value of COFFEE_P and COFFEE_Y. The line of forecasting of the series is continues rising during the forecast period. Figure 11 and figure 12 shows that graphical presentations of forecasted data and actual data of coffee production and yield. The software has named the estimated

series as PRODUCTION F and YIELD F, and graph shows the predicted values of the series from is observations (2023 to 2035) with $\pm 2^*$ Standard Errors Production and Productivity (with Standard Error)

Table 6 Forecast Value of Coffee Production Yield					Yield	Yield		
Year	Production Forecast Value (Lakh tonnes)	Production (Upper limit)	Production (Lower limit)	Std. Error	Forecast Value (Kg/Hat.)	(Kg/Hectare) (Upper limit)	(Kg/Hectare) (Lower limit)	Std. Error
			2504.04	487.62	821.27	1082.52	560.02	130.0
2022-23	3479.28	4454.53	2504.04	c10.23	834.26	1093.61	574.89	-50.62
2023-24	3639.35	4660.01	2618.69	510.55	020.25	1173 73	502.77	129.68
2024-25	3655.42	5012.25	2298.60	678.41	838.25	1110.10	502.77	167.74
202120	2841.02	5300.86	2382.99	729.47	842.69	1185.32	500.07	171.31
2025-26	3841.92	5502.16	2229.89	818.07	847.16	1197.12	497.20	174.98
2026-27	3866.03	5502.10	2227107	004 67	851.66	1209.14	494.17	179.70
2027-28	4036.38	5845.71	2227.04	904.01	056 17	1221.37	490.08	110.14
2028-29	4100.34	6029.62	2171.07	964.64	850.17	122107	170.70	182.59
2029-30	4236.43	6389.11	2083.75	1076.34	860.71	1233.79	487.62	186.54
2020 21	4346 67	6618.15	2075.18	1135.74	865.28	1246.44	484.12	190.58
2030-51	4540.07	6059.84	1948 07	1252.69	869.86	1259.27	480.45	194.70
2031-32	4453.45	0938.84	1940.07	1224 44	874 48	1272.30	476.64	109.02
2032-33	45977.62	7246.50	1948.73	1324.44	0/4.40			170.92
2033-34	4692.91	7562.52	1823.30	1434.80	879.11	1285.54	472.69	203.21
034-35	4851.98	7900.06	1803.90	1524.04	883.78	1298.97	468.56	207.5

Source: Authors calculation using EVies12

Conclusion

In present study, coffee production and yield forecasting in India were studied, and we found that ARIMA (2, 1, 1) for production and ARIMA (0, 1, 3) for yield found to best fit models for projection of coffee production and yield in India and both models are show a positive, and continues rising trend in forecasting period. The model is valid and adequate to predict coffee production and yield. The results obtained prove that this model can be used for modelling and forecasting future demand of total coffee production. However, these results will provide experts in the agricultural sector to make decisions about future demands, and hence the results can be used by authorities to update their planning and management. This will reduce the import cost and help us take right decisions regarding demand and supply of essential coffee.

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Conflict of Interest

Author's declared that there is no conflict of interest.

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Data availability statement

The required data used in this paper are available at Reserve bank of India (RBI) website: Reserve The required - Database (rbi.org.in) and the office of the Department of Agriculture & Farmers, Welfare Ministry of Agriculture & Farmers Welfare, Government of India.

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Government Expenditure of Social Sectors and Its Impact on the Economic Growth of Chhattisgarh

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Government Expenditure of Social Sectors and its impact on the Economic Growth of Chhattisgarh

Abstract

Vikram* Pragati Krishnan** Ravindra K Brahme ***

Since the 19th century, the liaison between economic growth and government spending has been explored, debated and discussed by many. Social sector expenditures, including education, health, shelter, nutrition and social protection/social security, are productive. The establishment and enhancement of social security systems by governments and access to basic social services for all should form an important component of policies for social development. The aim of the present study is to make an empirical study of the relationship between government expenditures on social sectors of Chhattisgarh at disaggregated level and Gross State Domestic Product (GSDP) during a twenty three time period (2000-21 to 2022-23). The study highlights the existence of a long-term relationship among GSDP, education expenditure, and health expenditure, emphasizing the interdependence and equilibrium among these variables despite their individual non-stationary behavior. The Vector Error Correction Model (VECM) employed captures both the long-term equilibrium relationships and shortterm adjustments among these factors, providing a nuanced understanding of their dynamics. The study's implications offer a strategic roadmap for policymakers in Chhattisgarh. Keywords: Cointegration, gross state domestic product, public expenditure, social sectors, unit roots

Introduction

Since the 19th century, the liaison between economic growth and government spending has been explored, debated and discussed by many (Wagner, 1883; Keynes, 1936; Ram, 1986; and so on). Accordingly, in a country, the government spending either is being stimulated due to increase in the economic activities or it stimulates the economic activities (Bhavsar & Samanta, 2023). Over the years the economic activities of the government vis-à-vis public expenditure have grown both relatively and absolutely in all the states of the Indian union. A predominant objective of public expenditure policy is sustained and equitable economic growth. Public expenditures have played an important role in physical and human capital formation over a period of time. Appropriate public expenditures can also be effective in boosting economic growth even in the short run. Therefore, the effect of public expenditure on economic growth may be a comprehensive indicator of public expenditure productivity. The two components of such an indicator should be measureable: the contribution of public expenditures to economic growth, and the efficiency with which these expenditures yield their output (Lhoungu, et al, 2016). Jaman (2019) opined that Social sector expenditures, including education, health, shelter, nutrition and social protection/social security, are productive. The establishment and enhancement of social security systems by governments and access to basic social services for all should form an important component of policies for social development. The aim of the present study is to make an empirical study of the relationship between government expenditures on social sectors of Chhattisgarh at disaggregated level and Gross State Domestic Product (GSDP) during a twenty three time period (2000-21 to 2022-23).

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The Indian Economic Journal

Vol.4, No.39; Dec-2023

Bibliometric analysis on Public Expenditure and Economic Growth

Vikram* Pragati Krishnan** <u>Ravindra K B</u>rahme ***

Over the past decade and a half, a substantial volume of empirical research has been directed towards identifying the elements of public expenditure (at its aggregate and disaggregate levels) that bear significant association with economic growth. A large body of empirical research supports the notion that healthy budgetary balances are, over the long run, good for growth. Henceforth, the principal threshold of the paper is to exhibit a sketch on the work done on Public Expenditure and Economic growth" through its bibliometric analysis. Therefore, the paper highlights a descriptive-quantitative analysis of the concept of Public Expenditure and Economic Growth and SciVerse Scopus was used to collect the research publications on it. The results of the study show that the top two relevant sources are the Sustainability (Switzerland) and Applied Economics which published 9 and 8 articles most contributing authors, the Author Magazzino C, Minea A, Sasmal J and Villieu P has the highest h-index and g-index of 4. Further the word cloud results emphasised that economic growth is the predominant word followed by public spending, fiscal policy, economic development, expenditure etc.

Keywords: Bibliometric analysis, economic growth, education, health, public expenditure, fiscal policy, SOCPUS.

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However, the impact on the level of variables (output, capital stock, labour, etc.) is permanent. Further, the model also provides a conditional solution to the 'second' Harrod knife-edge problem: the destabilising behaviour of firms (as they adjust their investment decisions to the discrepancy between the actual and the normal rates of capacity utilisation) is now required to achieve the normal rate of capacity utilisation.

Abstract

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छत्तीसगढ राज्य में सार्वजनिक ब्यय का स्वास्थ्य पर प्रभाव का अध्ययन

अर्चना सेठी^{1*}, मेघा डडसेना²

^{1,2}अर्थशास्त्र अध्ययनशालाए, पं रविशंकर शुक्ल विश्वविद्यालय रायपुर

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सारांश

कुल सार्वजनिक व्यय में स्वास्थ्य पर व्यय के प्रतिशत में उतार—चढ़ाव की प्रवृत्ति देखने को मिलती है एवं अध्ययन अवधि के अंत में दोनो में सकल राज्य घरेलु उत्पाद (जी.एस.डी.पी.) तथा कुल सार्वजनिक व्यय में वृद्वि हो रही है। है। जिसमें वर्ष 2001–02 में GSDP में 25846.2 करोड़ रूपये है। राज्य में कुल सार्वजनिक व्यय 5471.5 करोड़ रूपये किया गया। सकल राज्य घरेलू उत्पाद के प्रतिशत के रुप में सार्वजनिक व्यय सर्वाधिक 26.1 प्रतिशत 2018.19 में है एवं सबसे कम 2015.16 में 19.5 प्रतिशत है एवं अध्ययन अवधि के अंत में दोनो में सकल राज्य घरेलु उत्पाद (जी.एस.डी.पी.) तथा कुल सार्वजनिक व्यय में वृद्वि हो रही है। सकल राज्य घरेलु उत्पाद में औसत वार्शिक वृद्वि दर सर्वाधिक 32.4 प्रतिशत 2012.13 में ह एवं सबसे कम वृद्वि 2016.17 में 1.9 प्रतिशत है। सार्वजनिक व्यय में औसत वार्शिक वृद्वि दर सर्वाधिक 26.8 प्रतिशत 2006.07 में एवं सबसे कम 2020.21 में -3.6 प्रतिशत है। कुल सार्वजनिक व्यय एवं शिशु मृत्यु दर के बीच उच्च स्तर का ऋणात्मक सहसंबंध गुणांक-0.925 एवं कुल सार्वजनिक व्यय एवं मातृत्व मृत्यु दर के बीच उच्च स्तर का अट्रणात्मक सहसंबंध गुणांक - 0.941 हैं। जिससे स्पष्ट है कि कुल सार्वजनिक व्यय का स्वास्थ्य के घटकों पर सार्थक प्रभाव पड रहा है।

शब्द कूंजी :सार्वजनिक व्यय ,शिशु मृत्यु दर, मातृत्व मृत्यु दर

प्रस्तावना

स्वास्थ्य ही मनुष्य का असली धन है। अच्छे स्वास्थ्य के अन्तर्गत शारीरिक शक्ति, क्षमता और सहनश्शीलता तथा मानसिक सन्तुलन भी आता है। किसी भी राष्ट्र तथा समाज की उन्नती उसके नागरिकों के स्वास्थ्य पर निर्भर करता है। वहीं देश उन्नति के उच्च शिखर पर पहुँच सकता है जहाँ के निवासी स्वस्थ्य हो। छत्तीसगढ सरकार द्वारा सामाजिक सेवाओं पर किये गये सार्वजनिक व्यय का सार्थक एवं सकारात्मक प्रभाव मानव विकास के संकेतो पर पड़ रहा है। (Reddy& Reddy 2019) किसी भी कार्य को कुशलतापूर्वक करने के लिए व्यक्ति को शारीरिक एवं मानसिक रूप से स्वस्थ होना आवश्यक होता है। स्वस्थ व्यक्ति की कार्यक्षमता अधिक होती है तथा वह अपने सभी कार्यों को मन लगाकर कर सकता है। अस्वस्थ व्यक्ति अपने कार्यों से दूर भागता है अपने कार्यों को टालता रहता है। स्वास्थ्य लोगो की दक्षता तथा स्थिरता सुनिश्चित

करता है। (patra 2019)

अध्ययन का उद्देश्य

- 1. अध्ययन अवधि के दौरान छत्तीसगढ़ के शासन की सार्वजनिक व्यय का अध्ययन करना।
- छत्तीसगढ़ केश्शासन की सार्वजनिक व्यय का स्वास्थ्य के विभिन्न घटक शिशु मृत्यु दर एवं मातृत्व मृत्यु दर पर प्रभाव का अध्ययन करना।

अध्ययन की शोध प्रविधि : प्रस्तुत अध्ययन मुख्य रूप से द्वितीयक आंकड़ो पर आधारित है। शिक्षा एवं स्वास्थ्य पर किये जाने वाले सार्वजनिक व्यय तथा कुल पंजीयन दर, ड्राप आउट दर तथा शिशु मृत्यु दर एवं मातृत्व मृत्यु दर से सम्बंधित आंकड़ो को राज्य सरकार द्वारा प्रकाशित छत्तीसगढ़ का आर्थिक सर्वेक्षण एवं राज्य की जनगणना रिपोर्ट से एकत्रित किया गया है।

आंकडों के विश्लेषण के लिए प्रतिशत, औसत वार्षिक विकास दर, विचरण गुंणांक,सहसंबंध गुणांक एवं प्रतीपगमन गुणांक का प्रयोग किया गया है।

अध्ययन की परिकल्पना

Ho: सार्वजनिक व्यय का स्वास्थ्य स्तर के विभिन्न संकेतकों पर सार्थक प्रभाव नहीं पड़ा है। H1: सार्वजनिक व्यय का स्वास्थ्य स्तर के विभिन्न संकेतकों पर सार्थक प्रभाव पड़ा है।

Econometric modelling and forecasting of groundnut production and productivity in India using ARIMA Model

Ram Prasad Chandra * Ravindra Brahme **

ABSTRACT

Groundnut is the largest oilseed produced in the world and stands third largest oilseed in India. The aim of this study was to model groundnut production and yield in India, using data from the period 1970-71 to 2021-22 in India an effort to forecast groundnut production and productivity amounts between the years 2022-23 to 2039-40 by using Autoregressive Integrated Moving Average (ARIMA) models. The Box Jenkins ARIMA methodology has been used for forecasting. The diagnostic checking has shown that ARIMA (0, 1, 2) and ARIMA (0, 1, 2), is the most appropriate model among twenty studied ARIMA models; and so for forecasted the groundnut production and yield amounts for the next 18 years. We forecasted that annual amount of groundnut production and yield obtained in the year 2022-23 was 93.136 lakh tonnes and 1850.777 kg/hectare respectively, and it reached to 119.459 lakh tonnes and 2488.912 kg/hectare respectively in the year 2039-40 with a significant acceleration for groundnut production and yield. Forecasting results of the ARIMA (0, 1, 2) and (0, 1, 2) illustrated an increasing trend in the amount of groundnut production & yield, and they might help to determine a better policy for increasing groundnut production in India.

Keyword: Groundnut, Forecasting, ARIMA, AIC, BIC, GPY

JEL Code: C12, C22, C52. C53

INTRODUCTION

Agriculture is back bone of the Indian Economy. Groundnut is the largest oilseed produced in the world and stands third largest oilseed in India. Groundnut is important oilseeds crop and oil content material of the seed varies from 44-50%, relying on varieties and agronomic conditions. Groundnut is additionally of price as a rotation crop (Mohapatra et al., 2018; Kumar et al., 2020). India is one of the second largest producers of oilseeds in the world and occupies an important position in the Indian agricultural economy. It is one of the most important food and cash crops of our country. While being a valuable source of all the nutrients, it is a low-priced commodity. Groundnut is also called as wonder nut and poor men's cashew nut. Groundnut is one of the most important cash crops of our country. It is a low-priced commodity but a valuable source of all the nutrients. The major groundnut producing countries in the world are India, China, Nigeria, Senegal, Sudan, Burma and the United States of America (Borkar, 2016; Saranyadevi, 2022). It is estimated that nine oilseeds namely groundnut, rapeseed-mustard, soybean, sunflower, safflower, sesame, Niger, castor and linseed, accounted for an area of 28.8 million hectares with the production of 35.9 million tonnes and yield 1247 kg/ht. in FY 2020-21 and in which groundnut cultivated area 6.01 million hectares, production 10.2 million tonnes and yield 1703 kg/ht. in FY 2020-21.

Attention has been given to the univariate time series Auto-Regressive Integrated Moving Average (ARIMA) Models, which is principally due to World of Box and Jenkins. Yule and Walker proposed the Autoregressive Moving Average (ARMA) model, and Box and Jenkins proposed the method (ARIMA) model afterward (Box and Jenkins, 1976; Saranyadevi, 2022). Among the stochastic ARIMA types are robust, effective and famous as they can correctly describe the found facts and can make forecasts with minimum forecast error (Aarekar and Reddy, 2017; Hemavathi and Prabakaran, 2018).

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Econometric modelling and forecasting of groundnut production and productivity in India using ARIMA Model

Ram Prasad Chandra * Ravindra Brahme **

ABSTRACT

Groundnut is the largest oilseed produced in the world and stands third largest oilseed in India. The aim of this study was to model groundnut production and yield in India, using data from the period 1970-71 to 2021-22 in India an effort to forecast groundnut production and productivity amounts between the years 2022-23 to 2039-40 by using Autoregressive Integrated Moving Average (ARIMA) models. The Box Jenkins ARIMA methodology has been used for forecasting. The diagnostic checking has shown that ARIMA (0, 1, 2) and ARIMA (0, 1, 2), is the most appropriate model among twenty studied ARIMA models; and so for forecasted the groundnut production and yield amounts for the next 18 years. We forecasted that annual amount of groundnut production and yield obtained in the year 2022-23 was 93.136 lakh tonnes and 1850.777 kg/hectare respectively, and it reached to 119.459 lakh tonnes and 2488.912 kg/hectare respectively in the year 2039-40 with a significant acceleration for groundnut production and yield. Forecasting results of the ARIMA (0, 1, 2) and (0, 1, 2) illustrated an increasing trend in the amount of groundnut production & yield, and they might help to determine a better policy for increasing groundnut production in India.

Keyword: Groundnut, Forecasting, ARIMA, AIC, BIC, GPY

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Impact of Narva Scheme on Small Farmers of Chhattisgarh

Omprakash Vermas Pragati Krishnan*, Ravindra K Brahmers

Abstract

Indian agriculture is marked by the presence of millions of marginal and small-scale farmers who encounter significant challenges in managing the inherent risks associated with farming. Climate change plays an important role in agricultural production and the production of land crops, vegetables and fruits. Agricultural activities are done mainly by small and marginal farmers for livelihood Agriculture plays an important role in the Indian economy. Agriculture is a major contributor to the gross domestic product and also ranks first in terms of employment. The objective of the present study is to study the impact of Narva, Scheme on Small Farmers of Chhattisgarh. The results presented in table 1 reveals that merely 45.79% of respondents across various districts have access to irrigation facilities. Table 2 indicates a success rate of 75.09% in check dam construction, with Gariyaband exhibiting the lowest performance at 60.29%. Irrigation accounts for the majority of check dam applications at 71.83%, as indicated in Table 3, while secondary uses such as bathing or providing water for animals are minimal. Table 4 reveals a revival success rate of 75.09%, with Gariyaband showing a lower rate of 60.29%. The evaluation of irrigation systems, check dams, and the revitalization of water channels under the Narva Scheme indicates notable advancements, yet it also uncovers regional inequalities and opportunities for enhancement.

Keywords: Agriculture, Narva, small farmers, regional inequalities.

Introduction

Indian agriculture is marked by the presence of millions of marginal and small-scale farmers who encounter significant challenges in managing the inherent risks associated with farming. These risks stem from unpredictable weather patterns, inconsistent access to technology and natural resources. unreliable supply chains for inputs, strained infrastructure in both power and irrigation, and uncertain marketing conditions. Such factors contribute to a diminished bargaining power for Indian farmers in both input and output markets within the current economic landscape. (Singh, 2012) Climate change plays an important role in agricultural production and the production of land crops, vegetables and fruits. Agricultural activities are done mainly by small and marginal farmers for livelihood. Agriculture plays an important role in the Indian economy. Agriculture is a major contributor to the gross domestic product and also ranks first in terms of employment. Farmers' income has also increased due to agricultural production and it is also necessary to develop agriculture to promote exports. Development of agriculture is not only a major source of employment but also removes poverty. Most of the farmers in India are marginal and small farmers, hence promoting the development of sustainable agriculture will also boost food security.

Most of the population of Chhattisgarh is mainly dependent on agriculture. Agriculture is the main basis of livelihood of 80 percent of the population here. In Chhattisgarh there is the predominance of both the small and marginal farmers.

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Comparative Study of Gothans and Godhan Nyay Scheme in Chhattisgarh

Omprakash Verma* Pragati Krishnan** Ravindra K Brahme ***

Abstract Vermicomposting is one of the generating additional sources of income, economic empowerment, and Vermicom sustainable livelihood approach along with the already base vermicomposting is livelihood approach along with the already known environmental benefits, has assuring sustainable livelihood to be one of the most appropriate and successful and to be one of the most appropriate and successful a vering sustainable in powerine and g with the already known environmental benefits, has assuring newly found to be one of the most appropriate and successful models for the rural or not socio-been newly resourceful communities. Godhan Nyay Yojana was a successful models for the rural or not sociobeen newly found to be under the appropriate and successful models for the rural or not socio-been newly resourceful communities. Godhan Nyay Yojana was started in Chhattisgarh on 20 July economically resources the Hareli festival. This scheme of purchasing cow dung at Rs.2 per kg has become 2020, on the day of the practice of open grazing to a 2020, on the day of the scurbed the practice of open grazing cow dung at Rs.2 per kg has become very popular. This has curbed the practice of open grazing to a great extent. The scheme includes very popular. The scheme includes very popular, the environmental protection, increase in area under double crops, reduction in the cost of cleanliness through compost production, and promotion of environmental compost production in the cost of cleanliness and chrough compost production, and promotion of organic farming. The present study is about cultivation and sale of vermicompost and super compost and compost and super compost an cultivation through each of vermicompost and super compost under Gothan and Godhan Nyay Scheme the production and sale of secondary data; the findings of the the production and Godhan Nyay Scheme in Chhattisgarh. Based on secondary data; the findings of the study are Durg division has highest in Chhattisgani, (26.03%) in terms of vermicompost production, followed by Bilaspur (23.09%) and Raipur efficiency (20.001), Similarly, the efficiency of Gothan's in terms of super compost production (21.42%) respectively. Similarly, the efficiency (22.64%) of super compost production (21.42%) respectively likewise, the efficiency (23.64%) followed by Durg (21.96%) and Surguja (21.87%) respectively. Likewise, the efficiency of Gothan's in sale of vermicompost and super compost (21.8/7%) that Durg division stood first (26.27%) in terms of vermicompost sale followed by Bilaspur (23.38%) and Raipur (22.10%) respectively. Similarly, the efficiency of Gothan's in terms of super (25.3670) and shows that Raipur division has the highest efficiency (25.24%) followed by Surguja (20.52%) and Durg (19.61%) respectively.

Keywords : Gothan, Godhan Nyaya Scheme, super compost, vermi compost

I. Introduction

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Godhan Nyay Yojana was started in Chhattisgarh on 20 July 2020, on the day of the Hareli festival. This scheme of purchasing cow dung at Rs.2 per kg has become very popular. This has curbed the practice of open grazing to a great extent. The scheme includes cleanliness and environmental protection, increase in area under double crops, reduction in the cost of cultivation through compost production, and promotion of organic farming. In the state of Chhattisgarh, till July 31, 2022, under the Godhan Nyaya Yojana, a total of Rs 155 crore 58 lakhs has been paid to cattle rearers, villagers, and cow dung sellers in lieu of the purchase of 77 lakh 39 thousand quintals of cow dung. Rs 155.88 crore has been paid to Gothan committees and women's self-help groups. More than 2 lakh 11 thousand rural, cattle rearing farmers are being benefited from the Godhan Nyaya Yojana.

Status of Gothan and Godhan Nyay Yojna

The state government launched the scheme to increase the income of farmers. Main objective of Gothan is to promote organic compost, to reduce chemical fertilizer usage and improve soil health. Gothan is a highland near the village where village's animals are collected in the morning as part of the animal's daily sojourn of posturing.

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छत्तीसगढ के जिलो में मृत्यु दर का विश्लेषणात्मक अध्ययन

अर्चना सेठी

अर्थंशास्त्र अध्ययनशाला, पं रविशंकर शुक्ल विश्वविद्याालय,रायपुर, छत्तीसगढ़

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सारांश: छत्तीसगढ में स्वास्थ्य स्थिति बहुत खराब है। विश्व स्वास्थ्य संगठन के अनुसार 1000 ब्यक्तियों पर 1 डाक्टर की उपलब्धता प्राप्त करने में भारत को 6 वर्ष लगेगा और छत्तीसगढ को 18 वर्ष लगेगा। छत्तीसगढ में 2017 में शिशु मृत्यु दर 37प्रति हजार है अखिल भारत में यह 33 प्रति हजार है। बारहवीं पंचवर्षीय योजना में शिशु मृत्यु दर 25 प्रति हजार का लक्ष्य था जो प्राप्त नहीं हो सका। भारत में औसत जीवन प्रत्याशा 65.2 वर्ष है और छत्तीसगढ में 62.5 वर्ष है। जो अखिल भारतीय स्तर से काफी कम है। छत्तीसगढ में शिशु मृत्यु दर अखिल भारतीय स्तर से अधिक है। ग्रामीण क्षेत्र में शिशु मृत्यु दर शहरी क्षेत्र से अधिक है। ग्रामीण क्षेत्र में चिकित्सा सुविधाओं का अभाव है। बालिका वर्ग में शिशु मृत्यु दर अधिक हैं। बालिका वर्ग में शिशु मृत्यु दर अधिक होने का मुख्य कारण उसे जन्म से ही भाइयों से घटिया भोजन ,वस्त्र सुविधा,शिक्षा ,चिकित्सा,उपलब्ध होती है। छत्तीसगढ में मातृत्व मृत्यु दर अखिल भारतीय स्तर से अधिक है।

शब्द कूंजी : शिशु मृत्यु दर ,मातृत्व मृत्यु दर ,बाल मृत्यु दर ,नवजात शिशु मृत्यु दर ।

प्रस्तावना

मानव ज्ञान के विकास में मृत्यु ने महत्वपूर्ण भूमिका निभायी है। चिकित्सा शास्त्र का विकास मृत्यु पर विजय पाने के लिए किये गये परिश्रमों का परिणाम है। यद्यपि मृत्यु एक जीव की आयु की समाप्ति की स्वाभाविक प्रक्रिया है तथा यह जीव की एक अनिवार्य घटना भी है। किंतु दीर्घायु के उपरांत ही देहवासन स्वाभाविक लगता है। मृत्यु दरें किसी जनसंख्या में किसी निश्चित अवधि में मृतकों की संख्या एवं जनसंख्या का 1000 में ब्यक्त अनुपात है।

अध्ययन का उद्देश्य

- 1. छत्तीसगढ एवं छत्तीसगढ के जिलों में शिशु मृत्यु दर का अध्ययन करना।
- 2. छत्तीसगढ एवं छत्तीसगढ के जिलों में मातृत्व मृत्यु दर का अध्ययन करना।
- 3. छत्तीसगढ एवं छत्तीसगढ के जिलों में बाल मृत्यु दर का अध्ययन करना।
- 4. छत्तीसगढ एवं छत्तीसगढ के जिलों में नवजात शिशु मृत्यु दर एवं जन्म के बाद शिशु मृत्यु दर का अध्ययन करना।

अध्ययन पद्धति

प्रस्तुत अध्ययन द्वितीयक समंकों पर आाधारित है। अध्ययन हेतु छत्तीसगढ की जनांकिकी एवं आर्थिक सर्वे 2019..20 से समंक लिया गया है।

अध्ययन का महत्व

मृत्यु दर संबंधी सुचनायें किसी समाज में उपलब्ध स्वास्थ्य सेवाओं पर प्रकाश डालता है। मृत्यु दर संबंधी सुचनाओं से अनाथों की संभावना का पूर्वानुमान आसानी से लगाया जा सकता है। मृत्यु दर संबंधी सुचनायें जीवन प्रत्याशा को प्रभावित करता है। मृत्यु दर जन्म दर को भी प्रभावित करता है। मृत्यु दर के अध्ययन से किसी देश की श्रमशक्ति का ज्ञान होता है। मृत्यु दर किसी देश की सभ्यता का सर्वोत्कृण्ट माप हैं। जिस देश की मृत्यु दर निम्नतम होती है वहां जीवन प्रत्याशा अधिक होती है। जिस देश की जीवन प्रत्याशा अधिक होती है वह देश उतना ही सभ्य होता है।

शोध साहित्य का अध्ययन

सोनेकर,सेठी एवं चंद्रा 2019 इन्होंने अपने अध्ययन में बताया कि छत्तीसगढ में शिशु मृत्यु दर एवं मातृत्व मृत्यु दर भारत की तुलना में अधिक है। इसका कारण स्वास्थ्य पर अपेक्षाकृत कम ब्यय करना है। 2018.19 में छत्तीसगढ मे सकल राज्य घरेलू उत्पाद का 1.68 प्रतिशत एवं सार्वजनिक ब्यय का 1.91 प्रतिशत ब्यय किया गया था। कृष्णा नंद यादव 2019 इन्होंने अपने अध्ययन में बताया कि पर्यावरण क्षति के कारण मानव के स्वास्थ्य पर विपरीत प्रभाव पडता है। इसके कारण आयु प्रत्याशा कम होती है एवं शिशु मृत्यु दर एवं मातृत्व मृत्यु दर में वृद्धि होती है। किरण कुमारी 2019 इन्होंने अपने अध्ययन में बताया कि पर्यावरण स्वास्थ्य को प्रभावित करने वाले तत्वों में प्रमुख है। बढती जनसंख्या,औद्योगीकरण ,नगरीकरण ने पर्यावरण को प्रदूषित किया है। अच्छे स्वास्थ्य के लिए यह आवश्यक है कि पर्यावरण की रक्षा की जाये। ए.तिवारी 2017 इन्होंने अपने अध्ययन में बताया कि मानव आधुनिक आविष्कारों के कारण भौति उपकरणों का गुलाम हो गया है। इन उपकरणों में मोबाइल फोन मुख्य है। मोबाइल फोन एक लघु उपकरण है लेकिन मगर कार्य करने के लिए उन सूक्ष्म तरंगों को अवशोषित करता है जो मानव हडडी को भेद सकता है। मोबाइल फोन आंतरिक अंगों के साथ वाह्य अंगों को भी प्रभावित करता है। जिससे मानव का स्वास्थ्य प्रभावित होता है। International J. Advances in Social Sciences 11(4): October - December 2023

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RESEARCH ARTICLE

भारतीय नई कृषि नीति (Indian New Agricultural Policy)

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ABSTRACT:

भारत सरकार की कृषि नीति कैसी होनी चाहिए, यह इस बात पर निर्भर करता है कि कृषि विकास के किस चरण में है। इस समय सरकार को कृषि के आधुनिक साधनों की आपूर्ति पर बल देना चाहिए। नई कृषि विधेयक सकारात्मक थे किसान अपनी उपज कहीं भी बेंच सकेंगे अभी राज्य के कानून पर निर्भर है। इन बिलों के आने से राज्य अपना कमीशन और मंडी शुल्क खो देंगे। लेकिन किसानों को डर था कि इससे सरकार द्धारा गाारंटीयुक्त न्यूनतम समर्थन मूल्य समाप्त हो जायेगा, जिससे उन्हें अपनी फसलों के लिए प्राप्त होने वाली कीमतें कम हो जायेगी। जिससे किसानों ने इन अधिनियमों के खिलाफ प्रदर्शन किया। भारत के सर्वोच्च न्यायालय ने जनवरी 2021 में कृषि कानूनों के कार्यान्वयन पर रोक लगा दी।

KEYWORDS: कृषि नीति, न्यूनतम समर्थन मूल्य, प्रति हेक्टेअर आय।

प्रस्तावनाः –

कृषि नीति का अर्थ कृषि के सर्वांगींण विकास करने से है। कृषि नीति कृषि उत्पादन में वृद्धि एवं किसानों के जीवन स्तर को उठाने की नीति है। भारत की अधिकांश जनसंख्या कृषि में संलग्न है, लेकिन उचित नीति के अभाव में वे निम्न जीवन जीने को मजबूर हैं। उचित कृषि नीति के क्रियान्वयन से भारतीय कृषि की दशा सुधारी जा सकती है।

अध्ययन का उददेश्य OBJECTIVE OF STUDY

- 1. भारतीय कृषि नीति का अध्ययन करना।
- 2. कृषि विधेयकों का अध्ययन करना।

इस समय सरकार को कृषि के आधुनिक साधनों की आपूर्ति पर बल देना चाहिए। इस उददेश्य की आपूर्ति के लिए सरकार को न केवल देश में उत्पादन की ब्यवस्था करनी चाहिए वरन आवश्यकतानुसार इसे देश के बाहर से आयात भी करना चाहिए। साथ ही सरकार को इनके प्रयोग करने के लिए किसानों को International J. Advances in Social Sciences 11(4): October - December 2023

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RESEARCH ARTICLE

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KEYWORDS: कृषि नीति, न्यूनतम समर्थन मूल्य, प्रति हेक्टेअर आय।

प्रस्तावनाः –

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प्रतिषत जनजाति संतुष्ट नहीं है एवं 20.95 प्रतिषत जनजाति मध्यस्थ से संतुष्ट है एवं काई स्कवेयर परीक्षण से परिकत



छत्तीसगढ के जिलो में मृत्यु दर का विश्लेषणात्मक अध्ययन

<mark>अर्चना सेठी</mark>

अर्थशास्त्र अध्ययनशाला, पं रविशंकर शुक्ल विश्वविद्यालय,रायपुर, छत्तीसगढ़

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सारांश: छत्तीसगढ में स्वास्थ्य स्थिति बहुत खराब है। विश्व स्वास्थ्य संगठन के अनुसार 1000 ब्यक्तियों पर 1 डाक्टर की उपलब्धता प्राप्त करने में भारत को 6 वर्ष लगेगा और छत्तीसगढ को 18 वर्ष लगेगा। छत्तीसगढ में 2017 में शिशु मृत्यु दर 37प्रति हजार है अखिल भारत में यह 33 प्रति हजार है। बारहवीं पंचवर्षीय योजना में शिशु मृत्यु दर 25 प्रति हजार का लक्ष्य था जो प्राप्त नहीं हो सका। भारत में औसत जीवन प्रत्याशा 65.2 वर्ष है और छत्तीसगढ में 62.5 वर्ष है। जो अखिल भारतीय स्तर से काफी कम है। छत्तीसगढ में शिशु मृत्यु दर अखिल भारतीय स्तर से अधिक है। ग्रामीण क्षेत्र में शिशु मृत्यु दर शहरी क्षेत्र से अधिक है। ग्रामीण क्षेत्र में चिकित्सा सुविधाओं का अभाव है। बालिका वर्ग में शिशु मृत्यु दर अधिक हैं। बालिका वर्ग में शिशु मृत्यु दर अधिक होने का मुख्य कारण उसे जन्म से ही भाइयों से घटिया भोजन ,वस्त्र सुविधा,शिक्षा ,चिकित्सा,उपलब्ध होती है। छत्तीसगढ में मातृत्व मृत्यु दर अखिल भारतीय स्तर से अधिक है।

शब्द कूंजी : शिशु मृत्यु दर ,मातृत्व मृत्यु दर ,बाल मृत्यु दर ,नवजात शिशु मृत्यु दर ।

प्रस्तावना

मानव ज्ञान के विकास में मृत्यु ने महत्वपूर्ण भूमिका निभायी है। चिकित्सा शास्त्र का विकास मृत्यु पर विजय पाने के लिए किये गये परिश्रमों का परिणाम है। यद्यपि मृत्यु एक जीव की आयु की समाप्ति की स्वाभाविक प्रक्रिया है तथा यह जीव की एक अनिवार्य घटना भी है। किंतु दीर्घायु के उपरांत ही देहवासन स्वाभाविक लगता है। मृत्यु दरें किसी जनसंख्या में किसी निश्चित अवधि में मृतकों की संख्या एवं जनसंख्या का 1000 में ब्यक्त अनुपात है।

अध्ययन का उद्देश्य

- 1. छत्तीसगढ एवं छत्तीसगढ के जिलों में शिशु मृत्यु दर का अध्ययन करना।
- 2. छत्तीसगढ एवं छत्तीसगढ के जिलों में मातृत्व मृत्यु दर का अध्ययन करना।
- 3. छत्तीसगढ एवं छत्तीसगढ के जिलों में बाल मृत्यु दर का अध्ययन करना।
- 4. छत्तीसगढ एवं छत्तीसगढ के जिलों में नवजात शिशु मृत्यु दर एवं जन्म के बाद शिशु मृत्यु दर का अध्ययन करना।

अध्ययन पद्धति

प्रस्तुत अध्ययन द्वितीयक समंकों पर आाधारित है। अध्ययन हेतु छत्तीसगढ की जनांकिकी एवं आर्थिक सर्वे 2019..20 से समंक लिया गया है।

अध्ययन का महत्व

मृत्यु दर संबंधी सुचनायें किसी समाज में उपलब्ध स्वास्थ्य सेवाओं पर प्रकाश डालता है। मृत्यु दर संबंधी सुचनाओं से अनाथों की संभावना का पूर्वानुमान आसानी से लगाया जा सकता है। मृत्यु दर संबंधी सुचनायें जीवन प्रत्याशा को प्रभावित करता है। मृत्यु दर जन्म दर को भी प्रभावित करता है। मृत्यु दर के अध्ययन से किसी देश की श्रमशक्ति का ज्ञान होता है। मृत्यु दर किसी देश की सभ्यता का सर्वोत्कृण्ट माप हैं। जिस देश की मृत्यु दर निम्नतम होती है वहां जीवन प्रत्याशा अधिक होती है। जिस देश की जीवन प्रत्याशा अधिक होती है वह देश उतना ही सभ्य होता है।

शोध साहित्य का अध्ययन

सोनेकर,सेठी एवं चंद्रा 2019 इन्होंने अपने अध्ययन में बताया कि छत्तीसगढ में शिशु मृत्यु दर एवं मातृत्व मृत्यु दर भारत की तुलना में अधिक है। इसका कारण स्वास्थ्य पर अपेक्षाकृत कम ब्यय करना है। 2018.19 में छत्तीसगढ मे सकल राज्य घरेलू उत्पाद का 1.68 प्रतिशत एवं सार्वजनिक ब्यय का 1.91 प्रतिशत ब्यय किया गया था। कृष्णा नंद यादव 2019 इन्होंने अपने अध्ययन में बताया कि पर्यावरण क्षति के कारण मानव के स्वास्थ्य पर विपरीत प्रभाव पडता है। इसके कारण आयु प्रत्याशा कम होती है एवं शिशु मृत्यु दर एवं मातृत्व मृत्यु दर में वृद्धि होती है। किरण कुमारी 2019 इन्होंने अपने अध्ययन में बताया कि पर्यावरण स्वास्थ्य को प्रभावित करने वाले तत्वों में प्रमुख है। बढती जनसंख्या,औद्योगीकरण ,नगरीकरण ने पर्यावरण को प्रदूषित किया है। अच्छे स्वास्थ्य के लिए यह आवश्यक है कि पर्यावरण की रक्षा की जाये। ए.तिवारी 2017 इन्होंने अपने अध्ययन में बताया कि मानव आधुनिक आविष्कारों के कारण भौति उपकरणों का गुलाम हो गया है। इन उपकरणों में मोबाइल फोन मुख्य है। मोबाइल फोन एक लघु उपकरण है लेकिन मगर कार्य करने के लिए उन सूक्ष्म तरंगों को अवशोषित करता है जो मानव हडडी को भेद सकता है। मोबाइल फोन आंतरिक अंगों के साथ वाह्य अंगों को भी प्रभावित करता है। जिससे मानव का स्वास्थ्य प्रभावित होता है।



छत्तीसगढ राज्य में सार्वजनिक ब्यय का स्वास्थ्य पर प्रभाव का अध्ययन

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सारांश

कुल सार्वजनिक व्यय में स्वास्थ्य पर व्यय के प्रतिशत में उतार—चढ़ाव की प्रवृत्ति देखने को मिलती है एवं अध्ययन अवधि के अंत में दोनो में सकल राज्य घरेलु उत्पाद (जी.एस.डी.पी.) तथा कुल सार्वजनिक व्यय में वृद्वि हो रही है। है। जिसमें वर्ष 2001–02 में GSDP में 25846.2 करोड़ रूपये है। राज्य में कुल सार्वजनिक व्यय 5471.5 करोड़ रूपये किया गया। सकल राज्य घरेलू उत्पाद के प्रतिशत के रुप में सार्वजनिक व्यय सर्वाधिक 26.1 प्रतिशत 2018.19 में है एवं सबसे कम 2015.16 में 19.5 प्रतिशत है एवं अध्ययन अवधि के अंत में दोनो में सकल राज्य घरेलु उत्पाद (जी.एस.डी.पी.) तथा कुल सार्वजनिक व्यय में वृद्वि हो रही है। सकल राज्य घरेलु उत्पाद में औसत वार्शिक वृद्वि दर सर्वाधिक 32.4 प्रतिशत 2012.13 में ह एवं सबसे कम वृद्वि 2016.17 में 1.9 प्रतिशत है। सार्वजनिक व्यय में औसत वार्शिक वृद्वि दर सर्वाधिक 26.8 प्रतिशत 2006.07 में एवं सबसे कम 2020.21 में -3.6 प्रतिशत है। कुल सार्वजनिक व्यय एवं शिशु मृत्यु दर के बीच उच्च स्तर का ऋणात्मक सहसंबंध गुणांक-0.925 एवं कुल सार्वजनिक व्यय एवं मातृत्व मृत्यु दर के बीच उच्च स्तर का ऋणात्मक सहसंबंध गुणांक - 0.941 है। जिससे स्पष्ट है कि कुल सार्वजनिक व्यय का स्वास्थ्य के घटकों पर सार्थक प्रभाव पड रहा है।

शब्द कूंजी :सार्वजनिक व्यय ,शिशु मृत्यु दर, मातृत्व मृत्यु दर

प्रस्तावना

स्वास्थ्य ही मनुष्य का असली धन है। अच्छे स्वास्थ्य के अन्तर्गत शारीरिक शक्ति, क्षमता और सहनश्शीलता तथा मानसिक सन्तुलन भी आता है। किसी भी राष्ट्र तथा समाज की उन्नती उसके नागरिकों के स्वास्थ्य पर निर्भर करता है। वहीं देश उन्नति के उच्च शिखर पर पहुँच सकता है जहाँ के निवासी स्वस्थ्य हो। छत्तीसगढ सरकार द्वारा सामाजिक सेवाओं पर किये गये सार्वजनिक व्यय का सार्थक एवं सकारात्मक प्रभाव मानव विकास के संकेतो पर पड़ रहा है। (Reddy& Reddy 2019) किसी भी कार्य को कुशलतापूर्वक करने के लिए व्यक्ति को शारीरिक एवं मानसिक रूप से स्वस्थ होना आवश्यक होता है। स्वस्थ व्यक्ति की कार्यक्षमता अधिक होती है तथा वह अपने सभी कार्यों को मन लगाकर कर सकता है। अस्वस्थ व्यक्ति अपने कार्यों से दूर भागता है अपने कार्यों को टालता रहता है। स्वास्थ्य लोगो की दक्षता तथा स्थिरता सुनिश्चित

करता है। (patra 2019)

अध्ययन का उद्देश्य

- 1. अध्ययन अवधि के दौरान छत्तीसगढ़ के शासन की सार्वजनिक व्यय का अध्ययन करना।
- छत्तीसगढ़ केश्शासन की सार्वजनिक व्यय का स्वास्थ्य के विभिन्न घटक शिशु मृत्यु दर एवं मातृत्व मृत्यु दर पर प्रभाव का अध्ययन करना।

अध्ययन की शोध प्रविधि : प्रस्तुत अध्ययन मुख्य रूप से द्वितीयक आंकड़ो पर आधारित है। शिक्षा एवं स्वास्थ्य पर किये जाने वाले सार्वजनिक व्यय तथा कुल पंजीयन दर, ड्राप आउट दर तथा शिशु मृत्यु दर एवं मातृत्व मृत्यु दर से सम्बंधित आंकड़ो को राज्य सरकार द्वारा प्रकाशित छत्तीसगढ़ का आर्थिक सर्वेक्षण एवं राज्य की जनगणना रिपोर्ट से एकत्रित किया गया है।

आंकडों के विश्लेषण के लिए प्रतिशत, औसत वार्षिक विकास दर, विचरण गुंणांक,सहसंबंध गुणांक एवं प्रतीपगमन गुणांक का प्रयोग किया गया है।

अध्ययन की परिकल्पना

Ho: सार्वजनिक व्यय का स्वास्थ्य स्तर के विभिन्न संकेतकों पर सार्थक प्रभाव नहीं पड़ा है। H1: सार्वजनिक व्यय का स्वास्थ्य स्तर के विभिन्न संकेतकों पर सार्थक प्रभाव पड़ा है। See discussions, stats, and author profiles for this publication at: https://www.researchgate.net/publication/390324615

A Study on Economic Status and Constraints of Handicraft Artisans in Chhattisgarh

Article · March 2025

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A Study on Economic Status and Constraints of Handicraft Artisans in Chhattisgarh

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Abstract- The handicrafts are an important source of income for rural areas. Handicrafts hold enormous potential as they are essential to both the millions of artisans who already exist in the country and the growing number of newcomers entering the craft sector. The handicraft sector faces many challenges to cope with the current economic environment due to the advancement and development of technology. The present study examines the key marketing and financial constraints faced by handicraft artisans in Bastar and Kondagaon districts of Chhattisgarh. With the decline in demand and sales of handicraft products, artisans' incomes are also falling, forcing them to take up additional income-generating work by artisans. This study also attempts to identify the other sources of income as artisans in Bastar and Kondagaon districts of Chhattisgarh state. The study is based on primary data collected from 120 handicraft artisans of Bastar and Kondagaon districts of Chhattisgarh state.

Keywords: Handicraft, Artisans, Marketing Constraints, Financial Constraints, Source of Income.

INTRODUCTION

The handicrafts market will witness remarkable growth with an expected CAGR of 8.87 during 2022-2027. This growth is expected to increase the market size by \$407.15 billion. Several factors, including the need for reduced capital investment, increased travel and tourism, and greater government support and funding, play a key role in the future of the craft. In this comprehensive analysis, we examine the key marketing constraints faced by artisans in Bastar and Kondagaon districts of Chhattisgarh. Before the British era, the trade of artisans was flourishing, the sales of their products were also high and their socio-economic situation was also very good. Handicrafts were their only source of income, and the artisans generally devoted their entire working time to producing handicrafts. However, during the British era and the Industrial Revolution around the world, crafts lost their

identity and importance, resulting in a decline in demand for their handicraft products, resulting in low sales and therefore low production and income. Therefore, during this time, the artisans start looking for a new source of income in order to survive. The present study also tries to find out the source of income other than of handicraft artisans of Bastar and Kondagaon district of Chhattisgarh state. An important factor of the handicraft market is the minimum capital investment required to start a handicraft business. The handicrafts market faces a significant challenge in the form of a lack of managerial capabilities among manufacturers. Many handicraft producers often lack essential managerial skills, including workplace management, market research, inventory control, and sales promotion. This deficiency poses a barrier to the promotion of artisan handicrafts. Access to business development service providers (BDSPs) is limited for handicraft manufacturers, as they frequently operate on tight budgets and in isolation from urban businesses. This lack of access to managerial resources, coupled with a shortage of understanding regarding the needs of foreign exporters, constrains market growth during the forecast period.

1.1 Review of Literatures

Kumar, Dilip and PV, Rajeev (2014) Marketing Challenges of Handicraft Retailers in Changing Environment: - The article is divided into five parts, with the first part discussing the importance of craftsmanship and marketing in the changing environment of the retail industry and covering various aspects of retail stores. Upadhyay, Manali and Jain, U.C. (2018) Managerial Challenges of Handicraft Industry: An Indian Perspective: - The article throws light on the problem and different issues related to handicraft industries and marketing challenges in India. crafts have huge potential as it is important to maintain the existing pool of million artisans across the country. The craft sector plays an

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Trade of Handicraft Products through E-commerce in Bastar District of Chhattisgarh: Issues and Challenges

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Abstract

The handicrafts are an important source of income for rural areas. It employs more than six million artisans, including many women and members of socially disadvantaged groups. Today, craftsmanship contributes significantly to exports and job creation. The craft holds enormous potential as it is vital to both the millions of artisans already in the country and the growing number of newcomers entering the craft industry. Each handcrafted item has a story that tells the craftsman's inspiration or enthusiasm in making it. This study is based only on primary data collected from the artisans of Bastar districts of Chhattisgarh. The study attempted to determine the level of digitalization of handicrafts in Bastar district and the challenges faced by artisans in adopting modern technology and e-commerce for trade.

Keywords: Handicraft, Artisans, Ecommerce, Trading, Challenges, Digitalization. **1. Introduction**

There was a time when traditional crafts flourished, but today they are threatened with

Status of Indian Handicrafts: Challenges and Opportunities in the Global Economy

Archana Sethi

Abstract

India is the center of handicrafts and a nation rich in ethnic customs and cultural heritage. India's handicraft industry is an unorganized, decentralized, and labour-intensive business. Because of its high percentage of value addition, minimal capital investment, and great potential for export and foreign exchange gains, the handicraft industry is extremely important to the economy. Over the past several decades, India's economy and society have undergone significant development. In India, the handicraft industry is a very labour-intensive, disorganized, and decentralized sector. The handicraft industry contributes significantly to the export economy, is the second-largest employer after agriculture. Additionally, in order to give the strategic direction and action plans for system evolution, like-minded institutions must collaborate. Protocols and standards pertaining to design, the market, technology. "India needs to focus on the flowering of arts, science, and literature," stated **Paul and Ruth Mc Cracken and Professor C. K. Prahalad**. The goal is for India to become the global standard for handling diversity. It may end up serving as a standard for inclusivity and universality. Subsidies are not the goal of inclusive growth. The goal is to provide long-lasting opportunities.

Key words: Handicrafts, Disorganized, Decentralized, Sustainable Growth

Introduction

India is the center of handicrafts and a country rich in ethnic customs and cultural heritage. India's cultural diversity produces a wide range of exquisite handicrafts. Handicrafts, made with local materials and craft skills, are a distinctive aspect of a given culture. In India, the handicraft industry is a very labour-intensive, disorganized, and decentralized sector. The handicraft industry contributes significantly to the export economy, is the second-largest employer after agriculture, and is essential to economic growth. Products made entirely by hand or with the use of hand tools are referred to as handicrafts. The unique qualities of handcrafted goods—which might be functional, beautiful, artistic, inventive, or culturally connected—are what give them their unique character. according to Manjusmita Dash (2011), handicrafts have a distinctive location in India, yet handicrafts haven't gotten the recognition they merit.

India's contribution in global handcraft exports is less than 2%. Due to its high percentage of value addition, minimal capital investment, and strong export and foreign exchange earnings potential, this handicraft industry is extremely important to the economy. India's handicrafts have an extensive history and culture. They use a wide range of unusual raw materials to create a vast array of handcrafted goods. In other nations, Indian handicrafts are highly popular and in high demand. Every Indian state has its own unique handicrafts and art crafts. Wood, metal, ceramic, hand-printed fabrics, embroidery, paintings, and other handicrafts are the main products of Indian handicrafts.

Review of Litrature

Dalal, Subrata and Chattopadhyay 2021, his study, A Preliminary Study on Popularizing Indian Handicrafts Using Internet Technology – A Bengal Specific Study, Study based on west Bengal. The handicraft sector is unorganized and it is the second-largest employment generating sector in India after agriculture.

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In Achieving Zero Hunger Goal: A Study on Goal 2 Zero-hunger and Collective efforts of India

Gaurav Jain * Archana Sethi **

with starvation and malnourishment. Despite the largest rationing rise and the country's with starvation and malnourishment. Despite the largest rationing plan for food distribution, with start as conditions like not eating twice a day, especially during the 75th anniversary of the source. India is tackling hunger through the government's Poshar Abbie faces precations tackling hunger through the government's Poshan Abhiyan 2.0 initiative, aiming and the government's Poshan Abhiyan 2.0 initiative, aiming and food nutritious and healthy for women, children, and the entire population. Problems such as studies and anemia have been addressed and efforts are ongoing to lower the rate. Door-tomedical units promote awareness, and families receive sukha-ration and a noon meal. Research and medical arriculture, food security, manufacturing, and distribution.

Mords- Poverty, Poshan Abhiyan 2.0, Food security, sustainable agriculture, Zero Hunger,

moduction: - "A two-time meal is what a man all need". The bread (Roti) of two times is obtained fortune or hard work. A man works day and night to quench his hunger. India has the 2nd population in the world, standing at around 1.4 billion people. Feeding 1.4 billion stomachs is is proper recting 1.4 on the stomaches is ind security" focus to an agenda that promotes "nutrition security" instead. The drive to reduce in the world has largely relied on crops such as wheat and rice that provide calories. But an arease in calories alone is not good enough. Improved diets and good health require bolstering mbon (M.S. Swaminathan, 2014) Here is a developing economy with a GDP of 160.06 trillion mes in 2022-23 (PBI 2023), Fastest-growing nation in the world. We landmarks have achieved so in the fields of science, technology (digital yug of India), roads, and electricity meetivity that are getting better and stronger. But The triple burden of malnutrition-the coexistence i indemourishment, micronutrient deficiency, and over nutrition manifest in overweight and testy-is a growing challenge all over the world (Gomez et al. 2013). To satisfy hunger, food is messary; the matter is to have nutrition in it. Nutrition has the power to empower present and future mations. We are Celebrating 75 years of independence (Azadi ka Amrit Mahotsav) in India. Hunger In is still questionable in our people's bucket lists. India put a massive effort together to tackle and there SDG goal 2: reducing hunger to zero by 2030. Here are some outlooks that show we are on a and path to achieving the target. Since the green revolution, India has become self-sufficient in food materion. India has made tremendous strides over the last six decades in reducing hunger. Hunger The reduced by increasing the production of cereals, and farmers in India have done this, but at the of losing soil fertility, environmental degradation, bio-diversity affected, water table downs, and are chemical fertilizer uses for more productivity. With more production, nutrition's getting less in Scientists, agriculturists, economists, and research and development teams of various nations into this, and to overcome this situation, new technologies have been made according to the need tot only enhance productivity but also take care of the soil, from the increasing use of chemical liver to bio fertilizer. Here are some Indian perspectives on achieving the second goal of zero Lager.

Marketh Scholar, S.o.S in Economics, Pt.Ravishankar Shukla University, Raipur, And Scholar, S.o.S in Economics, Pt.Ravishankar Shukla University, Raipur, Mathant Professor, S.o.S in Economics, Pt.Ravishankar Shukla University, Raipur,



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Measurement & Comparison of Poverty in Abhujmadiya Tribe: Income-based and Deprivation-based Poverty Approach

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Abstract:

The present paper is attempted to measure and compare the difference and discrepancy between the income-based and deprivation-based poverty measurement in poverty of Abhujmadiya tribes of Chhattisgarh. Two international poverty measurement approach is considered for poverty measurement of Abhujmadiya tribes, first income-based measurement developed by World Bank and second, Multidimensional Poverty Index developed by United Nation Development Program (UNDP). Research study is based on primary data of 80 household collected from 8 village of 2 block of Narayanpur district of Chhattisgarh State. Results shows that 90% Abhujmadiya peoples are poor in income-based poverty whereas, 48.43% Abhujmadiya peoples are poor in deprivation-based poverty measurement. A difference of 41.57% is found in the measurement of poverty by both the poverty measurement approach and this discrepancy is more in income-based poverty as compare to multidimensional poverty measurement. The study also reveals that health facilities, year of schooling, cooking fuel, sanitation and housing conditions are the major contributor in the poverty of Abhujmadiya Tribes.

Keywords: Multidimensional Poverty Index, Income-based Poverty, Abhujmadiya Tribe

Introduction

Poverty, a global phenomenon and biggest hurdle in the path of development. It is a challenge for economists, policymakers, and even government to understand it. Every developing country faces poverty as a big challenge. The effort which governments are taking in different nations to eradicate poverty in rural and urban areas are really appreciable but to reach tribal areas is a big challenge in itself. There are various measures of poverty, however, two international approach of poverty measurement, first income based developed by World bank and second Deprivation based multidimensional poverty index developed by United nation development Program is popularly famous in poverty measurement. But researcher and policy makers are always debate between income-based and deprivation-based poverty measurement because of difference or discrepancy in the results of both the measures.

Sen (1992) in his book "Inequality Re-examined" written that poverty is not due to lack of income but it is deprivation in basic human capabilities. Income poverty seems poverty as a result of inability of the individual or family to congregate their basic needs (world bank, 2000). Still most of the nation developed or developing nation like India consider and using income or consumption expenditure of the people's to measure poverty (Santos and Alkire,2011). There is negative relationship between income and multidimensional poverty (Wang et.al,2016). There are some other literature studies which argues that the poverty is due to experience of various deprivations and non-monetary measure is complementary to

Sustainability in Health and Nutrition – A Sub-National Study of India

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Abstract: The Sustainable Development Goals (SDGs) were introduced by the United Nations and adopted by India and other member countries in 2015, aiming at a more inclusive, economically empowered, and sustainable world. The 17 SDGs encompass various targets and indicators. SDG 3 or the 'Good Health and Well-Being' goal aims at ensuring healthy lives and promoting well-being for all at all ages. The paper seeks to explore the pivotal challenges and opportunities of SDG 3, and how can these be addressed to ensure long-term positive impacts at the sub-national level systematically. Based on this the primary objective of the present study is to assess the level of sustainability in health and nutrition in the states and union territories of India. Statistical data analysis and comparative evaluation are performed on the findings of the Sustainable Development Goals National Indicator Framework Progress Report 2023 (MoSPI, 2023) in the background of the 39 SDG-3 indicators and 9 targets. The study is quantitative and cross-sectional in nature based on secondary data and the results of the study show that out of 15 key indicators of SDG 3, India is on track or maintaining SDG achievement in five indicators, which are (i) Maternal mortality rate (per 100,000 live births), (ii) Neonatal mortality rate (per 1,000 live births), (iii) Mortality rate under-5 (per 1,000 live births), (iv)New HIV infections (per 1,000 uninfected population), and (v) Births attended by skilled health personnel (%). The SDG index score on Goal 3 for India stands at 74. Gujarat emerges as the best performer among the states (86), and Delhi among the UTs (90) in the SDG-3 scoring of 2020. Achievement of SDG 3 is specifically essential for India, considering the demographic dividend it has at its disposal. India being presented as the voice of the Global South has become a shared platform to deliberate on the concerns, issues and policies that affect the developing countries in multi-faceted ways. India has faced hurdles in the equitable allocation and provision of health services in the past moreover there also exists a divide in rural and urban areas. Thus, it is imperative to introduce policy measures working towards the reduction of headline indicators like maternal mortality rate and alleviating malnutrition levels among children. The COVID-19 pandemic and other geo-political crises have hindered the progress in achieving SDG 3 in the last few years resulting in an exacerbation of health inequalities and a defer in progress towards universal health coverage. Health is considered a key factor in explaining the economic growth of a country. Therefore, dedicated efforts towards healthcare services and activities will contribute to the existing demographic dividend, labour productivity and lower cost of ailments. It is concluded that although India has been working to touch every aspect of SDG 3 and strengthen the health sector in the country yet for India, to achieve the 2030 target of UN SDG 3 - 'Good Health and Well Being', the need of the hour is to accelerate the pace of policy implementation and cover the rural-urban gap in healthcare services.

Keywords: Health, Sustainable Development Goals, Nutrition, Mortality Rate, SDG 3

JEL Code: 110, 115, 118, Q01

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Keywords: Health, Sustainable Development Goals, Nutrition, Mortality Rate, SDG 3

JEL Code: 110, 115, 118, Qo1

The Nexus between Public Expenditure and Economic Growth: A Time Series Analysis of Chhattisgarh

Vikram* Pragati Krishnan** Ravindra K Brahme***

Abstract

Public expenditure plays a pivotal role in shaping economic growth and development. This study investigates the long-term relationship between public expenditure and economic growth in Chhattisgarh, India. Employing time series econometric techniques, including unit root tests, cointegration analysis, and Granger causality tests, the study analyzes the impact of various categories of public expenditure on Gross State Domestic Product (GSDP).

The empirical findings reveal a nuanced picture. While public expenditure on general and social services positively influences economic growth, expenditure on economic services appears to have a negative impact. These findings underscore the importance of efficient resource allocation and effective policy implementation within the economic services sector.

Keywords: Fiscal Policy and Taxation, Economic Growth and Development, Time-Series Models

JEL: H50, O40, C22

Introduction

One of the main goals of public expenditure policy is to achieve long-lasting and fair economic growth. Numerous public programs are designed with the specific purpose of fostering sustained and equitable economic growth (Gangal and Gupta ,2013). Public spending plays a crucial role in the economic progress of a nation like India. As the government takes on more responsibilities and becomes more involved in the economic activities of the country, the amount of public expenditure in a densely populated country like India is rising rapidly. There are two main types of public expenditure: developmental and non-developmental. Developmental expenditure is primarily focused on activities such as building infrastructure, promoting industry, improving healthcare and education. On the other hand, non-developmental expenditure is more about maintaining law and order, defense, and administrative services. The size of the government is expected to impact a country's economic growth through factors like taxation, expenditure, and budget balance, affecting resource allocation efficiency and the rate of factor accumulation. Public expenditures encompass spending by local, state, and national governments and agencies, distinct from private individuals, organizations, or firms (Anyafo, 1996). These expenditures are typically divided into recurrent (current goods and services) and capital (infrastructure investments and other development-related expenses) categories (Grier, et al ,1989).

Public spending is aimed at driving economic growth and development in order to transition the country into an industrialized economy and enhance the quality of life for its citizens (Usman and Agbede,2015). It has been instrumental in building up physical and human capital over time. Well-planned public spending can also have a positive impact on economic growth, even in the short term (Gangal and Gupta, 2013). Public spending encompasses the collection of government revenues, derived from taxes and other sources, and is primarily focused on expenses related to maintaining government operations for the overall growth and stability of the economy (Anyanwu, 1993).



The COVID-19-Led Reverse Migration and Labour Supply in Rural Economy: Challenges, Opportunities and Road Ahead in Chhattisgarh

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Abstract:

Migration is an integral part of the Indian economy and constitutes a significant share in the GDP of the country. But the COVID-19 pandemic has emerged as a devastating shock resulting in huge reverse migration in India as well as in its respective states. In this context the present study tries to investigate labour supply and employment opportunity in rural areas of Chhattisgarh due to COVID-19-led reverse migration and also examines the gender specific impacts of COVID-19 on reverse migrants in Chhattisgarh. The study also suggests the possible measures to rebuild the Chhattisgarh's rural economy after COVID-19. Thus, the study inculcates both secondary and primary data. Descriptive statistics and regression analysis are computed to get the results. The study found that there is a sudden rise in labour supply in the rural economy of Chhattisgarh. Job loss is the biggest problem faced by migrants followed by loss in income. The study also found that there is no significant impact of reverse migration due to Covid-19 between both the gender in rural Chhattisgarh. Thus, on the basis of primary survey and focused group discussions the study concludes that the returned migrants would surely get back to their normal lives and would gradually afford the better standard of living to themselves as well as to their families. A comprehensive overview of the economic, health and gendered implications of the Covid-19 pandemic reveals the need for a more proactive and on-the-ground strategy to combat the post -crisis scenario in the rural economy of Chhattisgarh. Also, the Covid-19 pandemic have reinforced the need for and the importance of compiling data of migrants. Such a database helps in effective administration of various government interventions. However, there is also an urgent call for the proactive actions to be undertaken to retain these reverse migrants in their original source, so that they would contribute towards the development of their own state.

Keywords: Covid-19, employment, job satisfaction, loss of income, rural economy, reverse migration.

JEL Classifications: J20, J21, J22, J28, J61.

1. Introduction:

The COVID-19 pandemic is the most crucial global health calamity of the century and the greatest challenge that the humankind faced since the 2nd World War (Chakraborty & Maity ,2020). Not only this, the virus has also expeditiously proliferated all around the globe which is posing an enormous health, economic, environmental and social threat to the entire human population. Dhungana, N. (2020) highlighted that the coronavirus (COVID-19) outbreak, and the resultant lock-downs and cross-border travel restrictions have reinvigorated public debates about the vulnerability of the global migrants, together with the responsibility of the States to ensure dignified treatment of migrants. The coronavirus pandemic has triggered massive reverse migration in the country. The COVID-19-led migration is the second largest



A Comparative Study of Socio-Economic Status on PVTGs of Chhattisgarh

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Abstract : Tribal communities are often identified by some specific signs such as primitive traits, distinctive culture, geographical isolation, shyness to contact with the community at large and backwardness. Along with these, some tribal groups have some specific features such as dependency on hunting, gathering for food, having pre-agriculture level of technology, zero or negative growth of population and extremely low level of literacy. These groups are called **Particularly Vulnerable Tribal Groups (PVTGs)**. The social and economic position is very important factor to understand the status of living it is responsible for the education, health, occupation, income, family effluence, caste, social participation, social position, political position of Individual, family or group. The present research study is on five Particular Vulnerable Group of tribes of Chhattisgarh namely Baiga, Pahadi Korwa, Kamar, Abujhmadiya and Birhor tribes which measure and compare Socio-Economic Status in Udai Pareek SES Scale of these PVTGs. Research study is based on primary data of 400 household collected from 40 villages of 10 blocksof 7 district of Chhattisgarh State. Results shows that there is difference in socio-economic status of these PVTGs, according to occupation, material possession and social participation of the family the SES of Kamaar is better than the other PVTGs followed by Baiga, Abhujhmadiya, Birhor and Pahadi Korwa.

Keywords: Particularly Vulnerable Tribal Groups, Socio-Economic Status, Udai Pareek SES Scale.

Introduction - The social and economic position is very important factor to understand the status of living it is responsible for the education, health, occupation, income, family effluence, caste, social participation, social position, and political position of Individual, family or group. Tribal communities are often identified by some specific signs such as primitive traits, distinctive culture, geographical isolation, shyness to contact with the community at large and backwardness. Along with these, some tribal groups have some specific features such as dependency on hunting, gathering for food, having pre-agriculture level of technology, zero or negative growth of population and extremely low level of literacy. These groups are called Particularly Vulnerable Tribal Groups (PVTGs). Chhattisgarh is a home of 5 out of 75 PVTGs, listed by central government of India namely Abujhmadiya, Baiga, Birhor, Kamar and Pahadi Korwa whose total population is 1,84,985 constituted in 49,080 Percentage Share of family Baiga (50.05%), Pahadi Korwa (22.79%), Kamar (15.12%), Abujhmadiya (9.75%), Birhor tribes (2.29%) family living in 53 blocks of 18 districts. Sex ratio of tribals in Chhattisgarh is 1020, Baiga (989), Pahadi Korwa (984), Kamar (15.12%), Abujhmadiya (1040), Birhor tribes (1022) respectively. Literacy rate of Chhattisgarh is 70.3 whereas Literacy rate of tribals is 59.1, Baiga (53.97%), Pahadi Korwa (%), Kamar (47.7%), Abujhmadiya (29.88%), Birhor tribes (47.98%) respectively. There is gap of 11.2 % in states literacy rate and tribals literacy rate. It shows that poor education facilities are being made available to these PVTGs.

The discussion above revealed that there is some confliction and difference in the Socio-economic status of these PVTGs. This paper tries to measure and compare the Socio-Economic Status of these PVTGsof Chhattisgarh statein Udai Pareek SES Scaleto find the difference and confliction in values of Socio-Economic Status. In the end this paper gives suggestions to policy makers, governments and researchers through they can increase the socioeconomic status significantly.

Literature Review

Dewangan S. K., Sahu K. R., Achari K. V. and Soni S. (2011)There is positive correlation between sericulture and socio-economic status. Sericulture creates local employment which results less inter-state migration. Due to sericulture, they released from debtless which resulted the elevation of self-respect and Socio-Economic Empowerment of Tribal Women.

Kispotta, Seraphinus (2014)The government programmes are almost nil except MNREGA, in spite of many developmental programmes, the economic standards of the tribal'sis still very low and need of joint efforts and better

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Women Empowerment Through **Collective Actions In Bilaspur District of Chhattisgarh**

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ABSTRACT

Women empowerment is integral to achieving gender equality and fostering inclusive socio-economic development. This paper investigates the concept of women empowerment through self help from various perspectives, focusing on social, economic, political, and cultural dimensions.

Through a comprehensive review of academic literature studies, the paper explores how women's access to education, economic resources, and political participation contributes to their empowerment.

The research evaluates the role of government policies, non-governmental organizations (NGOs), and international bodies in creating enabling environments for women's empowerment. Specific emphasis is placed on grassroots initiatives and governmental reforms, examining their effectiveness in dismantling structural inequalities. This study from various regions highlights successful empowerment strategies, alongside the persistent challenges

in conservative or underdeveloped settings.

findings underscore The the transformative power of women empowerment, linking it to broader goals of poverty reduction, improved public health, and economic growth.

The paper concludes with policy recommendations aimed at promoting gender equality through enhanced legal frameworks, greater financial inclusion, and increased political representation for women. By emphasizing the need for a holistic approach, the paper advocates for collective action to remove obstacles that hinder women from reaching their full potential in both private and public spheres.

Keywords: Women Eempowerment, Self Help Group, Activity and Knowledge Domain, Domestic Autonomy, Social Interaction

I. INTRODUCTION

Women constitute about half of the total population of country but they suffer from many disadvantages as compared to men in terms of literacy rates, labour participation rates earnings. Social, economic and political empowerment is the need of the day, as it is one only surest way of making women "equal partners in development". The process of women empowerment is conceptualized in terms of personal assertions, self-esteem and confidence, ability to protect themselves as women attaining socio-political participation and economic independence, ownership of productive assets and provide leadership in women. The Government has been implementing various schemes for the socioeconomic advancement and development of women in the country. (Meena Kumari)

Empowering women involves granting them tools opportunities and autonomy. Empowerment is the process of obtaining basic opportunities for marginalized people, either directly by those people, or through the help of non-marginalized others who share their own access to these opportunities. It also includes

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Artificial Intelligence and Its Impact on Labor Productivity and Employment

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Abstract: The dynamics of labour productivity and employment across sectors are being reshaped as a result of the emergence of artificial intelligence (AI), which has emerged as a disruptive force today. This study investigates the influence that artificial intelligence (AI) has had on the worldwide labour market, which has both positive and negative aspects. On the one hand, automation and intelligent systems that are driven by artificial intelligence may boost productivity by simplifying operations, lowering operating costs, and allowing new solutions in the areas of manufacturing, services, and logistics. The incorporation of artificial intelligence, on the other hand, raises worries about the displacement of jobs, gaps in skill sets, and pay heterogeneity. In spite of the fact that repetitive and regular work are becoming increasingly mechanised, which may result in possible joblessness in some industries, new job possibilities are emerging in the fields of artificial intelligence research, data analysis, and maintenance. On the other hand, these positions require more sophisticated abilities and ongoing training. Specifically, the report emphasizes the significance of proactive measures, such as labour reskilling, social safety nets, and ethical AI governance, in order to guarantee that everyone would benefit equally from breakthroughs in artificial intelligence. The ability of industries to achieve sustainable development, reduce the number of job losses, and improve economic resilience may be achieved via the promotion of a synergistic approach between human labour and artificial intelligence technology. This abstract highlights the fact that there is a crucial need for joint efforts across governments, industries, and educational institutions in order to harness the promise of artificial intelligence while reducing the issues that it poses for the labour market. Keywords: Artificial intelligence, Employment, Labor market, Productivity.

Introduction - Artificial intelligence (AI) is becoming an essential factor in driving innovation, efficiency, and competitiveness, and it is currently undergoing a remarkable transformation in the global economic environment. The use of artificial intelligence technology has spread throughout many different industries, including healthcare, manufacturing, retail, and logistics. These technologies have the ability to automate repetitive processes and provide complex decision-making capabilities. These technological improvements have resulted in a huge increase in labour productivity, which has enabled organisations to optimise their operations, lower their expenses, and provide superior services. Nevertheless, the fast adoption of artificial intelligence has also spawned considerable arguments over the influence that technology would have on employment. At the same time as artificial intelligence (AI) presents potential for new work positions, notably in the fields of AI development, data science, and system maintenance, it concurrently undermines existing employment patterns by automating professions that were previously dependent on human labour. The existence of this duality gives rise to important problems concerning the future of labour, the distribution of money, and the readiness of the workforce. There is a need for a thorough investigation of the implications that artificial intelligence has on labour productivity and employment as it continues to develop. Among the most significant causes for worry are the displacement of workers with low levels of expertise, the formation of a polarizedlabour market, and the difficulties associated with providing the workforce with the skills essential for an economy driven by artificial intelligence. In this study, we will investigate the myriad ways in which artificial intelligence (AI) is affecting labour productivity and employment. The purpose of this study is to investigate the ways in which artificial intelligence (AI) boosts productivity across a variety of industries, evaluate the difficulties and possibilities that it provides to the workforce, and offer insights into policies and tactics that help reduce the disruptive impacts of AI. This research endeavours to contribute to a more well-rounded understanding of the role that artificial intelligence (AI) will play in influencing the future of work and its ability to create sustainable economic growth by addressing the problems that have been raised. **Literature Review**

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JEL Code: 110, 115, 118, Qo1

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Vikram* Pragati Krishnan** Ravindra K Brahme***

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The empirical findings reveal a nuanced picture. While public expenditure on general and social services positively influences economic growth, expenditure on economic services appears to have a negative impact. These findings underscore the importance of efficient resource allocation and effective policy implementation within the economic services sector.

Keywords: Fiscal Policy and Taxation, Economic Growth and Development, Time-Series Models

JEL: H50, O40, C22

Introduction

One of the main goals of public expenditure policy is to achieve long-lasting and fair economic growth. Numerous public programs are designed with the specific purpose of fostering sustained and equitable economic growth (Gangal and Gupta ,2013). Public spending plays a crucial role in the economic progress of a nation like India. As the government takes on more responsibilities and becomes more involved in the economic activities of the country, the amount of public expenditure in a densely populated country like India is rising rapidly. There are two main types of public expenditure: developmental and non-developmental. Developmental expenditure is primarily focused on activities such as building infrastructure, promoting industry, improving healthcare and education. On the other hand, non-developmental expenditure is more about maintaining law and order, defense, and administrative services. The size of the government is expected to impact a country's economic growth through factors like taxation, expenditure, and budget balance, affecting resource allocation efficiency and the rate of factor accumulation. Public expenditures encompass spending by local, state, and national governments and agencies, distinct from private individuals, organizations, or firms (Anyafo, 1996). These expenditures are typically divided into recurrent (current goods and services) and capital (infrastructure investments and other development-related expenses) categories (Grier, et al ,1989).

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The COVID-19-Led Reverse Migration and Labour Supply in Rural Economy: Challenges, Opportunities and Road Ahead in Chhattisgarh

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Abstract:

Migration is an integral part of the Indian economy and constitutes a significant share in the GDP of the country. But the COVID-19 pandemic has emerged as a devastating shock resulting in huge reverse migration in India as well as in its respective states. In this context the present study tries to investigate labour supply and employment opportunity in rural areas of Chhattisgarh due to COVID-19-led reverse migration and also examines the gender specific impacts of COVID-19 on reverse migrants in Chhattisgarh. The study also suggests the possible measures to rebuild the Chhattisgarh's rural economy after COVID-19. Thus, the study inculcates both secondary and primary data. Descriptive statistics and regression analysis are computed to get the results. The study found that there is a sudden rise in labour supply in the rural economy of Chhattisgarh. Job loss is the biggest problem faced by migrants followed by loss in income. The study also found that there is no significant impact of reverse migration due to Covid-19 between both the gender in rural Chhattisgarh. Thus, on the basis of primary survey and focused group discussions the study concludes that the returned migrants would surely get back to their normal lives and would gradually afford the better standard of living to themselves as well as to their families. A comprehensive overview of the economic, health and gendered implications of the Covid-19 pandemic reveals the need for a more proactive and on-the-ground strategy to combat the post -crisis scenario in the rural economy of Chhattisgarh. Also, the Covid-19 pandemic have reinforced the need for and the importance of compiling data of migrants. Such a database helps in effective administration of various government interventions. However, there is also an urgent call for the proactive actions to be undertaken to retain these reverse migrants in their original source, so that they would contribute towards the development of their own state.

Keywords: Covid-19, employment, job satisfaction, loss of income, rural economy, reverse migration.

JEL Classifications: J20, J21, J22, J28, J61.

1. Introduction:

The COVID-19 pandemic is the most crucial global health calamity of the century and the greatest challenge that the humankind faced since the 2nd World War (Chakraborty & Maity ,2020). Not only this, the virus has also expeditiously proliferated all around the globe which is posing an enormous health, economic, environmental and social threat to the entire human population. Dhungana, N. (2020) highlighted that the coronavirus (COVID-19) outbreak, and the resultant lock-downs and cross-border travel restrictions have reinvigorated public debates about the vulnerability of the global migrants, together with the responsibility of the States to ensure dignified treatment of migrants. The coronavirus pandemic has triggered massive reverse migration in the country. The COVID-19-led migration is the second largest



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™छत्तीसग्रढ़ से ग्रामीण मजदूरों के अल्पकालिक उत्प्रवास पर कोविड-19 का प्रभाव (AbstractView.aspx?PID=2024-12-4-1)

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छत्तीसगढ़ से ग्रामीण मजदूरों के अल्पकालिक उत्प्रवास पर कोविड—19 का प्रभाव

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ABSTRACT:

भारत में आर्थिक, औद्योगिक एवं सामाजिक विकास ने ग्रामीण क्षेत्र की जनसंख्या को षहरों की ओर प्रवासित होने का मार्ग प्रषस्त किया है। देष के कई प्रदेषों से लोग कुछ माह या दिनों के लिए अपना घर छोड़कर अन्य प्रदेषों में रोजगार की तलाष में प्रवास करते हैं। इस प्रकार के मौसमी प्रवास को तकनीकी दृष्टि से 'सर्कुलेशन माइग्रेशन' कहा जाता है, क्योंकि 'स्थानान्तरण' का अभिप्राय स्थायी रूप से अपना मूल स्थान छोड़ना नहीं होता है। देष में मजदूरों के इसप्रकार के स्थानान्तरण की संख्या करोड़ों में है। इसके बावजूद देश की आर्थिक नीतियों में इनके लिए कोई अनुकूल व्यवस्था या नीति निर्माण नहीं की गई है। छत्तीसगढ़ प्रदेष से भी प्रतिवर्ष बड़े पैमाने पर अल्पकालिक उत्प्रवास होता है। छत्तीसगढ़ के ग्रामीण क्षेत्रों में पूर्णकालिक रोजगार एवं लघु–उद्योगों के अभाव के कारण ग्रामीण जनसंख्या का अल्पकालिक उत्प्रवास इतनी अधिक मात्रा में होता है कि उससे क्षेत्र की आर्थिक, सामाजिक एवं राजनैतिक सक्रियता के समक्ष चूनौती प्रस्तूत हो गई है। अभी वर्तमान में कोविड–19 के कारण देष के विभिन्न प्रांतों से उत्प्रवासित मजदूरों को संकुषल घर वापसी एक चुनौती बन गई थी। कोविड-19 एवं लॉकडाउन के कारण आवागमन सुविधाओं के अवरूद्ध होने के कारण छत्तीसगढ़ प्रदेष के समक्ष भी एक चुनौती उत्प्रवासित मजदूरों को अपने मूल निवास स्थल की ओर सकुषल वापसी की थी। जिसका समाधान राज्य सरकार ने अपने स्तर पर करने का प्रयास किया और प्रदेष से उत्प्रवासित मजदूरों को सकुषल घर वापसी करवाया गया। किन्तु इस दौरान उत्प्रवासित मजदूरों को कोविड–19 के नियमों के पालन एवं संकुषल घर वापसी के लिए कई प्रकार की कठिनाईयों का सामना करना पड़ा है। प्रस्तुत शोध पत्र उत्प्रवास के कारणों, उत्प्रवासित मजदूरों को कोविड–19 के कारण होने वाली समस्याओं एवं भविष्य में उत्प्रवास की प्रवृत्ति के अध्ययन से संबंधित है।

KEYWORDS: अल्पकालिक उत्प्रवास, ग्रामीण विकास, रोजगार, कोविड–19, उत्प्रवास प्रवृत्ति।

INTRODUCTION:

कोविड—19 (कोरोना वायरस) महामारी पहली बार दिसम्बर 2019 में चीन के वूहान षहर में पहचाना गया था और धीरे—धीरे यह महामारी संपूर्ण विष्व को प्रभावित किया। मार्च 2020 को विष्व स्वास्थ्य संगठन (डब्ल्यूएचओ) द्वारा कोविड—19 के प्रकोप को महामारी घोषित किया गया। यह वायरस खांसी, छिंकने एवं संक्रमितों के सीधे संपर्क में आने से फैलता है। जिसका संक्रमण पूरे विष्व में बहुत तेजी से हो रहा था। इलाज सुविधाओं के अभाव में इससे बचने का तत्कालिक एकमात्र उपाय स्वयं को अन्य व्यक्तियों के संपर्क से दूर रखना था। जिसके कारण भारत सरकार द्वारा पूरे देष में 22 मार्च 2020 को जनता कर्फ्यू का आदेष दिया गया। फिर पाँच चरणों में (25 मार्च से 30 जून 2020 तक) पूरे देष में व्रथा मं विराम लग गया। लोगों की पहली प्राथमिकता स्वयं को कोविड़—19 वायरस के संक्रमण से अपने आप को सुरक्षित रखना था। सुरक्षित स्थानों की तलाष में लोग अपने घरों में स्वतः कैद हो गये। इसप्रकार की माहामारी पिछले सौ वर्षों में कभी नहीं देखी गई थी। अतः इसके प्रभाव आर्थिक एवं स्वास्थ्य के क्षेत्र में बहुत अधिक गंभीर हो रहे थे। कई देषों की सरकारों के सामने इस समय सबसे बड़ी समस्या यह थी कि किस प्रकार स्वास्थ्य एवं अर्थव्यवस्था (आर्थिक गतिविधियों) में सामंजस्य बैठाया जाये, क्योंकि कोविड—19 महामारी सभी देषों में दोनों प्रमुख क्षेत्र अर्थात स्वास्थ्य एवं आर्थिक प्रगति को प्रभावित कर रही थी। विष्व स्वास्थ्य संगठन के अनुसार जनवरी 2021 तक कोविड—19 से संपूर्ण विष्व की लगभग 77 करोड़ आबादी संक्रमित एवं 69 लाख लोगों की मृत्यु हुई। जिनमें से भारत में 4.5 करोड़ लोग संक्रमित एवं 5.32 लाख की मृत्यु हुई।

इस कोविड–19 का प्रभाव सबसे अधिक उत्प्रवासी मजदूरों पर देखा गया। जो अनेक राज्यों में रोजगार के लिए प्रवासित हुए थे। ऑकस्मिक लॉकडाउन होने की वजह से उत्प्रवासित मजदूरों का रोजगार छिन गया, कार्य का भुगतान नहीं किया गया और कुछ ही दिनों में खाने-पीने और रहने की समस्या उत्पन्न होने के साथ-साथ बचत भी समाप्त होने लगी और लॉकडाउन के कारण यातायात के साधनों के अभाव में अपने मूल निवास स्थान पहुंच पाना एक बड़ी समस्या बन गयी। कुछ दिन इन्ही समस्याओं के साथ गुजारा करने के बाद उत्प्रवासी मजदूरों द्वारा केन्द्र सरकार एवं राज्य सरकारों से गंतव्य स्थल से अपने मूल निवास स्थल पहुंचाने की गुहार लगाने लगे। कोविड–19 की बढ़ती समस्या से घबराकर उत्प्रवासी मजदूर पैदल, सायकल एवं उपलब्ध अन्य यातायात के साधनों की सहायता से कडी धुप में घर वापसी के लिए निकल पडे तथा दिन-रात निरंतर चलते-चलते अनेक राज्यों की सीमाओं पर पहुंचने लगें। किन्तु लॉकडाउन के कारण राज्यों की सीमाओं में प्रवेष प्रतिबंध था। महामारी के भय से मानवीय संवेदनाएं लगभग समाप्त हो चूकी थी। जिसके कारण उत्प्रवासी मजदूरों को रात्रि विश्राम, भोजन, पेयजल, कोविड—19 का परीक्षण, मेडीकल सुविधाएं न मिल पाना एवं कोविड—19 से संक्रमित होने की आषंका से अलग व्यवहार किया जाने लगा। उत्प्रवासी परिवारों में महिलाएं एवं बच्चों को भी असुरक्षा का सामना करना पड़ा। उत्प्रवासी परिवारों की इन समस्याओं को समाचार चैनलों के माध्यम से उन्हें पैदल आते हुए, अनेक समस्याओं से गुजरते हुए दिखाया गया जिससे केन्द्र एवं राज्य सरकारों की पहल पर उत्प्रवासियों को सुरक्षापूर्वक उनके मूल र्स्थान पर पहुंचाने के लिए बस, ट्रेन एवं निजी वाहनों का प्रयोग किया जाने लगा। अनेक सामाजिक संगठनों, स्वयं सेवी संस्थाओं, समाज सेवी व्यक्तियों एवं फिल्म सितारों आदि के माध्यम से उत्प्रवासी परिवारों को घर पहुंचाया गया। उत्प्रवासी मजदूरों का अन्य राज्यों में प्रवेष पर कोविड—19 परीक्षण, भोजन, पेयजल, रात्रि विश्राम एवं मेडिकल सविधा उपलब्ध कराई जाने लगी।

शोध का उद्देष्य :--

1. ग्रामीण अल्पकालिक उत्प्रवासियों पर कोविड–19 के प्रभावों का अध्ययन करना।

2. ग्रामीण अल्पकालिक उत्प्रवासियों की कोविड–19 के कारण आप्रवास की समस्याओं का अध्ययन करना।

षोध प्रविधि :—

प्रस्तुत अध्ययन छत्तीसगढ़ के उन अल्पकालिक उत्प्रवासित ग्रामीण मजदूरों, जो कोविड—19 एवं लॉकडाउन के कारण अपने घरों की ओर लौटने मजबूर हुए और उन्हें इस दौरान जो विकट परिस्थितियों का सामना करना पड़ा था, पर आधारित है। यह अध्ययन मूलतः प्राथमिक आंकडों के आधार पर किया गया है। प्राथमिक आंकडों का संकलन प्रत्यक्ष साक्षात्कार अनुसूची की माध्यम से एवं आवष्यकतानुसार द्वितीयक आंकडों का भी प्रयोग किया गया है। उपरोक्त अध्ययन हेतु अध्ययन क्षेत्र के चयन के समस्त स्तरों पर दैव निदर्षन विधि का उपयोग किया गया है। उपरोक्तानुसार छत्त्तीसगढ़ राज्य के बलौदाबाजार—भाटापारा जिला का चयन किया गया है। चयनित जिला के 6 विकासखण्डों में से बिलाईगढ़ विकासखण्ड का चयन कर तीन गांव हरदी, गाताडीह एवं पीपरडीह से क्रमषः 26, 22, 32 परिवार इसप्रकार कुल 80 आप्रवासित परिवारों का दैव निदर्षन विधि से चयन कर प्रत्यक्ष साक्षात्कार अनुसूची के माध्यम से आंकड़ों का संकलन किया गया है। साक्षात्कार अनुसूची के माध्यम से प्राप्त प्राथमिक आंकड़ों का विष्कोषण प्रतिषत विधि की सहायता से किया गया है।

अध्ययन क्षेत्र :–

प्रस्तुत अध्ययन छत्तीसगढ़ के बलौदाबाजार—भाटापारा जिला के उत्प्रवासित मजदूरों से संबंधित है। बलौदाबाजार—भाटापारा जिला रायपुर जिला से पृथक होकर 01 जनवरी 2012 को अस्तित्व में आया है। जिसका मुख्यालय बलौदाबाजार है। बलौदाबाजार—भाटापारा जिला का क्षेत्रफल 4748.44 वर्ग किलोमीटर लगभग है। जनगणना 2011 के अनुसार कुल जनसंख्या 13,05,343 है, जिसमें 49.91 प्रतिषत (651474) पुरूष तथा 50.09 प्रतिषत (653869) महिलाएं है। इसप्रकार जिला में प्रति हजार पुरूषों के बीच 1004 (लिंगानुपात) महिलाएं रहती हैं। जनसंख्या का ग्रामीण—शहरी वितरण क्रमषः 87.27 एवं 12.73 प्रतिषत है। जिला का साक्षरता दर 70.68 प्रतिषत है, जिसमें 82.79 प्रतिषत पुरूष तथा 58.57 प्रतिषत महिलाएं साक्षर हैं। जिले की कुल जनसंख्या में 23.37 प्रतिषत जनसंख्या अनुसूचित जाति तथा 12.83 प्रतिषत जनसंख्या अनुसूचित जनजातियों की तथा जनसंख्या घनत्व 350 व्यक्ति प्रति वर्ग किलोमीटर है। इस जिले में कुल 961 ग्राम व 6 विकासखंड तथा 9 नगरीय निकाय, 17 पुलिस संटेषन, 12 महाविद्यालय, 11 आईटीआई, 2 पॉलिटेक्निक कॉलेज, 6 न्यायालय, 7 सामुदायिक स्वास्थय केन्द्र तथा 16 लोकसेवा केन्द्र स्थापित हैं। बलौदाबाजार—भाटापारा जिला प्रदेष की तीव्र विकसित होने वाले जिलों में प्रमुख है।

छत्तीसगढ़ में ग्रामीण अल्कालिक उत्प्रवास की प्रवृत्ति एव कारण :--

श्रम विभाग द्वारा प्राप्त सूचनाओं के आधार पर छत्तीसगढ़ से प्रतिवर्ष लगभग 11–12 लाख मजदूर अल्पकाल के लिए अन्य राज्यों एवं प्रदेष के अन्य जिलों में रोजगार की तलाष के लिए प्रवासित होते हैं। प्रवास एक जटिल प्रक्रिया है। प्रवास के कारणों की जानकारी प्राप्त करना सरल कार्य नहीं है क्योंकि जनसंख्या संचरण को प्रभावित करने वाले कारकों में आकर्षक एवं विकर्षक दोनों कारक होते हैं, जो साथ—साथ कार्य करते हैं। आधुनिक समय में आवागमन एवं संचार के द्रुतगामी साधनों के विकास से प्रवास की प्रवृत्ति में तीव्र वृद्धि हुई है। व्यक्तियों का सामाजिक एवं आर्थिक स्तर प्रवास की मात्रा एवं दिषा के निर्धारण में महत्वपूर्ण भूमिका अदा करती है। जनसंख्या में वृद्धि, कुटीर उद्योग का पतन, भूमिहीन कृषक, ऋणग्रस्तता, सामाजिक अयोग्यताएं, संयुक्त परिवार, पारिवारिक कलह, अधिक आय अर्जित करने की आषा, अधिक मजदूरी दर, नगरों का आकर्षण, उन्नतषील जीवन, बेरोजगारी, स्वास्थ्य एवं मनोरंजन की सुविधाएं आदि प्रवास की प्रवृत्ति में वृद्धि के प्रमुख उत्तरदायी कारक हैं।

119 40	पुल	उत्प्रवासित	। राज्य							
नाम	उत्प्रवासित	जम्मू	हिमाचल	पष्चिम	तमिलनाडु	पंजाब	उड़ीसा	उत्तर	गुजरात	छ.ग.
	परिवार	कष्मीर	प्रदेष	बंगाल				प्रदेष		
हरदी	26	15	24	00	00	00	2	6	9	5
गाताडीह	22	29	17	2	00	00	5	00	7	00
पीपरडीह	32	24	10	14	5	3	00	00	00	8
योग	80	68	51	16	5	3	7	6	16	13
प्रतिषत्	(100)	(36.75)	(27.56)	(8.64)	(2.70)	(1.62)	(3.78)	(3.24)	(8.64)	(7.02)

सारणी क्र. 1: छत्तीसगढ़ से देष के विभिन्न राज्यों में अल्पकालिक उत्प्रवास – 2019–20

स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

नोट – कोष्ठक में दिए गए आकडे प्रतिषत में है।

देष के विभिन्न राज्यों में छत्तीसगढ़ से मजदूरों का अल्पकालिक उत्प्रवास

उपरोक्त सारणी क्र. 1 के अनुसार वर्ष 2019–20 के दौरान अल्पकालिक उत्प्रवासित 80 परिवारों के कुल 185 सदस्य उत्प्रवासित हुए थे। जिनमें से सर्वाधिक 36.75 प्रतिषत (68 सदस्य) जम्मू–कष्मीर में उत्प्रवासित हुए। 27.56 प्रतिषत् (51 सदस्य) हिमाचल प्रदेष में, 8.64 प्रतिषत (16 सदस्य) पष्ट्रिम बंगाल तथा गुजरात में उत्प्रवासित हुए। छत्तीसगढ़ राज्य के अन्य जिलों में 7.02 प्रतिषत् (13 सदस्य) उत्प्रवासित हुए। उड़ीसा में 3.78 प्रतिषत् (7 सदस्य) उत्प्रवासित हुए। उत्तर प्रदेष में 3.24 प्रतिषत् (6 सदस्य) उत्प्रवासित हुए। उड़ीसा में 2.70 प्रतिषत् (5 सदस्य) उत्प्रवासित हुए। उत्तर प्रदेष में 3.24 प्रतिषत् (6 सदस्य) उत्प्रवासित हुए। इसप्रकार देष के विभिन्न राज्यों में 92.98 प्रतिषत् (172 सदस्य) ने उत्प्रवास किया था। जिसका मुख्य कारण निवास स्थान में अल्प रोजगार एवं मजदूरी दर में कमी होना तथा गंतव्य स्थल में पूर्ण रोजगार की उपलब्धता एवं अधिक आय प्राप्त होना पाया गया है।

सारणी क्र. 2 : – उत्प्रवासित परिवारों के उत्प्रवास का माध्यम

गाँव का नाम	कुल उत्प्रवासित परिवार	उत्प्रवास का माध्यम					
		स्वयं	ठेकेदार	मित्र व रिष्तेदार			
हरदी	26	11	11	4			
गाताडीह	22	9	9	4			
पीपरडीह	32	12	18	2			
योग	80	32	38	10			
प्रतिशत्	(100)	(40.00)	(47.50)	(12.50)			

स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

नोट – कोष्ठक में दिए गए आंकडे प्रतिषत में है।

उपरोक्त सारणी क्र. 2 के अनुसार सर्वेक्षित 80 परिवारों में से 47.50 प्रतिषत् (38 परिवार) सबसे अधिक ठेकेदार के माध्यम से उत्प्रवासित हुए हैं। 40.00 प्रतिषत् (32 परिवार) स्वयं द्वारा तथा 12.50 प्रतिषत् (10 परिवार) मित्र / रिष्तेदार के माध्यम से देष के अन्य राज्यों में उत्प्रवासित हुए। सर्वेक्षित उत्प्रवासी परिवारों में से सबसे अधिक ठेकेदारों के माध्यम से उत्प्रवासित हुए। जिसका कारण ठेकेदार द्वारा उन्हें पुर्णकालिक रोजगार उपलब्ध कराया जाता है। साथ ही आवष्यकता अनुसार भुगतान की सुविधा, आवास की सुविधा प्रदान करना, आवागमन में किराये का भुगतान किया जाना आदि है। कुल उत्प्रवासित परिवारों में से स्वयं से एवं मित्र / रिष्तेदारों के माध्यम से कुल 52.50 प्रतिषत (42 परिवार) उत्प्रवासित हुए। इसप्रकार विगत् कई वर्षों से निरन्तर प्रवास के कारण प्रदेष में स्वयं एवं मित्र / रिष्तेदारों के माध्यम से उत्प्रवास करने की क्षमता में वृद्धि हुई है। सारणी क्र. 3 :- उत्प्रवासित परिवारों के आवागमन का साधन

गाँव का नाम	कुल उत्प्रवासित परिवार	आवागमन के साधन	
		बस	ट्रेन
हरदी	26	5	21
गाताडीह	22	1	21
पीपरडीह	32	5	27
योग	80	11	69
प्रतिशत्	(100)	(13.75)	(86.25)

स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

नोट— कोष्ठक में दिए गए आकडे प्रतिषत में है।

उपरोक्त सारणी क्र. 3 के अनुसार सर्वेक्षित 80 परिवारों के उत्प्रवासित करने हेतु आवागमन का साधन रेल्वे एवं बस सुविधा प्रमुख है। प्रदेष से अन्य राज्यों में उत्प्रवासित परिवारों में सें 86.25 प्रतिषत (69 परिवार) ट्रेन के द्वारा तथा 13.75 प्रतिषत (11 परिवार) बस के माध्यम से उत्प्रवासित हुए। उत्प्रवासित परिवारों द्वारा अन्य राज्यों में उत्प्रवास के लिए रायगढ़, बिलासपुर, रायपुर, दुर्ग, भाटापारा आदि रेलवे जंक्षन से यात्रा किया जाता है तथा अपने राज्य के भीतर अन्य जिलों एवं उड़ीसा में उत्प्रवास के लिए आवागमन के साधन के रूप में बस सेवा उपलब्ध किया जाता है। रेल सुविधा का अधिक दूरी तक उत्प्रवास में महत्वपूर्ण योगदान है। इसप्रकार आवागमन की सुविधा उत्प्रवास को प्रभावित करती है। आवागमन सुविधाओं की सहज उपलब्धता ने उत्प्रवासी परिवारों को अधिक दूरी तक भी आसानी से उत्प्रवास हेतु प्रेरित किया है।

सारणी क्र. 4 :-- उत्प्रवासित स्थल पर कार्य की अधीनस्तता

गाँव का नाम	कुल उत्प्रवासित परिवार	कार्य की अधीनस्तता		
		स्वतंत्र	मालिक	ठेकेदार
हरदी	26	9	5	12
गाताडीह	22	4	2	16
पीपरडीह	32	4	6	22
योग	80	17	13	50
प्रतिषत्	(100)	(21.25)	(16.25)	(62.50)

स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

नोट- कोष्ठक में दिए गए आंकड़े प्रतिषत में है।

उपरोक्त सारणी क्र. 4 के अनुसार सर्वेक्षित 80 उत्प्रवासी परिवारों की गंतव्य स्थल में कार्य की अधीनस्तता सबसे अधिक 62.50 प्रतिषत (50 परिवार) ठेकेदार, 21.25 प्रतिषत (17 परिवार) स्वतंत्र एवं 16.50 प्रतिषत (13 परिवार) मालिक के अधीन थे। ठेकेदारों के अधीन 62.50 प्रतिषत (50 परिवार) का कार्य करने का मुख्य कारण ठेकेदार द्वारा गंतव्य स्थल पर पूर्णकालिक रोजगार की निष्चितता, आवष्यकता के समय पूर्ण भुगतान की सुविधा, आवागमन के साधनों की व्यवस्था करना, उचित मजदूरी दर प्रदान करना, आवास, पेयजल, षौचालय आदि अनेक सुविधाएं उपलब्ध कराना आदि है।

ग्रामीण अल्पकालिक उत्प्रवासियों पर कोविड—19 का प्रभाव :—

केन्द्रीय श्रम आयुक्त द्वारा जारी आंकड़ों के अनुसार छत्तीसगढ़ राज्य सें प्रवासी मजदूरों की कुल संख्या 10.86 लाख थी जो विभिन्न राज्यों में रोजगार की तलाष में प्रवासित हुए थे। कोविड—19 एवं लॉकडाउन के कारण आप्रवास की समस्या उत्पन्न हुई। प्रवासी मजदूर घरों की ओर लौटने लगे किन्तु आवागमन के साधनों के अभाव में घर वापसी सबसे बड़ी चुनौती बन गई थी। ये मजदूर आवागमन सुविधाओं के अभाव में पैदल ही घरों की ओर निकल गये। किन्तु तत्कालिन स्वाख्यगत् सुरक्षा कारणों से इन्हें कई समस्याओं का सामना करना पड़ रहा था। अंततः केन्द्र एवं राज्य सरकारों आवागमन सुविधाओं की उपलब्धता के कारण ये मजदूर अपने निवास स्थान में पहुंचने लगे जहां उन्हे स्कूलों, कॉलेजों, सामुदायिक भवनों आदि पर 14 दिनों के लिए क्वारेंटाइन किया जाने लगा। जिसमें उनका कोविड—19 का परीक्षण, भोजन, पेयजल, षौचालय, मेडिकल सुविधा, ग्राम पंचायतों द्वारा किया जाने लगा। इन क्वारेंटाइन सेंटरों में पर्याप्त मुलभूत सुविधाओं का अभाव था। जिससे उत्प्रवासित श्रमिकों को घर वापसी के दौरान कई प्रकार की समस्याओं का सामना करना पड़ रहा था। जिससे क्वारेंटाइन किये गये स्थानों पर विवाद की स्थितियां निर्मित होने लगी थी। उपरोक्त समस्याओं के बीच मजदूरों को इस बात की राहत थी कि वे सकुषल अपने मूल निवास स्थान पहुंच गये।

सारणी क्र. 5 :-- उत्प्रवासित परिवारों का लॉकडाउन के कारण घर वापसी एवं कार्य का पूर्ण भुगतान

गाँव का नाम	कुल उत्प्रवासित परिवार	लॉकडाउन के कारण वापसी	कार्य का पूर्ण भुगत	ान
		हाँ	हाँ	नहीं
हरदी	26	26	22	4
गाताडीह	22	22	15	7
पीपरडीह'	32	29	27	2
योग	80	77	64	13
प्रतिषत्	(100)	(96.25)	(80.00)	(16.25)

स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

नोट- कोष्ठक में दिए गए आंकडे प्रतिषत में है।

ग्राम पीपरडीह से कुल 32 परिवार उत्प्रवासित हुए थे किन्तु कोविड—19 के कारण घर वापसी 29 परिवारों द्वारा किया गया। शेष 3 परिवार कोविड—19 के कारण लगने वाले लॉकडाउन से पूर्व ही घर आ गये थे।

उपरोक्त सारणी क्र. 5 के अनुसार सर्वेक्षित 80 उत्प्रवासित परिवारों में से 96.25 प्रतिषत (77 परिवार) ने लॉकडाउन के कारण सामान्य समय से पूर्व घर वापसी की तथा 3.75 प्रतिषत (3 परिवार) लॉकडाउन के पूर्व ही निवास स्थल में लौट आये थे।

सर्वेक्षित 80 उत्प्रवासित परिवारों को लॉकडाउन के पूर्व कार्यों का पूर्ण भुगतान के अध्ययन से ज्ञात होता है कि 80. 00 प्रतिषत (64 परिवार) को कार्य का पूर्ण भुगतान किया गया तथा 16.25 प्रतिषत (13 परिवार) को पूर्ण भुगतान नहीं किया गया। षेष 3.75 प्रतिषत (3 परिवार) लॉकडाउन के पूर्व ही घर लौट आये थे। इसलिए इन तीन परिवारों को कार्य का पूर्ण भुगतान प्राप्त हो चूका था। कोविड—19 के कारण सम्पूर्ण देष में आकस्मिक लॉकडाउन होने से उत्प्रवासित परिवारों में से 16.25 प्रतिषत (13 परिवार) को पूर्ण भुगतान नहीं किया गया। उत्प्रवासित मजदूरों का कहना था कि सामान्य परिस्थितियों में इसप्रकार भुगतान की समस्या उन्हें कभी भी नहीं हुई थी। चूंकि इस बार कोविड—19 के कारण विषम परिस्थितियां निर्मित हो गई थी इसलिए उन्हें पूर्ण भुगतान की सुविधा प्राप्त नहीं हुई। परिस्थितियों सामान्य होने पर उन्हें यह भुगतान प्राप्त होने की आषा है।

गाँव का नाम	कुल उत्प्रवासित परिवार	घर वापसी का माध्यम			
		बस	किराया के वाहन		
हरदी	26	8	18		
गाताडीह	22	17	5		
पीपरडीह	29	12	17		
योग	77	37	40		
प्रतिषत	(100.00)	(48.05)	(51 <u>.</u> 95)		

सारणी क्र. 6 : उत्प्रवासित परिवारों के घर वापसी का माध्यम

स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

उपरोक्त सारणी क्र. 6 के अनुसार सर्वेक्षित 80 उत्प्रवासित परिवारों के घर वापसी के अध्ययन से ज्ञात होता है कि कोविड—19 एवं लॉकडाउन के कारण घर वापसी हेतु 48.05 प्रतिषत (37 परिवार) को शासकीय एवं अन्य माध्यमों से बस सुविधा प्रदान की गई तथा 51.95 प्रतिषत (40 परिवार) निजी वाहन के माध्यम से स्वयं के व्यय से घर वापसी की। देष की राज्य सरकारों ने कोविड—19 के कारण रेल्वे सेवाओं की सुविधा के अभाव में उत्प्रवासी मजदूरों को उनके मूल निवास में सकुषल पहुंचाने के लिए बस एवं अन्य आवागमन सुविधाओं का उपयोग किया। राज्य सरकारों ने अपने—अपने उत्प्रवासी मजदूरों को लाने के लिए निरंतर प्रयासरत थे। यह देष के राज्य सरकारों द्वारा विपरीत परिस्थितियों में किया गया एक सराहनीय कार्य था।

सारणी क्र. ७ :-- उत्प्रवासित परिवारों को घर वापसी के दौरान प्राप्त षासकीय सहयोग

गाँव का नाम	कुल उत्प्रवासित परिवार	षासकीय सहयोग		मुफ्त यात्रा सुविधा		मुफ्त भोजन व पेयजल सुविधा		
		हाँ	नहीं	हाँ	नहीं	हाँ	न्हीं	
हरदी	26	8	18	8	18	8	18	
गाताडीह	22	17	5	17	5	17	5	
पीपरडीह	29	12	17	12	17	12	17	
योग	77	37	40	37	40	37	40	
प्रतिषत	(100)	(48.05)	(51.95)	(48.05)	(51.95)	(48.05)	(51.95)	

स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

नोत- कोष्तक में दिए गए आंकडे पतिषत में है।

उपरोक्त सारणी क. 7 के अनुसार सर्वेक्षित 80 उत्प्रवासी परिवारों में से 77 परिवार लॉकडाउन के कारण घर वापसी की तथा 3 परिवार लॉकडाउन के पूर्व ही घर वापस आ चूके थे। लॉकडाउन के कारण घर वापसी करने वाले परिवारों में से 51.95 प्रतिषत (40 परिवार) को घर वापसी हेतु कोई शासकीय सहयोग प्राप्त नहीं हुआ तथा 48.05 प्रतिषत (37 परिवार) को शासकीय सहयोग प्राप्त हुआ है। कोविड—19 एवं लॉकडाउन के कारण उत्प्रवासी मजदूरों को अपने मूल निवास पर सुरक्षित लाने की मुख्य जिम्मेदारी राज्य सरकारों की थी। इसप्रकार जम्मू—कष्मीर सहित अन्य राज्यों में प्रवासित मजदूर परिवारों में से 48.05 प्रतिषत को घर वापसी हेतु छत्तीसगढ़ शासन द्वारा शासकीय सहयोग प्राप्त हुआ। शेष 51.95 प्रतिषत परिवारों को स्वयं के व्यय पर घर वापसी करना पड़ा।

गाँव का नाम	कुल उत्प्रवासित	कोविड—19 का	कोविड–19 का परीक्षण		संक्रमण से बचाव के उपाय			
	परिवार	हाँ	हाँ नहीं ः		सामाजिक दूरी	सेनेटाइजर की		
						व्यवस्था		
हरदी	26	26	00	26	26	26		
गाताडीह	22	22	00	22	22	22		
पीपरडीह	32	29	3	32	32	32		
योग	80	77	3	80	80	80		
प्रतिषत	(100)	(96.25)	(3.75)	(100.00)	(100.00)	(100.00)		

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सारणी	क १	२ उत्पर्वासित	परिवारी क	त काविड	—19 का	परीक्षण	ਹਰ	सकमण	सं	बचाव	क उपा
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स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

उपरोक्त सारणी क्र. 8 के अनुसार सर्वेक्षित 80 उत्प्रवासी परिवारों को घर वापसी के उपरांत कोविड—19 का परीक्षण 96.25 प्रतिषत (77 परिवार) का किया गया था तथा 3.75 प्रतिषत (3 परिवार) का कोविड—19 का परीक्षण नहीं किया गया। क्योंकि ये 3 परिवार लॉकडाउन से पूर्व घर वापस लौट आये थे। घर वापसी के पष्चात् जितने लोगों को क्वारेंटाइन किया गया था। उनके लिए सरकार के द्वारा रहने, खाने—पीने आदि की व्यवस्था तथा सामाजिक दूरी का पालन कराया गया था। मास्क एवं सैनेटाइजर की व्यवस्था के साथ प्राथमिक उपचार की सुविधा उपलब्ध कराया गया था।

उत्प्रवासित परिवारों का घर वापसी के दौरान कोविड—19 संक्रमण से बचाव के उपाय शत् प्रतिषत परिवारों ने मास्क का उपयोग, सामाजिक दूरी, सैनेटाइजर का उपयोग एवं कोविड—19 से बचाव के दिषा निर्देषों का पालन करते हुए लॉकडाउन में घर वापसी की। सर्वेक्षित 80 उत्प्रवासित परिवारों में से 77 परिवार को क्वारेंटाइन किया गया था। कोविड—19 के कारण उत्प्रवासित परिवारों को मूल निवास स्थल में पहुंचने के बाद 14 दिनों के क्वारेंटाइन किया जाता था। जहां उन्हे आवास, भोजन, षौचालय, पेयजल आदि निःषुल्क सुविधाओं के साथ—साथं चिकित्सकीय सुविधा भी प्रदान किया जाता था। ये सभी सुविधाएं ग्राम पंचायत द्वारा कराई जाती थी। क्वारेंटाइन सदस्यों को गाँव के किसी अन्य सदस्यों से मिलने की अनुमति नहीं थी चाहे वह उनका पारिवारिक सदस्य ही क्यों न हो।

गाँव का नाम	कुल उत्प्रवासित परिवार	स्थानीय रोजगार के इच्छुक	उत्प्रवास के इच्छुक
हरदी	26	5	18
गाताडीह	22	8	9
पीपरडीह	32	4	16
योग	80	17	63
प्रतिषत	(100)	(21.25)	(78.75)

सारणी क्र. 9 :-- उत्प्रवासित परिवारों को स्थानीय रोजगार मिलने पर उत्प्रवास की संभावना

रत्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

उपरोक्त सारणी क्र. 9 के अनुसार सर्वेक्षित 80 उत्प्रवासी परिवारों में 78.75 प्रतिषत (63 परिवार) स्थानीय रोजगार मिलने के उपरात भी उत्प्रवास के इच्छुक हैं तथा 21.25 प्रतिषत (17 परिवार) स्थानीय रोजगार की उपलब्धता की स्थिति में उत्प्रवास हेतु इच्छुक नहीं हैं। उपरोक्त अध्ययन से ज्ञात होता है कि प्रदेष के मजदूरों में उत्प्रवास की प्रवृत्ति अत्यधिक है। इसके प्रमुख कारण उत्प्रवासित स्थल में पूर्णकालिक रोजगार, प्रदेष की तुलना में अधिक मजदूरी दर, उत्प्रवासित स्थल में सामाजिक–धार्मिक, सांस्कृतिक गतिविधियों में कमी के कारण अधिक कार्य एवं अनावष्यक व्यय में कमी, अधिक बचत की संभावना एवं जीवन स्तर में सुधार की सकारात्मक सोच के कारण उत्प्रवास के इच्छूक हैं।

निष्कर्ष :—

प्रामीणों का पलायन रोकने के लिए गाँवों में जहाँ रोजगार के नये—नये साधन विकसित किए जा रहे हैं। वहीं परम्परागत कार्यों को व्यावसायिक गतिविधियों से जोड़ा जा रहा है। साथ ही वर्तमान में केन्द्र एवं राज्य सरकारों द्वारा गाँवों के विकास को महत्व दिया जा रहा है। यदि जनसंख्या की प्रवास की प्रवृत्ति को देखें तो गांवों से षहरों की ओर होन वाले उत्प्रवास में ग्रामीण अल्पकालिक उत्प्रवास सर्वाधिक होता है। जिसमें न सिर्फ पुरूषों की प्रधानता होती है वरन् आज महिलाओं में भी यह प्रवृत्ति देखने को मिलती है। षहरों की चकाचौंध एवं उन्नत जीवन स्तर की कल्पना उत्प्रवासियों को आकर्षित करती है। जहां गाँवों में विद्यमान गरीबी, बेरोजगारी, कम मजदूरी, मौसमी अनियमितता, जाति व वर्ग भेद, सामाजिक रूढ़ी, अनुपयोगी होती भूमि इत्यादि कारणों ने न सिर्फ लोगों को बाहर जाने की प्रेरणा दी वहीं षहरों ने सुविधाएं, युवाओं के सपने, रोजगार के अवसर, आर्थिक विविधता, निष्चित और लगातार अवसर ने आकर्षित करने में कोई कसर नहीं छोड़ी है। इस प्रकार पुरूषों और महिलाओं के बड़ी आबादी ने गाँवों से उन्नत जीवन स्तर की आषा से उत्प्रवास की दिषा पकड़ी है।

सुझाव :--

छत्तीसगढ़ में मौसमी बेरोजगारी से बचने के लिए मजदूरों का प्रतिवर्ष उत्प्रवास हो रहा है। यह उत्प्रवास भूमिहीन कृषि मजदूर एवं सीमांत कृषक अधिक मात्रा में करते हैं। मूल निवास में फसल कटाई के बाद दूसरा कोई विकल्प नवंबर—दिसंबर से जून तक नहीं होता है। इसी अवधि में बड़ी संख्या में ग्रामीण अल्पकालिक रोजगार की तलाष में प्रदेष से बाहर उत्प्रवास कर जाते हैं। उत्प्रवास के लिए मूल निवास में कम मजदूरी एवं सीमित रोजगार का होना प्रमुख कारण है। इसलिए अल्पकाल के लिए उत्प्रवास का फैसला ग्रामीण परिवारों द्वारा किया जाता है। जिससे इनके पारिवारिक आय में वद्धि होती है। किन्त कई बार ये उत्प्रवासी मजदर किसी ठेकदार या साहकार के यहां

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ABSTRACT:

भारत में आर्थिक, औद्योगिक एवं सामाजिक विकास ने ग्रामीण क्षेत्र की जनसंख्या को षहरों की ओर प्रवासित होने का मार्ग प्रषस्त किया है। देष के कई प्रदेषों से लोग कुछ माह या दिनों के लिए अपना घर छोड़कर अन्य प्रदेषों में रोजगार की तलाष में प्रवास करते हैं। इस प्रकार के मौसमी प्रवास को तकनीकी दृष्टि से 'सर्कुलेशन माइग्रेशन' कहा जाता है, क्योंकि 'स्थानान्तरण' का अभिप्राय स्थायी रूप से अपना मूल स्थान छोड़ना नहीं होता है। देष में मजदूरों के इसप्रकार के स्थानान्तरण की संख्या करोड़ों में है। इसके बावजूद देश की आर्थिक नीतियों में इनके लिए कोई अनुकूल व्यवस्था या नीति निर्माण नहीं की गई है। छत्तीसगढ़ प्रदेष से भी प्रतिवर्ष बड़े पैमाने पर अल्पकालिक उत्प्रवास होता है। छत्तीसगढ़ के ग्रामीण क्षेत्रों में पूर्णकालिक रोजगार एवं लघु–उद्योगों के अभाव के कारण ग्रामीण जनसंख्या का अल्पकालिक उत्प्रवास इतनी अधिक मात्रा में होता है कि उससे क्षेत्र की आर्थिक, सामाजिक एवं राजनैतिक सक्रियता के समक्ष चूनौती प्रस्तूत हो गई है। अभी वर्तमान में कोविड–19 के कारण देष के विभिन्न प्रांतों से उत्प्रवासित मजदूरों को संकुषल घर वापसी एक चुनौती बन गई थी। कोविड-19 एवं लॉकडाउन के कारण आवागमन सुविधाओं के अवरूद्ध होने के कारण छत्तीसगढ़ प्रदेष के समक्ष भी एक चूनौती उत्प्रवासित मजदूरों को अपने मूल निवास स्थल की ओर सकुषल वापसी की थी। जिसका समाधान राज्य सरकार ने अपने स्तर पर करने का प्रयास किया और प्रदेष से उत्प्रवासित मजदूरों को सकुषल घर वापसी करवाया गया। किन्तु इस दौरान उत्प्रवासित मजदूरों को कोविड–19 के नियमों के पालन एवं संकुषल घर वापसी के लिए कई प्रकार की कठिनाईयों का सामना करनाँ पड़ा है। प्रस्तुत शोध पत्र उत्प्रवास के कारणों, उत्प्रवासित मजदूरों को कोविड–19 के कारण होने वाली समस्याओं एवं भविष्य में उत्प्रवास की प्रवृत्ति के अध्ययन से संबंधित है।

KEYWORDS: अल्पकालिक उत्प्रवास, ग्रामीण विकास, रोजगार, कोविड–19, उत्प्रवास प्रवृत्ति।

INTRODUCTION:

कोविड—19 (कोरोना वायरस) महामारी पहली बार दिसम्बर 2019 में चीन के वूहान षहर में पहचाना गया था और धीरे—धीरे यह महामारी संपूर्ण विष्व को प्रभावित किया। मार्च 2020 को विष्व स्वाख्य संगठन (डब्ल्यूएचओ) द्वारा कोविड—19 के प्रकोप को महामारी घोषित किया गया। यह वायरस खांसी, छिंकने एवं संक्रमितों के सीधे संपर्क में आने से फैलता है। जिसका संक्रमण पूरे विष्व में बहुत तेजी से हो रहा था। इलाज सुविधाओं के अभाव में इससे बचने का तत्कालिक एकमात्र उपाय स्वयं को अन्य व्यक्तियों के संपर्क से दूर रखना था। जिसके कारण भारत सरकार द्वारा पूरे देष में 22 मार्च 2020 को जनता कर्फ्यू का आदेष दिया गया। फिर पाँच चरणों में (25 मार्च से 30 जून 2020 तक) पूरे देष में लॉकडाउन लागू किया गया। कोविड—19 के प्रभाव के कारण संपूर्ण विष्व सहित देष की समस्त आर्थिक गतिविधियों पर भी विराम लग गया। लोगों की पहली प्राथमिकता स्वयं को कोविड़—19 वायरस के संक्रमण से अपने आप को सुरक्षित रखना था। सुरक्षित स्थानों की तलाष में लोग अपने घरों में स्वतः कैद हो गये। इसप्रकार की माहामारी पिछले सौ वर्षो में कभी नहीं देखी गई थी। अतः इसके प्रभाव आर्थिक एवं स्वास्थ्य के क्षेत्र में बहुत अधिक गंभीर हो रहे थे। कई देषों की सरकारों के सामने इस समय सबसे बड़ी समस्या यह थी कि किस प्रकार स्वास्थ्य एवं अर्थव्यवस्था (आर्थिक गतिविधियों) में सामंजस्य बैठाया जाये, क्योंकि कोविड—19 महामारी सभी देषों में दोनों प्रमुख क्षेत्र अर्थात स्वास्थ्य एवं आर्थिक प्रगति को प्रभावित कर रही थी। विष्व स्वास्थ्य संगठन के अनुसार जनवरी 2021 तक कोविड—19 से संपूर्ण विष्व की लगभग 77 करोड़ आबादी संक्रमित एवं 69 लाख लोगों की मृत्यु हुई। जिनमें से भारत में 4.5 करोड़ लोग संक्रमित एवं 5.32 लाख की मृत्यु हुई।

इस कोविड–19 का प्रभाव सबसे अधिक उत्प्रवासी मजदूरों पर देखा गया। जो अनेक राज्यों में रोजगार के लिए प्रवासित हुए थे। ऑकस्मिक लॉकडाउन होने की वजह से उत्प्रवासित मजदूरों का रोजगार छिन गया, कार्य का भुगतान नहीं किया गया और कुछ ही दिनों में खाने-पीने और रहने की समस्या उत्पन्न होने के साथ-साथ बचत भी समाप्त होने लगी और लॉकडाउन के कारण यातायात के साधनों के अभाव में अपने मूल निवास स्थान पहुंच पाना एक बड़ी समस्या बन गयी। कुछ दिन इन्ही समस्याओं के साथ गुजारा करने के बाद उत्प्रवासी मजदूरों द्वारा केन्द्र सरकार एवं राज्य सरकारों से गंतव्य स्थल से अपने मूल निवास स्थल पहुंचाने की गुहार लगाने लगे। कोविड–19 की बढ़ती समस्या से घबराकर उत्प्रवासी मजदूर पैदल, सायकल एवं उपलब्ध अन्य यातायात के साधनों की सहायता से कडी धुप में घर वापसी के लिए निकल पडे तथा दिन-रात निरंतर चलते-चलते अनेक राज्यों की सीमाओं पर पहुंचने लगें। किन्तु लॉकडाउन के कारण राज्यों की सीमाओं में प्रवेष प्रतिबंध था। महामारी के भय से मानवीय संवेदनाएं लगभग समाप्त हो चूकी थी। जिसके कारण उत्प्रवासी मजदूरों को रात्रि विश्राम, भोजन, पेयजल, कोविड—19 का परीक्षण, मेडीकल सुविधाएं न मिल पाना एवं कोविड—19 से संक्रमित होने की आषंका से अलग व्यवहार किया जाने लगा। उत्प्रवासी परिवारों में महिलाएं एवं बच्चों को भी असुरक्षा का सामना करना पड़ा। उत्प्रवासी परिवारों की इन समस्याओं को समाचार चैनलों के माध्यम से उन्हें पैदल आते हुए, अनेक समस्याओं से गुजरते हुए दिखाया गया जिससे केन्द्र एवं राज्य सरकारों की पहल पर उत्प्रवासियों को सुरक्षापूर्वक उनके मूल र्स्थान पर पहुंचाने के लिए बस, ट्रेन एवं निजी वाहनों का प्रयोग किया जाने लगा। अनेक सामाजिक संगठनों, स्वयं सेवी संस्थाओं, समाज सेवी व्यक्तियों एवं फिल्म सितारों आदि के माध्यम से उत्प्रवासी परिवारों को घर पहुंचाया गया। उत्प्रवासी मजदूरों का अन्य राज्यों में प्रवेष पर कोविड—19 परीक्षण, भोजन, पेयजल, रात्रि विश्राम एवं मेडिकल सविधा उपलब्ध कराई जाने लगी।

शोध का उद्देष्य :--

1. ग्रामीण अल्पकालिक उत्प्रवासियों पर कोविड–19 के प्रभावों का अध्ययन करना।

2. ग्रामीण अल्पकालिक उत्प्रवासियों की कोविड–19 के कारण आप्रवास की समस्याओं का अध्ययन करना।

षोध प्रविधि :—

प्रस्तुत अध्ययन छत्तीसगढ़ के उन अल्पकालिक उत्प्रवासित ग्रामीण मजदूरों, जो कोविड—19 एवं लॉकडाउन के कारण अपने घरों की ओर लौटने मजबूर हुए और उन्हें इस दौरान जो विकट परिस्थितियों का सामना करना पड़ा था, पर आधारित है। यह अध्ययन मूलतः प्राथमिक आंकडों के आधार पर किया गया है। प्राथमिक आंकडों का संकलन प्रत्यक्ष साक्षात्कार अनुसूची की माध्यम से एवं आवष्यकतानुसार द्वितीयक आंकडों का भी प्रयोग किया गया है। उपरोक्त अध्ययन हेतु अध्ययन क्षेत्र के चयन के समस्त स्तरों पर दैव निदर्षन विधि का उपयोग किया गया है। उपरोक्तानुसार छत्त्तीसगढ़ राज्य के बलौदाबाजार—भाटापारा जिला का चयन किया गया है। चयनित जिला के 6 विकासखण्डों में से बिलाईगढ़ विकासखण्ड का चयन कर तीन गांव हरदी, गाताडीह एवं पीपरडीह से क्रमषः 26, 22, 32 परिवार इसप्रकार कुल 80 आप्रवासित परिवारों का दैव निदर्षन विधि से चयन कर प्रत्यक्ष साक्षात्कार अनुसूची के माध्यम से आंकड़ों का संकलन किया गया है। साक्षात्कार अनुसूची के माध्यम से प्राप्त प्राथमिक आंकड़ों का विष्कोषण प्रतिषत विधि की सहायता से किया गया है।

अध्ययन क्षेत्र :–

प्रस्तुत अध्ययन छत्तीसगढ़ के बलौदाबाजार—भाटापारा जिला के उत्प्रवासित मजदूरों से संबंधित है। बलौदाबाजार—भाटापारा जिला रायपुर जिला से पृथक होकर 01 जनवरी 2012 को अस्तित्व में आया है। जिसका मुख्यालय बलौदाबाजार है। बलौदाबाजार—भाटापारा जिला का क्षेत्रफल 4748.44 वर्ग किलोमीटर लगभग है। जनगणना 2011 के अनुसार कुल जनसंख्या 13,05,343 है, जिसमें 49.91 प्रतिषत (651474) पुरूष तथा 50.09 प्रतिषत (653869) महिलाएं है। इसप्रकार जिला में प्रति हजार पुरूषों के बीच 1004 (लिंगानुपात) महिलाएं रहती हैं। जनसंख्या का ग्रामीण—शहरी वितरण क्रमषः 87.27 एवं 12.73 प्रतिषत है। जिला का साक्षरता दर 70.68 प्रतिषत है, जिसमें 82.79 प्रतिषत पुरूष तथा 58.57 प्रतिषत महिलाएं साक्षर हैं। जिले की कुल जनसंख्या में 23.37 प्रतिषत जनसंख्या अनुसूचित जाति तथा 12.83 प्रतिषत जनसंख्या अनुसूचित जनजातियों की तथा जनसंख्या घनत्व 350 व्यक्ति प्रति वर्ग किलोमीटर है। इस जिले में कुल 961 ग्राम व 6 विकासखंड तथा 9 नगरीय निकाय, 17 पुलिस संटेषन, 12 महाविद्यालय, 11 आईटीआई, 2 पॉलिटेक्निक कॉलेज, 6 न्यायालय, 7 सामुदायिक स्वास्थय केन्द्र तथा 16 लोकसेवा केन्द्र स्थापित हैं। बलौदाबाजार—भाटापारा जिला प्रदेष की तीव्र विकसित होने वाले जिलों में प्रमुख है।

छत्तीसगढ़ में ग्रामीण अल्कालिक उत्प्रवास की प्रवृत्ति एव कारण :--

श्रम विभाग द्वारा प्राप्त सूचनाओं के आधार पर छत्तीसगढ़ से प्रतिवर्ष लगभग 11–12 लाख मजदूर अल्पकाल के लिए अन्य राज्यों एवं प्रदेष के अन्य जिलों में रोजगार की तलाष के लिए प्रवासित होते हैं। प्रवास एक जटिल प्रक्रिया है। प्रवास के कारणों की जानकारी प्राप्त करना सरल कार्य नहीं है क्योंकि जनसंख्या संचरण को प्रभावित करने वाले कारकों में आकर्षक एवं विकर्षक दोनों कारक होते हैं, जो साथ—साथ कार्य करते हैं। आधुनिक समय में आवागमन एवं संचार के द्रुतगामी साधनों के विकास से प्रवास की प्रवृत्ति में तीव्र वृद्धि हुई है। व्यक्तियों का सामाजिक एवं आर्थिक स्तर प्रवास की मात्रा एवं दिषा के निर्धारण में महत्वपूर्ण भूमिका अदा करती है। जनसंख्या में वृद्धि, कुटीर उद्योग का पतन, भूमिहीन कृषक, ऋणग्रस्तता, सामाजिक अयोग्यताएं, संयुक्त परिवार, पारिवारिक कलह, अधिक आय अर्जित करने की आषा, अधिक मजदूरी दर, नगरों का आकर्षण, उन्नतषील जीवन, बेरोजगारी, स्वास्थ्य एवं मनोरंजन की सुविधाएं आदि प्रवास की प्रवृत्ति में वृद्धि के प्रमुख उत्तरदायी कारक हैं।

119 40	पुल	उत्प्रवासित	। राज्य							
नाम	उत्प्रवासित	जम्मू	हिमाचल	पष्चिम	तमिलनाडु	पंजाब	उड़ीसा	उत्तर	गुजरात	छ.ग.
	परिवार	कष्मीर	प्रदेष	बंगाल				प्रदेष		
हरदी	26	15	24	00	00	00	2	6	9	5
गाताडीह	22	29	17	2	00	00	5	00	7	00
पीपरडीह	32	24	10	14	5	3	00	00	00	8
योग	80	68	51	16	5	3	7	6	16	13
प्रतिषत्	(100)	(36.75)	(27.56)	(8.64)	(2.70)	(1.62)	(3.78)	(3.24)	(8.64)	(7.02)

सारणी क्र. 1: छत्तीसगढ़ से देष के विभिन्न राज्यों में अल्पकालिक उत्प्रवास – 2019–20

स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

नोट – कोष्ठक में दिए गए आकडे प्रतिषत में है।

देष के विभिन्न राज्यों में छत्तीसगढ़ से मजदूरों का अल्पकालिक उत्प्रवास

उपरोक्त सारणी क्र. 1 के अनुसार वर्ष 2019–20 के दौरान अल्पकालिक उत्प्रवासित 80 परिवारों के कुल 185 सदस्य उत्प्रवासित हुए थे। जिनमें से सर्वाधिक 36.75 प्रतिषत (68 सदस्य) जम्मू–कष्मीर में उत्प्रवासित हुए। 27.56 प्रतिषत् (51 सदस्य) हिमाचल प्रदेष में, 8.64 प्रतिषत (16 सदस्य) पष्ट्रिम बंगाल तथा गुजरात में उत्प्रवासित हुए। छत्तीसगढ़ राज्य के अन्य जिलों में 7.02 प्रतिषत् (13 सदस्य) उत्प्रवासित हुए। उड़ीसा में 3.78 प्रतिषत् (7 सदस्य) उत्प्रवासित हुए। उत्तर प्रदेष में 3.24 प्रतिषत् (6 सदस्य) उत्प्रवासित हुए। उड़ीसा में 2.70 प्रतिषत् (5 सदस्य) उत्प्रवासित हुए। उत्तर प्रदेष में 3.24 प्रतिषत् (6 सदस्य) उत्प्रवासित हुए। इसप्रकार देष के विभिन्न राज्यों में 92.98 प्रतिषत् (172 सदस्य) ने उत्प्रवास किया था। जिसका मुख्य कारण निवास स्थान में अल्प रोजगार एवं मजदूरी दर में कमी होना तथा गंतव्य स्थल में पूर्ण रोजगार की उपलब्धता एवं अधिक आय प्राप्त होना पाया गया है।

सारणी क्र. 2 : – उत्प्रवासित परिवारों के उत्प्रवास का माध्यम

गाँव का नाम	कुल उत्प्रवासित परिवार	उत्प्रवास का माध्यम		
		स्वयं	ठेकेदार	मित्र व रिष्तेदार
हरदी	26	11	11	4
गाताडीह	22	9	9	4
पीपरडीह	32	12	18	2
योग	80	32	38	10
प्रतिशत्	(100)	(40.00)	(47.50)	(12.50)

स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

नोट – कोष्ठक में दिए गए आंकडे प्रतिषत में है।

उपरोक्त सारणी क्र. 2 के अनुसार सर्वेक्षित 80 परिवारों में से 47.50 प्रतिषत् (38 परिवार) सबसे अधिक ठेकेदार के माध्यम से उत्प्रवासित हुए हैं। 40.00 प्रतिषत् (32 परिवार) स्वयं द्वारा तथा 12.50 प्रतिषत् (10 परिवार) मित्र / रिष्तेदार के माध्यम से देष के अन्य राज्यों में उत्प्रवासित हुए। सर्वेक्षित उत्प्रवासी परिवारों में से सबसे अधिक ठेकेदारों के माध्यम से उत्प्रवासित हुए। जिसका कारण ठेकेदार द्वारा उन्हें पुर्णकालिक रोजगार उपलब्ध कराया जाता है। साथ ही आवष्यकता अनुसार भुगतान की सुविधा, आवास की सुविधा प्रदान करना, आवागमन में किराये का भुगतान किया जाना आदि है। कुल उत्प्रवासित परिवारों में से स्वयं से एवं मित्र / रिष्तेदारों के माध्यम से कुल 52.50 प्रतिषत (42 परिवार) उत्प्रवासित हुए। इसप्रकार विगत् कई वर्षों से निरन्तर प्रवास के कारण प्रदेष में स्वयं एवं मित्र / रिष्तेदारों के माध्यम से उत्प्रवास करने की क्षमता में वृद्धि हुई है। सारणी क्र. 3 :- उत्प्रवासित परिवारों के आवागमन का साधन

गाँव का नाम	कुल उत्प्रवासित परिवार	आवागमन के साधन	
		बस	ट्रेन
हरदी	26	5	21
गाताडीह	22	1	21
पीपरडीह	32	5	27
योग	80	11	69
प्रतिशत्	(100)	(13.75)	(86.25)

स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

नोट— कोष्ठक में दिए गए आकडे प्रतिषत में है।

उपरोक्त सारणी क्र. 3 के अनुसार सर्वेक्षित 80 परिवारों के उत्प्रवासित करने हेतु आवागमन का साधन रेल्वे एवं बस सुविधा प्रमुख है। प्रदेष से अन्य राज्यों में उत्प्रवासित परिवारों में सें 86.25 प्रतिषत (69 परिवार) ट्रेन के द्वारा तथा 13.75 प्रतिषत (11 परिवार) बस के माध्यम से उत्प्रवासित हुए। उत्प्रवासित परिवारों द्वारा अन्य राज्यों में उत्प्रवास के लिए रायगढ़, बिलासपुर, रायपुर, दुर्ग, भाटापारा आदि रेलवे जंक्षन से यात्रा किया जाता है तथा अपने राज्य के भीतर अन्य जिलों एवं उड़ीसा में उत्प्रवास के लिए आवागमन के साधन के रूप में बस सेवा उपलब्ध किया जाता है। रेल सुविधा का अधिक दूरी तक उत्प्रवास में महत्वपूर्ण योगदान है। इसप्रकार आवागमन की सुविधा उत्प्रवास को प्रभावित करती है। आवागमन सुविधाओं की सहज उपलब्धता ने उत्प्रवासी परिवारों को अधिक दूरी तक भी आसानी से उत्प्रवास हेतु प्रेरित किया है।

सारणी क्र. 4 :-- उत्प्रवासित स्थल पर कार्य की अधीनस्तता

गाँव का नाम	कुल उत्प्रवासित परिवार	कार्य की अधीनस्तता	कार्य की अधीनस्तता		
		स्वतंत्र	मालिक	ठेकेदार	
हरदी	26	9	5	12	
गाताडीह	22	4	2	16	
पीपरडीह	32	4	6	22	
योग	80	17	13	50	
प्रतिषत्	(100)	(21.25)	(16.25)	(62.50)	

स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

नोट- कोष्ठक में दिए गए आंकड़े प्रतिषत में है।

उपरोक्त सारणी क्र. 4 के अनुसार सर्वेक्षित 80 उत्प्रवासी परिवारों की गंतव्य स्थल में कार्य की अधीनस्तता सबसे अधिक 62.50 प्रतिषत (50 परिवार) ठेकेदार, 21.25 प्रतिषत (17 परिवार) स्वतंत्र एवं 16.50 प्रतिषत (13 परिवार) मालिक के अधीन थे। ठेकेदारों के अधीन 62.50 प्रतिषत (50 परिवार) का कार्य करने का मुख्य कारण ठेकेदार द्वारा गंतव्य स्थल पर पूर्णकालिक रोजगार की निष्चितता, आवष्यकता के समय पूर्ण भुगतान की सुविधा, आवागमन के साधनों की व्यवस्था करना, उचित मजदूरी दर प्रदान करना, आवास, पेयजल, षौचालय आदि अनेक सुविधाएं उपलब्ध कराना आदि है।

ग्रामीण अल्पकालिक उत्प्रवासियों पर कोविड—19 का प्रभाव :—

केन्द्रीय श्रम आयुक्त द्वारा जारी आंकड़ों के अनुसार छत्तीसगढ़ राज्य सें प्रवासी मजदूरों की कुल संख्या 10.86 लाख थी जो विभिन्न राज्यों में रोजगार की तलाष में प्रवासित हुए थे। कोविड—19 एवं लॉकडाउन के कारण आप्रवास की समस्या उत्पन्न हुई। प्रवासी मजदूर घरों की ओर लौटने लगे किन्तु आवागमन के साधनों के अभाव में घर वापसी सबसे बड़ी चुनौती बन गई थी। ये मजदूर आवागमन सुविधाओं के अभाव में पैदल ही घरों की ओर निकल गये। किन्तु तत्कालिन स्वाख्यगत् सुरक्षा कारणों से इन्हें कई समस्याओं का सामना करना पड़ रहा था। अंततः केन्द्र एवं राज्य सरकारों आवागमन सुविधाओं की उपलब्धता के कारण ये मजदूर अपने निवास स्थान में पहुंचने लगे जहां उन्हे स्कूलों, कॉलेजों, सामुदायिक भवनों आदि पर 14 दिनों के लिए क्वारेंटाइन किया जाने लगा। जिसमें उनका कोविड—19 का परीक्षण, भोजन, पेयजल, षौचालय, मेडिकल सुविधा, ग्राम पंचायतों द्वारा किया जाने लगा। इन क्वारेंटाइन सेंटरों में पर्याप्त मुलभूत सुविधाओं का अभाव था। जिससे उत्प्रवासित श्रमिकों को घर वापसी के दौरान कई प्रकार की समस्याओं का सामना करना पड़ रहा था। जिससे क्वारेंटाइन किये गये स्थानों पर विवाद की स्थितियां निर्मित होने लगी थी। उपरोक्त समस्याओं के बीच मजदूरों को इस बात की राहत थी कि वे सकुषल अपने मूल निवास स्थान पहुंच गये।

सारणी क्र. 5 :-- उत्प्रवासित परिवारों का लॉकडाउन के कारण घर वापसी एवं कार्य का पूर्ण भुगतान

गाँव का नाम	कुल उत्प्रवासित परिवार	लॉकडाउन के कारण वापसी	कार्य का पूर्ण भुगत	ान
		हाँ	हाँ	नहीं
हरदी	26	26	22	4
गाताडीह	22	22	15	7
पीपरडीह'	32	29	27	2
योग	80	77	64	13
प्रतिषत्	(100)	(96.25)	(80.00)	(16.25)

स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

नोट- कोष्ठक में दिए गए आंकडे प्रतिषत में है।

ग्राम पीपरडीह से कुल 32 परिवार उत्प्रवासित हुए थे किन्तु कोविड—19 के कारण घर वापसी 29 परिवारों द्वारा किया गया। शेष 3 परिवार कोविड—19 के कारण लगने वाले लॉकडाउन से पूर्व ही घर आ गये थे।

उपरोक्त सारणी क्र. 5 के अनुसार सर्वेक्षित 80 उत्प्रवासित परिवारों में से 96.25 प्रतिषत (77 परिवार) ने लॉकडाउन के कारण सामान्य समय से पूर्व घर वापसी की तथा 3.75 प्रतिषत (3 परिवार) लॉकडाउन के पूर्व ही निवास स्थल में लौट आये थे।

सर्वेक्षित 80 उत्प्रवासित परिवारों को लॉकडाउन के पूर्व कार्यों का पूर्ण भुगतान के अध्ययन से ज्ञात होता है कि 80. 00 प्रतिषत (64 परिवार) को कार्य का पूर्ण भुगतान किया गया तथा 16.25 प्रतिषत (13 परिवार) को पूर्ण भुगतान नहीं किया गया। षेष 3.75 प्रतिषत (3 परिवार) लॉकडाउन के पूर्व ही घर लौट आये थे। इसलिए इन तीन परिवारों को कार्य का पूर्ण भुगतान प्राप्त हो चूका था। कोविड—19 के कारण सम्पूर्ण देष में आकस्मिक लॉकडाउन होने से उत्प्रवासित परिवारों में से 16.25 प्रतिषत (13 परिवार) को पूर्ण भुगतान नहीं किया गया। उत्प्रवासित मजदूरों का कहना था कि सामान्य परिस्थितियों में इसप्रकार भुगतान की समस्या उन्हें कभी भी नहीं हुई थी। चूंकि इस बार कोविड—19 के कारण विषम परिस्थितियां निर्मित हो गई थी इसलिए उन्हें पूर्ण भुगतान की सुविधा प्राप्त नहीं हुई। परिस्थितियों सामान्य होने पर उन्हें यह भुगतान प्राप्त होने की आषा है।

गाँव का नाम	कुल उत्प्रवासित परिवार	घर वापसी का माध्यम	
		बस	किराया के वाहन
हरदी	26	8	18
गाताडीह	22	17	5
पीपरडीह	29	12	17
योग	77	37	40
प्रतिषत	(100.00)	(48.05)	(51 <u>.</u> 95)

सारणी क्र. 6 : उत्प्रवासित परिवारों के घर वापसी का माध्यम

स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

उपरोक्त सारणी क्र. 6 के अनुसार सर्वेक्षित 80 उत्प्रवासित परिवारों के घर वापसी के अध्ययन से ज्ञात होता है कि कोविड—19 एवं लॉकडाउन के कारण घर वापसी हेतु 48.05 प्रतिषत (37 परिवार) को शासकीय एवं अन्य माध्यमों से बस सुविधा प्रदान की गई तथा 51.95 प्रतिषत (40 परिवार) निजी वाहन के माध्यम से स्वयं के व्यय से घर वापसी की। देष की राज्य सरकारों ने कोविड—19 के कारण रेल्वे सेवाओं की सुविधा के अभाव में उत्प्रवासी मजदूरों को उनके मूल निवास में सकुषल पहुंचाने के लिए बस एवं अन्य आवागमन सुविधाओं का उपयोग किया। राज्य सरकारों ने अपने—अपने उत्प्रवासी मजदूरों को लाने के लिए निरंतर प्रयासरत थे। यह देष के राज्य सरकारों द्वारा विपरीत परिस्थितियों में किया गया एक सराहनीय कार्य था।

सारणी क्र. ७ :-- उत्प्रवासित परिवारों को घर वापसी के दौरान प्राप्त षासकीय सहयोग

गाँव का नाम	कुल उत्प्रवासित परिवार	षासकीय सहयोग		मुफ्त यात्रा सुविधा		मुफ्त भोजन व पेयजल सुविधा	
		हाँ	नहीं	हाँ	नहीं	हाँ	न्हीं
हरदी	26	8	18	8	18	8	18
गाताडीह	22	17	5	17	5	17	5
पीपरडीह	29	12	17	12	17	12	17
योग	77	37	40	37	40	37	40
प्रतिषत	(100)	(48.05)	(51.95)	(48.05)	(51.95)	(48.05)	(51.95)

स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

नोत- कोष्तक में दिए गए आंकडे पतिषत में है।

उपरोक्त सारणी क. 7 के अनुसार सर्वेक्षित 80 उत्प्रवासी परिवारों में से 77 परिवार लॉकडाउन के कारण घर वापसी की तथा 3 परिवार लॉकडाउन के पूर्व ही घर वापस आ चूके थे। लॉकडाउन के कारण घर वापसी करने वाले परिवारों में से 51.95 प्रतिषत (40 परिवार) को घर वापसी हेतु कोई शासकीय सहयोग प्राप्त नहीं हुआ तथा 48.05 प्रतिषत (37 परिवार) को शासकीय सहयोग प्राप्त हुआ है। कोविड—19 एवं लॉकडाउन के कारण उत्प्रवासी मजदूरों को अपने मूल निवास पर सुरक्षित लाने की मुख्य जिम्मेदारी राज्य सरकारों की थी। इसप्रकार जम्मू—कष्मीर सहित अन्य राज्यों में प्रवासित मजदूर परिवारों में से 48.05 प्रतिषत को घर वापसी हेतु छत्तीसगढ़ शासन द्वारा शासकीय सहयोग प्राप्त हुआ। शेष 51.95 प्रतिषत परिवारों को स्वयं के व्यय पर घर वापसी करना पड़ा।

गाँव का नाम	कुल उत्प्रवासित	कोविड—19 का	कोविड—19 का परीक्षण		र्ज उपाय		
	परिवार	हाँ	नहीं	मास्क का उपयोग	सामाजिक दूरी	सेनेटाइजर की	
						व्यवस्था	
हरदी	26	26	00	26	26	26	
गाताडीह	22	22	00	22	22	22	
पीपरडीह	32	29	3	32	32	32	
योग	80	77	3	80	80	80	
प्रतिषत	(100)	(96.25)	(3.75)	(100.00)	(100.00)	(100.00)	

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सारणी	क १	२ उत्प्रवासित	परिवारी क	ा काविड -	–19 का	परीक्षण	ਹਰ	सकमण	सं	बचाव	क उप	तय
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स्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

उपरोक्त सारणी क्र. 8 के अनुसार सर्वेक्षित 80 उत्प्रवासी परिवारों को घर वापसी के उपरांत कोविड—19 का परीक्षण 96.25 प्रतिषत (77 परिवार) का किया गया था तथा 3.75 प्रतिषत (3 परिवार) का कोविड—19 का परीक्षण नहीं किया गया। क्योंकि ये 3 परिवार लॉकडाउन से पूर्व घर वापस लौट आये थे। घर वापसी के पष्चात् जितने लोगों को क्वारेंटाइन किया गया था। उनके लिए सरकार के द्वारा रहने, खाने—पीने आदि की व्यवस्था तथा सामाजिक दूरी का पालन कराया गया था। मास्क एवं सैनेटाइजर की व्यवस्था के साथ प्राथमिक उपचार की सुविधा उपलब्ध कराया गया था।

उत्प्रवासित परिवारों का घर वापसी के दौरान कोविड—19 संक्रमण से बचाव के उपाय शत् प्रतिषत परिवारों ने मास्क का उपयोग, सामाजिक दूरी, सैनेटाइजर का उपयोग एवं कोविड—19 से बचाव के दिषा निर्देषों का पालन करते हुए लॉकडाउन में घर वापसी की। सर्वेक्षित 80 उत्प्रवासित परिवारों में से 77 परिवार को क्वारेंटाइन किया गया था। कोविड—19 के कारण उत्प्रवासित परिवारों को मूल निवास स्थल में पहुंचने के बाद 14 दिनों के क्वारेंटाइन किया जाता था। जहां उन्हे आवास, भोजन, षौचालय, पेयजल आदि निःषुल्क सुविधाओं के साथ—साथं चिकित्सकीय सुविधा भी प्रदान किया जाता था। ये सभी सुविधाएं ग्राम पंचायत द्वारा कराई जाती थी। क्वारेंटाइन सदस्यों को गाँव के किसी अन्य सदस्यों से मिलने की अनुमति नहीं थी चाहे वह उनका पारिवारिक सदस्य ही क्यों न हो।

गाँव का नाम	कुल उत्प्रवासित परिवार	स्थानीय रोजगार के इच्छुक	उत्प्रवास के इच्छुक
हरदी	26	5	18
गाताडीह	22	8	9
पीपरडीह	32	4	16
योग	80	17	63
प्रतिषत	(100)	(21.25)	(78.75)

सारणी क्र. 9 :-- उत्प्रवासित परिवारों को स्थानीय रोजगार मिलने पर उत्प्रवास की संभावना

रत्रोत – व्यक्तिगत सर्वेक्षण पर आधारित है।

उपरोक्त सारणी क्र. 9 के अनुसार सर्वेक्षित 80 उत्प्रवासी परिवारों में 78.75 प्रतिषत (63 परिवार) स्थानीय रोजगार मिलने के उपरात भी उत्प्रवास के इच्छुक हैं तथा 21.25 प्रतिषत (17 परिवार) स्थानीय रोजगार की उपलब्धता की स्थिति में उत्प्रवास हेतु इच्छुक नहीं हैं। उपरोक्त अध्ययन से ज्ञात होता है कि प्रदेष के मजदूरों में उत्प्रवास की प्रवृत्ति अत्यधिक है। इसके प्रमुख कारण उत्प्रवासित स्थल में पूर्णकालिक रोजगार, प्रदेष की तुलना में अधिक मजदूरी दर, उत्प्रवासित स्थल में सामाजिक–धार्मिक, सांस्कृतिक गतिविधियों में कमी के कारण अधिक कार्य एवं अनावष्यक व्यय में कमी, अधिक बचत की संभावना एवं जीवन स्तर में सुधार की सकारात्मक सोच के कारण उत्प्रवास के इच्छूक हैं।

निष्कर्ष :—

प्रामीणों का पलायन रोकने के लिए गाँवों में जहाँ रोजगार के नये—नये साधन विकसित किए जा रहे हैं। वहीं परम्परागत कार्यों को व्यावसायिक गतिविधियों से जोड़ा जा रहा है। साथ ही वर्तमान में केन्द्र एवं राज्य सरकारों द्वारा गाँवों के विकास को महत्व दिया जा रहा है। यदि जनसंख्या की प्रवास की प्रवृत्ति को देखें तो गांवों से षहरों की ओर होन वाले उत्प्रवास में ग्रामीण अल्पकालिक उत्प्रवास सर्वाधिक होता है। जिसमें न सिर्फ पुरूषों की प्रधानता होती है वरन् आज महिलाओं में भी यह प्रवृत्ति देखने को मिलती है। षहरों की चकाचौंध एवं उन्नत जीवन स्तर की कल्पना उत्प्रवासियों को आकर्षित करती है। जहां गाँवों में विद्यमान गरीबी, बेरोजगारी, कम मजदूरी, मौसमी अनियमितता, जाति व वर्ग भेद, सामाजिक रूढ़ी, अनुपयोगी होती भूमि इत्यादि कारणों ने न सिर्फ लोगों को बाहर जाने की प्रेरणा दी वहीं षहरों ने सुविधाएं, युवाओं के सपने, रोजगार के अवसर, आर्थिक विविधता, निष्चित और लगातार अवसर ने आकर्षित करने में कोई कसर नहीं छोड़ी है। इस प्रकार पुरूषों और महिलाओं के बड़ी आबादी ने गाँवों से उन्नत जीवन स्तर की आषा से उत्प्रवास की दिषा पकड़ी है।

सुझाव :--

छत्तीसगढ़ में मौसमी बेरोजगारी से बचने के लिए मजदूरों का प्रतिवर्ष उत्प्रवास हो रहा है। यह उत्प्रवास भूमिहीन कृषि मजदूर एवं सीमांत कृषक अधिक मात्रा में करते हैं। मूल निवास में फसल कटाई के बाद दूसरा कोई विकल्प नवंबर—दिसंबर से जून तक नहीं होता है। इसी अवधि में बड़ी संख्या में ग्रामीण अल्पकालिक रोजगार की तलाष में प्रदेष से बाहर उत्प्रवास कर जाते हैं। उत्प्रवास के लिए मूल निवास में कम मजदूरी एवं सीमित रोजगार का होना प्रमुख कारण है। इसलिए अल्पकाल के लिए उत्प्रवास का फैसला ग्रामीण परिवारों द्वारा किया जाता है। जिससे इनके पारिवारिक आय में वद्धि होती है। किन्त कई बार ये उत्प्रवासी मजदर किसी ठेकदार या साहकार के यहां

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Subject Dependent and Subject Independent Analysis for Emotion Recognition Using Electroencephalogram (EEG) Signal

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Abstract. Brain signals for the human-computer interface is a research interest in recent years. The brain is the most vital part of our body. It handles and manages all types of activities of the body. Brain signals appear when neurons inside the brain send electrical impulses to communicate and elicit electrical potentials. This electrical activity can be measured by Electroencephalogram (EEG) through electrodes. EEG signals can help to recognize human emotions effectively. It is a non-invasive method to collect brain signals. In this paper, we have studied the subject-dependent and subject-independent analysis for four emotions (happy, sad, fear, and neutral) using the SEED-IV dataset of EEG signals for emotion. The raw EEG signals of the SEED-IV dataset have been preprocessed to remove unwanted signals and noise. 32 statistical features have been extracted from the preprocessed EEG signals and used as input for classifiers. Here, we achieved an average of 95.73% accuracy for 15 subjects for subject-dependent analysis for emotional classification using a cubic support vector machine (SVM). Based on cubic SVM and fine Gaussian SVM, we achieved an average classification accuracy of 78.46% and 83.7% for subject-independent analysis.

Keywords: Electroencephalogram, Support Vector Machine, Emotion

1. Introduction

Complex psychological and physiological states known as emotions can be brought on by both internal and external factors. They are subjective experiences that involve a range of cognitive, behavioral, and physiological responses [1,2]. Some common emotions are fear, anger, happiness, surprise, sadness, love, and disgust. Emotions are also categorized as positive or negative emotions, as they vary in duration and intensity. They are affected by various reasons, including genetics, culture, upbringing, personality, and experiences. Emotions play an important role in communication.

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Subject Dependent and Subject Independent Analysis for Emotion Recognition Using Electroencephalogram (EEG) Signal

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Abstract

Brain signals for the human-computer interface is a research interest in recent years. The brain is the most vital part of our body. It handles and manages all types of activities of the body. Brain signals appear when neurons inside the brain send electrical impulses to communicate and elicit electrical potentials. This electrical activity can be measured by Electroencephalogram (EEG) through electrodes. EEG signals can help to recognize human emotions effectively. It is a non-invasive method to collect brain signals. In this paper, we have studied the subject-dependent and

Feedback



Time-Frequency Image-based Speech Emotion Recognition using Artificial Neural Network

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Abstract. Automatic Speech Emotion Recognition (ASER) is a state-of-the-art application in artificial intelligence. Speech recognition intelligence is employed in various applications such as digital assistance, security, and other human-machine interactive products. In the present work, three open-source acoustic datasets, namely SAVEE, RAVDESS, and EmoDB, have been utilized (Haq et al., 2008, Livingstone et al., 2005, Burkhardt et al., 2005). From these datasets, six emotions namely anger, disgust, fear, happy, neutral, and sad, are selected for automatic speech emotion recognition. Various types of algorithms are already reported for extracting emotional content from acoustic signals. This work proposes a time-frequency (t-f) image-based multiclass speech emotion classification model for the six emotions mentioned above. The proposed model extracts 472 grayscale image features from the t-f images of speech signals. The t-f image is a visual representation of the time component and frequency component at that time in the two-dimensional space, and differing colors show its amplitude. An artificial neural network-based multiclass machine learning approach is used to classify selected emotions. The experimental results show that the above-mentioned emotions' average classification accuracy (CA) of 88.6%, 85.5%, and 93.56% is achieved using SAVEE, RAVDESS, and EmoDB datasets, respectively. Also, an average CA of 83.44% has been achieved for the combination of all three datasets. The maximum reported average classification accuracy (CA) using spectrogram for SAVEE, RAVDESS, and EmoDB dataset is 87.8%, 79.5 %, and 83.4%, respectively (Wani et al., 2020, Mustageem and Kwon, 2019, Badshah et al., 2017). The proposed t-f image-based classification model shows improvement in average CA by 0.91%, 7.54%, and 12.18% for SAVEE, RAVDESS, and EmoDB datasets, respectively. This study can be helpful in human-computer interface applications to detect emotions precisely from acoustic signals.

Keywords: Time-Frequency Image; Neural Network; Automatic Speech Emotion Recognition; Acoustic Signal; Grayscale Image Feature

Introduction

Emotions are an individual's feelings about a situation. It is the body's physical and emotional response to a person's thoughts and feelings. People express emotions in identical situations differently. People's expressions on their faces and their voices usually reflect their feelings. For effective communication, emotion is essential. Different emotions can be expressed as happiness, sadness, anger, anxiety, cheerfulness, excitement, lonely, helplessness, annoyance, etc. Additionally, it can be categorized as positive and negative emotions. The primary emotions are classified into six categories: happy, sad, anger, fear, disgust, and surprise (Ekman et al., 2013). Human uses many types of gestures, including speech, as a means of communication. Speech is the most common, easiest, and natural form of communication. Communication can be done in other ways as well, but it lacks emotions such as text messages, without proper emotions, can induce misunderstanding. So, emojis were introduced, which replicated the emotions. Using emojis in text messages conveys our emotions. When people speak, their emotions are reflected in their voices, facilitating better



Time-Frequency Image-based Speech Emotion Recognition using Artificial Neural Network

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Sziklai Pair based Small Signal Amplifier with BJT-MOSFET Hybrid Unit at 180nm Technology

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ABSTRACT

Two circuit models of Small Signal amplifier, constituted with BJT-MOSFET hybrid unit under Sziklai pair topology are designed and analyzed using 'PSpice' and 'Cadence Virtuoso and Spectre simulation tool (at GPDK 180nm technology)' respectively. First amplifier (Circuit-1) uses PSpice user-defined model of BJT and MOSFET whereas the second amplifier (Circuit-2) consists of transistors available at GPDK 180nm technology. Circuit-1 can amplify the AC signals of 1mV-1nV range with optimum voltage gain 389.532, 137.570 current gain, 14.464MHz bandwidth and 2.43% THD. However, Circuit-2 can amplify AC signals of 0.1mV-10nV range with 164.018 voltage gain, 32.775 current gain, 11.906 MHz bandwidth, and 13.608E-6% THD. Both the proposed amplifier circuits remove narrow band problem and generate better results than earlier announced small signal Sziklai pair amplifier with BJT-MOSFET hybrid unit in respect of voltage and current gains, bandwidth, THD, and power consumption. Proposed amplifiers successfully address the problem of poor frequency response of small signal Darlington pair amplifier in higher frequency range and narrow bandwidth limitations of small-signal PNP Sziklai pair amplifier. Dependency of the proposed amplifiers at various biasing resistances and performance with temperature variation, noise variation, DC supply variation, and phase variation are also discussed herein. Proposed Circuits display strong dependency over ideal maximum forward beta '\beta' of NPN transistor, Transconductance 'V_{TO}' of P-MOS transistor and additional biasing resistances 'R_A'. Layout of Circuit-2 is found to cover 96.3898µm² area with 11.32µm length and 8.515µm breadth. Minor percentage variation between pre-layout and post-layout simulation results of Circuit-2 validates the proposed design at GPDK 180nm technology. Monte Carlo and Process Corner analysis are also performed to test the robustness and insensitivity of Circuit-2 against mean value of the parameters and process and mismatch variations respectively. Performance summary of the proposed circuits and comparison with the recently reported designs shows effectiveness of the proposed circuits in terms of power gain, THD, voltage gain, current gain, input referred noise and power gain. Qualitative analysis of the proposed Circuits recommends its usability as Low Noise Amplifier in the portable RF noise measurement system.

Key Words: Sziklai pair, Small signal amplifier, compound pair

INTRODUCTION

For a variety of electronics and communication system applications, the preferred device configurations are the Darlington and Sziklai Pairs [1]-[4]. Due to the identical ranges for input impedance, output impedance, voltage gain, and current gain factor ' β ', Darlington and Sziklai pairs are regarded as complementary to one another in many applications [4]-[5]. But now-a-





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Energy harvesting in cellular radio access networks based on Q-learning

Authors: S. Sharma ■, N. Dewangan ■, S. Mandal ■, K. Thakur ■, and A. Sharma ■ | <u>Authors Info & Affiliations</u>
 Publication: IET Conference Proceedings Volume 2023, Issue 4 https://doi.org/10.1049/icp.2023.1456



Abstract

In the modern communication world, capacity of future mobile networks will continuously rise for enhanced data traffic and high reliability. The current evolution trends in 5G networks and beyond impose drastic increase in energy consumption and therefore, a high level of carbon footprint by industry network infrastructures. Modern 5G wireless communication can be a potential driver for machine learning (ML) and artificial intelligence architecture at network edge. Herein, we investigate the performance and evaluation analysis of cellular radio access networks (RAN) simulated and based Q-learning approach by turning on-off some base stations (BSs) to achieve enhanced energy savings in a cellular RAN. In this work, we study the BS switching actions, considering traffic load variations.





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Research Article 05 July 2023

27th International Conference on Advanced Computing and Communications (ADCOM 2022)

Energy harvesting in cellular radio access networks based on Q-learning

Authors: S. Sharma ■, N. Dewangan ■, S. Mandal ■, K. Thakur ■, and A. Sharma ■ <u>Authors Info & Affiliations</u> Publication: IET Conference Proceedings Volume 2023, Issue 4 https://doi.org/10.1049/icp.2023.1456



Abstract

In the modern communication world, capacity of future mobile networks will continuously rise for enhanced data traffic and high reliability. The current evolution trends in 5G networks and beyond impose drastic increase in energy consumption and therefore, a high level of carbon footprint by industry network infrastructures. Modern 5G wireless communication can be a potential driver for machine learning (ML) and artificial intelligence architecture at network edge. Herein, we investigate the performance and evaluation analysis of cellular radio access networks (RAN) simulated and based Q-learning approach by turning on-off some base stations (BSs) to achieve enhanced energy savings in a cellular RAN. In this work, we study the BS switching actions, considering traffic load variations.





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Spectral features based speech emotion recognition using artificial neural network

Authors: N. Dewangan 🖾, S. Mandal 🖾, K. Thakur 🖾, and B. K. Singh 🖾 | Authors Info & Affiliations

Publication: IET Conference Proceedings Volume 2023, Issue 4 https://doi.org/10.1049/icp.2023.1448



Abstract

Emotion is an essential part of human communication. People communicate with emotions through words and body language. Speech emotion recognition is a well-known technique to detect emotions from speech signals. Here, we have proposed binary and multiclass classification models that combine two cepstral coefficients, i.e., Mel-Frequency Cepstral Coefficient (MFCC) and Mel-Frequency Magnitude Coefficient (MFMC) to extract the spectral features from the speech signals and classify them using backpropagation artificial neural network (BPANN). In our study, it is found that when significant features of both spectral coefficients are combined it shows improvement in training and classification results. The proposed model achieved 85.24% accuracy for the multiclass classification





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A Review on Estimation of soil Macronutrients using Satellite Image Processing

Swagota Bera, Arti Shrivastava, Himani Agrawal and Sunandal Mandal Published under licence by IOP Publishing Ltd Journal of Physics: Conference Series, Volume 2576, 2nd National Conference on Signal Processing, Sustainable Energy Materials and Astronomy & Astrophysics 2023 16/03/2023 - 18/03/2023 Raipur, India Citation Swagota Bera *et al* 2023 *J. Phys.: Conf. Ser.* **2576** 012003 DOI 10.1088/1742-6596/2576/1/012003

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Abstract

Major portion of Indian economy depends on agriculture. More than 40 % of the Indian land is used for agriculture which contributes to Gross Domestic Product (GDP) of the country and also provides employ to the population of the country. Increment in the population day by day increases the requirement for the increment in the yield of the agricultural products. There are several factors which is responsible to control the agricultural product yield. Among them Nitrogen, Phosphorus and Potassium are the macronutrients are the vital elements of the soil . Due to the instability in the climatic condition of India and also due to other biotic and abiotic factors macronutrients get varies. To increase the crop yield, the perfect handling of macronutrients i.e., nitrogen, phosphorus and potassium are required. As the technology is developing day by day, the application of remote Journal of Physics: Conference Series

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A Review on Estimation of soil Macronutrients using Satellite **Image Processing**

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Abstract. Major portion of Indian economy depends on agriculture. More than 40 % of the Indian land is used for agriculture which contributes to Gross Domestic Product (GDP) of the country and also provides employ to the population of the country. Increment in the population day by day increases the requirement for the increment in the yield of the agricultural products. There are several factors which is responsible to control the agricultural product yield. Among them Nitrogen, Phosphorus and Potassium are the macronutrients are the vital elements of the soil. Due to the instability in the climatic condition of India and also due to other biotic and abiotic factors macronutrients get varies. To increase the crop yield, the perfect handling of macronutrients i.e., nitrogen, phosphorus and potassium are required. As the technology is developing day by day, the application of remote sensing in agriculture is becoming promising. The satellite images of agricultural land can be processed and analysed to provide vital information for efficient agricultural practices. This paper is the review of the present state of art in the field of satellite image processing techniques for the estimation of the macronutrients of the agricultural land. This review will promote the acceptance of hyperspectral image technology for the investigation of soil NPK.

Keywords: Hyperspectral Imaging, Macronutrients, Machine Learning, Remote Sensing

1. Introduction

According to the document IISS Vision 2030, under Dr. S. Ayyappan, Director General, Indian Institute of Soil Science, Bhopal has come up with great work in the basic and planned soil research in India. The Indian population had increased from 683 million to 1210 million in the time span from 1981 to 2010. It is estimated to that population will reached to 1412 million in 2025 and to 1475 million in 2030. For feeding 1.48 billion in India by 2030, it is required to yield 350 million tons of food grains. The production of per unit of productive land is decreased from 0.34 ha to 0.15 ha from 1950-51 to 2000-01 and is expected to reduce more to 0.08 ha in 2025 and to 0.07 ha in 2030. The productivity of the soils differs and need different management practices. The physical, chemical and biological properties of soil are different for different soils and also the rainfall/availability of water also varies. So, the cropping system and irrigation system are different for different soils. Due to degradation in chemical, biological and physical health of the soils, the efficiency of the nutrient becomes less. The degradation in Phosphorous is 15-20 %, Nitrogen is 30-50 %, Sulphur is 8-12 %,

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Determination of Total Dissolved Solids (TDS) of RO Purified **Drinking Water Samples in Raipur**

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*Corresponding author: bhoisudheer08@gmail.com

Abstract

This research work deals with the TDS and physiochemical parameters of RO purified drinking water in Raipur region. Current pollution trends taught us that it is necessary to drink RO purified water but we must have to know the quality of RO purified drinking water because many peoples used RO water for consumption. This paper deals about RO water with special reference to TDS, but another physical parameter viz. pH, EC, Salt, Temperature and chemical parameter viz. Hardness (total hardness, calcium hardness & magnesium hardness) and Total alkalinity and NA⁺, K⁺ of RO purified water also tested and studied. We are able to know about the correlation between TDS and many physiochemical parameter after study about this research paper. 20 water samples collected from different places of Raipur city. The purpose of the research paper is to ensure the quality of RO purified water that people using for drinking purpose. Many samples of RO purified waters TDS level is below the permissible limit of BIS guidelines in the part of result and discussion the samples are mentioned properly in this present paper. Peoples should aware about the consequences which can occur after long term consumption of RO purified drinking water.

Keywords: RO purified drinking water, physiochemical parameters, TDS, BIS, WHO.

Introduction

Raipur district is not only the capital of Chhattisgarh but also heart of Chhattisgarh state. Very huge number of peoples are living in Raipur city. Raipur city is highly polluted because of large number of industries and large population. Due to high pollution of water, peoples are allowed to use RO purified water for safe drinking. But it is necessary to know that RO water is healthy for us or not. Hence it is important to know about physical and chemical parameter of RO purified drinking water. The physical parameters like EC, TDS, pH, Salt and temperature are mostly notable. The TDS of water is commonly becomes low after purification using RO. This phenomena leads to remove essential minerals from drinking water which can cause severe health consequences after long term consumption of RO purified water.

TDS correlates positively with EC and affects pH, the higher the TDS the higher the conductivity and lower the pH, towards the acidity. Similarly TDS strongly correlated with TH and Ca2+ etc. According to BIS & WHO the upper limit of TDS levels in water is 500 & 300 ppm respectively. But both high and low TDS levels is harmful for human beings. A certain levels of TDS is required for consumption. Hence the aim of this research work is to understand the quality of water with special reference to TDS because it is essential to aware people about the quality of water they are consuming.

Materials and methods

Sampling Area and Collection


Determination of Total Dissolved Solids (TDS) of RO Purified Drinking Water Samples in Raipur

Sudheer Bhoi^{1,*}, Ch<u>unendra Kashyap¹</u>, Sagar Kumar Rajak¹, Shobhana Ramteke¹ ¹ School of Studies in Environmental Science, Pt. Ravishankar Shukla University Raipur (Chhattisgarh) 492010. India.

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Research Paper / Article / Review

Phytochemical Estimation of *Chrysanthemum* flowers by FTIR Spectroscopy

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Abstract: The purpose of this study was to assess the total phenol, tannin, alkaloid, and flavonoid contents in the Chrysanthemum flower extracts in petroleum ether, ethyl acetate, and methanol. Petroleum ether, ethyl acetate, and methanol were used as solvents in a continuous hot percolation method in a soxhlet apparatus to extract powdered wood material. For the Folin-Ciocalteu method of determining total phenol and tannin, gallic acid was utilised as the standard. Quercetin was used as a standard in the chloride colorimetric method to determine the total alkaloid content. Using atropine as a standard, the results demonstrated that ethyl acetate extract had a high concentration of total phenol, tannin, alkaloid, and flavonoid contents when compared to bromocresol green solution. Total flavonoid content was determined by aluminium to petroleum ether, ethyl acetate and methanol extracts. Ethyl acetate extract contained the total phenol of 30.18 and tannins of 83.03 as mg of gallic acid equivalents (QE),

Key Words: Phenol, flavonoid; alkaloid; tannin; Chrysanthemum flower.



Graphical Abstract

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NOTE



Contamination, speciation, and health risk assessment of arsenic in leafy vegetables in Ambagarh Chowki (India)

Madhuri Khute¹ • S</mark>aroj Sharma¹ • Khageshwar Singh Patel² • Piyush Kant Pandey² • Jasmina Allen² • Warren Corns³ • Nelina Georgieva³ • Elena Bozhanina⁴ • Borislav Blazhev⁴ • Milosz Huber⁵ • Simge Varol⁶ • Pablo Martín-Ramos⁷ • Yanbei Zhu⁸[©]

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Abstract

Green leafy vegetables are essential for a balanced diet, providing vital nutrients for overall well-being. However, concerns arise due to contamination with toxic substances, such as arsenic, posing risks to food safety and human health. This study analyzes inorganic (iAs), monomethyl (MMA), and dimethyl arsenic (DMA) in specific leafy vegetables (*Amaranthus tricolor* L., *Corchorus olitorius* L., *Cordia myxa* L., *Hibiscus sabdariffa* L., *Ipomoea batatas* (L.) Lam., *Moringa oleifera* Lam., and *Spinacia oleracea* L.) grown in the heavily polluted Ambagarh Chouki region, Chhattisgarh, India. Concentrations of DMA, MMA, and iAs ranged from 0 to 155, 0 to 7, and 131 to 3579 mg·kg⁻¹, respectively. The health quotient (HQ) for iAs ranged between 0.37 and 3.78, with an average value of 2.58 ± 1.08 .

Keywords Arsenic speciation · Pollution · Leafy vegetables · Chhattisgarh · India

Introduction

Arsenic, a potent carcinogenic pollutant in the contemporary global environment, stems from both natural occurrences and human activities, posing a severe toxicity threat. Naturally occurring origins include the erosion and breakdown of rocks/minerals, the intermingling of geothermal fluids with near-surface groundwater, and volcanic events [1]. On the other hand, human-induced actions contributing to arsenic pollution encompass mining, coal and hydrocarbon exploitation, geothermal activities, agricultural practices, the application of fertilizers and pesticides, and the generation of industrial and urban waste [2]. Arsenic pollution adversely affects groundwater and surface water, which are utilized for drinking and irrigation, and it also has detrimental effects on soil, biota, and air quality [3].

The toxicity of arsenic in biological systems is contingent on its speciation pattern, with varying levels of toxicity observed across distinct species [4]. The discharge of arsenic into the environment poses significant threats to human health, especially through the consumption of contaminated drinking water and the contamination of the food chain. Numerous studies have demonstrated that arsenic

Extended author information available on the last page of the article

exposure leads to various diseases, such as cancers, diabetes, hyperkeratosis, hypertension, ischemic heart diseases, lung diseases, melanosis, and peripheral vascular diseases [5–9].

Arsenic pollution and its associated health issues are prevalent in several countries, including Argentina, Bangladesh, Chile, China, India, Japan, Mexico, Mongolia, Nepal, Poland, Taiwan, and Vietnam [9–21]. Among these countries, India is at the forefront of combating arsenic pollution and the problems caused by exposure to it. In India, exposure to arsenic primarily occurs through the consumption of polluted drinking water and contaminated food sources [22]. Groundwater is the primary contributor to arsenic pollution across India, leading to arsenic-related issues in various states, such as Assam, Chhattisgarh, Jharkhand, Uttar Pradesh, and West Bengal, due to excessive exploitation of groundwater resources [23–25].

Presently, agricultural products in many regions of India are also affected by arsenic pollution, as it accumulates in the soil, groundwater, and irrigation water. Extensive studies conducted throughout the country have revealed the extent of this issue in different regions [26–31]. Within the spectrum of plant-based foods, leafy vegetables pose a notable health hazard as a result of arsenic contamination [32–36]. This is particularly concerning because leafy and green vegetables are widely consumed throughout the year in India

RESEARCH





Multi-element Contamination and Health Risks in Green Leafy Vegetables from Ambagarh Chowki, Chhattisgarh, India

Bhagyashri Wakhle¹ · Saroj Sharma¹ · Khageshwar Singh Patel² · Piyush Kant Pandey² · Mavro Lučić³ · Željka Fiket³ · Sema Yurdakul⁴ · Simge Varol⁵ · Pablo Martín-Ramos⁶ · Hanan Mohamed Al-Yousef⁷ · Ramzi Ahmed Mothana⁷

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Abstract

Leafy plants are commonly consumed as vegetables in India due to their high nutrient and vitamin content. This study, conducted in Ambagarh Chowki (India), investigated the accumulation potential of 52 elements (including Al, As, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cu, Dy, Er, Eu, Fe, Ga, Gd, Ge, Ho, K, La, Li, Lu, Mg, Mn, Mo, Na, Nb, Nd, Ni, P, Pb, Pr, Rb, Sb, Sc, Se, Sm, Sn, Sr, Tb, Te, Th, Ti, Tl, Tm, U, V, W, Y, Yb, and Zn) in seven leafy vegetable species, namely Amaranthus tricolor L., Corchorus olitorius L., Cordia myxa L., Hibiscus sabdariffa L., Ipomoea batatas (L.) Lam., Moringa oleifera Lam., and Spinacia oleracea L. Technique: Inductively coupled plasma mass spectrometry (ICP-MS) was employed for analysis. The maximum concentrations of elements such as Al, Ba, Be, Bi, Cd, Co, Cr, Fe, Ga, Ge, Li, Mn, Ni, Pb, Sb, Th, Tl, U, V, W, and REEs were observed in S. oleracea leaves, indicating their highest accumulation potential. In contrast, the maximum concentrations of As were found in H. sabdariffa leaves; Ca and Si in M. oleifera leaves; Mg, Sr, and Mo in A. tricolor leaves; and P, K, Cu, and Zn in C. myxa leaves, respectively. Twenty-one elements (Cr, Cd, Pb, Ni, Co, V, Cu, Zn, Fe, Mn, Th, Sb, Ba, Be, Li, Sr, Tl, U, Se, Sn, and REEs) exceeded permissible limits set by the WHO. The elevated hazard index values indicated significant non-carcinogenic effects. The sources of these elements could be attributed to a combination of geological factors and agricultural practices. This study highlights the need for further investigation into the potential health implications of consuming these vegetables in the aforementioned region.

Keywords Leafy vegetables · Multielement accumulation · Trace and toxic elements · Health assessment · ICP-MS

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Preprints are preliminary reports that have not undergone peer review. They should not be considered conclusive, used to inform clinical practice, or referenced by the media as validated information.

Contamination and Sources of Surface Water in Korba Coal Basin, Chhattisgarh, India

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Research Article

Keywords: Surface water, quality, sources, Korba basin, India

Posted Date: June 7th, 2024

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Research paper





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Spatial and temporal variations of dug well water quality in Korba basin, Chhattisgarh, India: Insights into hydrogeological characteristics

Khageshwar Singh Patel^{a,*}, Piyush Kant Pandey^a, Sanjay Kumar Sharma^b, Bharat Lal Sahu^c, Shobhana Ramteke^d, Irena Wysocka^e, Sema Yurdakul^f, Simge Varol^g, Pablo Martín-Ramos^h, Dalchand Jhariyaⁱ, Mohammad Mahmudur Rahman^j, Prosun Bhattacharya^k

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HIGHLIGHTS

GRAPHICAL ABSTRACT

- Hydrogeochemical characteristics of water from dug wells in Korba basin were presented.
- Nitrate and fluoride contamination in dug well water of the basin were detected.
- Water of the Korba is mainly Ca-Mg-HCO₃ type, influenced by rocks and water interaction.
- Both geogenic and anthropogenic sources are responsible for dug wells pollution in the basin.
- Water quality evaluation data showed that most waters were suitable for irrigation.



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Research paper

SEVIER

Spatial and temporal variations of dug well water quality in Korba basin, Chhattisgarh, India: Insights into hydrogeological characteristics

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ORIGINAL PAPER





Characterization of Organic Aerosols in the Ambient Air of Raipur, Central India: Distribution, Seasonal Variations, and Source Apportionment

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Abstract

Due to their influence on climate and human health, organic aerosols, a substantial component of atmospheric particulate matter (PM), are a major area of scientific focus. This study investigates the distribution, seasonal variations, and sources of organic constituents —including *n*-alkanes, alkanol acids, alkanols, sugars, phthalate esters, lignin and resin products, sterols, and polycyclic aromatic hydrocarbons (PAHs)— in the coarse mode (PM_{10}) of ambient air samples collected in Raipur, India. The total concentration of the organic aerosols ranged from 5106 to 29,099 ng m⁻³, with a mean value of 16,701±3355 ng m⁻³. Fatty acids, phthalates, and levoglucosan were the major components. Seasonal analysis revealed higher concentrations of *n*-alkanes, PAHs, and lignin products during the winter, while alcohols, fatty acids, sterols, and sugars exhibited elevated levels in both autumn and winter. Size segregation analysis showed that all organic species, except phthalates and PAHs, accumulated predominantly in the fine and ultrafine particle fractions. Source apportionment through factor analysis revealed a complex mixture of sources shaping aerosol composition, including vehicular emissions, various combustion activities (biomass burning and charbroiled cooking), natural background factors, and the combination of urban dust and biogenic materials. The findings highlight the significant climatic and health implications of organic aerosols in the study region, necessitating urgent mitigation measures to address air pollution.

Keywords Distribution · PM₁₀ · Seasonal variations · Source apportionment · Toxicity

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ORIGINAL PAPER



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Article



Multi-Element Exposure and Health Risks of Grains from Ambagarh Chowki, Chhattisgarh, India

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Abstract: Rice, wheat, and maize grains are staple foods, widely consumed for their mineral and nutritional values. However, they can accumulate toxic elements from contaminated soils, posing health risks. This study investigates the bioaccumulation patterns of 52 elements (including nutrients, heavy metals, and rare earth elements) in various parts (grain, husk, straw, and root) of cereals grown in a heavily polluted region. The results revealed that rice grains exhibited a higher accumulation (Σ 33.4 mg/kg) of toxic elements (As, Cu, Cr, Ni, and Pb) than wheat (Σ 26.6 mg/kg) and maize (Σ 16.2 mg/kg) grains, with the high-yield RI64 cultivar (Σ 47.0 mg/kg) being the most susceptible. Across the rice plant, accumulation increased in the order of grain < husk < straw < root. Elements like P, K, Cu, and Zn showed the highest enrichment. Worryingly, the most toxic elements, such as As, Pb, and Cd, exceeded permissible limits across grains, straws, and husks. Health risk assessment indicated that wheat and maize pose greater non-cancer and cancer risks than rice. Despite being grown in a highly contaminated region, the study identifies some rice cultivars like *Luchai* and *Sarna* as relatively safer options due to a lower accumulation of toxic elements.

Keywords: grains; health hazards; mineral; potentiality; toxicity

1. Introduction

Cereals are among the most widely produced agricultural products worldwide. Cereals serve as a major energy source for humans, meeting the body's carbohydrate requirements [1]. Grains (seeds) of *Poaceae* grasses, such as rice, wheat, and maize, are extensively cultivated due to their use as food, nutrient, fiber, minerals, protein, vitamin, and antioxidant sources, and as renewable energy resources [2–5]. They are the main source of several trace elements (Mn, Fe, Co, Cu, Zn, and Se) needed for the proper growth and development of living organisms [6]. Iron plays a crucial role in oxygen transport, and its



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Research Paper / Article / Review

Determination of Physico-chemical Analysis of Different Soft Drinks Brands in Raipur City

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Abstract: Since soft drinks are consumed by many people all over the world, research into their qualitative and quantitative analysis is essential. We examined ten different soft drink brands that we got from the Raipur, Chhattisgarh, local market in order to achieve this. While pH, conductivity, density, potassium, sodium, and total soluble solids were estimated quantitatively, carbon dioxide, glucose, sucrose, ascorbic acid, phosphates, caffeine, and alcohol were analysed qualitatively. The different techniques determined this physico-chemical analysis. The obtained results showed that the phosphates and carbon dioxide in these soft drinks caused them to be highly acidic, ranging from 2.834 ± 0.218 . Because of the soluble ions, all of the soft drinks had a high conductivity. In a similar vein, the high sugar content made the density greater than that of water. At 1.0346 ± 0.075 mg/L, the concentration of total soluble solids—most commonly known as sucrose—was likewise high. The majority of cold beverages have a small amount of calcium (7.8 ± 2.240 mg/L), a small amount of sodium (23.4 ± 8.925 mg/L), and a potassium concentration of 45 ± 32.468 mg/L. Calcium concentration, on the other hand, is extremely low. A titrimetric method was used to quantify the acid strength; the maximum concentration of acid is 167.942 ± 119.178 mg/L.

Key Words: Soft drinks, Identification, Qualitative analysis, Flame photometer.

1. INTRODUCTION:

The beverage industry in Raipur, Chhattisgarh, has expanded quickly in the past few years. A broad variety of products, including soft drinks, squashes, fruit juices, milk, energy drinks, and more, are now produced by this industry [1-5]. The beverage industry in Raipur has grown by 30% more in the last few years, according to the statistics. Additionally, it has been noted that Raipur is home to over 170 beverage industrial units [6-10]. There are two categories for beverages: alcoholic and non-alcoholic, with the latter further divided into hot and cold varieties [11-14].

The early 1959s saw the advent of the cold drink/soft drink era, but due to the industry's attraction and profitability, numerous multinational corporations introduced their products in a variety of flavours under various brand names, including Sprite, 7up, Pepsi, Mountain Dew, Fanta, Mirinda, etc. People drink these beverages based on their moods and body temperatures. For example, it's commonly thought that Sprite, Fanta, and Mirinda make you feel lighthearted, while Pepsi and Coke make your heart and brain work harder. Soft drink brands and varieties abound, distributed nationwide by diverse brewing industries [15–20]. These beverages are frequently drink on a daily basis, particularly after engaging in taxing activities like sports and hard labour [21]. Additionally, because of their reasonably low costs, they are widely consumed on leisure and relaxation excursions and are provided to the public for events like traditional marriages, weddings, funerals, etc. [22]. Soft drinks are highly consumed because of their distinct flavour and taste as well as their capacity to slake thirst [25]. These qualities are determined by the ingredients included, which include sugar for sweetness, carbonated water (water compressed with carbon dioxide to relieve extreme thirst), and flavouring agents for enhancing drink flavour [26]. Soft drinks offer more than just flavour; they also include nutrients and health benefits to the body in the form of vitamins, phosphates, acids, and antioxidants [27–30]. However, because soft drinks are consumed in large quantities and are in high demand, quality control may be difficult to maintain throughout the production process, particularly during sterilisation and purification.



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Research Article

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Arsenic Speciation and Contamination in Cereals from Chhattisgarh, India

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ABSTRACT

Cereals serve as a major food source for humans and animals. This investigation explored the presence of arsenic species in cereal crops grown in the contaminated area of Ambagarh Chouki (Chhattisgarh, India). Rice, wheat and maize, along with husk, straw and soil samples, were analyzed using hydride generation—atomic fluorescence spectrometry (HG–AFS), and inductively coupled plasma-mass spectrometry (ICP-MS). Significant inorganic arsenic (iAs) contamination was found in rice, wheat, and maize plants, with the highest levels in roots, followed by husk, straw, and grain. Inorganic arsenic content in rice grain ranged from 229.9 mg kg⁻¹ to 684.7 mg kg⁻¹, while in wheat and maize it ranged from 84.6 mg kg⁻¹ to 218.5 mg kg⁻¹ and from 20.0 mg kg⁻¹ to 26.2 mg kg⁻¹, respectively. All cases exhibited a hazard quotient exceeding 1. Organic arsenic, specifically monomethyl arsenic (MMAs) and dimethyl arsenic (DMAs), were detected in rice plants. The findings address speciation, enrichment, sources, transfer factors, and health risk assessment. Overall, this study emphasizes the detrimental health effects of consuming cereals grown in this region, necessitating intervention by the Indian Government.

Keywords: Arsenic speciation; Grain; Health risk assessment; Pollution; Toxicity

INTRODUCTION

Exposure to arsenic and heavy metals from contaminated drinking water and food sources is a major concern, prompting extensive research in this field [1-3]. Among these contaminants, the presence of arsenic in grains has garnered global attention due to its varying concentrations both within and across countries [4-7]. The toxicity of arsenic is intricately linked to their speciation patterns, which exhibit differences among

different species [8]. Rice, in particular, is highly vulnerable to arsenic contamination, primarily due to its aquatic nature [9]. In the Ambagarh Chouki area of Chhattisgarh, India, the issue of arsenic contamination has become particularly prominent [10,11]. This study aims to investigate the contamination levels and sources of arsenic species in various organs (grain, husk, straw, and root) of cereal crops, including rice, wheat, and maize, cultivated in the contaminated soil of this region. By examining these aspects, we can gain valuable insights into the

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Fourier Transform Infrared Spectroscopy (FTIR) Spectral evaluation in *Chrysanthemum* flower species

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Abstract.

The current study's goal was to identify the various functional groups found in chrysanthemums using FTIR Spectroscopy. The FTIR spectrometer identifies 4000 series, with a scan range of 4,000–400 cm-1, was used to perform the FTIR analysis. The presence of distinct peak values with various useful mixtures of functional groups, including hydroxy groups (-OH), aliphatic, metal carbonyl, alcohols (-OH), nitrile (-C=N), phenols, alkynes (CnH2n-2), ketones (C=O), carboxylic acids (R-COOH), amides (-CONH2), and aromatics, was revealed by FTIR spectroscopy analysis. The FTIR investigation showed that there were 17 functional groups in the chrysanthemum flowers. The FTIR spectra showed an intense peak that correlated to the hydroxyl groups, phenol alcohol, and aromatic compounds, respectively, at 3348.42 cm⁻¹, 1380.02 cm⁻¹, and 1480.33 cm⁻¹ in various flower species. In light of this, the current investigation found that, in contrast to the extracts of *Chrysanthemum* flowers' leaves and bark, the flower extract had robust functional groups. FTIR spectroscopy was used to quantitatively analyse the flavonoids, phenolic acids, anthocyanins, and carotenoids present in the nine chrysanthemum cultivars' flowers.

Keywords: FTIR; Functional groups; Chrysanthemum flowers

Introduction

The present investigation assessed the total phenol, tannin, alkaloid, and flavonoid contents of *Chrysanthemum* extracts prepared in petroleum ether, ethyl acetate, and methanol. In order to extract the powdered wood material from the soxhlet device, a continuous hot percolation process was employed, with petroleum ether, ethyl acetate, and methanol serving as the solvents. The standard used was gallic acid. Utilizing the proportions of aluminum to ethyl acetate, petroleum, and petroleum ether. For many centuries, plants have given humans access to herbal remedies for a variety of illnesses. Herbal medicines have been the cornerstone of traditional Indian medicine systems like Ayurveda, Unani, and Sidha for the treatment and curing of a wide range of ailments. Since ancient times, crude medicines derived from plants and animals have been utilised for their therapeutic properties through a straight forward process that does not require the isolation of pure compounds. The components of a crude medication determine its pharmacological action.

Therefore, a plant species can be considered biosynthetic for the chemical compounds it produces, such as proteins, carbohydrates, and fats that animals and humans use as food, as well as for the vast array of other compounds it produces, such as alkaloids, terpenoids, flavonoids, glycosides, and others that have specific physiological effects. The majority of the intended positive attributes are caused by these chemical compounds. Asteraceae is the family of perennial plants that includes the species *Chrysanthemum* morifolium. One of the four most well-known *chrysanthemum* species in China is *Chrysanthemum* morifolium, also referred to as mums. *Chrysanthemum* morifolium has been described as having an affinity for the liver

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The present investigation assessed the total phenol, tannin, alkaloid, and flavonoid contents of *Chrysanthemum* extracts prepared in petroleum ether, ethyl acetate, and methanol. In order to extract the powdered wood material from the soxhlet device, a continuous hot percolation process was employed, with petroleum ether, ethyl acetate, and methanol serving as the solvents. The standard used was gallic acid. Utilizing the proportions of aluminum to ethyl acetate, petroleum, and petroleum ether. For many centuries, plants have given humans access to herbal remedies for a variety of illnesses. Herbal medicines have been the cornerstone of traditional Indian medicine systems like Ayurveda, Unani, and Sidha for the treatment and curing of a wide range of ailments. Since ancient times, crude medicines derived from plants and animals have been utilised for their therapeutic properties through a straight forward process that does not require the isolation of pure compounds. The components of a crude medication determine its pharmacological action.

Therefore, a plant species can be considered biosynthetic for the chemical compounds it produces, such as proteins, carbohydrates, and fats that animals and humans use as food, as well as for the vast array of other compounds it produces, such as alkaloids, terpenoids, flavonoids, glycosides, and others that have specific physiological effects. The majority of the intended positive attributes are caused by these chemical compounds. Asteraceae is the family of perennial plants that includes the species *Chrysanthemum* morifolium. One of the four most well-known *chrysanthemum* species in China is *Chrysanthemum* morifolium, also referred to as mums. *Chrysanthemum* morifolium has been described as having an affinity for the liver

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REVIEW ARTICLE



Role and uptake of metal-based nanoconstructs as targeted therapeutic carriers for rheumatoid arthritis

Shradha Devi Dwivedi¹ · Anita Bhoi² · Madhulika Pradhan³ · Keshav Kant Sahu² · Deependra Singh¹ · Manju Rawat Singh¹

Received: 8 December 2023 / Accepted: 15 April 2024 © King Abdulaziz City for Science and Technology 2024

Abstract

Rheumatoid Arthritis (RA) is a chronic autoimmune systemic inflammatory disease that affects the joints and other vital organs and diminishes the quality of life. The current developments and innovative treatment options have significantly slowed disease progression and improved their quality of life. Medicaments can be delivered to the inflamed synovium via nanoparticle systems, minimizing systemic and undesirable side effects. Numerous nanoparticles such as polymeric, liposomal, and metallic nanoparticles reported are impending as a good carrier with therapeutic properties. Other issues to be considered along are nontoxicity, nanosize, charge, optical property, and ease of high surface functionalization that make them suitable carriers for drug delivery. Metallic nanoparticles (MNPs) (such as silver, gold, zinc, iron, titanium oxide, and selenium) not only act as good carrier with desired optical property, and high surface modification ability but also have their own therapeutical potential such as anti-oxidant, anti-inflammatory, and anti-arthritic properties, making them one of the most promising options for RA treatment. Regardless, cellular uptake of MNPs is one of the most significant criterions for targeting the medication. This paper discusses the numerous interactions of nanoparticles with cells, as well as cellular uptake of NPs. This review provides the mechanistic overview on MNPs involved in RA therapies and regulation anti-arthritis response such as ability to reduce oxidative stress, suppressing the release of proinflammatory cytokines and expression of LPS induced COX-2, and modulation of MAPK and PI3K pathways in Kuppfer cells and hepatic stellate cells. Despite of that MNPs have also ability to regulates enzymes like glutathione peroxidases (GPxs), thioredoxin reductases (TrxRs) and act as an anti-inflammatory agent.

Keywords Rheumatoid arthritis · Metallic nanoparticle · Targeting · Cellular uptake

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Introduction

Rheumatoid Arthritis (RA) is a chronic systemic autoimmune disorder. It is characterized by the destruction of bone and cartilage inflammation at a synovial site, leading to enhanced mortality disability and reduced quality of life. (Song et al. 2021; Devi Dwivedi et al. 2023) Out of 100,000 of the total population, 40 persons are affected by RA, more significant than 0.5 to 1%. It commonly starts at the age of 40 to 60 years (Zheng et al. 2021). According to the Global Burden of Disease 2010, the prevalence of RA in women is almost three times greater than in males which is usually one female in 28 and one male in 59. RA can develop at any stage of life. Women between the ages of 30 and 60 are more likely than males to acquire RA (Brennan-Olsen et al. 2017). Advancement in RA therapy was associated with the joint damage, inhibition, control the progression of disease



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तिल्दा विकासखंड में भूमि उपयोग एव कृषि प्रतिरुप

डा० शुचिता बघेल

अतिथि व्याख्याता, भूगोल अध्ययनशाला, पं० रविशंकर शुक्ल विश्वविद्यालय, रायपुर (छ.ग.)

शोध सारांश

कृषि देश की अर्थव्यवस्था की रीढ़ है। अतः कृषि की उन्नति से ही देश की उन्नति संभव है। भारत में कृषि केवल जीविकोपार्जन का साधन मात्र नहीं है, वरन एक परंपरा एवं जीवन संस्कृति है। तीव्र गति से बढती हुई जनसंख्या की खाद्य आपूर्ति के लिये कृषि अक्षम है। जनसंख्या वृद्धि एवं खाद्यान उत्पादन में असंतुलन बढता जा रहा है। अतः देश की खाद्यान समस्या के समाधान और आर्थिक प्रगति के लिये कृषि उत्पादन में वृद्धि एक राष्ट्रीय आवश्यकता है। जब तक पर्याप्त वन संसाधन उपलब्ध थे खाद्य पदार्थों की आपूर्ति वन एवं जल से प्राप्त होती थी। किंतु वन संसाधन के दिन प्रतिदिन कम होने तथा वन एवं जल पर बढ़ते शारीरिक नियंत्रण के फलस्वरूप संसाधन आधार अत्यंत संकुचित हो गया है। अध्ययन क्षेत्र के चयनित गावों भुरसुवा, भरुवाडीह कला, कोदवा एवं परसदा का मुख्य, व्यवसाय कृषि है, किन्तुयहां की कृषि अब भी अपनी परंपराओ और प्राचीन विधियों से जकडी हुई है। सिंचाई की कमी, न्यून कृषि आधारशिला पूंजी की कमी तथा उद्यच शिक्षा अभाव के कारण कृ षि उत्पादन कम है।

परिचय

"कृषि का विकास मानव सभ्यता से जुडा है कृषि को सभी सभ्यताओं की जन्नी कहा गया है भारत आदि काल से ही कृषि प्रधान देश रहा है। भारत का प्रत्येक व्यक्ति प्रत्यक्ष तथा अप्रत्यक्ष रूप से कृषि से जुड़ा है। भारत के आर्थिक विकास एवं प्रगति का एक मात्र आधार स्तंभ कृषि है इस संबंध में ब्रिटिश गर्वनर लार्ड मेयो का कथन है कि आने वाली अनेक पीढ़ि यों तक धन एवं सभ्यता के विकास की दृष्टि से भारत की प्रगति प्रत्यक्ष रूप से उसकी कृषि पर ही निर्भर करेगी। संसार में संभवतः कोई भी देश नहीं जिसका कृषि में इतना प्रत्यक्ष सीधा एवं घनिष्ट स्वार्थ निहित हो, अतएव भारत सरकार केवल सरकार ही नहीं वरन् एक भूस्वामी भी है।"

जिस प्रकार किसी भी वृक्ष का अस्तित्व एवं विकास उसकी जड़ो पर निर्भर करता है । उसी प्रकार आर्थिक वृक्ष का अस्तित्व एवं विकास भी कृषि रूपी जड़ो पर निर्भर करता है। जिस प्रकार विना जडों के वृक्षों की कल्पना ही नहीं की जा सकती उसी प्रकार विना कृषि के आर्थिक जीवन की भी कल्पना नहीं की जा सकती ।

अध्ययन क्षेत्र

तिल्दा विकासखंड छत्तीसगढ़ राज्य में रायपुर जिले के उत्तरी—पश्चिम भाग में 21° 59' से 22° 28' उत्तरी अक्षांश तथा 81° 31' 30" से 82° 1' 30" पूर्वी देशांतर के मध्य स्थित है। इसका क्षेत्रफल 718.88 वर्ग कि.मी. हैं। तिल्दा विकासखंड के उत्तर में सिमगा तहसील पूर्व में पलारी विकासखंड तथा दक्षिणी भाग में धरसींवा विकासखण्ड स्थित है।रायपुर जिले के तिल्दा विकासखण्ड के अन्तर्गत भुरसुदा, भरुवाडीहकला, कोदवा एवं परसदा गाँव का अध्ययन किया गया है। प्रत्येक गाँव से 100 परिवारो का सर्वेक्षण किया गया है। उपयुक्त चारों गाँवों का भूमि उपयोग एवं शस्य प्रतिरूप का विस्तृत रूप से अध्ययन एवं विश्लेषण किया गया है। कुल जनसंख्या क्षेत्र में भूमि का उपयोग एवं शस्य प्रतिरूप सिंचाई का अध्ययन विकासखण्ड को आधार मानकर भी किया गया है। Petrogenesis of ultramafic rocks with abyssal peridotite affinity from the Central Bundelkhand Craton, India - ScienceDirect



Geosystems and Geoenvironment

Volume 3, Issue 1, February 2024, 100221

Petrogenesis of ultramafic rocks with abyssal peridotite affinity from the Central Bundelkhand Craton, India

Abinash Sahu ^{a b}, Neeraj Vishwakarma ^a $\stackrel{\scriptstyle ext{C}}{\sim}$, M. Santosh ^{c d}, Yamuna Singh ^e, K.R. Hari ^f

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Highlights

- The <u>ultramafic rocks</u> from Babina <u>greenstone belts</u> show primary magmatic nature.
- The <u>REE</u> pattern are similar to that of oceanic abyssal <u>peridotite</u>.
- These ultramafics were derived after low degree melt extraction of <u>mantle source</u>.

Abstract

The Bundelkhand craton in India preserves important records of archean geological evolution, where several ultramafic rocks belonging to the Babina Greenstone Belt (BGB)



ScienceDirect

Precambrian Research

Volume 391, 1 July 2023, 107040

Insights into the petrogenetic evolution of the Khallari layered intrusion and coeval granites of the Paleoproterozoic Dongargarh Supergroup, Bastar Craton, India

M.P. Manu Prasanth ^a ♀ ⊠, Alora Sweta Padma Sharma ^b, M. Santosh ^{c d}, Cheng-Xue Yang ^c, K.R. Hari ^e Show more ∨

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Highlights

- <u>Layered intrusion</u> formation by <u>fractional crystallization</u> and crystal accumulation.
- Granites and layered intrusion show ~2.4Ga crust building peak in Bastar <u>craton</u>.
- <u>Layered intrusion</u> and granites emplaced in a post-collisional rift setting.



Frontiers | Corrigendum: Geochemistry of Precambrian dyke swarms in the Singhbhum craton, India: Implications for recycled crusta...

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¹ Institute of Earth Sciences, Academia Sinica, Taipei, Taiwan

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Geochemistry of Precambrian dyke swarms in the Singhbhum craton, India: Implications for recycled crustal components in the mantle source

M. P. Manu Prasanth¹*, Kwan-Nang Pang¹, K. R. Hari², Bibhuti Bhusan Sahoo^{2,3}, Arathy Ravindran^{4,5} and Yoshiyuki Iizuka¹

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The Singhbhum craton, eastern India records multiple stages of emplacement of Precambrian dyke swarms with contrasting petrogenetic models proposed for their formation. In this study, we document elemental and Sr-Nd isotopic data for three major dyke swarms in the southern part of the craton, including the ca. 2.7 Ga Ghatgaon dyke swarm, the Early Proterozoic Keonjhar dyke swarm and the ca. 1.76 Ga Pipilia dyke swarm. Dyke compositions are dominated by basalt and basaltic andesite with minor andesite, showing trace element signatures typical of continental crustal rocks. Age-corrected Nd isotopic data for Ghatgaon $(\varepsilon_{Ndt} = -4.8 \text{ to} + 4.6)$, Keonjhar $(\varepsilon_{Ndt} = -11.9 \text{ to} + 3.8)$, and Pipilia (a single sample with $\varepsilon_{\rm Ndt} = -8.8$) dyke swarms display substantial variations. The lack of magma compositions that could indicate the presence of elevated mantle potential temperature among the rocks suggests melting regime was likely similar to the ambient mantle. The Dy/Yb and Dy/Dy* systematics of the rocks indicates melting occurred between spinel-stable depths and the spinel-garnet transition zone. The dominantly mafic compositions of the rocks and ubiquitous continental crustal trace element signature are best explained by peridotite source with recycled crustal components, probably in the form of pyroxenites. Our new Nd isotopic data, which argue against any simple secular evolution trend invoked in previous studies, indicate that crustal recycling was likely an episodic phenomenon rather than a discrete, single-stage process since the Archean. Geochemical modelling indicates that a sublithospheric mantle source with (10% or less) recycled crustal components satisfactorily explains the trace element variations of the dyke swarms.

KEYWORDS

precambrian, singhbhum craton (India), dyke swarms, mantle melting, crustal recycling

1 Introduction

Giant radiating dyke swarms represent conspicuous extensional structures that are widespread throughout Archean cratons and have been commonly used to reconstruct the rifting history of cratonic blocks (Wilson, 1990; Bleeker and Ernst, 2006; Söderlund et al., 2010). For example, geochronologic and paleomagnetic data for Neoarchean-Paleoproterozoic dyke swarms led to the identification and characterization of several distinct, transient, late Archean super cratons (e.g., Scalvia, Superia and Vaalbara). Although by no means universal, giant



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Precambrian Research

Volume 391, 1 July 2023, 107040

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छत्तीसगढ़ का प्रयागराज-राजिम: एक ऐतिहासिक पुनरावलोकन

आकाश बाघमारे&डॉ. डी. एन. खुटे

सारांश:-भारत में जो महत्व प्रयागतीर्थ 'प्रयागराज' का है, वही महत्व छत्तीसगढ़ प्रदेश में प्रयागतीर्थ 'राजिम' का है। राजिम ऐतिहासिक एवं पुरातात्विक महत्व का स्थल है ही साथ ही इसे धर्म-नगरी, लोककला संस्कृति का गढ़ कहा जाता है। राजिम महानदी, पैरी व सोंढूर नदी के संगम किनारे अवस्थित है। महानदी अथवा चित्रोत्पला को प्राचीन साहित्य में समस्त पापों का हरण करने वाली परम पुण्यदायिनी कहा गया है। महाभारत के भीष्म पर्व में तथा मत्स्य एवं ब्रह्मपुराण में भी चित्रोत्पला का उल्लेख है। इस नदी के उद्गम के बारे में जो बातेंमिलती है, उसमें कोई संदेह नहीं रह जाता कि यह नाम महानदी के लिए ही प्रयुक्त किया गया था। महानदी जैसे पापनाशिनी में दो अन्य नदियों के संगम के कारण से यह एक परमपुण्य स्थली मानी जाती है। राजिम को धार्मिक तथा सांस्कृतिक केंद्र के रूप में ख्याति प्राप्त है। यहां मंदिरों की बहुलता तथा यहां आयोजित होने वाले उत्सव आदि इस बात की

शब्द कुंजी:- राजिम, प्रयाग, पंचकोशी, राजीवलोचन, पद्मक्षेत्र, शिलालेख, विलासतुंग, कुलेश्वर, तीर्थ।

राजिम छत्तीसगढ़ का प्रसिद्ध धार्मिक स्थल है। यह तीर्थ स्थल रायपुर से लगभग 48 कि.मी. दक्षिण-पूर्व में महानदी, पैरी और सोंढूर नदी के संगम स्थल में बसा है। इसलिए इसे छत्तीसगढ़ का प्रयाग कहा जाता है।' राजिम ऐतिहासिक एवं पुरातात्विक महत्व का स्थल है। यहां से प्राप्त अध्ययन से जो निष्कर्ष मिले है वे सब राजिम के ऐतिहासिक तथ्यों को उजागर करते हैं। इससे यह पता चलता है कि राजिम के इतिहास की अंतः प्रकृति राजनैतिक न होकर सांस्कृतिक है। इसके उन्नयन में राजवंशों का ऐश्वर्यशाली एवं विलासतापूर्ण जीवन की झांकी नहीं दिखाई देती अपितु सांस्कृतिक उत्थान का परिचय मिलता है। यह प्राचीन दक्षिण कोसल के दो प्रमुख राजवंशों - शरभपुरियों व सोमवंशियों की राजधानी रही है।²छत्तीसगढ़ का प्रयाग कहे जाने वाले राजिम को पद्मावतीपुरी', 'पंचकोशी' एवं 'छोटा काशी' के नामों से भी पहचाना जाता है। इस त्रिवेणी संगम के समीप प्राचीन कुलेश्वर 'पद्मावतीपुरी', 'पंचकोशी' एवं 'छोटा काशी' के नामों से भी पहचाना जाता है। इस त्रिवेणी संगम के समीप प्राचीन कुलेश्वर 'पद्मावतीपुरी', 'पंचकोशी' एवं 'छोटा काशी' के नामों से भी पहचाना जाता है। इस त्रिवेणी संगम के समीप प्राचीन कुलेश्वर महादेव मांदिर, राजीवलोचन मंदिर, सोमेश्वर महादेव का मंदिर एवं महर्षि लोमश ऋषि का आश्रम स्थित है।' संगम स्थल पर कुलेश्वर महादेव का मंदिर है यह नदी की मुख्यधारा पर अवस्थित है और नदी के प्रबल प्रवाहो के थपेड़े सहता हुआ भी अडिग खड़ा है। राजिम लोचन कुलेसर घाट, बर रूख में फर फरे तीन सौ साठा⁴राजिम धार्मिक समन्वय का स्थल था जहां शैव, बैष्णव और शाक्तसंप्रदायों का मिलन हुआ जो यहां के मूर्ति शिल्प से स्पष्ट होता है।⁵ यहां पर प्रतिवर्ष माघ पूर्णिमा को वृहद मेला लगता है और पुण्य प्राप्ति हेतु नदी में स्नान किया जाता है।⁶ यहां आयोजित होने वाले अर्द्युअभमें देश के महान संत शंकराचार्य व हिन्दू धर्म के विशिष्टसंवाहकों के आगमन से यह क्षेत्र और भी अधिक प्रतिष्ठित हो गया है। इस महान धार्मिक क्षेत्र में प्रतिवर्ष फरवरी से मार्च माह (माघ पूर्णिमा से महाशिवरात्रि तक) में एक माह तक प्रसिद्ध मेले का आयोजन होता है जो कि महाशिवरात्रि के दिन अत्यधिक विशाष्ट हो जाता है।⁷

पद्मपुराण से प्राप्त कथा के अनुसार इस क्षेत्र को देवपुर भी कहा गया है।⁸ यह स्थान कभी मुनि, योगियों और तपस्वियों की तपोभूमि थी। इसलिये यह देवपुरी नगरी मानी जाती थी। राजिम छत्तीसगढ़ अंचल का महत्वपूर्ण तीर्थ स्थल है। यहां श्राद्ध तर्पण, पर्व, स्नान व दान आदि विभिन्न धार्मिक कृत्यों के संपादन के लिये क्षेत्रीय जन यहां आते रहते है। राजिम में महानदी और पैरी नदी का संगम है, इस संगम को कुलेश्वर महामंदिर अभिलेख में श्री संगम कहा गया है। 'राजिम' शब्द राजीव लोचन का अपभ्रंश रूप है। राजिम और राजीवलोचन के अतिरिक्त इसे कमलक्षेत्र या पद्मपुर भी कहा गया है। 'राजिम' शब्द राजीव लोचन का अपभ्रंश रूप है। राजिम और राजीवलोचन के अतिरिक्त इसे कमलक्षेत्र या पद्मपुर भी कहा गया है,पर राजिम नाम विशेष प्रचलित है। इसके नामकरण के कई रहस्य बताये जाते है जिसमें एक है राजीव या राजू नाम की एक तेलिन की कथा से जोड़ा गया है। राजीव नाम की एक तेलिन इस अमुक स्थान से होकर रोज तेल बेचने आया करती थी। एक दिन वह यहां विश्राम करने के लिये ठहर गई। उसने अपने तेल का टोकना एक पत्थर पर रख दिया फिर आगे बढ़ गई। उस दिन उसका तेल बिक जाने के बाद भी भरा रहा। उसने अपने देख का टोकना एक पत्थर पर रख दिया फिर आगे बढ़ गई। उस दिन उसका तेल बिक जाने के बाद भी भरा रहा। उसने अपने देख का यह चमत्कार अजमाया। तब इस तेली परिवार ने उस पत्थर को अपने घर ले जाना चाहा। पत्थर को उलटाया गया, तब पता चला कि वह भगवान विष्णु की औंधी हुई मूर्ति थी। इसी मूर्ति के बारे में दुर्ग नरेशरत्नपुर सामंत वीरवरजयपाल को स्वप्न हुआ। तब उसका नाम जुड़ना चाहिये। शायद इसीलिये इस मंदिर का नाम राजीवलोचन पड़ा। मंदिर के अहाते में आज भी एक स्थल राजीवा के लिये सुरक्षित है। यह भगवान को देखते-देखते सती हो गुई थी।⁹

एक अन्य कथानुसार राजीव तेलीन के पास काले पत्थर की मूर्ति थी। जगपाल ने राजीव तेलीन को सोना देकर मूर्ति प्राप्त कर राजीव लोचन नामक मंदिर बनवाया।¹⁰ मंदिर के भीतर सती चौरा है, जिसका संबंध इसी स्त्री से बताया जाता है।¹¹प्राचीन ग्रंथों के अनुसार, इसे 'पद्मक्षेत्र' की भी जो संज्ञादी गई है, वह भी धार्मिक भावना का ही द्योतक है। इसके अनुसार सृष्टि के प्रारंभ में

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शोध सार

आधुनिक छत्तीसगढ़ प्राचीन काल में दक्षिण कौसल कहलाता था। प्राचीन धार्मिक ग्रंथों में दक्षिण–कौसल के शासकों का नाम वर्णित है। पं. लोचन प्रसाद पाण्डेय के अनुसार- प्राचीन काल में दक्षिण कौसल की सीमा का निर्धारण इस प्रकार था- उत्तर में गंगा, दक्षिण में गोदावरी, पश्चिम में उज्जैन तथा पूर्व में उड़ीसा। चीनी यात्री व्हेनसांग के अनुसार दक्षिण कौसल की तत्कालीन राजधानी सिरपुर थी। प्राचीन इतिहास के आधार पर यहाँ मौर्यों, सातवाहनों, गुप्तों, राजर्षितुल्य-कुल, शरभपुरीय, सोमवंशियों और नलवंशीय शासकों का शासन विद्यमान था। क्षेत्र का इतिहास उस क्षेत्र विशेष की संस्कृति पर प्रभाव डालता है। क्षेत्र का पुरातात्विक एवं ऐतिहासिक परिचय प्राप्त करने के लिये दक्षिण कौसल के विभिन्न राजवंशों की जानकारी प्राप्त करना आवश्यक है। छठवीं शताब्दी ईस्वी में दक्षिण कौसल के बहुत बड़े भू-भाग पर पाण्डुवंशी राजाओं का शासन था। शरभपुरीय वंश के

शासन की समाप्ति के बाद पाण्डुवंशियों ने दक्षिण कोसल में अपने साम्राज्य की स्थापना की तथा सिरपुर को अपनी राजधानी बनाया। मेकल में इस राजवंश को पाण्डुवंश तथा दक्षिण कौसल में इन्हें सोमवंशी कहा गया है। पाण्डुवंशी राजा सोमवंशी थे और वैष्णव धर्म को मानते थे। पाण्डुवंश के इतिहास को बताने वाले छः ताम्रपत्र और इतने ही शिलालेख छत्तीसगढ़ क्षेत्र और उसके आसपास से प्राप्त हुए है। सिरपुर से प्राप्त बालार्जुन के शिलालेख में इस वंश का पहला शासक उदयन बताया गया है। इसका पुत्र इन्द्रबल था जो शरभपुरी शासक सुदेव राज का सामन्त था। संभवतः इसी ने शरभपुरीयों को सत्ताच्युतकर पाण्डुवंश की स्थापना की थी।

मुख्य शब्द

दक्षिण कौसल, व्हेनसांग, शरभपुरीय, पाण्डुवंशी, बालार्जुन, कौसलाधिपति.

किसी प्रदेश के इतिहास एवं संस्कृति को प्रभावित करने वाले आधारभूत कारणों में संबंधित भू–भौतिकी ^{पर्यावरण} को नियायक तत्व के रूप में स्वीकार किया जाता है। भारतवर्ष के अंतर्गत अपनी विशिष्ट भौगोलिक स्थिति के काज्य करे ^{के कारण} आदिम संस्कृति की विशेषताओं को संजोये रखने में समर्थ अनेक छोटे–छोटे प्रदेश विद्यमान है। इस दृष्टि से कत्ती जान प्राचीन काल से ही भू–विज्ञान, वनस्पति से छत्तीसगढ़ प्रदेश का उल्लेखनीय स्थान माना जा सकता है। छत्तीसगढ़ प्राचीन काल से ही भू–विज्ञान, वनस्पति विज्ञान सकता है। छत्तीसगढ़ प्रदेश का उल्लेखनीय स्थान माना जा सकता है। छत्तीसगढ़ प्राचीन काल से ही भू–विज्ञान वनस्पति ^{केहा} जाने वाला छत्तीसगढ़ अंचल भारत वर्ष के हृदय प्रदेश मध्यप्रदेश का एक हिस्सा रहा है। यह मध्यप्रदेश ^{शुनर्ग}ठन किर्फन ^{पुनर्ग}ठन विधेयक 2000 के द्वारा 1 नवम्बर 2000 को मध्यप्रदेश से पृथक होकर भारतीय संघ का 26वां राज्य बना। ^{इसकी} कल भोजने रेंसिका कुल भौगोलिक क्षेत्रफल 1,35,194 वर्ग कि.मी. है जो मध्यप्रदेश का 30.52 प्रतिशत तथा भारत का 4.14 प्रतिशत

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शोध सार

भारतीय राजनीति में गांधी जी के प्रादुर्भाव से एक नया अध्याय आरंभ हुआ। लोग गांधीजी के कार्यक्रमों-ग्राम स्वराज, कुटीर उद्योग, चरखा और तदुपरांत अछूतोद्धार इत्यादि से जुड़ते गए और देश में राष्ट्रीयता की एक नई सकारात्मक चेतना का प्रसार हुआ। गांधीजी ने राष्ट्रीय आंदोलन को जनसाधारण तक पहुंचा कर भारतीय खतंत्रता संग्राम को सामान्य व्यक्ति की लड़ाई बना दिया। उनके नेतृत्व में सभी वर्गों, व्यवसायों और सम्प्रदायों के वाक्तियां ने आंदोलन में भाग लिया। सुभद्रा कुमारी चौहान भी गांधीजी से काफी प्रभावित रहीं तथा उनके साथ आंदोलन में शामिल हो गई। जनजागरण के इस महायज्ञ में सुभद्रा कुमारी चौहान की भूमिका को भुलाया नहीं जा सकता। सुभद्रा कुमारी चौहान कवयित्री होने के साथ-साथ हमारे स्वतंत्रता संग्राम की योद्धा भी थी और उनका जीवन घर से कारागार और कारागार से घर जाने में ही बीता।

मुख्य शब्द

साम्राज्यवाद, उपनिवेश, कवयित्री, असहयोग आंदोलन, विखरे मोती.

भारतीय स्वाधीनता आंदोलन साम्राज्यवाद और उपनिवेशी शोषण के विरूद्ध जनजागरण का परिणाम था। ब्रिटिश शासकों की दमनकारी नीतियों के विरोध में सन् 1857 में महान क्रांति का बिगुल बजा था। नवजागरण की यह चेतना देशव्यापी थी। इस व्यापक जनजागरण को नई गति और नई दिशा देने में देश के महान स्वतंत्रता संग्राम सेनानियों, समाज सुधारकों, क^{वियों,} शायरों, भजनोपदेशकों और लोकगायको का महत्वपूर्ण योगदान रहा है। भारतीय राष्ट्रीय कांग्रेस की स्थापना के बाद देश में नई सोच के साथ दृष्टिकोण में परिवर्तन आना भार – आना शुरू हुआ। कुछ समय के बाद देश के लोगों में

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छत्तीसगढ़ में कल्चुरि कालीन सामाजिक व आर्थिक दशा—एक ऐतिहासिक पुनरावलोकन



शोध सार

किसी भी देश व प्रांत के क्षेत्र के सम्पूर्ण विकास के लिये प्रशासन अत्यंत महत्वपूर्ण एवं आवश्यक अंग होत है। प्राचीन छत्तीसगढ़ में प्रशासनिक व्यवस्था की जे परिपाटी थी वह प्रायः कल्युरि काल में विद्यमान थां। छत्तीसगढ़ में लम्बे समय तक कल्युरि राजवंश के अधिसत्ता रही है। इस राजवंश ने 11वीं शताब्दी से लेक अधिसत्ता रही है। इस राजवंश ने 11वीं शताब्दी से लेक 18वीं शताब्दी मध्यान्त तक शासन किया था। दक्षि कोसल के कल्युरि, चेदि कल्युरियों के वंशज थे, जिनकी राजधानी पुरानी शहर त्रिपुरी थी। इन कल्युरियों ने छत्तीसगढ़ के इतिहास में एक नए काल की शुरूआत की है। लक्ष्मण राज ने त्रिपुरी से अपने पुत्र कलिंगराज के भेजा। कलिंगराज ने न केवल तुम्माण को अपने अधिका में किया वरन अपने बाहुबल से दक्षिण कोसल का जनपर भी जीत लिया। उसने तुम्माण को अपनी राजधानी बनाया और दक्षिण कोसल में कल्युरियों की वास्ताविक

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सत्ता की स्थापना की एवं नये सिरे से कल्चुरि राज्य की नींव 1000 ई. में डालकर अपनी शक्ति में वृद्धि कर तै। कुछ समय बाद कल्चुरि राज्य रतनपुर और रायपुर दो भागों में विभाजित हो गया। रतनपुर में कल्चुरि शासन 114 ई. तक रहा। रायपुर में इनकी एक शाखा आई जिसे लहुरी अर्थात कनिष्ठ शाखा भी कहते हैं। कल्चुरि कातैन छत्तीसगढ़ का समाज श्रम विभाजन के आधार पर बंटा हुआ था। उसके अधिकार और कर्तव्य बंटे हुए थे। प्राचैन छत्तीसगढ़ में वर्ण व्यवस्था अपना स्थान प्राप्त कर चुके थे किंतु कट्टरता का अभाव था। राजपद प्राप्त करने के तिषे क्षत्रिय वंश होना आवश्यक नहीं था। हिंदू समाज का स्वरूप संकुचित न होकर व्यापक था। यही कारण है कि शक् कुषाण, गुर्जर आदि विदेशी जातियों को हिंदू समाज में समाहित कर लिया गया। ब्राह्मणों का विशेष स्थान तथ सम्मान था।

मुख्य शब्द

कल्चुरि, रतनपुर, माहिष्मति, तुम्मान, दोगनी, पंसेरी.

कल्चुरियों का उद्भव

भारत वर्ष के इतिहास में कल्युरि नरेशों का स्थान कई दृष्टियों से महत्वपूर्ण है। 550 ई. से 1740 ^{ई. त} लगभग बारह सौ वर्षों तक कल्युरि नरेशों ने भारत के उत्तर अथवा दक्षिण किसी न किसी प्रदेश में अपना ^{गज} चलाया है। इस वंश का संस्थापक कौन था? इस विषय में कुछ भी ज्ञात नहीं है।' भारतीय राजवंशों ^{में कल्ज़ी} राजवंश बहुत पुराना है।²

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विस्तृत क्षेत्रों और विभिन्न लेखों, तामपत्रों में इस राजवंश का नाम कटच्छुरि, कलत्सुरि, कल्चुर्य, कलचुति एवं कल्चुरि आदि मिलता है। वस्तुतः यह तुर्क शब्द कुलचुर से संबंधित बताया गया है, जो एक उच्च पद का द्योतक है। अर्थात् कल्चुरि निश्चयतः उच्च कुल के रहे होंगे। चेदि प्रदेश पर शासन करने के कारण उन्हें चेदि, वैद्य तथा चेदिकुल भी कहा गया है। कुछ ख्थानों पर उन्हें अहिहय भी कहा गया है।

पांचवीं—छठवीं ई. शताब्दी बाद भारतीय राजा गण पुराण कालीन सुप्रसिद्ध राजवंशों से अपना संबंध जोड़ने में गौरव का अनुभव करने लगे। किसी ने बड़े अभिमान से राजा नल के वंश से अपना संबंध वताया, तो किसी ने पांडव कुल से संबंध जोड़ने का प्रयास किया। कल्चुरि नरेश भी इसका अपवाद नहीं थे, उन्होंने अपना संबंध पुराण प्रसिद्ध कार्तवीर्थ हैहय से जोड़ा। हैहय वंश का वृत्तान्त पुराणों एवं प्राचीन साहित्यों में मिलता है। प्राचीन दक्षिण कोसल की राजधानी रतनपुर के हैहय वंशी राजाओं ने अपना जो इतिहास (बाबू रेवाराम कृत रतनपुर का इतिहास) लिखवाया उसके अनुसार इस वंश का विवरण इस प्रकार है– ब्रह्म के पुत्र अत्रि हुए, उसके पुत्र सोम हुये जिनसे सोमवंशी उत्पन्न हुए। इस वंश में ऐल नामक राजा हुआ था जिसके वंश ययाति, यदु और पुरू थे। यदु का पुत्र हैहय था जिसके अपना राज्य नर्मदा तट पर माहिष्मति में स्थापित किया।⁵

डॉ. मिराशी के अनुसारः कल्चुरि नरेश अपने को हैहय सहसार्जुन कहलाने में गौरव का अनुभव करते थे. इसलिये शिलालेखों में उनका उल्लेख हैहय वंश के रूप में हुआ है।⁶ कुछ इतिहास कार विशेषकर डॉ. देवदत्त पन्त भण्डारकर ने चन्दबरदाई कृत पृथ्वीराज रासो के आधार पर इन्हें विदेशी मानते है, किन्तु डॉ. मिराशी ने इसका खण्डन किया है। कल्चुरि कौन थे? इसका निराकरण नहीं हो पाया है। लेकिन कल्चुरि और हैहयवंशी एक ही थे। इतिहास कारों ने इन्हें चन्द्रवंशी क्षत्रिय माना है। कल्चुरि राजवंश की प्रथम राजधानी माहिष्मति थी। यहां राज्य करते हुए कल्चुरि इतने समृद्ध और शक्तिशाली हो गये थे कि इनका राज्य विस्तार गुजरात, महाराष्ट्र और मालवा पर ही नहीं अपितु कोंकण तक अपनी प्रभुसत्ता स्थापित किये। उन्होंने कालिंजर, प्रयाग, त्रिपुरी, काशी, तुम्माण, रतनपुर, खल्लारी, रायपुर में अपनी राजधानी स्थापित किये।

छत्तीसगढ़ के कल्चुरि

त्रिपुरी के कल्चुरियों की एक शाखा छत्तीसगढ़ में आ बसी। बिलासपुर जिले में प्रायः गोलाकार एक पत्थर श्रेणी है जिसके भीतर लगभग 30 गांव बसे है। मुख्य गांव तुम्मान है जिसके कारण पर्वत से घिरे हुए समूचे स्थल का नाम तुम्मान खोज रख लिया गया है। शिलालेखों में इस ग्राम या पुर का नाम तुम्मान लिखा हुआ मिलता है।°

डॉ. मिराशी ने लिखा है: ईसा पश्चात् 9वीं शताब्दी के अंत में त्रिपुरी के कल्चुरियों ने दक्षिण कोसल में अपनी शाखा स्थापित करने का श्रेय प्राप्त किया था। अभिलेखों से यह ज्ञात होता है कि प्रथम कोकल्ल के पुत्र द्वितीय शंकरगण ने कोसल नरेश से पालि देश जीत लिया था। यह पालि देश बिलासपुर जिले के पाली नामक स्थान के आसपास का प्रदेश होगा।⁹

तुम्माण में आगमन

दक्षिण कोसल के कल्युरि, चेदि कल्युरियों के वंशज थे, जिनकी राजधानी पुरानी शहर त्रिपुरी थी (जिले वर्तमान में तेवर कहा जाता है) इन कल्युरियों ने छत्तीसगढ़ के इतिहास में एक नए काल की शुरूआत की है। 9वीं शताब्दी के अंत में त्रिपुरी के कल्युरियों ने दक्षिण कोसल में अपनी शाखा स्थापित करने का प्रयत्न किया। इस समय कोकल्ल के द्वारा मध्य भारत के पूर्वी भाग में एक बहुत ही सुदृढ़ शासन की स्थापना की गई थी। जहां पहले वाकाटक परिव्राज्क तथा उच्छकल्प के शासक गुप्तों के पतन के बाद शसन करते थे। कोकल्ल का उल्लेख सबसे पहले उसके दामाद कृष्णराज द्वितीय के जो कि मान्यखेट के राष्ट्रकूट वंश के थे शिलालेख ख में वर्णित है।¹⁰ अभिलेखों से यह ज्ञात होता है कि कोकल्ल प्रथम के पुत्र शंकरगण द्वितीय अर्थात् मुग्धतुंग प्रसिद्ध धवल ने कोसल नरेश से पालि प्रदेश (बिलासपुर के पालि के आसपास का क्षेत्र) जीत लिया था। इस समय वहां बाणवंशी विक्रमादित्य प्रथम राज्य कर रहा था। इसके अथवा इसके उत्तराधिकारी से शंकरगण द्वितीय ने यह प्रदेश जीता होगा। पाली रतनपुर के उत्तर पूर्व में 12 कि.मी. दूर बिलासपुर जिला में स्थित है। यह स्थल 6वीं शताब्दी ई. से दक्षिण कोसल

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YEAR-03, VOLUME-03, ISSUE-03 ISSN: 2583-0775 (P), 2583-3189 (E)] का प्रमुख राजनीतिक केन्द्र रहा है। पाली के शिवमंदिर के गर्भगृह के द्वार पर लगे शिलालेख जिसका उल्लेख का प्रमुख राजनीतिक केन्द्र रहा है। पाली के शिवमादर के पार्ट मिराशी ने रटडीज इन इण्डोलाजी में रूल आफ बानकिंग आफ महाकोसल के पृष्ठ 68 में तथा कार्पस इन्सकि मिराशी ने रटडीज इन इण्डोलाजी में रूल आफ बानकिंग लेख के पृष्ठ 24 में एवं मिराशी ने कल्यरि के मिराशी ने रटडीज इन इण्डोलाजी में रूल आफ बानाकन जान, गुष्ठ 24 में एवं मिराशी ने कल्युरि नरेश इंडिकरम वाल्युम चार के पृष्ठ 10 में, बालचंद जैन के उत्कीर्ण लेख के पृष्ठ 24 में एवं मिराशी ने कल्युरि नरेश उनके काल, पुष्ठ 39 में किया है।

काल, पृष्ठ 39 म किया ह। मंडलेश्वर का यह वंश 125 वर्षों तक तुम्माण में चलता रहा, परन्तु बाद में कमजोर होने पर सोमवंशिय मेडलेश्वर का यह वंश 125 वर्षों तक तुम्माण में चलता रहा, परन्तु बाद में कमजोर होने पर सोमवंशिय मंडलेश्वर का यह वंश 125 वर्षा तक तुम्माण प राज में त्रिपुरी से अपने अन्य पुत्र कलिंगराज को भेजा। कलिंग वहां अपना अधिकार कर लिया था तभी लक्ष्मण राज ने त्रिपुरी से अपने आहबल से दक्षिण कोसल का क वहां अपना अधिकार कर लिया था तभी लक्ष्मण राज प्राय प्राय प्राय अपने बाहुबल से दक्षिण कोसल का जाति की लेगा के ने न केवल तुम्माण को ही फिर से अपने अधिकार में किया वरन अपने बाहुबल से दक्षिण कोसल का जनपर ने न केवल तुम्माण को ही फिर से अपन आधकार प्रायस्था को सल में कल्युरियों की वास्ताविक सत्ति की तास्ताविक सत्ति की वास्ताविक सत्ति के लिया। उसने तुम्माण को अपनी राजधानी बनाया और दक्षिण कोसल में कल्युरियों की वास्ताविक सत्ति रथापना की एवं नये सिरे से कल्चुरि राज्य की नींव 1000 ई. में डालकर अपनी शक्ति में वृद्धि कर ली।

रतनपुर में कल्चुरि शासन 1741 ई. तक रहा। रायपुर में इनकी एक शाखा आई जिसे लहुरी अर्थात् की शाखा भी कहते हैं। 1375 ई. में कनिष्ठ शाखा ने रायपुर राजधानी से शासन प्रारंभ किया।12

सामाजिक दशा

कल्युरि कालीन छत्तीसगढ़ का समाज श्रम विभाजन के आधार पर बंटा हुआ था। उसके अधिकार और को बंटे हुए थे। प्राचीन छत्तीसगढ़ में वर्ण व्यवस्था अपना स्थान प्राप्त कर चुके थे किंतु कहरता का अभाव था। राज्य प्राप्त करने के लिये क्षत्रिय वंश होना आवश्यक नहीं था। हिंदू समाज का स्वरूप संकुचित न होकर व्यापक यही कारण है कि शक, कुषाण, गुर्जर आदि विदेशी जातियों को हिंदू समाज में समाहित कर लिया गया। का का विशेष स्थान तथा सम्मान था। छत्तीसगढ़ के कल्युरि लेखों में ब्राह्मण, क्षत्रिय और वैश्य का उल्लेख मिलत किन्तु शूद्र का उल्लेख नहीं मिलता है। इस युग की जाति या वर्ग को इस प्रकार उल्लेखित किया गया है ब्राह्मण

चर्तुवर्ण व्यवस्था में ब्राह्मणों को विशेष मान दिया जाता था। ब्राह्मणों को 'पंचमहायज्ञादि' धार्मिक कृत्व कर के लिये राजा की ओर से मंगल कार्य के प्रसंग में भूमिदान दिया जाता था।13 इस समय ब्राह्मणों में द्रविद्र के जैसे भेद नहीं थे, केवल वेद, शाखा और गोत्र के आधार पर ही भेद माना जाता था।14 ब्राह्मण अपने मूल स्थान ध्यान में रखते थे और उसका उल्लेख गर्व पूर्वक करते थे।

कल्युरियों के दरबार में राजाश्रय पाने के लिये दूर-दूर के प्रदेशों से ब्राह्मण आया करते थे। शिलातेखें ज्ञात होता है कि रतनपुर के कल्युरि राजा के यहां आश्रय प्राप्ति के लिये उत्तर प्रदेश के शोणभद्र और मध्यका के कुम्मटी नामक ग्रामों से ब्राह्मण आये हुए थे। कुछ ब्राह्मणों के साथ उनके मूल स्थान को प्रदर्शित करने क 'माथुर', 'नागर' जैसे विशेषण जुड़े थे। लगता है इसी भांति बाद में ब्राह्मणों की उपजातियों का प्रादुर्भाव हुआ। नाम के आगे पंडित, ठाकुर, गैंता आदि शब्द तथा नाम के अंत में प्रायः शर्मा शब्द आता है। मिश्र, त्रिपार्व के उपनाम 15–16वीं शताब्दी के लेखों में मिलते हैं।

अनेक ब्राह्मण वेदों और शास्त्रों के अध्ययन में ही अपना समय व्यतीत करते थे। एक से अधिक वेदों के ब्राह्मण को द्विवेदी, त्रिवेदी, चतुर्वेदी जैसे पदवी प्रदान की जाती थी। कई राज दरबार में होने वाली काय स्पर्ध वाद—विवाद में भी भाग लेते थे। ग्रहण आदि विषयों पर दरबार में ज्योतिषियों का वाद—विवाद होता था प्र भविष्य वक्ता को राजकीय सम्मान दिया जाता था। कुछ ब्राह्मण गृह त्याग, सन्यास भी ग्रहण कर लेते थे

मंत्री पद पर प्रायः ब्राह्मण नियुक्त किये जाते थे एवं संकटकालीन परिस्थितियों में राजा को सलाह आदि थे। ऐसे चत्र विद्वानों का उल्लेख कल्वरि यापित करियों के राजा को सलाह आदि करते थे। ऐसे चतुर विद्वानों का उल्लेख कल्युरि युगीन अभिलेखों में गर्व के साथ किया गया है। पुरुषोत्म गंगाधर आदि मंत्रियों का उल्लेख अभिलेखों में है। कि उन्नरी के साथ किया गया है। पुरुषोत्म गंगाधर आदि मंत्रियों का उल्लेख अभिलेखों में है।¹⁸ कल्युरि नरेशों ने समय–समय पर ब्राह्मणों को ग^{म क्} दिये थे। ग्राम दान केवल उन्हीं ब्राह्मणों को दिया जाता था जो कुल और ज्ञान में श्रेष्ठ होते थे। ब्राह्मणों ^{ग्रम क}्र कौशल में भी निपुण होते थे। कई ब्राह्मणों ने राज प्रशस्तियों पर्न न कौशल में भी निपुण होते थे। कई ब्राह्मणों ने राज प्रशस्तियों एवं रचनाएँ लिखी थीं।

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क्षत्रिय

समाज में क्षत्रियों का सम्मान था। कल्चुरि नरेश रचयं को क्षत्रिय कहते थे। उनके ताम्रपत्रों में कल्चुरि नरेश अपने को कार्तवीर्य सहसार्जुन का वंशज मानते थे। राज्य के महत्वपूर्ण पदों पर उनकी नियुक्ति हुआ करती थी। उन्हें सेना तथा प्रशासन के उच्च पदों पर नियुक्त किया जाता था। क्षत्रिय अधिकारियों के नाम के अन्त में "भट" शब्द आता है। तत्कालीन चालुक्य, राष्ट्रकूट, चंदेल, पाल इत्यादि क्षत्रिय वंशों से कल्युरियों का वैवाहिक संबंध था। कई क्षत्रिय ब्राह्मणों की तरह विद्या के क्षेत्र में निपुण थे। अनेक अभिलेखों में कुमार पाल नामक हैहयवंशीय का उल्लेख है जो कि राजनीति, साहित्य तथा ज्योतिष का ज्ञाता था। उन्होंने कई प्रशरितयां लिखी, जो उत्तम काव्य गुणों से युक्त थीं।[®]

वैश्य

वैश्य जाति को समाज में विशिष्ट स्थान प्राप्त था। इस जाति के पास व्यापार व उद्योग के सूत्र होते थे। यह वर्ग धनी व सम्पन्न था इसके कारण स्थानीय कामकाज में उनका एकाधिकार था। कल्चुरियों के लेखों में ''यश'' नामक वैश्य का उल्लेख रतनपुर के 'पुरप्रधान' के रूप में अनेक बार आया है। यह वर्ग युद्ध में भी भाग लेते थे तथा अपने पराक्रम को प्रदर्शित भी करते थे। कल्चुरियों के वैश्य सामंत बल्लभराज के अनेक लेखों में उसे गौड़ देश में मिली विजय का वर्णन आया है। इसने अनेक मंदिर, तालाब, उद्यान आदि का निर्माण करवाया।²¹ ग्रामों में बसे वैश्य पंचायतों में महत्वपूर्ण पदों पर प्रतिष्ठित थें। बनिया का काम करने वाला वात्सल्य कहलाता था।

कायस्थ

रतनपुर के कल्चुरि राजाओं के राज्य में अनेक सम्पन्न व विद्वान कायस्थ रहते थे। यह वर्ग ब्राह्मणों के समान विद्या के प्रेमी थे। कायस्थ प्रायः हिसाब–किताब रखते थे। कई लेखों में इन्हे 'करणिक' भी कहा गया है राज्य के प्रशासन व निर्माण कार्यों में कायस्थ जाति का उल्लेखनीय योगदान रहा है। रतनसिंह नामक एक कायस्थ थे मल्लार में शिवमंदिर बनवाया था।22

अन्य जातियाँ

अन्य वर्गों के लोग भी यहाँ रहते थे। कल्चुरि कालीन शिलालेखों में सूत्रधार जाति का उल्लेख है। यह जाति शिल्पकला के क्षेत्र में प्रवीण थी। प्रायः राज्य के मंदिरों का निर्माण यही किया करते थे। खल्लारी से प्राप्त कल्चुरि लेख में देवपाल नामक एक मोची ने खल्लवाटिका (खल्लारी) में विष्णु मंदिर बनवाया था। शिल्पी जाति द्वारा उत्कीर्ण लेखों की संख्या अत्यधिक है।²³

छत्तीसगढ़ क्षेत्र वनों से आच्छादित है जिसके कारण यहां आरण्यक सभ्यता विद्यमान रही। आदिवासी क्षेत्रों में गोड़, परजा आदि रहते थे बैगा—मुनिया लोगों को आदिवासी क्षेत्रों में महत्वपूर्ण स्थान था। तंत्र—मंत्र को सम्पूर्ण छत्तीसगढ़ क्षेत्र में मान्यता प्राप्त थी। अधिकांश लोग गांवों में रहकर कृषि, मजदूरी करते थे। प्रत्येक गांव में विशिष्ट कार्य करने वाले लोगों जैसे— लुहार, नाई, धोबी, कफमहार आदि को समयानुसार उचित सम्मान प्राप्त होता था। उनके मकान साफ—सुथरे, घास—फूस के छाजन वाले होते थे। लोग सीधे सादे तथा ईमानदार होते थे। ग्रामीण वाद—विवाद का निर्णय पंचायतें करती थीं। उसकी अपील राजा के पास की जाती थी।²⁴ पंचायत पंचकूल नामक समूह के जिम्मे रहती थी जिसके सदस्य महत्तर कहलाते थे। ग्राम प्रमुख ग्रामकूट या भौटिक कहलाते थे।

समाज में महिलाओं की दशा

कल्चुरि कालीन अभिलेखों में स्त्रियों का उल्लेख बड़े सम्मान के साथ हुआ है। राज परिवार की महिलाएँ जैसे– नोनल्ला, उल्हण देवी, लाच्छल्ल देवी ने राजकीय एवं धार्मिक क्षेत्रों में अपना वर्चस्व स्थापित किया था। पृथ्वी देव द्वितीय के रतनपुर शिलालेख में यह उल्लेख मिलता है कि वल्लभराज ने अपने पत्नी की प्रेरणा से अनेक धार्मिक व लोक कल्याणकारी कार्य किये थे। इसी प्रकार जाजल्लदेव प्रथम ने अपनी माता के आदेश पर बस्तर के राजा सोमेश्वर देव को कैद से मुक्त कर दिया था।²⁵

इस युग में बहुविवाह की प्रथा विद्यमान थी। राजा रतनदेव तृतीय की दो रानियाँ रत्ना और पद्मा थीं, इसी

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प्रकार अल्हन देव की तीन रानियाँ थीं। लेकिन समाज न जा है। शिवरीनारायण के कल्चुरियों की छोटी समय बाल विवाह का भी प्रचलन था। रतनपुर में कई सती चौरे है। शिवरीनारायण के कल्चुरियों की छोटी समय बाल विवाह का भी प्रचलन था। रतनपुर में कई राती चौरे है। शिवरीनारायण के कल्चुरियों की छोटी समय बाल विवाह का भी प्रचलन था। रतनपुर में कई राती चौरे है। शिवरीनारायण के कल्चुरियों की छोटी समय प्रकार अल्हन वेच को पान था। रतनपुर में कई सता या ए गया था। उसी समय उसकी तीनों रानियाँ शाख बाल विवाह का भी प्रचलन था। रतनपुर में कई सता या गया था। उसी समय उसकी तीनों रानियाँ शाख उल्हण देव त्रिपुरी के जयसिंह से ताड़ते हुए रणस्थल में मारा गया था। उसी समय उसकी तीनों रानियाँ से स्व

सामान्यतः महिलाओं को समाज में आदर की दृष्टि से देखा जाता था लेकिन वे बहु विवाह एवं सती प्र_{था के} 81 13 कुप्रधा का शिकार भी होती थी।

संयुक्त परिवार प्रथा

क परिवार प्रथा कल्चुरि कालीन छत्तीसगढ़ में संयुक्त परिवार की पद्धति प्रचलित थी। मल्लार के शिलालेख में कल्चुरि कालीन छत्तीसगढ़ में संयुक्त परिवार की पद्धति प्रचलित थी। मल्लार के शिलालेख में कल्चुरि कालीन छत्तीसगढ़ में संयुक्त पारपार एक नातिन और दो अन्य रिश्तेदारों के साथ-साथ में के राज्य-साथ रहने रत्नसिंह, उनकी पत्नी, एक पुत्र, दो बहुओं, दो नातियों, एक नातिन और दो अन्य रिश्तेदारों के साथ-साथ रहने रत्नसिंह, उनकी पत्नी, एक पुत्र, दो बहुओं, दो नातियों, एक नातिन और दो अन्य रिश्तेदारों के अवसर एक के रत्नसिंह, उनकी पत्नी, एक पुत्र, दा बहुआ, पा भाषाय, में चांवल ही थी विशेष उत्सवों के अवसर पर विशेष उत्सवें के अवसर पर विशेष के उत्लेख है।" तत्कालीन समय में लोगों का मुख्य भोजन चांवल ही थी विशेष का भाव अधिक रहता के उल्लेख है।" तत्कालीन समय म लागा का पुज्य गरत थे तथा उनमें संतोष का भाव अधिक रहता था। के बनाये जाते थे। लोग तंबाकू और बीड़ी का सेवन करते थे तथा उनमें संतोष का भाव अधिक रहता था। के सामाजिक व्यवहार में मिली-जुली संस्कृति के तत्व दिखाई पड़ते थे।28

लोग अधविश्वास से बड़े प्रभावित थे। तंत्र-मंत्र की मान्यता प्रचलित थी। यहां की आबादी का धनल के कम था लोगों में सैनिक गुणों का अभाव था, वे शांति प्रिय थे तथा उन्हें युद्ध या संघर्ष पसंद नहीं था

शिक्षा, साहित्य एवं भाषा

साहित्यिक दृष्टि से भी कल्चुरिकाल में छत्तीसगढ़ अत्यन्त समृद्ध था। नारायण, अल्हण, कीर्तिधर, बत्ताः धर्मराज, मागे, सुरगण रतनसिंह, कुमारपाल, त्रिभुवन पाल, देवपणि, नरसिंह और दामोदर मिश्र जैसे कवियों के का उल्लेख कल्युरि लेखों में प्राप्त होता है। संस्कृत के साथ प्राकृत भाषा के कवियों को भी कल्युरि स्ताः राजाश्रय प्राप्त था। यहाँ विद्या का भी बहुत प्रसार था। पाठशालाओं और महाविद्यालयों को राजकीय अनुंतन्त्र होता था। गुरू आश्रम की परम्परा विद्यमान थी। कल्युरिकालीन साहित्य की प्रमाणिकता बाबू रेवाराम द्वारा लिंब ग्रन्थ तवारीख ए हैहयवंशीय राजाओं की के द्वारा होती है। इसके अलावा पण्डित शिवदत्त शास्त्री ने 📷 आख्यान लिखा था जिसमें छत्तीसगढ़ के जमींदारों का इतिहास भी है। इन्होने इतिहास समुच्चय पुस्तक की ल भी की है जिसमें रतनपुर के इतिहास के सम्बन्ध में जानकारी मिलती है। इस काल में साहित्यकारों की 🛤 प्रशस्तिकार कवि अधिक थे, जो ब्राह्मण व कायस्थ होते थें प्रकृति विज्ञान व आयुर्विज्ञान की दृष्टि से क विकसित था। देखा जाय तो जनसामान्य में यहाँ छत्तीसगढ़ी बोली का प्रचार-प्रसार था, किन्तु राजकार्य के भाषा में होता था।30

कल्युरि कालीन आर्थिक दशा

कल्युरि शासन काल में छत्तीसगढ़ की आर्थिक स्थिति समृद्ध थी। इस काल की आर्थिक स्थिति के अभिलेखों, ताम्रपत्रों, दानपत्रों से कोई विशेष जानकारी नहीं मिलती फिर भी इस युग के निर्माण कार्यों जेते तालाब, बाग बगीचे, शांतिमय वातावरण सुदृढ़ आर्थिक रिथति के परिचायक हैं। रतनपुर, रायपुर, तुम्माण, जीजि मल्हार, विकर्णपुर, खल्लारी इत्यादि कल्युरि कालीन प्रमुख नगर थे, ये नगर समृद्ध थे।

छत्तीसगढ़ के अधिकांश लोगों के आर्थिक जीवन का आधार कृषि एवं पशुपालन था। यहां की प्र^{मुख} कोदो, गेहूँ, दाल आदि थीं। ये वस्तुमं सानं चर्च चांवल, कोदो, गेहूँ, दाल आदि थीं। ये वस्तुएं यहां पर्याप्त मात्रा में होती थी, पर इनकी बिक्री की समुचित नहीं थी, क्योंकि यहां यातायात के साधन बहुत कम थे। इसलिए किसानों को उनके उत्पादन का भरपूर की मिल पाता था। इसके कारण कृषि योग्य भमि का विक्रान के स्वादन का भरपूर की मिल पाता था। इसके कारण कृषि योग्य भूमि का विकास नहीं हो पाता था। यहां जंगली वस्तुओं का उत्पादन के भ^{रपूर प} मात्रा में होता था जिनमें हर्रा, चिरौंजी, आंवला, जहर आदि मात्रा में होता था जिनमें हर्रा, चिरौंजी, आंवला, शहद आदि प्रमुख थे। यहां जंगली वस्तुओं का ^{उर्भा} की लोगों के द्वारा पाले जाते थे व पशुपालन से भी लोग कर लोगों के द्वारा पाले जाते थे व पशुपालन से भी लोग धन उपार्जन करते थे।32



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कालीन सिक्कों के प्रमाण विभिन्न अंचलों में मिले है। खैरागढ़ क्षेत्र से कल्चुरि शासकों के 200 तांवे के सिक्के प्राप्त हुए है।³³ जाजल्ल देव, रत्नदेव तथा पृथ्वी देव के सोने के 136 सिक्के रायपुर क्षेत्र के दलदल सिवनी से प्राप्त हुए है। धनपुर (बिलासपुर) से कल्चुरि कालीन तांबे के 390 सिक्के मिले है तथा भगौड़ (विलासपुर) से सोने के 9 सिक्के प्राप्त हुए है।³⁴

छत्तीसगढ़ में वस्तुओं का क्रय विक्रय कौड़ियों के माध्यम से होता था। कौड़ियों का मान इस प्रकार था³⁵:

- 1. चार कोरी एक गंडा
- 2. पांच गंडा एक कोरी
- 3. बीस कोरी एक दोगनी
- 4. सोलह दोगनी– एक रूपया

कुछ वस्तुएं तौलकर बेची जाती थी। तौल का मान इस प्रकार बेची जाती थीः

- 1. पांच सेट एक पंसेरी
- 2. आठ पंसेरी एक मन

कल्चुरि काल में राजा की आय का प्रमुख स्त्रोत भूमि कर था। भूमि की नाप हलों की संख्या में दर्शायी जाती थी। एक हल भूमि का अर्थ होता था पांच एकड़ जमीन।³⁶ कर का भार जनता पर अधिक था इसका कारण था सरकारी कर्मचारियों द्वारा कर वसूली के कार्य में उदासीन होना। लगान ज्यों—ज्यों बढ़ता गया, त्यों—त्यों पैदावार कम होती गयी। इसके कारण किसान एक स्थान को छोड़कर अन्यत्र जाने लगे जिससे उत्पादन कम होने लगा और सरकार की आर्थिक स्थिति बिगड़ती गयी। फलतः सरकार दिवालिया होने की कगार पर पहुंच गयी। कल्चुरि राज्य के पतन का एक कारण यह भी था। राजस्व विभाग का मुख्य अधिकारी महाप्रमातृ होता था जो भूमि की माप करवाकर लगान निर्धारित करता था। नमक कर, खान कर, वन चारागाह, बाग—बगीचा, आम, महुए, आदि पर लगने वाले कर राजकीय आय के स्त्रोत थे। नदी के पार करने पर तथा नाव आदि पर कर लगाया जाता था। इनके अतिरिक्त मण्डी में बिक्री के लिये आई हुई सब्जीयों / सामग्रियों पर कर लगाया जाता था। प्रत्येक घोड़े के लिये 2 पौर और हाथी के लिये 4 पौर कर लगाया जाता था। पौर चांदी का एक सिक्का होता था। मण्डी में सब्जी बेचने के लिये युगा नामक परवाना लेना पड़ता था जो दिन भर के लिये होता था। 2 युगाओं के लिये 1 पौर दिया जाता था। कर वसूलने वाला शोल्किक कहलाता था। छत्तीसगढ़ की कुछ विशिष्ट जातियां हस्तकौशल और गृह उद्योग से धन उपार्जित कर अपनी जीविका चलाती थी।³⁷

कल्याण साय और उसके पुत्र लक्ष्मण साय के "जमाबंदी" और "देशवही" से यह जानकारी प्राप्त होती है कि करीब 61 लाख रूपये भू राजस्व के रूप में प्राप्त होता था।³⁸ शहरों की प्रगति वास्तविक रूप में व्यापार और उद्योग की उन्नति पर निर्भर थी। पांडुका सिरकट्टी के पास से नदी मार्ग से उत्कल व्यापार होता था।³⁹ इन सब के अतिरिक्त कल्वुरि नरेश राज्य के कोषालय को शत्रुओं के खजाने को लूटकर एवं पराजित राज्यों से वार्षिक भेंट या कर सेटलमेंट अधिकारी प्राप्त कर बढ़ाते थे। इस काल में नगरों की अपेक्षा ग्रामों पर अधिक ध्यान दिया जाता था जिसमें इनकी संख्या अधिक थी, किन्तु नये नगरों का निर्माण भी हो रहा था जैसे– रतनपुर, रायपुर, मल्लालपत्तन, बिलासपुर, जांजगीर, विकर्षपुर, तेजल्लपुर आदि। राजा अपने साम्राज्य के विस्तार के लिये तत्पर रहते थे। पराजित राजाओं से वार्षिक कर लिया जाता था। राजा कल्याणसाय जब मुगल बादशाह जहाँगीर से मिलने दिल्ली गये तब उसके साथ आश्रित 22 राजा भी गये थे। राजा का राजस्व 9 लाख रूपये वार्षिक था। उनकी सेना में 116 हाथी थे। कल्याणसाय ने जहाँगीर को 1 लाख रूपये नगद और 60 हाथी भेंट में दिये थे। इससे राजा की अच्छी स्थिति का परिचय मिलता है। कल्वुरि लेखों से यह स्पष्ट प्रतीत होता है कि कल्युरिकालीन छत्तीसगढ़ की आर्थिक स्थिति सम्पन्न व समृद्ध थी।⁴⁰

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2583-0770 से वर्ण-व्यवस्था प्रचलित थी किंगु के कल्युरि कालीन समाज में वर्ण-व्यवस्था प्रचलित थी किंगु के इस प्रकार अध्ययन से झात होता है कि कल्युरि कालीन समाज में वर्ण के आधार पर कार्य करने के इस प्रकार अध्ययन से झात होता है कि कल्युरि कालीन राजा के मंत्री बहुदा ब्राह्मण हुआ के करने के का निष्कर्भ इस प्रकार अध्ययन से ज्ञात होता है कि कल्युरि कालान से को वर्ण के आधार पर कार्य करने की नहीं थी। हिन्दू समाज का स्वरूप संकुचित न होकर व्यापक था। लोगों को वर्ण के आधार पर कार्य करने की नहीं थी। हिन्दू समाज का स्वरूप संकुचित न होकर व्यापक था। कल्युरि राजा के मंत्री बहुदा ब्राह्मण हुआ करते थे। नहीं थी। हिन्दू समाज का स्वरूप संगत वैश्य जाति का था। कल्युरि राजा के मंत्री बहुदा ब्राह्मण हुआ करते थे। इस प्रकार अध्ययन स आर नहीं थी। हिन्दू समाज का स्वरूप संकुचित न होकर व्यापक था। कल्युरि राजा के मंत्री बहुदा ब्राह्मण हुआ करते थे। नहीं थी। कल्युरियों का एक सामंत वैश्य जाति का था। कल्युरि राजा के मंत्री बहुदा ब्राह्मण हुआ करते थे। नहीं थी। कल्युरियों का एक सामंत वैश्य जाति का था। कहते थे। वैश्य व्यापार कार्य करते थे। शिल्पी जाति नहीं थी। हिन्दू समाज का स्वरण राषु नहीं थी। कल्जुरियों का एक सामंत वैश्य जाति का था। कल्पुर ये वैश्य व्यापार कार्य करते थे। शिल्पी जाति के नहीं थी। कल्जुरियों का एक सामंत वैश्य जाति का क्षत्रिय कहते थे। वैश्य व्यापार कार्य करते थे। शिल्पी जाति के में क्षत्रियों का मान था, कल्जुरि नरेश स्वयं को क्षत्रिय कहते थे। वैश्य व्यापार कार्य करते थे। शिल्पी जाति के में क्षत्रियों का मान था, कल्जुरि नरेश स्वयं को क्षत्रिय कहते थे। वैश्य व्यापार कार्य कार्य करते थे। शिल्पी जाति नहीं थी। कल्चुरिया का एक से रुपयं को क्षत्रिय कहर जा। में क्षत्रियों का मान था, कल्चुरि नरेश रुपयं को क्षत्रिय कहर जा। भी यहाँ रहते थे। देवपाल मोची ने खल्लारी में विष्णु मंदिर बनवाया था। इससे ज्ञात होता है कि कल्युरि के

समाज में सामाजिक समरसता का अदभूत उदाहरण है। में सामाजिक समरसता का अवरूप की आर्थिक स्थिति समृद्ध थी। इस युग के निर्माण कार्यों जैसे क कल्तुरि शासन काल में छत्तीसगढ़ की आर्थिक स्थिति के परिचायक हैं। रतनपुर, रायपुर, तुम्माण –

कल्चुरि शासन काल में छत्तीसगढ़ का आविय रियति के परिचायक हैं। रतनपुर, रायपुर, तुम्माण, जोजे तालाब, बाग बगीचे, शांतिमय वातावरण सुदृढ़ आर्थिक स्थिति के परिचायक हैं। रतनपुर, रायपुर, तुम्माण, जोजे तालाब, बाग बगीचे, शांतिमय वातावरण सुदृढ़ आर्थिक स्थिति के परिचायक हैं। रतनपुर, रायपुर, तुम्माण, जोजे तालाब, बाग बगीचे, शांतिमय वातावरण सुदृढ़ आाथक रिपाल थे, ये नगर समृद्ध थे। छत्तीसगढ़ के अधिकांत्र मल्हार, विकर्णपुर, खल्लारी इत्यादि कल्चुरि कालीन प्रमुख नगर थे, ये नगर समृद्ध थे। छत्तीसगढ़ के अधिकांत्र मल्हार, विकर्णपुर, खल्लारी इत्यादि कल्चुरि कालीन प्रमुख नगर थे, ये नगर समृद्ध थे। छत्तीसगढ़ के अधिकांत्र भल्हार, विकर्णपुर, खल्लारी इत्यादि कल्चुरि कालान अनुज मल्हार, विकर्णपुर, खल्लारी इत्यादि कल्चुरि कालान अनुज के आर्थिक जीवन का आधार कृषि एवं पशुपालन था। यहां की प्रमुख उपज चांवल, कोदो, गेहूँ, दाल आदि थां। के आर्थिक जीवन का आधार कृषि एवं पशुपालन था। यहां की प्रमुख उपज चांवल, कोदो, गेहूँ, दाल आदि थां। के आर्थिक जीवन का आधार कृषि एवं पशुपालन था। वहां की प्रमुख उपज चांवल, कोदो, गेहूँ, दाल आदि थां। के आर्थिक जीवन का आधार कृषि एव पशुपालन था। पर के हर्रा, चिरौंजी, आंवला, शहद आदि प्रमुख थे। यहां जंगली वस्तुओं का उत्पादन अधिक मात्रा में होता था जिनमें हर्रा, चिरौंजी, आंवला, शहद आदि प्रमुख थे। यहां जंगली वस्तुओं का उत्पादन अधिक मात्रा में होता था जिनमें हर्रा, चिरौंजी, आंवला, शहद आदि प्रमुख थे। यहां के जंगली वस्तुओं का उत्पादन अधिक मात्रा में होता था जिनमें हर्रा, चिरौंजी, आंवला, शहद आदि प्रमुख थे। यहां के जंगली वस्तुओं का उत्पादन अधिक मात्रा में होता था जिनमें हर्रा, चिरौंजी, आंवला, शहद आदि प्रमुख थे। यहां के जंगली वस्तुओं का उत्पादन अधिक मात्रा में होता था जिनमें हर्रा, चिरौंजी, आंवला, शहद आदि प्रमुख थे। यहां के जंगली वस्तुओं का उत्पादन अधिक मात्रा में होता था जिनमें हर्रा, चिरौंजी, जावला, शहद आदि प्रमुख थे। यहां के जंगली वस्तुओं का उत्पादन अधिक मात्रा में होता था जिनमें हर्जी के त्या पाले जाते थे व जंगली वस्तुओं का उत्पादन अधिक मात्रा म हाता था पत्न जाते थे व पशुपालन से भी लोग धन उपार्जन कते । बैल, भैंस, भेड़, बकरी आदि जानवर लोगों के द्वारा पाले जाते थे व पशुपालन से भी लोग धन उपार्जन कते ।

यहां यातायात के साधन बहुत कम थे।

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• डॉ. डिश्वर नाथ खुटे

रघुजी प्रथम के पुत्र बिम्बाजी भोंसला छत्तीसगढ़ के प्रथम मराठा शासक थे। उन्होंने सन् 1757 में यहाँ रतनपुर पर अपना प्रत्यक्ष शासन स्थापित किया। 7 दिसंबर 1787 में बिम्बाजी की मृत्यु के बाद व्यंकोजी छत्तीसगढ़ के नये मराठा शासक हुए। व्यंकोजी ने यहाँ का शासन अप्रत्यक्ष रूप से नागपुर में रहकर सूबेदार के माध्यम से संचालित किया। इस नीति का परिणाम यह हुआ कि नागपुर छत्तीसगढ़ की राजनीतिक गतिविधियों का केन्द्र बन गया तथा रतनपुर का राजनीतिक वैभव धूमिल होने लगा था। छत्तीसगढ़ में स्थापित यह नवीन शासन व्यवस्था मराठों की उपनिवेशवादी नीति का परिचायक था जिसे ''सूबा सरकार'' की संज्ञा प्रदान की गयी। यह प्रणाली सन् 1787 से 1818 ई. तक चलती रही। इस नवीन शासन प्रणाली के जनक श्री व्यंकोजी भोंसला राजकुमार थे। अपने कार्यकाल के दौरान व्यंकोजी का केवल तीन बार रतनपुर आगमन हुआ था। किन्तु उन्होंने यहाँ के शासन में व्यक्तिगत रुचि नहीं ली थी वे स्वयं को कभी भी नागपुर की राजनीति से अलग नहीं कर सके थे और सत्ता संघर्ष में लीन रहे। सूबेदार का पद न तो स्थायी था और न ही वंशानुगत। ये नागपुर शासक के नियुक्त प्रतिनिधि होते थे। जो व्यक्ति छत्तीसगढ़ से सर्वाधिक राशि वसूल कर नागपुर भेजने का वादा करता था उसे सूबेदार नियुक्त कर दिया जाता था। इस पद पर नियुक्त व्यक्ति की प्रतिभा व कार्यकुशलता पर कोई विचार नहीं किया जाता था। सूबेदार वर्ष में एक निश्चित धनराशि पटाने के लिये जिम्मेदार होता था। इसलिये उसके आय-व्यय के आंकड़ों की जांच की व्यवस्था नहीं थीं। ये सूबेदार अपने पद पर बने रहने की आकांक्षा से कम से कम समय में अधिक आर्थिक लाभ अर्जित करने का प्रयास करते थे। 白叶树树树

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छत्तीसगढ़ में कल्चुरि कालीन सांस्कृतिक दशा-एक ऐतिहासिक पुनरावलोकन

डॉ.डी.एन. खुटे

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ABSTRACT:

किसी भी देश व प्रांत के क्षेत्र के सम्पूर्ण विकास के लिये प्रशासन अत्यंत महत्वपूर्ण एवं आवश्यक अंग होता है। प्राचीन छत्तीसगढ़ में प्रशासनिक व्यवस्था की जो परिपाटी थी वह प्रायः कल्वूरि काल में विद्यमान थीं। छत्तीसगढ़ में लम्बे समय तक कल्चुरि राजवंश की अधिसत्ता रही है। इस राजवंश ने 11वीं शताब्दी से लेकर 18वीं शताब्दी मध्यान्त तक शासन किया था। दक्षिण कोसल के कल्वुरि, चेदि कल्चुरियों के वंशज थे, जिनकी राजधानी पुरानी शहर त्रिपुरी थी। इन कल्वुरियों ने छत्तीसगढ़ के इतिहास में एक नए काल की शुरूआत की है। लक्ष्मण राज ने त्रिपुरी से अपने पुत्र कलिंगराज को भेजा। कलिंगराज ने न केवल तुम्माण को अपने अधिकार में किया वरन अपने बाहुबल से दक्षिण कोसल का जनपद भी जीत लिया। उसने तुम्माण को अपनी राजधानी बनाया और दक्षिण कोसल में कल्युरियों की वास्ताविक सत्ता की स्थापना की एवं नये सिरे से कल्युरि राज्य की नींव 1000 ई. में डालकर अपनी शक्ति में वृद्धि कर ली। कुछ समय बाद कल्वुरि राज्य रतनपुर और रायपुर दो भागों में विभाजित हो गया। रतनपुर में कल्चुरि शासन 1741 ई. तक रहा। रायपुर में इनकी एक शाखा आई जिसे लहुरी अर्थात कनिष्ठ शाखा भी कहते हैं। कल्युरि कालीन छत्तीसगढ़ का समाज श्रम विभाजन के आधार पर बंटा हुआ था। उसके अधिकार और कर्तव्य बंटे हुए थे। प्राचीन छत्तीसगढ़ में वर्ण व्यवस्था अपना स्थान प्राप्त कर चुके थे किंतु कट्टरता का अभाव था। छत्तीसगढ़ के कल्चुरि नरेश धर्म परायण थे और जनहित के कार्यों में रूचि रखते थे। इन्होंने अपने शासनकाल में शैव, वैश्णव, शाक्त, जैन, बौद्ध धर्मों को संरक्षण ही नहीं दिया अपितु उन्हें पुश्पित व पल्लवित भी किया। हिंदू समाज का स्वरूप संकुचित न होकर व्यापक था। यही कारण है कि शक, कुशाण, गुर्जर आदि विदेशी जातियों को हिंदू समाज में समाहित कर लिया गया।

KEYWORDS: कल्चुरि, पुराणकालीन, हैहय, रतनपुर, माहिश्मति, तुम्मान, कोकल्ल

प्रस्तावनाः –

कल्युरियों का उद्भव :--

भारत वर्ष के इतिहास में कल्चुरि नरेशों का स्थान कई दृष्टियों से महत्वपूर्ण है। 550 ई. से 1740 ई. तक लगभग बारह सौ वर्षों तक कल्चुरि नरेशों ने भारत के उत्तर अथवा दक्षिण किसी न किसी प्रदेश में अपना राज्य चलाया है। इस वंश का संस्थापक कौन था? इस विशय में कुछ भी ज्ञात नहीं है।⁽¹⁾ भारतीय राजवंशों में कल्चुरि राजवंश बहुत पुराना है।⁽²⁾

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- गहा : संघर्ष, केन्द्रीयकृत, अर्थनीतिक, औह	गेगिक उठाने नाम ।	🛛 डॉ.बन्सो नफरी
क् राज्य	ग्रामीण आफिन्म २२	Sec.
मा कल जनसंख्या की भारत का आदिवा	सी समदाय आपने गणन नी व	में भी ऐसी अनेक महिलाएं थीं.
तार गुडी जनसंख्या विविधताओं का प्र	तिनिधित्व पानीन समूह की विशालतम	जिन्होंने अपने जीविकोपार्जन एवं
भग की है। विश्व के सभी रहा है। आदिवार	नी लोगों का प्रकृति ने -	अधिकारों के लिए संघर्ष किया।
लाजा के कल्याणप्रद हमेशा से रहा है.	उन्हें प्रकृति ने आप क साथ जुड़ाव	एसा हो स्थिति धमतरी जिले के
के तिर्माण में महत्वपूर्ण की है. जिससे	वे अपना जीविकोणर्चन सपदा प्रदान	नगरा विकासखण्ड के अंतर्गत
न निमाई हैं। अपने देश मावानाटे मावाराज	(गोंडी भाषा में) 'हमारे मंत्र से नाम	जान वाल गांवी में भी बनी रही
का संरक्षण राज' एक केन्द्रीयव	र राजनीतिक अर्थनीतिक जनाव में हमारा	अादिवासी एक्त्रों का शा उन्हो
नाओं ने ही किया हैं। एक सीधी चनौती	देते हुए सहभागी प्रजातंत्र के लिए	कहीं ज्यादा महिलाओं का था।
ज के रीति-रिवाज एवं आवाहन है। "हा	नारे गांव में हमारा राज" की खबर	"हमारे गांव में हमारा राज" का
जाओं को भी अपने श्रम धमतरी जिले के	नगरों में भी फैल गई, तब यहां के	समाचार धमतरी जिले के नगरी
ज्ञान से जीवित भी निवासियों ने इस	नारे को आत्मसात किया। इनका	में भी फैल गया। यहाँ के
लों ने ही रखा है। सहारा जंगल ही	है. उनका मानना था. कि यहां के	आदिवासियों का जीविका वनों
त्रता से पर्व महिलाओं ने जंगल, जमीन में	सबका अधिकार है. जंगल सरकारी.	पर निर्भर है। सन् 1930 में
की राजनीति में भाग लिया तालाब सरकारी, व	तआं सरकारी कब हआ? सरकार को	माडमसिल्ली बांध का सिंचाई के
खं ब्रिटिश साम्राज्य के इमने बनाया है।	जल, जंगल, जमीन हमारा है, कलम	लिए निर्माण किया गया था।
कई बार आदिवासी तम्हारा। सन् 199	ा में आदिवासियों के हितेशी बस्तर	उसका पानी मुख्यतः भिलाइ
ओं ने पर्ख्यों के साथ जिल्ले के ताल्फालीन	कलेक्टर डॉ. ब्रह्मदेव शर्मा ने भारत	इस्पात के लिये किया जाता रहा
र जमींदारों तथा अंग्रेजों। चन आंग्रेचन का	गठन किया। यह समाचार धमतरी	तथा यहा का मछोलया मा
र्ष इटकर उनका सामना किने के जाती वि	कायगवण्ड में फैलने पर चनांगांव में	सरकार दारा अपना सावारन
यद्यपि इतिहास के गान्ती 1000 के नगरा थि	पाल आम सभा संपन्न हुई। यह	नाति के अतगत गालाना क
राश्री के प्रमा 1996 में संवर्भयम	एक जान (भा तन के रूप में	जाता रहा ह, तत्परपाएँ उस दम्
ग यह है कि उस उस्	भारताय जन जनवास	सहकारी सामात का खरासारम
लोओं का नाम सामन उ	भाया।	कर दिया गया। त्रार्
व करते आप के	सहकारी समिति का व	त्राय ठाक-ठाक पर्लाता रहा ग्रमुख
थी। वाप्तन में - ि में की प्रव	पढ़ा कुछ समय बाद यह	घाट में चला गर, रसे जु
विश्वास स्वरंग महिलाओं की राजनीतिक च	तन। अ कारण था, संगठन के	सदस्या म लालप उपमा सदस्या म लालप उपमा
भव हुआ कि न प्रश्चात् हुआ उन्हें	यह तथा बिचौलियों ठेकेदा	रों का आपसा युरापण को मारने
के उन्हें जन्में असंख्य समस्याओं के समा	धान के आम लोगों को उर	त जलाशय का मजारा में असंतोष
भाने सप्प ही लड़ना होगा आदिवासी महि	लाएँ का अधिकार भी नहीं	था, यहा स आम साम
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व्यक्तिगत सत्याग्रह में मध्यप्रांत के महिलाओं की भूमिका



शोध सार

व्यक्तिगत सत्याग्रह अगस्त प्रस्ताव का परिणाम था। अगस्त प्रस्ताव के पश्चात् ब्रिटिश सरकार द्वारा अध्यादेश जारी कर अभिव्यक्ति की स्वतंत्रता, प्रेस की स्वतंत्रता तथा सभा करने एवं संगठन बनाने का अधिकार को प्रतिबंधित कर दिया गया, जिसके प्रति उत्तर में महात्मा गाँधी जी ने व्यक्तिगत आधार पर सीमित सत्याग्रह प्रारंभ करने का निश्चय किया। उन्होंने इसके लिये यह तय किया कि प्रत्येक क्षेत्र में कुछ चयनित लोग व्यक्तिगत सत्याग्रह प्रारंभ करेंगे। सत्याग्रही द्वितीय विश्वयुद्ध एवं युध्द में भाग लेने के खिलाफ प्रचार करते हुये गाँव -गाँव में जाकर आम जनता को ब्रिटिश सरकार के भारतीय विरोधी नीतियों के वारे में बतायेंगे और यह तब तक करते रहेंगे, जब तक गिरफ्तार नहीं होते। ब्रिटिश विरोधी संदेश को गाँवों में फैलाते हुये दिल्ली की ओर कूच करने का प्रयास करेंगे इसलिए इस आंदोलन का नाम ''दिल्ली चलो आंदोलन" पडा। यह सत्याग्रह केवल स्वतंत्रता प्राप्ति के लिए ही नहीं था बल्कि इसमें अभिव्यक्ति के अधिकार को भी सुदृढ़ता पूर्वक प्रस्तुत किया गया।

मुख्य शब्द

अभिव्यक्ति, व्यक्तिगत, हस्तशिल्प, क्रियान्वयन.

प्रस्तावना

3 सितम्बर, 1939 को ब्रिटिश भारत के तत्कालीन वायसराय लार्ड लिनलिथगो ने यह घोषणा कि भारत भी द्वितीय विश्वयुद्ध में सम्मिलित है। इस घोषणा से पूर्व उसने किसी भी राजनैतिक दल से परामर्श नहीं किया। इससे कांग्रेस असंतुष्ट हो गई। महात्मा गाँधी ने ब्रिटिश सरकार की युद्ध नीति का विरोध करने के लिए सन् 1940 में अहिंसात्मक व्यक्तिगत सत्याग्रह आरंभ किया। महात्मा गाँधी जी के प्रस्ताव पर 17 अक्टूम्बर, 1940 में पवनार आश्रम (महाराष्ट्र) से प्रतीकात्मक विरोध स्वरूप व्यक्तिगत सत्याग्रह प्रारंभ किया। इस सत्याग्रह में महात्मा गाँधी के द्वारा चुना हुआ सत्याग्रही पूर्व निर्धारित स्थान पर भाषण देकर गिरफ्तारी देता था। भाषण से पूर्व सत्याग्रही अपने सत्याग्रह की सूचना जिला मजिस्ट्रेट को भी देता था।

उद्देश्य

शोध आलेख के चयन का प्रमुख उद्देश्य ब्रिटिश सरकार के उस दावे को खोखला साबित करना था, कि भारत की जनता द्वितीय विश्वयुद्ध में सरकार के साथ है। इस सत्याग्रह में पुरूषों के साथ महिलाओं ने भी बढ़–चढ़ भाग ली की।

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महात्मा गाँधी की बुनियादी शिक्षा एवं वर्तमान प्रासंगिकता

डॉ.बन्सो नुरूटी सहायक प्राध्यापक, इतिहास अध्ययनशाला पं रविशंकर शुक्ल विश्वविद्यालय, रायपुरछत्तीसगढ़।

सारांशः

महात्मा गाँधी का शिक्षा के क्षेत्र में विशेष योगदान रहा है। इन का मूलमंत्र था शोषण विहीन समाज की स्थापना करना। उसके लिए सभी को शिक्षित होना आवश्यक है क्योंकि शिक्षा के अभाव में एक स्वस्थ समाज का निर्माण असंभव है। महात्मा गाँधी अपनी पारंपरिक शिक्षा पद्धति को सर्वाधिक उपयोगी मानते थे, जो सर्व आयामी होती थी जिसमें व्यक्ति अपने सर्वांगीण विकास के साथ-साथ आपसी प्रेम, भाईचारा, सोहार्द, एकता की भावना आदि नैतिक मूल्यों को सीखता है। देश की आवश्यकता को ध्यान में रखते हुए उनके द्वारा एक नवीन शिक्षा प्रणाली का सुझाव दिया गया, जो बुनियादी शिक्षा के नाम से विख्यात है। महात्मा गाँधी बुनियादी शिक्षा के माध्यम से बालकों का सर्वांगीण विकास करना चाहते थे। महात्मा गाँधी ी की बुनियादी शिक्षा वर्तमान परिप्रेक्ष्य में भी प्रासंगिक है। महात्मा गाँधी के अनुसार शिक्षा का अर्थ बालक एवं व्यक्ति के शरीर और मस्तिष्क और आत्मा में जाने वाले सर्वोत्तम गुणों का चहुंमुखी विकास करना है। व्यक्ति को आत्मनिर्भर एवं स्वावलंबी बनाने में बुनियादी शिक्षा सहायक है। इसमें शिक्षा का केंद्र बिंदु कोई एक हस्त कार्य होगा जिसको भविष्य में विद्यार्थी आजीविका के रूप में अपना सके।

बीज शब्दः स्वावलंबी, सप्तवर्षीय, जीविकोपार्जन, हस्तकौशल, सहिष्णुता, सर्वोदय, मशीनीकरण।

विषय प्रवेशः

शिक्षा मानव जीवन का आधार स्तंभ है, इसके अभाव में मानव जीवन के विकास की कल्पना ही नहीं की जा सकती है। यह मानव जीवन की उत्कृष्टता एवं उच्चता का प्रतीक है। प्राचीन काल से ही शिक्षा को आत्म ज्ञान एवं आत्म प्रकाश का साधन माना गया है। शिक्षा जहाँ एक ओर बालक का सर्वांगीण विकास कर उन्हें विद्वान, चरित्रवान और वुद्धिमान वनाती है वहीं दूसरी ओर यह समाज के विकास के लिए भी एक आवश्यक एवं शक्तिशाली साधन है। महात्मा गाँधी सत्य और अहिंसा के पुजारी थे। उनके लिए अहिंसा का सही अर्थ- मन में, सोच में एक भी किसी को हानि नहीं पहुंचाना था। उनका मानना था कि मन साफ होगा तो हमारा व्यवहार, आचरण भी साफ और शांतिपूर्ण रहेगा। ऐसी सोच या मानसिक स्थिति कैसे आ सकती है महात्मा गाँधी के लिए ऐसी मनःस्थिति बनाने के लिए दो बातें जरूरी थी- एक अच्छा धर्म–कर्म और दूसरा अच्छी शिक्षा।

महात्मा गाँधी जीवन का सार शिक्षा को मानते थे। उनकी सोच में शिक्षा का मतलब कागजी उपलब्धियां (जैसे डिग्री या डिप्लोमा) ही नहीं था। न हीं शिक्षा प्राप्ति केवल व्यक्ति की भलाई का रास्ता था, बल्कि सही शिक्षा के रास्ते में व्यक्ति की भलाई भी होती है। महात्मा गाँधी शिक्षा की प्रचलित पद्धति से पूर्णतया असंतुष्ट थे। उन्होंने अनुभव किया कि हमारी शिक्षा किताबी शिक्षा है, वह केवल बुद्धि का प्रशिक्षण करती है। इस शिक्षा प्रणाली से शिक्षित युवक शरीर से तो भारतीय होता है किंतू हृदय और मरितष्क से विदेशी हो जाता है।²

अतः महात्मा गाँधी ने चिंतन किया कि यदि राजनीतिक स्वराज्य मिल जाए तो भी सामाजिक एवं आर्थिक स्वराज्य देश में तब तक नहीं आ सकता, जब तक की शिक्षा को राष्ट्रीय आवश्यकताओं के अनुरूप नहीं बनाया जा सकता। फरवरी 1937 में 1935 के भारतीय अधिनियम के अधीन प्रांतीय विधान सभाओं में चुनाव हुआ। इस चुनाव में काँग्रेस को अच्छी सफलता मिली। मुंबई, संयुक्त प्रांत, बिहार, मध्य प्रांत, उड़ीसा और मद्रास इन छह प्रांतों में काँग्रेस की सरकार बनी। अब इनके सामने देश की शिक्षा व्यवस्था को सुव्यवस्थित करने का काम था, लेकिन सभी प्रांतों में मंत्रिमंडलों के पास आर्थिक संसाधन सीमित थे और शिक्षा पर खर्च बढ़ाने हेतु संसाधन नहीं थे एक ऐसी शिक्षा नीति का विकास जरूरी था जिसके अंतर्गत प्रचूर आर्थिक संसाधनों का सहारा लिए बगैर शिक्षा की व्यवस्था कर सकें। तभी महात्मा गाँधी ने बुनियादी शिक्षा की रूपरेखा को देश के सम्मुख रखें।

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छत्तीसगढ़ के धार्मिक पर्यटन स्थल खल्लारी का ऐतिहासिक अध्ययन

सुश्री जागृति जगत अॉ. बन्सो नुरूटी

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सूचक शब्द : खल्लारी माता स्मारक, धार्मिक पर्यटन, प्रस्तर किसी भी राष्ट्र की भौतिक विशि जल प्रपात,प्राकृतिक एवं धार्मिक स्थल सदैव मनुष्य को अपनी ओर आकर्षित करती रही हैं। साथ ही वहाँ की संस्कृति भी उस जगह को एरिभाषित करती	मंदिर, राज्य संरक्षित अशांति से शांति अभिलेख, नागर शैली। प्राचीन काल में ज ष्टताएँ जैसे पर्वत, नदी समाज, संस्कृति त छत्तीसगढ़ के विभिन्न धार्मिक स्थलों में रायपुर सं के महासमुन्द जिला के अंतर्गत 36 गढ़ों में ख्यातिल गढ़ खल्लारी का विशेष स्थान है। प्राचीन खल्लवा की इष्ट आराध्या माता-खल्लारी सुरम्य प्राकृतिक सौ	की ओर ले जाते है। ² अनेक ऐसे स्मारक बनवाए गए, जिससे तथा इतिहास को संपन्नता प्रदान की जा सके। भारतीय धार्मिक संप्रदायों लब्ध देका न्दर्य पाप्त होती है। ये स्मारक न
साथ ही वहाँ की संस्कृति भी उस जगह को परिभाषित करती है। संसार में किसी भी वस्तु का वितरण एक समान नही होता। मानव अति महत्वाकांक्षी होने के कारण अपनी आकाक्षांओं और आवश्यकताओं को प्राप्त करने के लिए अन्यत्र स्थान की ओर सदैव गमन करता है। इसे ही पर्यटन का नाम दिया गया है। प्राचीन काल से ही भारत की भूमि सभी धर्मों के साथ सामंजस्य स्थापित करती आ रही है, अर्थात यहां विभिन्न धर्म को मानने वाले लोग निवास करते हैं। ¹ पर्यटन और धार्मिक स्थल का बहुत ही घनिष्ठ संबंध रहा है। भारतीय पर्यटन स्थलों में कुछ स्थल ऐसे भी हैं जिनका महत्व धर्म या आध्यात्म के कारण है। लोग अपनी आस्था एवं भक्ति के कारण धार्मिक	की इष्ट आराध्या माता-खल्लारी सुरम्य प्राकृतिक सौ से युक्त पहाड़ी के ऊपर विराजमान हैं, जहाँ से स क्षेत्र का प्राकृतिक सौन्दर्यपान विहंगम दृष्टि से किया सकता है। पर्वत के ऊपर खल्लारी माता के प्रा मंदिर का निर्माण लगभग 15 वीं सदी ई. में हुआ इसके अतिरिक्त यहाँ राज्य संरक्षित स्मारक नार मंदिर (वर्तमान जगन्नाथ मंदिर) स्थित है। खल्लारी प्राप्त प्रस्तर अभिलेख से यह ज्ञात होता है कि इस म का निर्माण 13 वी शताब्दी में देवपाल नामक मोर्च द्वारा करवाया गाया था। इस अभिलेख में इस स् का नाम "खल्लारिका" के रूप में उल्लिखित है। न शैली में निर्मित यह मंदिर वास्तुकला का सुन्दर उदाह है। इसके अलावा यहाँ राउर खल्लारी, भीम पाँव, चूल्हा, ऐतिहासिक कुंड, डोंगा पथरा, बघवा ख हाथी-हथिनी पत्थर आदि दर्शनीय स्थल हैं। खल् माता को शक्ति देवी के रूप में पूजा जाता है। अ मनोकामना पूर्ति हेतु दूर-दूर से श्रद्धालु बड़ी संख्य आते हैं। इस स्थान पर प्रति वर्ष चैत्र पूर्णिमा खल्लारी मेला महोत्सव का आयोजन किया जाता प्रस्तुत लेख धार्मिक पर्यटन स्थल खल्लारी के ऐतिर्हा अध्ययन का एक प्रयास रहा है।	तत्कालीन समाज की जानकारी प्राप्त होती है। ये स्मारक न केवल धार्मिक दृष्टिकोंण से महत्वपूर्ण हैं, बल्कि ये भारतीय संस्कृति की लोकप्रियता एवं गौरवपूर्ण अतीत का वर्णन भी करते हैं। ऐसे कई स्मारक या मंदिर भारत के विभिन्न स्थानों पर तत्कालीन शासकों द्वारा निर्मित कराये गये हैं, जो देश की विविध धार्मिक एवं सामाजिक संस्कृतियों को संजोकर रखे हुए हैं। ³ पर्यटन के अनेक स्वरूपों के अंर्तगत धार्मिक पर्यटन भी सम्मिलित है। धार्मिक पर्यटन में विभिन्न धर्म जैसे हिन्दू, बौद्ध, जैन, मुस्लिम, ईसाई आदि के धार्मिक स्थल आते हैं। भारत में पर्यटन के अन्य प्रकारों की तुलना में धार्मिक पर्यटन का एक अलग महत्व है। यहां धर्म पर
स्थलों की यात्रा करतें हैं। उनक स्थल पर जाकर अपनी मनोक करना है। धार्मिक स्थल सहज	ा प्राथमिक उद्देश्य उस आधरित स्थल ए गमना पूर्ति हेतु प्रार्थना आकर्षित करतें है रूप से मानव जाति को में हमारी संस्कृति	वं पर्व पर्यटकों को सहसा अपनी ओर है। यहाँ मनाए जानें वाले प्रत्येक त्यौहार की छाप स्पष्ट दिखाई देती है। वर्तमान

- शोध अध्येत्री, इतिहास अध्ययनशाला, पं. रविशंकर शुक्ल विश्वविद्यालय रायपुर (छ.ग.)
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डॉ. श्रीमती बन्सो नुरूटी,सहायक प्राध्यापक,इतिहास अध्ययन शाला, प. रविशकर शुक्ल विश्वविद्यालय,रायपुर (छ.ग.)

सारांश — रायगढ़ रियासत छत्तीसगढ़ के पूर्व स्थित छत्तीसगढ़ के चौदह रियासतों में से एक है। सन् 1910 में सिंघनपुर, काबरा पहाड़, खैरपुर और करमागढ़ के शैल चित्रों में पशु, मानव आकृतियाँ तथा समुदाय के प्रतीक चिन्ह प्राप्त हुये हैं। रायगढ़ रियासत ऐतिहासिक दृष्टि से महत्वपूर्ण है। रायगढ़ रियासत के संस्थापक मदन सिंह थे। इस रियासत के प्रमुख शासक राजा चक्रधर सिंह हुये अपने संगीत व साहित्य के द्वारा छत्तीसगढ़ का नाम सम्पूर्ण विश्व में प्रसार किया। यह रियासत अपनी संस्कृतिक विरासत के कारण वर्तमान में छत्तीसगढ़ की सांस्कृतिक नगरी के नाम से प्रसिद्ध है। आजादी के पहले रायगढ़ रियासत में मराठों व उसके बाद ब्रिटिश सरकार का अप्रत्यक्ष शासन था। 1947 में आजादी के बाद रियासतों के विलनीकरण के द्वारा भारत संघ में शामिल किया गया। यह रियासत पहला रियासत था जो मध्यप्रदेश में रायगढ़ जिले के रूप में सम्मिलित हुआ।

शब्द कुंजी – संस्कृति, विनलीकरण, जमींनदारी ।

परिचय—

रायगढ़ के प्रागेतिहासिक काल की कोई जानकारी उपलब्ध नहीं है, फिर भी उस इतिहास के निर्माण में इस अंचल का भी योगदान है। रायगढ़ रियासत 21°-42' में 22°- 33' उत्तरी अंक्षाश तथा 82°-25' 83°-53' पूर्वी देशांश रेखाओं के मध्य अवस्थित थी। इस रिसायत की कुल लम्बाई उत्तर से दक्षिण 56 मील, चौड़ाई पूर्व से पश्चिम 38 मील थी एवं इसका कुल क्षेत्रफल 1486 वर्ग मील था। इस क्षेत्र की जनसंख्या लगभग 2,18,860 थी। यह रियासत उत्तर में जशपुर, उदयपुर व गांगपुर रियासत, दक्षिण में सारंगढ़ रियासत, पूर्व से गांगपुर रियासत व पश्चिम में बिलासपुर जिला से घिरा हुआ है। मार व सिद्धि चौरा पहाड़ उदयपुर व रायगढ़ रियासत को पृथक करती है। यह रियासत 3 परगने पहला तमनार में चावर ढाल पहाड़ी पष्टिम से पूर्व दिशा की ओर जाती है , और बुगडेगा, लैलूंगा, जात्रा, मुगडेगा जमींदारियों के चारों ओर है, उत्तर की पहाड़ियां घने वन से आच्छादित है तथा रेतीली व पथरीली है। दूसरा बरगढ़ व तीसरा रायगढ़ परगना जो रियासत के दक्षिण भाग में है उपजाऊ मैदान हैं जो मांड नदी द्वारा अलग किये जाते हैं। 2'

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Abstract

The article underscores the evolving nature of cyber threats and the imperative for a dynamic approach to legislation and law enforcement. It emphasizes the importance of continuous efforts in capacity building, training, and technological advancements while acknowledging the rise of cryptocurrencies as a new challenge. The call for comprehensive strategies, investment in cybersecurity infrastructure, and a culture of cybersecurity awareness reflect the article's overarching message of securing a resilient and safe cyberspace for individuals and businesses.

Related papers

A Study of Crime against Religion in India

Vidhi Mishra

Scholar of PG School of Studies in Law Pt. Ravishankar Shukla University

Dr. Venudhar Routiya Assistant Professor School of Studies in Law Pt. Ravishankar Shukla University Raipur (C.G.) India

Abstract:

Indian Secularism is an important feature of Indian constitution which means giving equal importance to all religions i.e. "State is neutral in the matter of religion" and the state has no particular religion. Article 25 of the Indian Constitution guarantees religious freedom to all citizens. It is a fundamental right. Religion is a very sensitive matter in the world. *Especially in India, crimes are committed on the basis of religion. There are many incidents* of hate crime. Provision has been made to punish those who misuse the law. There is a need for dignity and personal security. All over the world people believe that India is a divine place, Indians also believe the same, but there are many flaws around us, we don't pay attention or ignore those flaws or mistakes. Truth be told, some religious crimes are taken lightly in India and admitting those crimes is a very informal thing nowadays. Violence in the name of religion is becoming a part of everyday activity. Repression of minorities and hate crimes are also on the rise in India. Technological advances are keeping us entertained in the 21st century, but heinous cybercrimes are still happening. Most of the hate crimes on social media are based on girls, politics and religion. Today's youth has to develop into a physical human being. This paper focuses on acknowledging the flaws in religious law and crimes and bringing unity among the people and reforming them.

Keywords: Crime against religion, Secularism and Right to Freedom of Religion.

Introduction:

The Supreme Court of India held that India is a secular state and there is no scope for hate crimes. Justice K.M. Joseph and Justice B.V. Nagaratna's bench said that when incidents

¹ Durai, Hashika and Niranjana, K. and Niranjana, K., A Study on Religious Laws and Religious Crimes in India (August 26, 2019). Available at SSRN: https://ssrn.com/abstract=3442697 or http://dx.doi.org/10.2139/ssrn.3442697

A Critical Study of Right to Health of BPL in India with Special Reference to the State of Chhattisgarh: Problems, Prospects and Way Forward

Dr. Leena Chandran LL.M., NET, Ph.D

Dr. Venudhar Routiya Assistant Professor Pt. Ravishankar Shukla University Raipur (C.G.)

ABSTRACT

This research paper is based on my Ph.D research wherein I have dealt with the right to health of the BPL section. In twenty first century, the Right to Health has become a global issue particularly after the outbreak of COVID 19. In India also, the right to health has become a matter of utmost importance after the pandemic situation exposed the weakness of our public health system. In India, right to health is not expressly mentioned in the category of Fundamental Rights. It is a Fundamental Right by judicial pronouncement under Article 21 which deals with Right to Life. The State has introduced various policy measures to ensure Right to Health particularly to the BPL section of the society who are totally dependent on the health care facilities provided by the Government. But the data collected for the study reveals that lack of poor implementation of the existing laws, health schemes and insurances is a great challenge facing our public health system. In order to overcome these challenges the Government needs to take various steps including increase of budget for health for overall development of public health infrastructure including proper implementation of various health schemes and insurances as well as increasing their coverage to make right to health a reality for the BPL section.

Key words: Right to Health, BPL, Fundamental Rights, implementation, medical facilities, Health schemes and insurances.

INTRODUCTION

The outbreak of the pandemic COVID-19 made right to health a burning issue which exposed the reality of our public health system. A very horrifying situation prevailed during the pandemic COVID 19 whereby innumerable people lost their life due to shortage of oxygen, hospital beds, ventilators and other essential medical amenities. Right to health is a matter of global concern and is given utmost priority in Sustainable Development Goal (SDG Goal No. 3, UNO).

The Constitution of India aims at the establishment of a welfare state in India and in order to manifest this noble vision incorporates various fundamental rights for the welfare, progress and development of its citizens. BPL means the People Living Below Poverty Line and the Government has fixed certain criteria for identification of BPL in India. The BPL section of the society are totally dependent upon the health care services rendered by the

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Understanding the Plight of Manual Scavengers in India: Challenges, Perspectives, and Solutions

• Janmejaya Sona •• Venudhar Routiya

Abstract- Manual scavenging, a dehumanizing practice entrenched in India's societal fabric, continues to persist despite legislative interventions and societal awareness. This research delves into the multifaceted dimensions of manual scavenging, exploring its historical context, socio-economic implications, and legal frameworks. Through a comprehensive review of existing literature and empirical studies, this paper examines the challenges faced by manual scavengers, including health hazards, social stigma, and economic vulnerability. Additionally, it investigates the efficacy of government policies and interventions aimed at eradicating manual scavenging and rehabilitating affected individuals. The findings underscore the urgent need for holistic approaches encompassing legal, social, economic, and technological aspects to address this entrenched social injustice. By shedding light on the grim reality of manual scavenging and proposing actionable recommendations, this research seeks to contribute to ongoing efforts towards social equity and human dignity.

Keywords- Manual Scavengers, Sanitation Workers, Social Stigma, Socio-Economic Conditions, Legal Framework, Policy Interventions, Human Rights, Social Justice.

Introduction- Scavenger, a practice rooted in the hierarchical structure of Indian society, continues to cause suffering to thousands of people despite legal bans and public awareness campaigns. The resilience of hand-harvesting highlights the deep socio-economic inequalities and systemic injustices embedded in the Indian landscape. In this introduction, we provide an overview of the constitutional and legal framework governing manual picking, defining the term and reviewing the key provisions of the Manual Scavenging Prohibition and their RehabilitationAct, 2013 (the 2013Act)¹.

Constitutional rights- The Constitution of India enshrines fundamental rights that guarantee equality, dignity and freedom from discrimination to all citizens. Article 14^2 ensures equality before the law, while Article 17 abolishes the practice of untouchability closely associated with manual collection. In addition, Article 21 protects the right to life and personal liberty, emphasizing the State's obligation to ensure the dignity and wellbeing of every person. These constitutional provisions are the basis for

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सारांश

संसदीय बहसों में देश की लंबित न्यायिक मामलों के लिए कानून मंत्री का दिया गया बयान चिंतनीय है एवं किसी देश की परम न्याय प्रणाली पर सोचनीय है। देशभर की अदालतो में लंबित मामले की संख्या में लगातार बढ़ोतरी हो रही है 2023 के संसद सत्र में संसद में ये मुद्दा उठा, जहां शीतकालीन सत्र के दौरान कानून मंत्री अर्जुनराम मेघवाल ने लोकसभा में बताया कि देश की अदालतों में फिलहात 5 करोड़ से ज्यादा मामले लंबित पड़े हैं. सिर्फ सुप्रीम कोर्ट में लंबित मामलों की संख्या 80 हजार है।

संसद में एक सवाल के जवाब में मेघवाल ने बताया कि 1 दिसंबर तक अदालतों में 5,08,85,856 मामले लंबित हैं इनमें से 61 लाख से ज्यादा मामले उच्च न्यायालयों की स्तर पर हैं वहीं जिल और अधीनस्थ अदालतों में लंबित मामलों की संख्या 4.46 करोड़ से ज्यादा है। ऐसे में अवश्य हमें न्याय प्रक्ति के लिए चिंतित होना पड़ेगा, एवं शीघ्रत्तर न्याय प्रदान करनें वाली देशों से हमारे न्याय प्रदान करनें वाली प्रणाली से तुलनात्मक अध्ययन करके उन देशों के न्याय प्रणाली को अपनाना होगा हमारे देश की न्याय को बिलंबित करने वाली समस्याओं को चिन्हाकित कर इसके हल ढूंढ़ने होंगे तथा न्याय में एक वस्तुनिध जांच परख व्यवस्था, निष्पक्ष विश्लेषण एवं समान न्याय प्रणाली लाने हेतु विधिक प्रयास किये जाने होंगे। इसके लिए सरकार को कठोर एवं शीघ्रत्तर उपाय खोजने होंगे। देश की न्याय प्रणाली सुधार व्यवस्था में शासन एवं अदालतों में एक भय मुक्त वातावरण विकसीत कर पीड़ितों को एक न्यायिक अभिनेता के रूप में स्थापित करने होंगे। इस विश्वास की प्राप्ति तभी संभव है जहां शीघ्रत्तर न्याय प्रदान प्रणाली की उच्चातर मानक को हम स्थापित कर पायेगें। न्याय व्यवस्था तथ्यात्मक रहस्य एवं वास्तविकता की खोज की एक लम्बी प्रक्रिया के मकड़जाल में फंसी हुई है जिसके लिए हमें न्याय प्रदान प्रक्रिया को सहज एवं सरल करने होंगे।

विषय वस्तु का वैश्विक परिचय

''विश्व न्यायिक परियोजना'' के रूल ऑफ लॉ इंडेक्स 2022 के अनुसार नागरिकों या निवसि^{यों} के दृष्टिकोण से कानून के शासन का सबसे अधिक पालन करने वाले शीर्ष पांच देशों की एक मूल्यां^{कन} डेटा प्रस्तुत करती है। जिसमें स्कैंडिनेवियाई, सिंगापुर, न्यूजीलैंड, एस्टोनिया का तुलनात्मक अध्ययनों ^{में} बेहतर न्याय के लिए शीर्ष पर रखा है।

इस सूची का मूल्यांकन करते समय आठ कारकों पर ध्यान दिया जाता है उनमें सरकारी शक्ति^{यौ} पर बाधाएं, भ्रष्टाचार की अनुपरिथति, सरकारों का खुलापन, मौलिक अधिकार व्यवस्था और सुरक्षा नियामक प्रवर्तन, नागरिक न्याय और आपराधिक न्याय सिस्टम।

इस परियोजना में किसी देश की कानून व्यवस्था के निर्घारण सिद्धान्तों में निम्नलिखित को सार्वभौमिक

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egality Of Live-In Relationship	
Dr. Alekh Sahu	Download Free PDF
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Abstract

This paper examines the concept of Live-In Relationship, its various facets and it's Legality in Indian Context.

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(Peer Reviewed Refereed UGC CARE Group 1 International Journal)

ONE NATION, ONE SCHOOL: A COMPREHENSIVE ANALYSIS OF THE LEGAL FRAMEWORK IN INDIA

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ABSTRACT:

This research paper provides a thorough examination of the policy's legal and constitutional aspects. The paper explores the rationale behind the "One Nation, One School" initiative, which aims to standardize educational standards across India to ensure equity and uniformity in schooling.

The study investigates the constitutional framework, focusing on fundamental rights and directive principles related to education. It analyzes the roles and responsibilities of central and state governments in education governance and reviews judicial pronouncements concerning the right to education. Additionally, it examines key education-related legislation, including provisions on school infrastructure and curriculum standards.

A comparative analysis with international education models is conducted to identify best practices. The paper also addresses challenges such as socio-economic disparities, cultural diversity, and regional autonomy, alongside the policy's potential controversies and political implications.

Data analysis from surveys and statistical evaluations provides insights into the policy's effectiveness and feasibility. The findings suggest that while the policy has the potential to enhance educational equity, its successful implementation will depend on addressing local needs, ensuring adequate infrastructure, and engaging stakeholders effectively.

KEYWORDS:One Nation, One School,Legal Framework,Constitutional Rights,Educational Equity

INTRODUCTION: Background and Rationale

The "One Nation, One School" policy is a significant initiative proposed to address the disparities in the Indian educational system by creating a unified framework for education across the country. The policy aims to standardize the educational experience by ensuring that all students, regardless of their geographical location, socio-economic status, or linguistic background, receive an equivalent quality of education. This initiative seeks to promote national

AMOGHVARTA

Marital Rape

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Abstract

We now live in a world that is evolving with every blink of our eyes. The world may be changing but most beliefs are not. This paper touches the depth of the most sensitive issue of women's development in the shadow of increasing violence against women, especially 'marital rape'. In view of increasing crimes against women, there is a continuous discussion about laws dealing with crimes against women. The term 'Marital rape' means is without the consent of wife unwanted sexual intercourse by her husband and is often achieved by force, threat of force, or physical violence. It violates the right to dignity of married women and is a non-consensual act of sexual perversion by a man on his wife where she is physically, sexually and mentally abused. This paper examines whether this right can be exercised by force or whether the right to sexual intercourse is dependent only on the wife's consent. Social practices and legal codes in India, mutually enforce

the denial of women's sexual agency and bodily integrity, which is central to women's human rights.

Key Words

Women, Marital, Rape, Sex, Violence.

Introduction

Rape is rape. Marital rape is the most common and abhorrent form of male violence in Indian society, it is hidden behind the curtain of mind but mutually accepted by social practices and legal codes in India. Denying female sexual agency and her integrity, which is at the top of women's human rights. Marital rape is a violent act motivated by a husband's desire to have control and power over his wife. It is a lack of sexual self-determination. It is a man's fantasy and a woman's nightmare, all the hatred, contempt and oppression towards women in our society concentrated into one violent act.

Rape is rape, be it marital rape but unfortunately the law does not consider marital rape as a crime. Even if this happens, there is always a cloud of legal uncertainty over its punishment. The patriarchal system governing Indian families has always treated women as mere objects of their husbands or guardians. Rape was therefore considered theft of women and wrong against the husband or guardian. This dogma has influenced our legislatures to deny the crime of spousal rape by shielding the marital rights of the husband and thereby tacitly accepting that women are mere objects with no will of their own. The perception towards sexual satisfaction of her husband has weakened women's right to equality and justice.

Dr. Priya Rao, Meena Dhruw Page No. 111 - 115

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Key Words

Legal aid, Human Right, Constitution, Laws.

Introduction

A fundamental right! The Right to Legal Aid is an important matter component of access to justice, enshrined in various international human rights instruments and national constitutions. It ensures that individuals, particularly those who are indigent or vulnerable, have access to legal assistance and representation.

The key to democracy rests on the free enjoyment of rights. Most of the people living in rural areas are illiterate and even more than that upon them by law. After six decades of our independence, many people don't know how to implement them under the in this land. Their legal needs always stand to become a crisis made to provide the benefits to the undone vast. The task is based on the principles of constitutional ethics.

The Indian Constitution ensures certain fundamental rights to the people, because those are fundamental for sustenance. Access to justice and free legal aid is a fundamental right coming within the right of personal underprivileged. The concept of legal aid is not a new phenomenon for condition providing legal to the vast segment of people became huge task.



Free Legal Aid: Empowering the Powerless

Abstract

In a just society, access to legal representation is a fundamental right, not a privilege reserved for the wealthy. However, many individuals and communities face significant barriers in accessing legal assistance, perpetuating inequality and injustice. Free legal aid programs aim to bridge this gap by providing pro bono services to those in need. This paper examines the critical role of free legal aid in promoting access to justice, addressing the legal aid gap, and empowering marginalized communities. It explores the history and evolution of free legal aid, its impact on social and economic outcomes, and the challenges and opportunities in delivering effective free legal aid services. The paper argues that free legal aid is essential for creating a more equitable society, promoting human rights, and upholding the rule of law. By highlighting best practices, innovative approaches, and policy recommendations, this paper aims to inform and inspire efforts to expand and strengthen free legal aid services, ensuring that justice is accessible to all.

Impact Factor

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Victim Compensation Under Various Indian Laws: A Critical Study



Key Words

Victim, Compensation, Laws, Rehabilitation.

Introduction

Abstract

The victim compensation Scheme is a Government-funded program designed to provide financial assistance to victims of crime, helping them recover from the physical, emotional, and financial trauma inflicted upon them. This scheme aims to promote justice, rehabilitation, and reparation for victims, while also acknowledging the state's responsibility towards its citizens. The scheme typically covers expenses such as medical treatment, counseling, and loss of income, among others. By providing timely and adequate compensation, the scheme seeks to alleviate the suffering of victims and their families, facilitating their reintegration into society. This abstract provides an overview of the Victim Compensation Scheme, highlighting its objectives, eligibility criteria, benefits, and implementation mechanisms. This paper highlights the various laws on Victim compensation scheme.

Indian Judiciary pioneered the concept of victim compensation to ensure justice. Modern justice emphasises providing relief to victims through compensation mechanisms. Since India's Constitution was formulated, laws and provisions for victim compensation have evolved. The rights of victims gained momentum in the 1980s, following the UN's Declaration of Basic Principles of Crime and Abuse of Power (1985). This led to recognising victims as central to the criminal justice system, prompting efforts to improve their treatment¹.

Compensating victims for damages is crucial for their reassurance and assistance, and is considered an essential part of the 'Right to Life' under Article 21 of the Indian Constitution.² To enforce this, Section 357A of the Code of Criminal Procedure (1973), now Section 396 of the Bharatiya Nyaya Suraksha Sanhita (BNSS), mandates state-provided compensation for victims and their dependents injured due to crime. Consequently, all Indian states have established Victim Compensation Schemes to provide fair compensation.³

The concept of restitution in Indian law originated during the British colonial era. The Code of Criminal Procedure (1898), specifically Section 545(1)(b), empowered courts to order compensation to individuals for losses or injuries caused by an offence, if the court deemed it substantial and recoverable through civil courts.⁴

SHODH SAMAGAM

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AI for Justice: Artificial Intelligence in Criminal Justice System

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ORIGINAL ARTICLE



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ABSTRACT

The rapid advancement of digital technologies worldwide has significantly transformed criminal processes, with artificial intelligence (AI) playing a pivotal role. Notably, the US judicial system has embraced various digital tools, while AI-driven legal start-ups have demonstrated remarkable accuracy in predicting court verdicts, underscoring the profound impact of technology on the legal landscape. AI in the 2015, Maharashtra Police pioneered the use of Artificial Intelligence (AI) in India's law enforcement by introducing predictive policing software to enhance crime control. Additionally, the department acquired advanced Universal Forensic Extraction Devices (UFED) from renowned global brands to strengthen digital forensic capabilities and investigation. Such devices can retrieve data, even deleted data, from mobile phones, social networking sites, hard disks, and various other devices. They can also recall audio-visual data from drone and CCTV cameras. The integration of Artificial Intelligence (AI) technologies into the criminal justice system has become a subject of increasing interest and debate. This research paper examines the integration of Artificial Intelligence (AI) in the criminal justice system, highlighting its advantages, obstacles, and moral implications. The study provides an in-depth analysis of AI's role in multiple stages of the justice process, spanning police investigations, court judgments, and correctional services. Additionally, it discusses the impact of AI on fairness, transparency, accountability, and the protection of individual rights within the criminal justice system. **KEY WORDS**

Criminal Justice, Artificial Intelligence, Justice System.

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Lotka's Law and Authorship patterns in Urinary tract infections and Diabetes: A Scientometric analysis Mahendra Kumar Patel¹; Dr. Maya Verma²

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ABSTRACT

An infection that can occur in any part of the urinary system is known as a urinary tract infection (UTI). The urinary system comprises the bladder, urethra, ureters, and kidneys. The majority of infections affect the lower urinary system's bladder and urethra. This study presents a scientometric analysis of authorship patterns in Urinary Tract Infection (UTI) and Diabetes. The study focuses on Lotka's law to understand the productivity and impact of authors in the field. For this study, 1149 documents were retrieved from the Web of Science database from 2009 to 2023. The USA leads in publications on UTIs and diabetes among all countries. Among all authors, Kuku K has been the most productive author. K-S test reveals that the current data set does not support Lotka's law's applicability to research on urinary tract infections and diabetes. The findings of the study suggest that there is a need for more research to be done to improve the understanding of the relationship between UTI and Diabetes.

KEYWORDS: Urinary Tract Infection, Diabetes Mellitus, Lotka's Law, Authorship pattern, Scientometric, Author productivity, Diabetes.

INTRODUCTION

A urinary tract infection (UTI) is an infection in any part of the urinary system. The urinary system includes the kidneys, ureters, bladder, and urethra. Most infections affect the lower urinary tract – the bladder and urethra. Women have a higher risk of developing a urinary tract infection than men. If an infection is limited to the bladder, it can be painful and annoying. However, if a urinary tract infection spreads to the kidneys, it can cause serious health problems. (*Urinary Tract Infection (UTI) - Symptoms and Causes - Mayo Clinic*, n.d.). Type 2 diabetes mellitus is a heterogeneous group of disorders characterized by variable degrees of insulin resistance, impaired insulin secretion, and increased glucose production. Patients with type 2 diabetes mellitus are at increased risk of infections, with the urinary tract being the most frequent infection site. The increased risk of UTI among diabetic patients, coupled with the increase in the incidence of type 2 diabetes mellitus worldwide in recent years, may impose a substantial burden on medical costs. (Nitzan et al., 2015). Due to several circumstances, the likelihood of



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Effect of Air Pollution on Respiratory System: A Scientometric Analysis

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Abstract

Air pollution is a significant health risk factor are all over the worlds. Air pollution has a very bad effect on the respiratory system. The term scientometrics originated as Russian term for the application of quantitative methods of the history of science, which studies the quantitative aspects of science. This applied study was done using scientometric techniques and software. The Data collection was performed on June 2, 2023 from the Web of Science (WoS) database. The search period was from 1991 to 2023. Data has been analyzed with the help of HistCite Software, chart & graphs have been made with the help of Microsoft Excel. In this study, the most productive authors, top journals, year wise distribution, and country-wise distribution of publication has been analyzed. The highest number of scientific output belongs to USA, China and UK followed by other countries which extensively had a lower rate of publication. Science of the Total Environment journal has been ranked first among the journals published the most articles i.e. 111 out of 2805 articles. The result shows that Bradford's law of scattering does not fit well when analyzing the collected data of research articles of air pollution on respiratory system.

Keywords: Scientometric analysis, Bradford Law, Air pollution, Respiratory system, Publication output.

1. Introduction

Air pollution is a significant health risk factor in Europe, and all over the world. A global study of diseases risk factors. Approximately 7 million people in the world and 400.000 people in the European Union (EU) experience early death due to air pollution.(Unver)

Air pollution is a complex mixture of different gaseous and particulate components and can cause several health effects. Both long and short term exposure to air pollution can cause cardiovascular diseases, respiratory diseases (e.g. asthma, chronic obstructive pulmonary disease) and mortality.(Bergstra et al.)

Four adverse effects of air pollution on respiratory system that is Asthma, COPD, lung cancer and respiratory infections all seem to be exacerbated due to exposure to a variety of environmental air pollutants with the greatest effects due to particulate matter (PM), ozone and nitrogen oxides, New publications reviewed reaffirm these findings.(Kurt Kar et al.)

Scientometrics

Since the development of scientometrics and bibliometric techniques they are proved to be the most dynamic tools to evaluate the productivity of universities, research institutes and individual researchers, as well as to map the growth of the research field. Scientometrics is a study of quantitative aspects of information in any form, not just records or bibliographies and

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Awareness and use of KrishiKosh (Institutional Repository of Indian National Agricultural Research System) by the Research Scholars of IGKV, Raipur: A Study

Dr. Santu Ram Kashyap Associate Professor, Pt. Ravishankar Shukla University, Raipur, Chhattisgarh Monika Tripathi Sharma Research Scholar, Pt. Ravishankar Shukla University, Raipur, Chattisgarh

Received on 02.11.2023, Accepted on 27.12.2023

ABSTRACT

The objective of this study is to investigate the level of awareness, utilization, and impact of the KrishiKosh Institutional Repository. It is an online repository established by the Indian Council of Agricultural Research (ICAR) to centralize agricultural research outputs and knowledge from ICAR institutes and affiliated organizations. The repository provides access to agricultural research literature and resources for researchers, academics, and professionals in the agricultural field. The study focused on research scholars from Indira Gandhi Krishi Vishwavidyalya, Raipur, and employed a questionnaire as the primary data collection tool. The results of the study revealed that a significant proportion (96.80%) of research scholars are aware of KrishiKosh, and the main source of their awareness is the university library and faculty/department. The majority of scholars reported using KrishiKosh for their research purposes. Additionally, the scholars expressed a need for more training programs and improved infrastructure to enhance their reading experience.

Key Words: KrishiKosh, User Awareness, Institutional Repository, Indian National Agricultural Research System, User Satisfaction, IGKV, ICAR.

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A Study on Use of Electronic Resources and Services by Users of Pt. Sundarlal Sharma Library, PRSU Raipur, Chhattisgarh

Santu Ram Kashyap^{1*}, Pramod Kumar²

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Abstract:

This paper aims to propagate the pivotal role of e-resources in the academic environment, particularly focusing on the postgraduate students of the Science stream of Pt. Ravishankar Shukla University, Raipur. A survey method was employed and a well-structured questionnaire was designed for collecting the data from respondents. This study focused to find out various aspects related to the use of e-resources by the target respondents i.e. awareness level, purpose of using e-resources, time spent by the respondents, etc. This study will enhance the infrastructure and basic requirement of e-resources in the library uplift the teaching and learning environment in the university and offer an insight to policy makers and librarians for better use of e-resources. as a result found that the Total 219 (100%) respondent's use internet for e- resources and other purposes. The highest 182 (83.11%) of respondents use email followed by 146 (66.67%) use e-books, e-journals 85 (38.81%), e-newspaper clippings 76 (34.70%), e-pg pathshala 64 (29.22%), e-magazines 37 (16.89%), e-thesis 26 (11.87%), e-shodhganga 21(9.59%), e-repository13(5.94%),e-database 12(5.48%), and lowest 03(1.37%)by used is eshodhsindhu. and The majority of the 163 (74.43%) respondents are satisfied with the use of eresources, 12 (5.48%) are dissatisfied, 19 (8.68%) are very satisfied and 25 (11.42%) respondents don't know the satisfaction level.

Keywords: Electronic Resources, Services, PG Students, Science, Pt. Sundar lal Sharma Library, PRSU Raipur.

Introduction

Developments in Information and Communication Technologies (ICT) have radically taken over every sphere of activity in university libraries. Academic libraries owe it a key duty to keep pace with technological advancement to cope with users' continual sophisticated information requirements. Academic libraries in the 21st century may not function properly without the existence of electronic resources. Over the years, technology has progressed significantly, leading to the development of new techniques and standards that manage and distribute content in various formats. As a result, librarians are increasingly embracing eresources in their collections to address users' e-resource needs. Information and Communication Technology (ICT) based computers and the internet have brought about significant changes in the operations of library institutions, necessitating adaptations in internal library processes and user services. Traditional libraries are transitioning into digital and virtual libraries due to advancements in technology and web development. Information technology has not only Educational Administration: Theory and Practice ^{2024, 30(5), 12681-12686} ISSN: 2148-2403 https://kuey.net/ Research Article



The study Assessed with Extent and Utilization of E-Resources at Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

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ABSTRACT
ABSTRACT The study unveils the diverse array of e-resources and services utilized by research scholars at Indira Gandhi Krishi Vishwavidyalaya, Raipur. Data collection employed a well-structured questionnaire, and descriptive inquiry was employed for analysis. Out of the 290 researchers surveyed, 247 responses were received. The study findings highlight that the most frequently accessed e- resources are e-books 137 (55.47%), e-journals 117 (47.37%), and e-magazines 91 (36.84%). Additionally, the study explores the challenges faced during the utilization of e-resources, with the highest reported issues being server downloads or system problems 77 (31.17%) and the least being poor connection
75 (30.36%). The results indicate that libraries play a crucial role in facilitating the effective use of e-resources.

Key Words: E-resources, e-books, e-Journals, IGKV, Raipur, Research Scholar, Library, Server.

INTRODUCTION

Every library is the heart of educational institutions and aids in fulfilling the objectives of educational institutions. The main purpose of libraries and information science is to provide satisfaction to the intellectual community around the world. Dr. Ranganathan, a pioneer in Indian library science, coined the term "Library Trinity" for books, users, and library staff. The evaluation of a library and its identification are based on the development and management of its resources; therefore, there is a significant emphasis on the collection, development, and management of resources in the library. Library experts have contributed to the

development and management of collections in libraries. As a result of the explosion of knowledge and the development of new technologies, library resources are transforming into electronic formats in the present time. With the rapid development of electronic publications, libraries are not only acquiring printed books and periodicals but also obtaining library resources in electronic form. In the 21st century, electronic resources have witnessed rapid development and resources come in various forms, including e-books, e-journals, e-research papers, e-databases, popularity. E-resources come in various forms, including e-books, e-manuscripts, e-newspapers, and CDs/DVDs, e-newsletters, e-conference proceedings, e-reports, e-manuscripts, e-newspapers, and Internet/websites, among others. The library is not just a repository of books but the center of knowledge.

INDIRA GANDHI KRISHI VISHWAVIDYALAYA, RAIPUR

Situated in the capital of Chhattisgarh, Raipur, Indira Gandhi Krishi Vishwavidyalaya is the sole Agricultural University in the state, entrusted with the responsibilities of agricultural education, research, and the extension of technologies. With a distinguished and extensive history of service to the tribal farming community in the region, the university has been a pivotal institution. Its primary objectives encompass providing education in agriculture and allied sciences, conducting research in these domains, implementing field extension programs, and enhancing the standard of living in rural areas. Recognized as a significant biodiversity repository globally, particularly for rice and lathyrus, the university plays a major role. Education is delivered through 28 constituent and 11 affiliated colleges within the faculties of agriculture and

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Utilization of E-Resources by Research Scholar of Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur: A Study

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Abstract

The presented research article is related to the use and awareness of e-resources by research scholars of Jawaharlal Nehru Agricultural University, Jabalpur. Main objective of the study is to find out the awareness and use of e-resources among the Research Scholars, to explore the purpose for which the research scholar uses the e-resources, to find out the frequency of usage of e-resources, assessing satisfaction with the use of e-resources among research scholars, to examine the various problems faced by the research scholar, and to give suggestions for improvement. The purpose of the study is based on primary data collected from Research Scholars of Jawaharlal Nehru Agricultural University, Jabalpur. The study found that users were aware of e-resources, e-journals being used the most by 79 (24.92%) users. Research scholars 84 (29.89%) are using e-resources the most for their research. 66 (18.54%) respondents are facing the problem of Poor connectivity (Low bandwidth) and also 45 (12.64%) are facing Server down or system problem. Researchers are saving time for their research by using e-resources 81 (24.55%).

Keywords: E-resources, JNKV, Research Scholar, e-books, e-Journals, database.

Introduction

The field of information and communication technology has progressed significantly, leading to revolutionary changes in all fields of knowledge. Libraries often referred to as storehouses of knowledge, have also kept pace with this development. With the explosion of information, users now have access to vast amounts of information, and the library plays a crucial role in preserving and serving their information needs. In the current context, libraries are the main facilitators in the scholarly communication system. In simple terms, libraries select, acquire process, store and retrieve information for current use, making them a place where books and other sources of information are available for teaching, research, and extension activities. The new generation of users prefers online resources as they want all the information at their fingertips. Electronic information resources have reduced the role of traditional libraries. Librarians must accept their

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Received: 25 Nov. 2023 ; Accepted: 9 Jan. 2024 ; Published: 12 January. 2024 Copyright to 2024 Author(s) retain the copyright of this article. This article is published under the terms of the Creative Commons Attribution License 4.0.

Research Productivity of the Journal of Ravishankar University (Part-A) from 2016-2023 Shrawan Yadav¹; Dr. Harish Kumar Sahu²

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ABSTRACT

The Purpose of the Study is to explore the Journal "Journal of Ravishankar University (Part-A)" and the relationship between measuring and analyzing Articles, Authorship, The subject of distribution, Growth Ratio, Relative Growth Rate etc. The paper analyzes a bibliometric study of 88 articles were published during the period 2016-2023 in the Journal of Ravishankar University (Part-A). The paper covers bibliometric analyses of the yearwise distribution of articles, subject-wise distribution of articles, authorship patterns, and Relative Growth Rate.

KEYWORDS: Bibliometrics, Authorship pattern, Growth Ratio, Journal of Ravishankar University (Part-A), Doubling time.

INTRODUCTION

Bibliometrics is a research method used in library and information science. It is a quantitative study of various aspects of the literature on a topic and is used to identify the pattern of publication, authorship, and secondary journal coverage to gain insight into the dynamics of the growth of knowledge in the areas under consideration. This can lead to better organization of information resources, which is essential for effective and efficient use. Bibliometrics has attained sophistication and complexity with a national, international, and interdisciplinary character. (Thanuskodi)

The terms Bibliometrics and Scientometrics were introduced simultaneously by Pritchard, Nalimov, and Mulchenko in 1969. Pritchard defined the term 'Bibliometrics' as the application of mathematical and statistical methods to books and other communication mediums'. "Nalimov and Mulchenko" defined 'Scientometrics' as 'the application of those quantitative methods which are dealing with the analysis of science viewed as an information process'. So, Scientometrics is the measurement of science communication, and Bibliometrics deals with more general information processes. Bibliometrics is a quantitative evaluation of publication patterns of all macro and micro

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अकादमिक लेखन में चैटजीपीटी का उपयोग (Use of ChatGPT in Academic Writing)

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गुन्थालय विज्ञान

[ग्रंथालय एवं शोध लेख लिखने के लिए चैटजीपीटी के उपयोग का वर्णन करता है। चैटजीपीटी एक भाषा आधारित मॉडल है, जिसका उपयोग शोधार्थी अपने शोध लेख, लेख लिखने और ग्रंथालयाध्यक्ष संदर्भ सेवाओं के लिए करते हैं। शोधार्थी द्वारा मुक्त कृत्रिम बुद्धिमता (Open Antificial Intelligence) उपकरण चैटजीपीटी का उपयोग कर अपनी शोध उत्पादकता की वृद्धि का वर्णन करता है।]

1. परिचय (Introduction)

चैटजीपीटी (ChatGPT) का पूरा नाम चैट जेनेरेटिव प्री-ट्रेन्ड ट्रांसफार्मर (Chat Generative Pre- trained Transformer) है। सन् 2020 में पहली बार मुक्त कृत्रिम बुद्धिमता (OpenAI) ने जीपीटी-3 मॉडल को लाया गया था, यह मॉडल गहन अध्ययन और ट्रांसफार्मर आर्किटेक्चर पर आधारित है। इस मॉडल में लगभग 175 अरब पैरामीटर हैं, जिनकी सहायता से मॉडल की माषा को समझने और समझाने में सहायता होती है। चैटजीपीटी एक बड़े स्तर पर डेटा से सीखने वाले (Data-driven) माषा मॉडल हैं। इसमें बड़ी संख्या में डेटा को प्रशिक्षित किया गया है जिससे वह वाक्यांशों को समझ सके और और उनका सार्थक उत्तर प्रदान कर सके। यह विभिन्न भाषाओं में अनुवाद करने, सारांश तैयार करने, प्रश्नों के उत्तर देने और अन्य भाषा से संबंधित कार्यों के लिए भी उपयुक्त है।

चैटजीपीटी के दो सबसे महत्वपूर्ण भाषा मॉडल वर्तमान में उपलब्ध है, पहला जीपीटी 3.5 और दूसरा जीपीटी-4। यह ज्ञान के कई क्षेत्रों में प्राकृतिक भाषा के पाठ को तैयार कर सकता है। अकादमिक लेखन, वैज्ञानिक लेखन और प्रकाशनों में चैटजीपीटी का उपयोग करना अन्य कृत्रिम बुद्धिमता (Artificial Intelligence) उपकरणों से अपेक्षाकृत और भी आसान है। वर्तमान में चैटजीपीटी का उपयोग शिक्षा के क्षेत्र में, स्वास्थ्य के क्षेत्र में, लेखन के क्षेत्र में व्यावसायिक क्षेत्र में, विज्ञान एवं तकनीकी क्षेत्र में किया जा रहा है।

2. जद्देश्य (Objectives)

चैटजीपीटी (ChatGPT) के निम्नलिखित उद्देश्य हैं :

 सार्थक उत्तर प्रदान करना : चैटजीपीटी (ChatGPT) का मुख्य कार्य वाक्यों को समझकर सार्थक उत्तर प्रस्तुत करना है, यह उपयोगकर्ताओं के विभिन्न प्रकार के प्रश्नों का उत्तर देने में सक्षम बनाता है।

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पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर के कला एवं सामाजिक विज्ञान के स्नातकोत्तर छात्रों द्वारा ई-संसाधनों का उपयोग (Use of e-resources by postgraduate students of Arts and Social Sciences of

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Pt. RaviShankar Shukla University, Raipur)

तोरन लाल खुटे डॉ. हरीश कुमार साहू

[ई-संसाधनों का अर्थ स्पष्ट करते हुए इनकी विशेषताओं का वर्णन करता है। पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर के कला एवं सामाजिक विज्ञान के स्नातकोत्तर छात्रों द्वारा ई सूचना संसाधनों उपयोग एवं लाभ का वर्णन करता है।]

प्रस्तावना (Introduction) . 1.

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समय के बदलते परिवेश में हमारे द्वारा उपयोग किये जाने वाले संसाधनों में अब मुद्रित संसाधनों का उपयोग कम होने लगा है तथा इसका स्थान ई-संसाधन ले रहे हैं। आधुनिक शैक्षणिक वातावरण में शिक्षण एवं शोध की प्रत्येक गतिविधि को ई-सूचना स्रोतों ने प्रभावित किया है। जिससे सूचना के स्थानांतरण एवं संचार प्रकिया में तेजी से परिवर्तन आया है। सूचना एवं संचार प्रौद्योगिकी के त्वरित विकासों ने सूचना स्त्रोतों की एक नई पीढ़ी को जन्म दिया है, जिसे हम ई-संसाधन कहते हैं। ई-संसाधन के द्वारा डिजिटल ग्रंथालयों, संस्थागत रिपोजेटरी, ई- लर्निंग एवं कनसोटिंया जैसी आधुनिक सेवाओं एवं गतिविधियों को बढ़ावा मिला है। आज के आधुनिक ग्रंथालय न केवल महत्त्वपूर्ण दौर से गुजर रहे हैं, बल्कि उनकी सेवाओं और तकनीकों में भी बदलाव आ चुका है। प्रस्तुत अध्ययन में ई-संसाधनों से तात्पर्य उन संसाधनों से है, जिनके द्वारा किसी भी विषयवस्तु की जानकारी क्षणों में प्राप्त की जा सकती है, जिसके अन्तर्गत ई-डेटाबेस, ई-जर्नल, ई-पुस्तकें, ई-थीसिस एवं ई-पत्रिकाएँ सम्मिलित हैं।

ई-संसाधन ऐसे स्त्रोत हैं, जिनमें सूचना इलेक्ट्रॉनिक माध्यम में पाई जाती है, इसमें सूचना प्राप्त करने के लिए इलेक्ट्रॉनिक संयंत्रों जैसे-कम्प्यूटर, लैपटॉप इत्यादि की आवश्यकता पड़ती है। इलेक्ट्रॉनिक संसाधन को ही ई-संसाधन के रूप में जाना जाता है । आज शिक्षा में भी अपनी पारंपरिक शिक्षा से ई-संसाधन की ओर स्थानांतरित होना पड़ रहा है। अतः अब ग्रथालयों द्वारा भी ई-डेटाबेस का उपयोग कर उपयोगकर्ताओं की मांग को पूरा किया जा रहा है।

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Research Productivity of Central University of Chhattisgarh and Madhya Pradesh

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Abstract

This paper analysis on the research output of two renowned Universities in India. A comparative Bibliometric study of the Guru Ghasidas University of Chhattisgarh and Hari Singh Gour the University of Madhya Pradesh. The GUN Ghasidas Vishwavidyalaya in the State of Chhattisgarh and Doctor Harisingh Gour Vishwavidyalaya in the State of Madhya Pradesh, established under the Madhya Pradesh Adhiniyam, 1973 under the university act 2009. Both Central Universities were analyzed with different parameters. This study attempted to analyze the publication trend and growth and pattern of published documents of Guru Ghasidas Vishwavidyalaya, Bilaspur, and Harisingh Gour Vishwavidyalaya, Sagar which were indexed in Web of Science by analyzing them with the help of bibliometric techniques from the period 1991-2022. The data shows that the total number of retrieved documents from Guru Ghasidas University was 1458 and data retrieved from Harisingh Gour University was 2805. This paper includes themes like relative growth rate, compound annual growth rate, degree of collaboration, and doubling time. This paper indicates that both universities work well in all the parameters. However, the result shows that the compound annual growth rate of Guru Ghasidas University is 19.33 and Harisingh Gour University is 3.04. Doubling time (Dt) shows that Guru Ghasidas University Maximum Dt was recorded in the year 2005 (11.60), and Harisingh Gour University Maximum Dt was recorded in the year 2022 (15.85).

Keywords: Research productivity, growth rate, doubling time, degree of collaboration and relative growth rate.

1. Introduction

Research productivity may often be considered a key role in achieving quality knowledge and disseminating knowledge worldwide. Research is a core part of every university it enables the generation of intellectual property, discoveries, and innovations with values. 'Bibliometric' and 'Scientometric' are two such words that are used simultaneously. The term 'Bibliometric' was first used by Alan Pritchard in 1969. Bibliometric means quantitative analysis of publication by application of mathematics and statistical methods. The term 'scientometric' was first used by Nalimov and Mulchenko in the same year of origin the term bibliometric 1969. Scientometric means quantitative analysis of science, technology, and innovation.

खाण्ड 54, ठांक 1, जनवरी - जून, 2023

उद्यान विज्ञान विषय पर कृषि वैज्ञानिकों की शोध उत्पादकता का अध्ययन : इंदिरा गांधी कृषि विश्वविद्यालय, रायपुर के विशेष संदर्भ में

(Study of Research Productivity of Agriculture Scientists on the subject of Horticulture with Special Reference to Indira Gandhi Krishi Vishwavidyalaya, Raipur)

श्रवण यादव

डॉ. हरीश कुमार साहू*

[उद्यान विज्ञान कृषि संकाय का आधार स्तम्भ है, इंदिरा गांधी कृषि विश्वविद्यालय, रायपुर में सन् 2004 से 2021 तक उद्यान विज्ञान विषय में कुल 67 शोध हुए हैं. जिसमें 44 पुरूष एवं 23 महिला शोधार्थी हैं। उद्यान विज्ञान में सबसे अधिक सन् 2021 में 15 शोध तथा डॉ. जितेन्द्र सिंह द्वारा सबसे अधिक 09 शोधार्थियों को शोध हेतु निर्देशित किया है। उद्यान विज्ञान में सर्वाधिक शोध आलू फ़सल का अध्ययन कर निष्कर्ष प्रस्तुत करता है।]

1. परिचय (Introduction)

उद्यान विज्ञान कृषि के महत्वपूर्ण विषयों में से एक है, जिसमें फल, फूल, सब्जियां, मसाले, कंद फसले, मशरूम, बांस, वृक्षारोपण फसलें और औषधीय एवं सुगंधित पौधे शामिल हैं। उद्यान विज्ञान शब्द आंग्ल मापा के शब्द Horticulture से मिलकर बना है। Horti शब्द लैटिन भाषा Hortus means garden तथा Culture शब्द Cultura means Cultivation से लिया गया है। उद्यान विज्ञान की प्रमुख शाखाएं फ़लोत्पादन विज्ञान, शाकोत्पादन विज्ञान, पुष्पोत्पादन विज्ञान व अलंकृत बागवानी एवं फल परीक्षण विज्ञान हैं। फल विज्ञान– इसमें फल उत्पादन के विभिन्न पहलुओं जैसे पौध प्रबंधन एवं नर्सरी प्रबंधन, उत्पादन तकनीक क्रियाओं, तुड़ाई एवं उसके उपरांत प्रवंधन एवं विकास के उपायों आदि के सैद्धांतिक एवं व्यावहारिक पहलुओं का अध्ययन करते हैं। शाकोत्पादन विज्ञान– इसके शाक–सब्जी के उत्पादन के सिद्धांत तथा तकनीकों का अध्ययन करते हैं। शाकोत्पादन विज्ञान– इसके शाक–सब्जी के उत्पादन के सिद्धांत तथा तकनीकों का अध्ययन करते हैं। विकनीकों का अध्ययन किया जाता है। फल परीक्षण विज्ञान – इसमें फसलों के उत्पादन की खाय होने से वयाने, उनके लम्बे समय तक उपलब्धता को सुनिश्चित करने तथा बिभिन्न प्रकार के खाद्य

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Review

Current perspective in research and industrial applications of microbial cellulases

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Abstract

The natural interactions between various bacteria, fungi, and other <u>cellulolytic</u> <u>microorganisms</u> destroy lignocellulosic polymers. The efficacy of this process is determined by the combined action of three main <u>enzymes</u>: <u>endoglucanases</u>, *exo*-glucanases, and βglucosidase. The enzyme attacks the polymeric structure's β-1,4-linkages during the <u>cellulose</u> breakdown reaction. This mechanism is crucial for the environment as it recycles cellulose in the biosphere. However, there are problems with enzymatic cellulose breakdown, including complex <u>cellulase</u> structure, insufficient degradation efficacy, high production costs, and post-translational alterations, many of which are closely related to certain unidentified <u>cellulase</u> properties. These issues impede the practical use of cellulases. A developing area of research is the application of this similar paradigm for industrial objectives. Cellulase enzyme exhibits greater promise in many critical industries, including biofuel manufacture, textile smoothing and finishing, paper and pulp manufacturing, and farming. However, the study on cellulolytic enzymes must move forward in various directions, including increasing the activity of cellulase as well as designing peptides to give





Article International e-Delphi Consensus Recommendations for the Assessment and Diagnosis of Circadian rest–Activity Rhythm Disorders (CARDs) in Patients with Cancer

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Simple Summary: Circadian rhythms are internal changes that happen roughly over a 24-h period. In patients with cancer, healthy circadian rhythms may become abnormal, and these changes have been linked to more symptoms, poorer quality of life, and shorter survival. Circadian rhythms can be observed in rest and during physical activity, and disorders of this rest–activity rhythm are common. There are many ways to research and report rest–activity rhythms, and currently, there are no formal criteria to diagnose the condition. This study aimed to provide recommendations on how to assess and diagnose the condition.

Abstract: Purpose: Circadian rest–Activity Rhythm Disorders (CARDs) are common in patients with cancer, particularly in advanced disease. CARDs are associated with increased symptom burden, poorer quality of life, and shorter survival. Research and reporting practices lack standardization, and formal diagnostic criteria do not exist. This electronic Delphi (e-Delphi) study aimed to formulate international recommendations for the assessment and diagnosis of CARDs in patients with cancer. Methods: An international e-Delphi was performed using an online platform (Welphi). Round 1 developed statements regarding circadian rest–activity rhythms, diagnostic criteria, and assessment techniques. Rounds 2 and 3 involved participants rating their level of agreement with the statements



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Article

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Intra- and interspecific interactions in the Indian urban ecosystem with special reference to street cattle as the pivot

Bhupendra Kumar Sahu^{1,2,3} · Atanu Kumar Pati^{2,3,4,5} · Arti Parganiha^{2,3}

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Abstract

In the urban landscape of developing countries like India, three species, i.e., humans, cattle, and dogs coexist and interact regularly. In the current study, we evaluated the intra- and interspecific interactions with special reference to street cattle in an urban area. We conducted the study at ten different locations in Raipur City and observed different types of possible interactions. We found licking and butting as the most frequent positive and negative intraspecific interactions, respectively among individuals of the street cattle population. The frequency of neutral interaction among the three species is statistically significantly higher than either positive or negative interactions. The positive interactions, the negative interaction was greater than the negative interaction. But, in the case of cattle-human interaction was noticed in the licking, playing, mounting, pushing, and butting behavior under the intraspecific interaction of dog towards cattle, and neutral interactions between cattle-dog and cattle-human also exhibited time-of-day variability. In conclusion, all three species coexist in the urban landscape with a markedly higher frequency of neutral interaction followed by negative interactions among them. For the welfare of all three species minimization of dumping of open garbage is recommended as one of the key strategies to overcome the cattle and dogs menace on the urban streets of India and elsewhere.

Keywords Street cattle \cdot Dog \cdot Human \cdot Interaction \cdot Urban landscape

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Introduction

In Indian cities, two species of animals, i.e., cattle (Bos species) and dog (Canis species) coexist with the human (Homo species) population. The 20th Livestock Census (2019) revealed about 198.48 million cattle (cows, bulls, and calves) in India. Approximately 32.62% of the global population of livestock is present in India. This makes India a leading country for cattle populations, followed by Brazil and China (Cook 2023a). Cattle are one of the most important resources and it has been playing a very essential role in human society since their domestication. Cattle are the major source of food security and revenue for developing and developed countries too (Coleman 2002; McDaniel et al. 2014). Cattle represent the most valuable property and provide meat, dairy products, clothing, animal traction, etc. In India, cattle are significant not only from an economic point of view but also from a socio-cultural perspective and they are worshiped as "mothers."



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ORIGINAL ARTICLE

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Effects of high and low temperatures on the rhythmic patterns in pit-building behavior of antlion larvae

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ABSTRACT

Temperature influences the survival, growth, and development of insects including the antlion. In the present study, we examined the 24-h rhythm in the pit-building behavior of the antlion larvae at three different temperature conditions, high (37°C), low (17°C), and room temperature (Control: $25.9 \pm 0.2^{\circ}$ C). We recorded pit-building activities by monitoring two variables: the Time Lag for the Initiation of Pit Reconstruction (TLIPR) after the demolition of the pit, and the Total Time for Pit Construction (TTPC). We monitored TLIPR and TTPC at four different time points with equidistant intervals (i.e. 08:00-10:00 h, 14:00-16:00 h, 20:00-22:00 h, and 02:00-04:00 h) each day over three consecutive days. We employed single Cosinor rhythmometry to evaluate the characteristics of 24-h rhythm in TLIPR and TTPC. We used one-way ANOVA to find out the effects of the temperature on TLIPR and TTPC. We detected a statistically significant 24-h rhythm in TLIPR at the group level, irrespective of the temperature conditions. 24-h rhythm in TTPC was abolished at high and low temperatures. Temperature significantly affected TLIPR and TTPC in general. It also significantly affected the mesor of the rhythms in both variables as well as the amplitude of TTPC. Finally, we noted that although high and low temperatures affected the pitbuilding behavior in general, the thermal conditions did not lead to a complete cessation of pitbuilding activities. The 24-h rhythmic pattern associated with TTPC is more susceptible to the effects of thermal regimes (17°C or 37°C) unlike that associated with TLIPR.

Introduction

Organisms modulate their behavioral and physiological responses to changes in the environment. Temperature is an abiotic element that has a significant impact on the cellular, physiological, and behavioral functions of organisms (Arnett and Gotelli 1999). The effects of temperature are more conspicuous among ectotherms, and the effects are manifested at all levels of biological organization. Temperature affects the survival, development, and day-to-day behavioral activities of insects (Klokocovnik et al. 2016), including growth, diapause, metamorphosis, and body size of antlions (Arnett and Gotelli 1999; Miler et al. 2020).

Most species of antlion, including *M. tenuipennis*, are sit-and-wait predators known to construct cone-shaped sand traps to catch tiny invertebrates (Jingu and Hayashi 2018). It has been reported that in the antlion, behaviors, namely predation, feeding, sand tossing frequency during pit building, and pit size increase at higher temperatures (Klokocovnik et al. 2016). Antlion larvae are highly active in pit construction at higher

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Antlion larvae; pit-building behavior; 24-hour rhythm; temperature; time lag for initiation of pit reconstruction; total time for pit construction

temperatures as compared to lower temperatures (Arnett and Gotelli 2001; Marsh 1987).

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species of antlion larvae, such Manv as M. immaculatus, M. hyalinus, and E. nostras prefer shaded microhabitat (Arnett and Gotelli 2001; Green 1955; Haub 1942; Heinrich and Heinrich 1984; Klein 1982; Klokocovnik et al. 2016; Rotkopf et al. 2012). About 90% of the species avoid open sand surfaces and prefer shady areas to build their pits (Gepp and Hölzel 1989). These species, namely M. immaculatus, M. hyalinus, and E. nostras may have lower thermal tolerance capabilities than those species that build their pits in sun-exposed open areas (Antol et al. 2018). These species are specialists concerning thermal tolerance capability. It has been demonstrated that larvae escape from high temperatures by exhibiting a variety of behavioral responses, such as migration to the underground or the cooler part of their habitats (Heinrich and Heinrich 1984; Marsh 1987). Alcalay et al. (2014) reported that antlion species relocate to comfortable habitats to avoid harsh temperature conditions.

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ABSTRACT

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Cognitive correlates of circadian rhythm and sleep-wake behaviour in chronic obstructive pulmonary disease patients

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ABSTRACT

Chronic obstructive pulmonary disease (COPD) patients often experience reduced physical activity, sleep disturbances, and cognitive impairment. However, reports on measurement of rest-activity rhythm and sleep-wake behavior and their impact on cognitive functions in COPD patients are limited. This study aimed to objectively measure circadian rhythms (rest-activity and ambient illuminance) and sleep behaviors in clinically stable COPD patients and their relationship with cognitive functions. The study involved 65 male COPD patients and 50 age-matched controls, monitored over 3-7 days using actigraphy. Cognitive status was assessed using the Montreal Cognitive Assessment (MoCA) followed by short interbal time estimation via time production and reproduction with reaction time measurement using TimeProd software. Findings indicated significant disruptions in circadian rhythms in COPD patients, characterized by lower mesor, amplitude, and autocorrelation coefficients compared to controls. Patients also reported poorer sleep quality and higher sleep fragmentation, with 85.7% displaying cognitive impairment. Notably, longer time estimations, increased variability in task performance, and slower reaction times suggested cognitive deterioration. Positive correlations emerged between rhythm parameters (amplitude and circadian quotient) and cognitive performance metrics. This highlights the relevance of circadian and sleep disturbances in COPD, suggesting that addressing these rhythms could help mitigate cognitive decline, potentially through chronotherapeutic strategies.

ARTICLE HISTORY

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KEYWORDS

Circadian rhythm; restactivity; illuminance; sleep measures; actigraphy; chronic obstructive pulmonary disease; cognition

Introduction

Circadian rhythm, a periodic oscillation of around 24 h in biological processes, is ubiquitous and inherent phenomenon in living organisms. In humans, an array of processes including biochemical (e.g. melatonin, cortisol secretion), physiological (e.g. body temperature, blood pressure), and behavioral (e.g. rest-activity, sleepwake cycle) have been found to exhibit marked circadian variations. Circadian disruption in biological variables has been associated with poor health or disease conditions (Sinha et al. 2021). Sleep is indispensable in humans for sound health, better cognitive performance and physical, psychological, and emotional wellbeing. Sleep-wake pattern and rest-activity rhythm are considered to be the simplest way to evaluate circadian misalignment. In this context, actigraphy has been extensively used as a tool to approximate sleep and activity levels, with rest-activity rhythm as one of the circadian markers (Ancoli-Israel et al. 2003; Brito and Thosar 2023). However, dim light melatonin onset (DLMO) is regarded as a robust marker for assessing the human circadian phase (Lewy 1999).

Chronic obstructive pulmonary disease (COPD), a chronic and progressive lung disease, characterized by chronic bronchitis, emphysema, difficulty in breathing, air flow limitation with wheezing, is the third most dreaded disease in terms of mortality (World Health Organization 2023). Among other conditions, patients suffering from COPD also frequently report night-time symptoms with nocturnal sleep disturbances and poor sleep quality (Nunes et al. 2013; Spina et al. 2017). This puts them in the highly vulnerable group for circadian rhythm disturbances, as sleep disturbances are associated with circadian rhythm impairment with a risk of adverse health outcomes and chronic diseases (Brito and Thosar 2023). However, very few reports have demonstrated circadian rhythm deterioration in ambulatory COPD patients evaluated through rest-activity

CONTACT Ajoy Kumar Behera 🔯 drajoykbehera2@gmail.com 🗈 Department of Pulmonary Medicine, All India Institute of Medical Sciences (AIIMS), Raipur C.G. 492099, India B Supplemental data for this article can be accessed online at https://doi.org/10.1080/07420528.2024.2410242

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Annual rhythm in immune functions of blood leucocytes in an ophidian, *Natrix piscator*

Alka Singh, Ramesh Singh, Arti Parganiha & Manish Kumar Tripathi

Scientific Reports 14, Article number: 12157 (2024)

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Abstract

Annual variations in animal's physiological functions are an essential strategy to deal with seasonal challenges which also vary according to the time of year. Information regarding annual adaptations in the immune-competence to cope with seasonal stressors in reptiles is scarce. The present research plan was designed to analyze the presence of circannual immune rhythms in defense responses of the leucocytes in an ophidian, *Natrix piscator*. Peripheral blood leucocytes were obtained, counted, and superoxide anion production, neutrophil phagocytosis, and nitrite release were tested to assess the innate immune functions. Peripheral blood lymphocytes were separated by centrifugation (utilizing density gradient) and the cell proliferation was measured. The Cosinor rhythmometry disclosed the presence of significant annual rhythms in the number of leucocytes, superoxide anion production, nitric oxide production, and proliferation of stimulated lymphocytes. The authors found that respiratory burst activity and proliferative responses of lymphocytes were crucial immune responses that showed the annual rhythm. It was summarized that the immune function of the *N. piscator* is a labile



Time of the day variability in pit-building behavior of antlion larvae

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Abstract

Pit-building behavior in antlion larvae is a unique trait that ensures survival, growth, and metamorphosis. In the present study, we examined the 24-hour rhythm in the pit-building behavior of 16 antlion larvae collected from the PRSU campus, Raipur. We kept each larva individually in a plastic drinking cup in the laboratory. We observed the pit-building behavior of antlion larvae by monitoring two variables, i.e., the time lag for the initiation of pit reconstruction (TLIPR) and total time for pit construction (TTPC) after its demolition over three consecutive days, at four time points each day. We employed single Cosinor Rhythmometry to compute the characteristics of 24-hour rhythm in TLIPR and TTPC. We found a statistically significant 24-hour rhythm in both variables. We found the peaks of TLIPR between 14.32 h and 17.15 h, irrespective of days. Further, the factor 'time of the day' produced a statistically significant effect on the TLIPR and the maximum and minimum values were found at 14.00 h and 02.00 h, respectively. This implies that antlion larvae took time during the afternoon to initiate pit construction. This phenomenon was reversed during nighttime. TTPC exhibited a statistically significant 24-hour rhythm on day 3 and at the group level. We concluded that antlion larvae exhibit a 24-hour rhythm in pit-building behavior and are nocturnal as they initiate pit construction quickly at night.

Keywords: antlion larvae, pit-building behavior, 24-hour rhythm, time of the day, time lag for initiation of pit reconstruction, total time for pit construction



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Total Chlorophyll Determination in Leafy Vegetables Cultivated in Hydroponics and Soil

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ABSTRACT:

There are many factors that can be used to describe the growth outline of the plant. Qualitative and quantitative estimation of phyto-chemical composition of the plant's can directly reflects the growth pattern. These may also reflects the nutraceutical values of the plant for human consumption. Selected plant species are leafy vegetables and popular among the people of central India. Cultivation of selected plant's species is carried out in two different ways. Traditional method of plant cultivation includes soil based cultivation and other is hydroponic technique. In hydroponics, there is no need of soil, liquid media remains in direct contact with the seed and root of the plant. Hydroponically grown S. oleracea L (1.447 mg/g) was recorded with highest amount of chlorophyll, followed by M. arvensis (1.338 mg/g), C. sativum (1.162 mg/g), T. F. graceum L. (1.097 mg/g), C. olitorius L. (1.060 mg/g), A. viridis (0.917 mg/g) and C. arietinum (0.643 mg/g). On the other hand total chlorophyll content in soil cultivated plants was found highest in M. arvensis (1.206) followed by S. oleracea L. (1.085), C. sativum (1.046 mg/g), T. F. graceum L. (0.906), C olitorius L. (0.859 mg/g), C. arietinum (836 mg/g) and A.viridis (0.794). This study may reveal the compatibility and acceptance of hydroponics for plant cultivation. Chlorophyll content was consistently high in most of the experimental plants cultivated in hydroponic system as compared to soil cultivated plants.

Keyword: Phyto-chemical, neutraceutical, hydroponics, total chrolophyll, protein content, carbohydrate, recognize, suitable.

INTRODUCTION:

Plant is composed of various type of light capturing pigment like chrolophyll, carotenoid and much other type of pigments. Chlorophyll is an important fraction of photosynthetic machinery. Amount of chlorophyll directly represent the number of chloroplast in plant cell. Richness in chlorophyll molecules is responsible for capturing sunlight and conversion into sugar compound. Hence, optimum rate of production of sugar inside plant cell mainly depends upon amount chlorophyll molecule. If optimum sugar is produced and stored by plant then this will result imitate optimum growth of plant too. It means chlorophyll is an important tool which is directly associated with growth of the plant. Chlorophyll is found in



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Total Protein and Carbohydrate Determination in Leafy Vegetables Cultivated in Hydroponics and Soil

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(Corresponding author: Labya Prabhas*) (Received: 20 June 2023; Revised: 06 July 2023; Accepted: 29 July 2023; Published: 15 August 2023) (Published by Research Trend)

ABSTRACT: In this study we are aiming to analyze the effect of change in plant cultivation technique associated with plant growth. Not only morphologically many anatomical and estimation of many phytochemicals can be considered to analyze the effect of plant cultivation technique. Seven leafy vegetable plant species were selected i.e. *Amaranthus viridis, Trigonella foenum graceum* L., *Chorchorus olitorius* L., *Coriandrum sativum, Mentha arvensis, Cicer arietinum, Spinacia oleracea* L. for cultivating under hydroponic system and in soil. Estimation of amount of protein, carbohydrate and moisture content were aimed to determine the effect on growth of the plant in hydroponics and soil cultivation technique. Hydroponically cultivated leafy plants was found rich in protein except *C. olitorius* (3.6 mg/g) and *T.F. graceum* L. (3.7 mg/g) as compared to soil cultivated plant *C. olitorius* (4.9 mg/g) and *T.F. graceum* L. (4.4 mg/g). Similarly, carbohydrate content was also consistently high in hydroponically cultivated leafy plants except one species of *S. oleracea* L. (3.9 mg/g) and it was found as 4.11 mg/g in soil cultivated leafy plant. Somehow growth rate was high in hydroponics under optimum condition. Some important factors in lifecycle of the plant like flowering and fruiting are still to be achieved.

Keywords: Plant cultivation, phyto-chemicals, hydroponics, soil cultivation, protein, carbohydrate, moisture, optimum.

INTRODUCTION

Food is consumed by all living organism to obtain nutritional support, necessary for their growth and survival. A big part of food resources are obtained from the plant by the humans like many other higher animals. Plant consumes energy from sunlight and prepares food for own benefits. Plant uses their stored food material for maintaining their own health and metabolic activities including giving rise to fruits and flower. Food is stored by the plants in form of protein and carbohydrates are also used by other higher organisms called consumers like human beings and animals belong to category of herbivores and omnivores too. Now the important thing is that the neutraceutical value of the food. If food is rich in various type of nutrients and minerals. It will directly reflect to the good health of the organisms who is consuming it as a source of nutrition. Leafy vegetables are one of an important part of nutrition for the people who live in Asia, especially in south Asian country like India. Varieties of leafy vegetables are found and listed in edible resources

under Indian Territory. Some of them are cultivated by farmers and local cultivators. Some are also available seasonally and are of wild type. Some of the popular leafy vegetables in central India are Oxalis corniculata, Cordia myxa Roxb., Cicer arietinum, Cassia tora, Amaranthus viridis L., Chorchorus olitorius, Leucas cephalotes, Amaranthus gangaticus L., Amaranthus tricolor L., Trigonella foenum graceum L., Spinacea oleracea L., Spinacea glabra L., Basella rubra L., Brassica compestris L., Coriandrum savtivum, Mentha arvensis, Allium cepa, Merremia emarginata Burm f., Moringa pterygosperma Lam., Ipomoea batatas Lam., Ipomoea aquatic Frosk etc. These are only few examples as the climate and region of the Asiatic region changes, plant diversity also varies significantly (Chauhan et al., 2014; Dhandore and Chandrakar 2021; Misra and Misra 2014; Sharma and Pandit 2022). Almost all kind of leafy vegetables species are well

Annost an kind of fearly vegetables species are well known for their nutritional values obtained by analyzing various kinds of fibers, vitamins, minerals, protein content, carbohydrate, lipid, and total moisture (Kumar *et al.*, 2020). Hence, reason behind the



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What makes it Green for the Unified Payment Interface (UPI)? A Study

Udita Kujur

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Keywords: Udita Kujur , Sanskrity Joseph, S. K. Indurkar

ABSTRACT

A unified payment system has become the need of the hour in India. The inclination of the consumer after demonetization and government promotion of virtual payment systems to cater to the needs of the scarcity of real money supply in the markets has increased manifold. The global digital payment market is expected to grow at a compound annual growth rate of 19.2% from 2016 to 2022 by reaching 168.6 billion US dollars, based on the report issued by Allied Market Research (Allied Market Research, 2017). This demonstrates the increasing popularity and acceptance of digital payment methods worldwide. The National Payment Corporation of India serves as an umbrella Organisation responsible for functioning retail payment system and settlement systems within the country. The Unified Payment Interface (UPI), HOME / ARCHIVES / VOL 3 SPECIAL ISSUE / Articles

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An Empirical Study On Awareness Of Cyber Security In Digital Banking Among College Going Students (With Special Reference To Korba District Of Chhattisgarh)

Manharan Anant¹, Kalpana Kanwar², Dr. Sushil Kumar Indulkar³

¹Arristant Professor: Department of Commerce, Guet Naveen College, Jatga: Dist.-Korba, CG, ²Assistant Professor: Department of Continerve: Guet, E, V P, G College Korba, Dist. Korba, C.G. ⁴Assistant Professor: Department of Management, Pt. Ravishankur Shidda University Ralpur, Dist. Raipur, C.G.

Abstract

Now a day it become a commun practice of many people to use the internet through computer or multilefor any banking activities because we all use living in the age of information and communication technology era. For digital banking, many upper were used such as Google Pay. PhonePe, Paym, BHM, NEFT, UPI etc. The number of unline-hanking users are eising rapidle, exercising is every much dependent upon the cyber world which also increases the chance of cubarceine. The term cybercritte means when a person using internet to access information of others without his permission with an intention to have him or her. Cybercritte is related to ATM, DEBIT card and out banking. As compared to other soctor, banking sector is more facing problem relating to cyberatucks. Due to such an individual and organization, both should take all precautions to minimize cybercitacks. Due to such an individual and organization down cybercritte and cybersecurity. It endeavors to attent the anyreverse of college students in Korba districe, Cubattingark, regarding cybersecurity in the banking sector.

Keyword: Cyher Crhne, Cyber Attacks, Digital banking.

1. INTRODUCTION

Cybersecurity holds immense significance within the realm of Information Technology, with businesses and financial institutions alike prioritizing safeguarding their digital assets. In the contemporary landscape, where over 60% of commercial transactions in India occur online, the risk of cybercrime looms large. Recognizing this threat, governments worldwide have enacted stringent laws to combat fraudulent activities and protect sensitive information. In the sphere of banking and financial transactions, technological advancements and robust infrastructure are pivotal for national development, especially among emerging economies. The internet has emerged as a symbol of progress, revolutionizing traditional banking with its user-friendly interfaces and enhanced flexibility in payments and transactions. Through online and core banking systems, customers now enjoy unparalleled convenience, accessing information and making financial decisions with a mere click, eliminating the need for physical mobility.

However, this digital convenience also exposes users to potential cyber threats if they remain unaware of security protocols and legal protections offered by financial institutions. Recognizing this vulnerability, banks and financial service providers have fortified their defenses with multi-layered security measures, aiming to shield customers from cyber-attacks. Moreover, extensive awareness programs on cybersecurity and cybererimes have been initiated to empower users with the knowledge necessary to navigate the digital landscape safely. In essence, the evolution of Information Technology has brought unprecedented convenience and accessibility to financial services, yet it has also necessitated a heightened focus on cybersecurity to mitigate risks and ensure the integrity of digital transactions. Volume 2, Issue 3, December – 2023 PP 77-87 International Journal of Futuristic Innovation in Arts, Humanities and Management (IJFIAHM)

"Transparency and Accountability in Global Supply Chains: Mitigating Ethical Risks for Multinational Corporations"

Jyoti Temre¹, Dr. S.K Indurkar², Dr. <u>Sanskrity</u> Joseph³, Dr. Gazala Yasmin Ashraf⁴ 1 PhD Research Scholar, Amity Business School, Amity University Raipur (C.G.), India

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ABSTRACT: Business knows no boundaries. The significance of competitive advantage and economics of scale has led to the development of transnational organisations. Expansion of markets, sourcing of cheaper inputs and attaining collusive markets has become an important competency in oligopoly markets. The business conglomerate are emphasising on the conceptof industry 4.0. Tjahjono (2017) highlighted that the concept of Industry 4.0 was coined to emphasise the fourth industrial revolution. The fourth industrial revolution emphasised on automation, internet of things (IOT) and use of high smart machines to increase productivity and efficiency across value chain. The productivity and efficiency in value chain will be enhanced by increasing the value of all the steps related with manufacturing of a product or service to its ultimate delivery to end consumer for consumption. The present paper is an attempt to understand the transparency and accountability required in global supply chains of transnational corporations. It explores the ethical risks associated with supply chain operations, highlighting the potential repercussions of negligence. The study proposes practical strategies and best practices for enhancing transparency, including supplier vetting, responsible sourcing, and stakeholder engagement. It also stresses the role of regulations and international cooperation. By integrating ethics into their supply chain management, multinational corporations can foster sustainability and competitiveness in an increasingly scrutinizing global marketplace.

Key Words: Industry 4.0, Supply Chain, Stakeholder Engagement

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GREEN RECRUITMENT PRACTICES: A STUDY OF SELECTED BANKS

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Sanskrity Joseph , Assistant Professor, Institute of Management, Pt. Ravishankar Shukla University, Raipur (C.G.).

Susheel Kumar Indurkar, Assistant Professor, Institute of Management, Pt. Ravishankar Shukla University, Raipur (C.G.),

Abstract:

In the present era, Sustainability has become the core of almost all corporate practices. Corporate houses across the world are taking conscious steps to halance the pyramid of "People, Profit, and Planet" for a balanced development for the future. Their efforts are visible in almost all functional departments. Researchers have conducted studies to highlight the company's effort in implementing sustainable environmental practices like green HRM to mitigate the effects of environmental degradation. Aruljah, Opatha&Nawaratne (2015) point out that Green HRM practices are powerful tools for making organizations and their operations green. The present paper focuses on green recruitment practices of selected banks to understand the extent to which theoretical understanding of a concept has been practically implemented by policymakers. John Sullivan (2007) opined that "Green Recruitment is an innovative idea through which companies leverage their environmental stance, using it as an important strategy for recruitment". In the above backdrop, the researcher has set the following research objectives:

- (i) Identify Green recruitment practices of selected banks
- (ii) Study the impact of green job analysis, job description, and job specification on attracting talent.
- (iii)Study the impact of green branding on developing attraction

Keywords: Sustainability, Green Recruitment, Green Branding, Attraction

Introduction

Environmental Sustainability:

Sustainability is the need of the hour. Even corporate houses are taking conscious efforts to engage in sustainable practices for a better and brighter future. Wilkinson et. al (2001) opined that the sustainability practices of corporate houses focus on their ability to design sustainable operations management practices and create manpower that can support and perform sustainable policies and practices. Scoones (2007) highlighted that policymakers are evaluating and understanding the visible effects of climate change, increasing the importance of biodiversity and the spread of epidemics due to environmental degradation, and taking conscious efforts to develop sustainable practices. The translation of the concept of sustainability is organization-specific and it depends upon its governance structures, business models, reporting practices, and human resources.

Human resources undertake a pivotal role in creating sustainability. The corporate can design policies and practices but the implementation and success depend upon the behavior and attitude of its employees. The concept of sustainability focuses on the pyramid of people, profit, and the planet. The efficiency of processes and the generation of profit are hugely dependent on human resources. Therefore it is essential to have conscious employees who can understand and implement sustainable practices designed by the organization. Thus, sustainability can be better attained by organizations by creating manpower that has a strong environmental orientation. Environmental orientation is a reflection of environmental awareness and environmental consciousness. Organizations related to world are defining and redefining their job analysis, job description, and job specifications related to

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GREEN RECRUITMENT PRACTICES: A STUDY OF SELECTED BANKS

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Environmental Impact Assessment of Agricultural Practices and Biological Scaling Using Fuzzy Logic and Mathematical Modeling

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Abstract

Environmental impact assessment is the need of the hour as it plays a pivotal role in promoting environmental sustainability and biological balance. This study demands a robust modelling framework to address diverse factors associated with agricultural activities and their complex relation patterns influencing sustainable development. This research work applies the Fuzzy Cognitive Mapping approach to make intensive studies on the factors subjected to the domains of agriculture, biological scaling, and environmental sustainability. Fuzzy logic and the cognitive mapping technique are competent in handling both the uncertainty and non-linearity in interrelation impacts between the factors of the study. The model developed in this work considers critical environmental factors derived from various input data sources. The modelling results demonstrate the efficacy of Fuzzy Cognitive Mapping in making environmental impact assessments of agricultural practices considering the factors of biological scaling. The insights from this research will facilitate agriculturalists and policymakers to enhance agricultural productivity by mitigating the environmental impacts and paving the way for sustainable development.

Keywords: Fuzzy Cognitive Maps (FCM), Environmental Impact Assessment (EIA), Sustainable Development, Agriculture.

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Strong convergence algorithm for proximal split feasibility problem

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Abstract

The purpose of this paper is to propose an algorithm for solving the proximal split feasibility problems and fixed point problems in Hilbert spaces. The algorithm is motivated by the inertial method and the split proximal algorithm with a self-adaptive stepsize such that their implementation does not need any prior information about the operator norm. We also apply

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Registered:

- Kumar, Ajay
- Thaku<u>r, Balwant Singh</u>
- Postolache, Mihai

Abstract

In this paper, we study the split common fixed point problem for two nonlinear mappings in p-uniformly convex and uniformly smooth Banach spaces. We propose an algorithm which uses dynamic stepsize, it allows to be easily implemented without prior information about operator norm. We further apply our result to solve the split variational inclusion problem, equilibrium problem and convexly constrained linear inverse problem. Moreover, we provide numerical examples to verify efficiency of our algorithm.

Suggested Citation

Kumar, Ajay & Thakur, Balwant Singh & Postolache, Mihai, 2024. "<u>Dynamic stepsize iteration process for solving split common</u> <u>fixed point problems with applications</u>," <u>Mathematics and Computers in Simulation (MATCOM</u>), Elsevier, vol. 218(C), pages 498-511.

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Some fixed point results in metric spaces equipped with a Graph and their applications

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Reny George Prince Sattam bin Abdulaziz University Ekta Tamrakar Saud Al Haqbani

Ajay Kumar

Hemant Pathak

Abstract

In this paper, we define the notion of \$(F-H)_G\$- contraction and utilize the same to obtain fixed point results in the setting of metric spaces equipped with a graph. Our results generalizes many known fixed point results in literature. As an application, we investigate the existence and uniqueness of a solution of integral equation. Finally, some suitable examples are given to validate our claim.

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Approximation of common best proximity points for proximally mean nonexpansive mappings in Banach spaces

Original Research Paper Published: 04 April 2024

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Abstract

In this paper, we considered Thakur et al. (J Inequal Appl 2014(328):15, 2014. https://doi.org/10.1186/1029-242X-2014-328) iterative process associated with three different mappings in the setting of Banach space. Using this iteration process, we approximate the common best proximity point for three different mappings that are together pairs of proximally mean nonexpansive mappings. We support our main result by a

SYNTHESIS, CHARACTERIZATION AND ANTI-PROLIFERATIVE EVALUATION OF ISOINDOLINE-1,3-DIONE DERIVATIVES

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Acknowledgements

The authors are thankful to Pt. Ravishankar Shukla University, Raipur and Santosh Rungta Group of Institution for their continuous support.

ABSTRACT: In the present study, some potential anti-proliferative compounds: isoindoline-1,3dione derivatives A1-A11 have been synthesized from various Schiff bases (aromatic amines) 1-11. The newly synthesized compounds were optimized by Thin layer chromatography and various physical parameters were as their structural assignments were based on elemental (C, H, N) and Spectral (IR, 1H-NMR, Mass) analysis. Then, these compounds were screened for the antiproliferative activity against various bacterial and fungal strains. The result of anti-proliferative screening has shown that iso-indoline-1,3-dione derivatives (A1-A11) possessed prominent antiproliferative profile. The compound A10 and A11 possessed mild against MDA-MB-231 (Human Breast Cancer Cell) and A11 and A1 showed antiproliferative activity against MCF-7 (Human Breast Cancer Cell) as compared to the other synthesized compounds showed most efficient and potent anti-proliferative activity with reference to the standard drug, Adriamycin (Doxorubicin). **KEYWORDS:** Anti-proliferative activity, isoindoline-1,3-dione, SRB assay, MCF-7, MDA-MB-468, Phthalimide, etc.

Introduction

The advent of multidrug resistance in different infections has increased the urgent necessity for novel medicines. Anti-cancer medications face a significant challenge in combating pathogen resistance, which calls for ongoing research to investigate new types of anti-proliferative agents.[1] Literature survey also reveals that isoindoline-1,3-dione and its derivatives were synthesized as anti-convulsant,[2] anti-inflammatory,[3] anti-microbial,[4] anti-tuberculosis,[5] anti-viral,[6] anti-proliferative,[7] anti-glycemia,[8] anti-HIV [9] etc. It has also been observed that the derivative of Schiff base [10-17] have been found to exhibit promising anti-proliferative activity. In view of these observations, it was thought worthwhile that to synthesize the newer derivatives

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Review Crit Rev Ther Drug Carrier Syst. 2024;41(4):87-102. doi: 10.1615/CritRevTherDrugCarrierSyst.2023044719.

Targeting Pathways and Integrated Approaches to Treat Rheumatoid Arthritis

Shradha Devi Dwivedi ¹, Krishna Yadav ², Anita Bhoi ³, Keshav Kant Sahu ⁴, Neelam Sangwan ⁵, Deependra Singh ⁶, Manju Rawat Singh ⁷

Affiliations

PMID: 38305342 DOI: 10.1615/CritRevTherDrugCarrierSyst.2023044719

Abstract

Rheumatoid arthritis (RA) is a chronic symmetrical systemic disorder that not only affects joints but also other organs such as heart, lungs, kidney, and liver. Approximately there is 0.5%-1% of the total population affected by RA. RA pathogenesis still remains unclear due to which its appropriate treatment is a challenge. Further, multitudes of factors have been reported to affect its progression i.e. genetic factor, environmental factor, immune factor, and oxidative factor. Therapeutic approaches available for the treatment of RA include NSAIDs, DMARDs, enzymatic, hormonal, and gene therapies. But most of them provide the symptomatic relief without treating the core of the disease. This makes it obligatory to explore and reach the molecular targets for cure and long-term relief from RA. Herein, we attempt to provide extensive overlay of the new targets for RA treatment such as signaling pathways, proteins, and receptors affecting the progression of the disease and its severity. Precise modification in these targets such as suppressing the notch signaling pathway, SIRT 3 protein, Sphingosine-1-phosphate receptor and stimulating the neuronal signals particularly efferent vagus nerve and SIRT 1 protein may offer long term relief and potentially diminish the chronicity. To target or alter the novel molecules and signaling pathway a specific delivery system is required such as liposome, nanoparticles and micelles and many more. Present review paper discusses in detail about novel targets and delivery systems for treating RA.

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"Development and Validation of HPTLC Method for the Determination of Clopidogrel bisulphate in Pharmaceutical Dosage Form and Simulated Biofluids"

Aakanksha Sinha

Sanjay J. Daharwal2

DOI: <u>https://doi.org/10.70135/seejph.vi.3243</u>

Abstract

A simple, rapid, and sensitive high performance thin layer chromatographic method has been developed for the quantification of clopidogrel in simulated biofluids and pharmaceutical dosage form and validated according to standard guidelines. The separation of clopidogrel bisulphate was achieved using aluminiumbacked layer of silica gel 60 F254. The toluene: acetonitrile: methanol: acetone (5.5:3:1:0.5 v/v/v/v) as the mobile phase used. Densitometric analysis was carried out in the absorbance mode at 230 nm. The system was found to give compact spots for clopidogrel bisulphate (Rf value of 0.81). Sample preparation of drug from simulated biofluids was carried out with 0.45 μ m nylon syringe filter. The limit of detection was 7.36 ng/band and limit of quantification was 22.89 ng/band. The linear regression analysis data for the calibration plots showed good linear relationship with r 2 = 0.9996 in the concentration range 25-250 ng per spot for both standard solutions and spiked simulated biofluids. The intra-day and inter-days precision (RSDs) was less than 2 % and the accuracy was more than 99%. The method could be applied for the estimation of clopidogrel bisulphate in simulated biofluids as well as to pharmaceutical dosage forms. Abbreviations – Clopidogrel bisulphate (CLB), Simulated biofluids (SBFs)

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How to Cite

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ABSTRACT:

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The medicinal potential of phytoconstituents obtained from plants is widely reconsidered as the best nanotechnology in delivery systems for drugs. Optimal absorption and utilization of nutraceuticals and herbal medications can be enhanced by the process of Phyto physophilic as the perimeter of the process of Phyto physophilic and the process of Phyto physophilic physophilic and the process of Phyto physophilic physophi

Keywords:

Phyto-phospholipid complexation () Vesicles () Drug delivery system () Herbal drug ()
 Bioavailability () Therapeutic effects ()

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Chandrakar, Vyas, Kumar, Sahu and Jain (2024). Phyto-phospholipid Complex Vesicles:A Revolutionary Approach for Enhancing Bioavailability and Optimizing Therapeutic Potential Home (https://jchr.org/index.php/JCHR/index)

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Formulation and characterization of Liposomal Fluconazole Transdermal Patch

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Keywords:

metabolic degradation, liposomal formulation, antifungal medication, liposomal fluconazole transdermal patch

Amol Chandekar, Bindesh Thakkar, <mark>Amber Vyas,</mark> Vishal Jain, Mohan Kale, Kshitij Thorat, Shweta Shelke, Saniya Nachan, Gautami Telang, Atul Tripathi

Abstract

Introduction

Fluconazole, a prominent triazole antifungal medication, is utilized to manage a broad range of Candida infections. It has been approved by the FDA for various systemic and superficial fungal conditions, including vaginal, oropharyngeal, and esophageal candidiasis. The effectiveness of fluconazole can be significantly improved through innovative drug delivery systems.

Objectives

The main objective of this study is to develop and characterize a liposomal fluconazole transdermal patch aimed at enhancing drug delivery. This involves improving systemic absorption, reducing gastrointestinal side effects, and preventing metabolic degradation.

Methods

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Formulation and characterization of Liposomal Fluconazole Transdermal Patch

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Methods

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Regulatory Frameworks for Integrated Medicine Management in USA, Europe, Japan, and China

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Formulation and Development of Novel Sulfasalazine Bilayer Tablets for The Treatment of Arthritis Associated With IBD: *In-vitro* and *In-vivo* Investigations

<mark>Shailendra Jadiya</mark> A[°] ⊠ · Neeraj Upmanyu A^{°a,b} ⊠ · <u>Arulmozhi Sathiyanarayanan</u> ^c · Vishal Jain ^d · Rupal Dubey ^a · Puja Buwade ^a

Affiliations & Notes 🗸 🛛 Article Info 🗸

Abstract

Sulfasalazine needs frequent daily dosing and the administration of numerous tablets per day pose challenges to patient compliance, contributing to increased adverse effects and difficulties in disease control. These inconveniences result in less effective treatment for arthritis associated with inflammatory bowel disease *i.e.* ulcerative colitis etc. To improve drug bioavailability, a delayed-release mechanism that releases the drug at the colon is necessary. To develop and optimize colon-targeted controlled release bilayer tablets coated with pH-dependent polymers. The bilayer tablets containing the immediate release part and sustained release part were developed. The tablets were coated with enteric-coated with Eudragit® S-100 and L-100 to achieve release in the colon. Granule properties and tablets were evaluated. The physicochemical parameters of the tablets were evaluated including, stability study, and drug release in 0.1 N HCl (pH 1.2), pH 6.8 phosphate buffer, pH 7.4 phosphate buffer for 2, 1, and up to 24 h respectively. Radiographic imaging and *in vivo* pharmacokinetic studies were also done in Rabbits. The bilayer tablets containing immediate and sustained release were successfully developed for the colon targeting. The granule properties were found within the acceptable range indicating good flow properties. The physicochemical properties of the tablets were also found acceptable. The tablets did not

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nanoparticles using Box-Behnken design for better diabetic wound healing

Harish Bhardwaj ^a · Ram Kumar Sahu ^b · Rajendra Kumar Jangde 🙁 ^a 🖾

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Abstract

A diabetic wound is one of the most devastating difficulties associated with diabetes and leads to significant death and morbidity. Hence, the aim was to make Doxycycline-loaded chitosan nanoparticles (DOX-CNPs) using ionic gelation with a cross-linking technique. In the Box-Behnken design, the DOX-CNPs were optimized by considering the effects of the following 3 variables independently, namely chitosan, sodium tripolyphosphate in volume ratio, strength of chitosan and sodium tripolyphosphate, among several response variables related to nanoparticle properties. The Fourier transform infrared, transmission electron microscopy, differential scanning calorimeter, X-ray diffraction, particle size, entrapment efficiency, and drug release in-*vitro* were used to characterized the nanoparticles. Additionally, DPPH scavenging activity and activity against *Escherichia coli* and *Staphylococcus aureus* bacteria and in *vivo* characterization were carried out to optimize DOX-CNPs. Then effective delivery of DOX-CNPs is incorporated in chitosan hydrogel for diabetic wounds. The findings of this study indicate that DOX-CNPs exhibit free radical scavenging properties, demonstrate significant antibacterial activity, and enhance cell viability and migration in an in *vitro* wound healing assay using the L929 fibroblast cell line, and in *vivo* demonstrate increased blood vessels, collagen deposition epithelization. Chitosan could

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Recent Progress in Nanoemulsion Technology for the Management of Hepatic Diseases

In Press, (this is not the final "Version of Record"). Available online 03 October, 2024

Author(s): Soniya Sarthi, Harish Bhardwaj and Rajendra Kumar Jangde*

Published on: 03 October, 2024 DOI: <u>10.2174/0124681873323497240922153222</u>

Price: \$95



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Abstract

Liver diseases pose a significant global health concern, particularly prevalent in developing nations, often induced by chemical exposure and high drug doses. Hepatic toxicity not only affects liver function but also extends to adjacent tissues, leading to diminished overall body function and necessitating effective treatment strategies. Despite modern medical advancements, stimulating liver function, protecting against damage, and promoting cell regeneration remain challenging tasks. Novel Drug Delivery Systems (NDDS), notably nanoemulsions, present promising avenues for addressing hepatic disorders. Nanoemulsions, characterized by biphasic dispersions of immiscible liquids stabilized by surfactants, possess unique drug-loading capabilities and viscoelastic properties that render them ideal candidates for liver-related conditions. However, their development, manufacturing, and manipulation for hepatic disorders are constrained by the partial applicability of conventional emulsion principles. This comprehensive review delves into various aspects of liver function, disease types, nanoemulsions, associated limitations and challenges, ongoing clinical trials, patents, and their inherent advantages. By shedding light on recent advancements in Nanoemulsion for hepatoprotective activity management, the review aims to illuminate the potential of tailored drug delivery systems in revolutionizing hepatic disease management. Exploring Nanoemulsion for hepatoprotective activity management signifies a crucial step toward offering targeted and efficient treatment modalities for liver diseases. Harnessing the unique capabilities of nanoemulsions could lead to significant improvements in patient outcomes and quality of life, thereby addressing the pressing global health concern posed by hepatic disorders.



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Journal of Clinical & Translational Endocrinology

Volume 37, September 2024, 100366

Advances in nucleic acid delivery strategies for diabetic wound therapy

Soniya Sarthi, Harish Bhardwaj, <mark>Rajendra Kumar Jangde</mark> 😤 🖾

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Abstract

In recent years, the prevalence of diabetic wounds has significantly increased, posing a substantial medical challenge due to their propensity for infection and delayed healing. These wounds not only increase mortality rates but also lead to amputations and severe mobility issues. To address this, advancements in bioactive molecules such as genes, growth factors, proteins, peptides, stem cells, and exosomes into targeted gene therapies have emerged as a preferred strategy among researchers. Additionally, the integration of photothermal therapy (PTT), nucleic acid, and gene therapy, along with 3D printing technology and the layer-by-layer (LBL) self-assembly approach, shows promise in diabetic wound treatment. Effective delivery of small interfering RNA (siRNA) relies on gene vectors. This review provides an in-depth exploration of the pathophysiological characteristics observed in diabetic wounds, encompassing diminished angiogenesis, heightened levels of reactive oxygen species, and impaired immune function. It further examines advancements in nucleic acid delivery, targeted gene therapy, advanced drug delivery systems, layer-by-layer (LBL) techniques, negative pressure wound therapy (NPWT), 3D printing, hyperbaric oxygen therapy, and ongoing clinical trials. Through the integration of recent research



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European Journal of Pharmaceutics and Biopharmaceutics

Volume 201, August 2024, 114371

Research paper

Development and characterization of ferulic acid-loaded chitosan nanoparticle embeddedhydrogel for diabetic wound delivery

<mark>Harish Bhardwaj, R</mark>ajendra Kumar Jangde Ӓ 🖾

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Abstract

Diabetic <u>wounds</u> present a significant global health challenge exacerbated by chronic hyperglycemia-induced oxidative stress, impeding the natural healing process. Despite various treatment strategies, diabetic foot ulceration lacks standardized therapy. <u>Ferulic acid</u> (FA), known for its potent <u>antidiabetic</u> and antioxidant properties, holds promise for diabetic wound management. However, oral administration of FA faces limitations due to rapid oxidation, stability issues, and low bioavailability. The topical application of FA-loaded chitosan <u>nanoparticles</u> (FA-CSNPs) has emerged as a promising approach to overcome these challenges. Here, we report the development of a sustained-release formulation of FA-CSNPs within a hydrogel matrix composed of Chitosan and gelatin. The FA-CSNPs were synthesized using the ionic <u>gelation</u> method andoptimized through a Central Composite Design (CCD) approach. Characterization of the optimized <u>nanoparticles</u> revealed spherical morphology, a particle size of 56.9±2.5nm, and an impressive entrapment efficiency of 90.3±2.4%. Subsequently, an FA-CSNPs-loaded hydrogel was formulated, incorporating

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Advanced Drug Delivery For Alzheimer's Disease Using Targeted Nanoparticles Across The Blood-Brain Barrier

<u>Uriti Sri Venkate</u>sh^{1*}, Y V Vandana², Sheik Jakir Hussain Mustaq³, Anand Kumar⁴, Varsha Burman⁵, Meesala Sudhakar⁶, Vaibhav T<u>ripathi⁷, Adeep Kujur⁸, V. Geet</u>ha⁹, Dsvgk Kaladhar¹⁰, Arpan Kumar Tripathi¹¹

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Abstract Recent discoveries in the field of medication delivery for Alzheimer's disease (AD) have focused on the use of customised nanoparticles as a means of breaking the blood-brain barrier (BBB) and boosting the efficacy of therapeutic interventions. This is because the BBB is a barrier that prevents blood from reaching the brain. The small size of nanoparticles, their capacity to modify their surfaces, and their biocompatibility make it possible for them to transport drugs to the brain in an accurate manner. Because of these characteristics, nanoparticles are a material that is both unique and useful. Through the implementation of this focused technique, the objective is to simultaneously increase the bioavailability of the medicine in the brain while simultaneously limiting the occurrence of systemic side effects. There are a number of different types of nanoparticles that have been investigated for their potential to deliver medications that target significant pathological aspects of Alzheimer's disease (AD), such as amyloid-beta plaques and neuroinflammation. These nanoparticles include magnetic nanoparticles, solid lipid nanoparticles, polymeric nanoparticles, and liposomes. Preclinical models of Alzheimer's disease (AD) have revealed promising findings, exhibiting improved drug delivery efficiency and therapeutic outcomes. These findings have been demonstrated by investigations. This study discusses the use of targeted nanoparticles as a sophisticated drug delivery system for the treatment of Alzheimer's disease. Additionally, the paper discusses the current developments, challenges, and potential future applications of this method.

 Keywords:
 Advanced Drug delivery, blood-brain barrier, Alzheimer's disease, targeted nanoparticles.

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 Uriti Sri Venkatesh et.al

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Abstract

The rise of antimicrobial resistance presents a critical challenge in modern healthcare, demanding the development of innovative therapeutic agents. Metal-based antibiotics, or metalloantibiotics, have gained attention due to their enhanced biological efficacy. Schiff base metal ion complexes, a subset of metalloantibiotics have demonstrated promising antibacterial, antifungal, antiviral, and anticancer properties. This study aims to synthesize and characterize novel Schiff base metal ion derivatives to contribute to the development of next-generation antimicrobial agents. Novel Schiff base metal ion derivatives were synthesized via the condensation of aldehydes and primary amines, followed by complexation with transition metal ions. The resulting metal complexes were characterized using Fourier-transform infrared (FTIR) spectroscopy, nuclear magnetic resonance (NMR) spectroscopy. FTIR was used to confirm the formation of the imine group (-CH=N) and metal-ligand coordination. NMR spectroscopy provided insights into the electronic environment of the protons and carbons within the complexes. FTIR spectra confirmed the successful formation of the Schiff base complexes, indicated by the presence of characteristic imine (-CH=N) peaks and metal-ligand interactions. NMR analysis revealed shifts in chemical signals consistent with metal coordination. Biological assays indicated that the synthesized metal ion derivatives exhibited enhanced antibacterial activity compared to the unmodified Schiff base ligands, with significant inhibition zones observed against common bacterial strains. In conclusion, this research provides valuable insights into the synthesis and characterization of Schiff base metal ion derivatives. The enhanced antimicrobial activity observed in the synthesized complexes supports their potential as next-generation agents to combat bacterial resistance, offering new possibilities for drug discovery and development in medicinal chemistry.

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Review Published: 28 June 2024

Volume 397, pages 8633–8649, (2024) Cite this article

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Abstract

The prevalence of Alzheimer's disease and other forms of dementia is increasing worldwide, and finding effective treatments for these conditions is a major public health challenge. Natural bioactive drugs have been identified as a promising source of potential treatments, due to their ability to target multiple pathways and their low toxicity. This paper reviews the https://link.springer.com/article/10.1007/s00210-024-03243-z

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Review Article Section: Pharmaceutical Sciences

Review Understanding of the many Facets of Cancer and the Management of Skin Cancer

Author(s): Arushi Saloki, Aditya Shrivastava, Sarita Gaikwad and Swarnlata Saraf*

Volume 3, 2025

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Pages: 18



Abstract

Cancer is a complex disorder characterized by the unregulated proliferation of cells that have the potential to invade other regions of the body. It stems from genetic alterations in various cell types, resulting in tumor formation. These growths are classified as benign (noncancerous) or malignant (cancerous). Unlike benign tumors, which typically remain localized, malignant tumors can spread, infiltrate nearby tissues, and establish

secondary growth in organs far from the original site. The treatment approach depends on the specific type and progression of cancer, encompassing options such as surgical intervention, radiation-based therapies, drug-based treatments, immune system-boosting techniques, and therapies targeting particular cellular mechanisms. Skin cancer is a common occurrence among various cancer types, especially in populations with lighter skin tones. Skin cancer is a prevalent form of cancer, particularly in the Caucasian population. The most common skin cancers are basal cell carcinoma (BCC), squamous cell carcinoma (SCC), and melanoma. BCCs, which arise from the basal layer of the epidermis, are often treated with surgery, topical therapies, or cryotherapy depending on their risk and location. Mohs micrographic surgery is effective for high-risk or recurrent BCCs, whereas topical treatments such as 5-fluorouracil and imiquimod are used for superficial BCCs. Early diagnosis through biopsy and various imaging techniques is crucial for effective management. Advances in treatment, including targeted therapies and improved surgical techniques, continue to enhance patient outcomes and reduce recurrence rates. Understanding these diverse aspects of cancer and skin cancer will help devise effective treatment strategies and improve patient prognosis.

Keywords: Cancer, Skin cancer, Treatment, Strategies, Phytochemicals, Topical therapies.

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Novel Nano Cargoes as Chemotherapeutic Agents

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ABSTRACT

Because conventional chemotherapy for cancer does not specifically select cells only that are tumor, it is limited in its ability to cure cancer, so is easily associated with harmful and adverse effects. Delivery that are targeted, can lessen a drug's harmful and adverse effects on healthy tissues as well cells while increasing the concentration of desired medication at the intended location. Novel delivery technologies for drugs, such as surface-modifiable and biocompatible nano carriers, are employed to precisely and controllably target locations of tumor. Since nano carrier systems have promising properties and potential to increase healing efficacy, they are widely employed in cancer imaging, diagnostics, and therapies. A useful technique for creating targeted nano carriers is to adorn them with ligands that can attach to certain receptors overexpressed on cancerous cells surfaces. To create systems selective to tumor drug delivery, number of ligands, such as folic acid, hyaluronic acid, transferrin, polypeptides etc. have been thoroughly investigated. This study centers on the development of several nano-delivery methods for anticancer medications that are intended to target exterior of cancer cells. We think that actively directed nano-drugs in oncology will become eminent game-changer and essential tool to precise chemo therapy via ongoing researches.

Keywords: Nano carriers, Smart nano delivery systems, Lipid-based delivery, Cancer cells targeting, Chemotherapy

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INTRODUCTION

Number of cases and lethality from cancer are rising quickly worldwide, making it a serious public health concern. The World Health Organization (WHO) recently released figures that show an expected 10 million deaths from cancer and 19.3 million newer incidences of cancer will occur globally in 2020^{1,2}. Because chemotherapy is now quite effective when combined with radiation and surgery, it is among the widely used anti-cancer therapies^{3,4}. Practical restrictions have been brought about by its poor discrimination for cancerous cells and difficulties in delivering drugs targeted to the site of tumor effectively, including their brief half-lives⁵. Multi-drug

resistance, yet additional challenge to effective treatment. Formulation of fruitful choices for treatment turn out to be very challenging due to intricacies involved in microenvironment of malignancies as well alterations between individuals⁶. To handle above said criticalities, development of innovative strategies for delivering the drugs has been encouraged. The advancement of nanotechnology has led to promising applications in nano medicine, particularly in the treatment of cancer. When compared to individual drug delivery, the nano-delivery system offers more benefits in the treatment of cancer because it may increase drug



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RESEARCH ARTICLE

Targeting Potential of Zinc Oxide Nanoparticles and Finasteride-loaded Nano Lipidic Carriers-infused Topical Gel - *In vitro* and *In vivo* Skin Permeation Studies

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ABSTRACT

Background: There is an unmet clinical need to develop topical carriers for finasteride to reduce its systemic side effects in the treatment of androgenic alopecia (AGA). Zinc oxide (ZnO) nanoparticles have also emerged as an influential agent in hair biology.

Aim: The main focus of the work was to develop a novel formulation to explore the potential of ZnO nanoparticles in combination with NLCs of finasteride (FIN) for topical delivery.

Method: ZnO nanoparticles were synthesized by precipitation method and were subsequently incorporated within the Carbopol gel. The ZnO nanoparticles and the gel were evaluated for their physicochemical characteristics. In vitro release study was performed for the determination of release of the drugs from the gel and ex vivo study was conducted for the determination of penetration of the NLCs and ZnO nanoparticles into the skin.

Result: The particle size of the nanoparticles was found to be 200 nm. The pH, viscosity and spreadability of the gel was observed to be 6.13 ± 2.11 , $35,845.3\pm6.97$ cps at 5 rpm and 17.14 ± 2.32 respectively. Ex vivo drug permeation and skin distribution studies of the NLC gel formulations carried on rat dorsal skin indicated $25.763\pm0.2 \ \mu g/cm^2$ and $19.375\pm1.2 \ \mu g/cm^2$ of FIN and ZnO in 12 hr respectively.

Conclusion: The results indicated the potential of developed systems for topical drug delivery for treatment of androgenic alopecia.

Keywords:

Metal nanoparticles, drug delivery, nanostructured lipid carriers, alopecia, hair.

Introduction

Androgenic alopecia is a patterned loss of hair, and is primarily mediated through the dihydrotestosterone (DHT) hormone. The conversion of testosterone to dihydrotestosterone (DHT) is facilitated through the enzyme Type-II 5- α reductase, which is expressed in hair follicles and other androgen dependent tissues, and is reported to be critical in androgenic alopecia. The characteristic feature of alopecia is the absence of hair

Abbreviations: NLC - Nanostructured lipid carriers; ZnO - Zinc oxide; FIN – Finasteride; DHT – Dihydrotestosterone; HF - Hair follicle; AGA - Androgenetic alopecia; SEM - Scanning Electron Microscopy; FTIR - Fourier transmission electron microscopy.



Formulation and Characterization of Magnetically Responsive Mesalamine Microspheres for Colon Targeting

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Abstract

Background: Magnetically Responsive Mesalamine Microspheres is an effective strategy for localized drug delivery only at the target site for the treatment of Irritable Bowel Diseases and thereby minimizing the dose and drug induced toxicity.

Objective: The main objective of the study is to localize the drug only at the target site thereby minimizing the dose.

Result and Discussion: 1. The aim of present study was to formulate Magnetically Responsive Mesalamine Microspheres by solvent evaporation method using biodegradable polymers Chitosan and Pectin and carry out the various pharmaceutical and magnetic characterizations, to study the effect of polymer type on in-vitro drug release and preclinical in-vitro screening studies such as in- vitro release studies using microflora activated system and in-vitro anti-inflammatory activity. 2. Chemical compatibility study was performed using FTIR spectroscopy studies indicated that the Mesalamine is compatible with polymers. The spectra showed no changes in the major peaks thus confirming no interactions between drug and polymers. 3. Calibration curves of Mesalamine was constructed in Phosphate Buffer Saline pH7. 4. Magnetite (Fe3O4) (used as magnetic carrier) was chemically synthesized using precipitation method.5. In the present study, 3 formulations were prepared in total by using Chitosan and Pectin as polymer in different ratios (1:1,1:2 and 1:3) of each polymer and combination of two polymers. Also, the effect of polymer type was studied.

Conclusion: It can be concluded that the Magnetically Responsive Mesalamine Microspheres offer a localized drug delivery only at the target site by the combined effect of physical approach (utilizing the principle of magnetic targeting with an intention to produce a depot near the target organ) and biochemical approach (using biodegradable polymers chitosan and pectin for drug release in a controlled manner). By producing a depot near the target organ, unwanted distribution of drug to non-target organ can be avoided.

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Role and uptake of metal-based nanoconstructs as targeted therapeutic carriers for rheumatoid arthritis

Review Article Published: 29 April 2024

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Shradha Devi Dwivedi, Anita Bhoi, Madhulika Pradhan, Keshav Kant Sahu, Deependra Singh & Manju Rawat Singh 🖂

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Abstract

Rheumatoid Arthritis (RA) is a chronic autoimmune systemic inflammatory disease that affects the joints and other vital organs and diminishes the quality of life. The current developments and innovative treatment options have significantly slowed disease





Mechanistic prospective and pharmacological attributes of quercetin in attenuation of different types of arthritis

Anita Bhoi¹ · Shradha Devi Dwivedi² · Deependra Singh² · S. Keshavkant¹ · Manju Rawat Singh²

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Abstract

Arthritis is a frequent autoimmune disease with undefined etiology and pathogenesis. Scientific community constantly fascinating quercetin (QUR), as it is the best-known flavonoid among others for curative and preventive properties against a wide range of diseases. Due to its multifaceted activities, the implementation of QUR against various types of arthritis namely, rheumatoid arthritis (RA), osteoarthritis (OA), gouty arthritis (GA) and psoriotic arthritis (PsA) has greatly increased in recent years. Many research evidenced that QUR regulates a wide range of pathways for instance NF- κ B, MAK, Wnt/ β catenine, Notch, etc., that are majorly associated with the inflammatory mechanisms. Besides, the bioavailability of QUR is a major constrain to its therapeutic potential, and drug delivery techniques have experienced significant development to overcome the problem of its limited application. Hence, this review compiled the cutting-edge experiments on versatile effects of QUR on inflammatory diseases like RA, OA, GA and PsA, sources and bioavailability, therapeutic challenges, pharmacokinetics, clinical studies as well as toxicological impacts. The use of QUR in a health context would offer a tearing and potential therapeutic method, supporting the advancement of public health, particularly, of arthritic patients worldwide.

Keywords Inflammation · Gout arthritis · Osteoarthritis · Psoriotic arthritis · Rheumatoid arthritis · Quercetin

Abbreviations

AIM2	Absent in melanoma 2
ADME	Absorption, distribution, metabolism, and
	excretion
ADA	Adenosine deaminase
AIA	Adjuvant-induced arthritic
ALP	Alkaline phosphatase
ASC	Apoptosis-associated speck-like protein con-
	taining CARD
CaC_2O_4	Calcium oxalate
CCL	C–C motif chemokine ligand
JNK	C-Jun N-terminal kinase
CD14	Cluster of differentiation14
CoPP	Cobalt protoporphyrin IX
CIA	Collagen-induced arthritic
C3	Complement protein 3
CFA	Complete Freund adjuvant

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COX	Cyclooxygenase
E-ADA	Ectoadenosine deaminase
ENM	Electrospun nanofiber membrane
ECM	Extracellular matrix
FLS	Fibroblst like synovium
GATA6	GATA transcription factor 6
GO	Gene ontology
GA	Gout arthritis
HO	Heme oxygenase
Н	Hydrogen
HIF-1	Hypoxia-inducible factor-1
iNOS	Inducible nitric oxide synthase
IL	Interleukin
KOA	Knee-OA
KEGG	Kyoto Encyclopedia of Genes and Genomes
LII	Limb idleness index
LOX	Lipooxigenase
LPS	Lipopolysaccharides
M1	Secretes pro-inflammatory cytokines
M2	Secretes anti-inflammatory cytokines
MMPs	Matrix metalloproteinases
MTX	Methotrexate
mPEG-PA	Methyl-poly(ethylene glycol)-l-poly(alanine)
MIA	Monoiodoacetate







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iNOS	Inducible nitric oxide synthase
IL	Interleukin
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Targeting Pathways and Integrated Approaches to Treat Rheumatoid Arthritis

Shradha Devi Dwivedi,^a Krishna Yadav,^a Anita Bhoi,^b Keshav Kant Sahu,^b Neelam Sangwan,^c Deependra Singh,^a & Manju Rawat Singh^{a,*}

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ABSTRACT: Rheumatoid arthritis (RA) is a chronic symmetrical systemic disorder that not only affects joints but also other organs such as heart, lungs, kidney, and liver. Approximately there is 0.5%-1% of the total population affected by RA. RA pathogenesis still remains unclear due to which its appropriate treatment is a challenge. Further, multitudes of factors have been reported to affect its progression i.e. genetic factor, environmental factor, immune factor, and oxidative factor. Therapeutic approaches available for the treatment of RA include NSAIDs, DMARDs, enzymatic, hormonal, and gene therapies. But most of them provide the symptomatic relief without treating the core of the disease. This makes it obligatory to explore and reach the molecular targets for cure and long-term relief from RA. Herein, we attempt to provide extensive overlay of the new targets for RA treatment such as signaling pathways, proteins, and receptors affecting the progression of the disease and its severity. Precise modification in these targets such as suppressing the notch signaling pathway, SIRT 3 protein, Sphingosine-1-phosphate receptor and stimulating the neuronal signals particularly efferent vagus nerve and SIRT 1 protein may offer long term relief and potentially diminish the chronicity. To target or alter the novel molecules and signaling pathway a specific delivery system is required such as liposome, nanoparticles and micelles and many more. Present review paper discusses in detail about novel targets and delivery systems for treating RA.

KEY WORDS: rheumatoid arthritis, causative factor, notch signaling, sirtuin, sphingosine-1-phosphate, neuronal signals, delivery system

I. INTRODUCTION

Rheumatoid arthritis (RA) is a chronic systemic autoimmune disorder that systematically affects the whole body. RA chronicity is manifested as destruction of cartilage lining by synovial capsule, the formation of pannus, morning stiffness, and intolerable pain particularly in cold conditions.¹ Globally, around 1% of the total world population suffer from RA.² The incidence of RA in women is two to three-times higher than men. At any age, RA can occur but it generally occurs at the age of 40–60 years in women while in men it is 60 years.³ Along with these, 40% of RA patients suffer from extra-articular symptoms such as glomerulonephritis, atherosclerosis, and small vascular vacuities. This deteriorates the quality of patient life both socially and economically which results

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Review 3 Biotech. 2023 Nov;13(11):362. doi: 10.1007/s13205-023-03787-6. Epub 2023 Oct 12.

Mechanistic prospective and pharmacological attributes of quercetin in attenuation of different types of arthritis

Anita Bhoi¹, Shradha Devi Dwivedi², Deependra Singh², S Keshavkant¹, Manju Rawat Singh²

Affiliations PMID: 37840879 PMCID: PMC10570262 DOI: 10.1007/s13205-023-03787-6

Abstract

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Keywords: Gout arthritis; Inflammation; Osteoarthritis; Psoriotic arthritis; Quercetin; Rheumatoid arthritis.

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Figures



Recent Updates on Nanocarriers for Drug Delivery in Posterior Segment Diseases with Emphasis on Diabetic Retinopathy



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Abstract: In recent years, various conventional formulations have been used for the treatment and/or management of ocular medical conditions. Diabetic retinopathy, a microvascular disease of the retina, remains the leading cause of visual disability in patients with diabetes. Currently, for treating diabetic retinopathy, only intraocular, intravitreal, periocular injections, and laser photocoagulation are widely used. Frequent administration of these drugs by injections may lead to serious complications, including retinal detachment and endophthalmitis. Although conventional ophthalmic formulations like eye drops, ointments, and suspensions are available globally, these formulations fail to achieve optimum drug therapeutic profile due to immediate nasolacrimal drainage, rapid tearing, and systemic tearing toxicity of the drugs. To achieve better therapeutic outcomes with prolonged release of the therapeutic agents, nano-drug delivery materials have been investigated. These nanocarriers include nanoparticles, solid lipid nanoparticles (SLN), nanostructured lipid carriers (NLC), dendrimers, nanofibers, *in-situ* gel, vesicular carriers, niosomes, and mucoadhesive systems, among others. The nanocarriers carry the potential benefits of site-specific delivery and controlled and sustained drug release profile. In the present article, various nanomaterials explored for treating diabetic retinopathy are reviewed.

Keywords: Diabetic retinopathy, ocular drug delivery, eye, biocompatible, nanomaterials, endophthalmitis.

1. INTRODUCTION

Drug delivery to the ocular segment is a formidable endeavor. The complex anatomical and physiological constraints imposed by the eye barriers render the challenge even more daunting for the drug carrier to reach the posterior segment. Several posterior segment eye disorders occur extensively and are one of the leading causes of visual impairment. These include glaucoma, diabetic retinopathy (DR), diabetic macular edema (DME), age-related macular edema (AMD), retinal vein occlusion, uveitis, cytomegalovirus (CMV) retinitis, and retinitis pigmentosa [1, 2].

Conventional ophthalmic formulations include eye drops, solutions, suspensions, and ointments, which are easy to administer but carry the burden of low ocular bioavailability ($\sim < 1\%$) [3]. Different routes of drug delivery to the eye, such as topical, subconjunctival, suprachoroidal, intravitreal, and periocular, have distinct advantages and limitations. The

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topical route provides ease of application; however, it faces several limitations, such as rapid tearing or washouts, limited drug penetration, drug binding with lacrimal proteins, and nasolacrimal absorption of the drug, which may further lead to systemic side effects. Some invasive approaches, such as intravitreal injection, periocular injection, etc., are available for drug delivery to the posterior segment but have inherent limitations. Intravitreal injections may cause retinal detachment, hemorrhage endophthalmitis, cataracts, and patient noncompliance (Fig. 1) [4]. Considering the limitations mentioned above with existing conventional ocular formulation, there is a glaring demand for better alternatives for efficient drug delivery and therapeutic outcomes by increasing ocular bioavailability through prolongation of precorneal drug residence time, achieving a controlled and sustained drug release profile along with avoidance of precorneal drug loss [3].

Diabetes has several complications and diabetic retinopathy (DR) is one of its most common and prominent microvascular complications. Chronic hyperglycemia damages the blood-retinal barrier, resulting in ischemic retina alterations [5]. This further results in the proliferation of new weak and leaky vessels, which leads to tractional retinal detachment

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Current Diabetes Reviews

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REVIEW ARTICLE



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Abstract: In recent years, various conventional formulations have been used for the treatment and/or management of ocular medical conditions. Diabetic retinopathy, a microvascular disease of the retina, remains the leading cause of visual disability in patients with diabetes. Currently, for treating diabetic retinopathy, only intraocular, intravitreal, periocular injections, and laser photocoagulation are widely used. Frequent administration of these drugs by injections may lead to serious complications, including retinal detachment and endophthalmitis. Although conventional ophthalmic formulations like eye drops, ointments, and suspensions are available globally, these formulations fail to achieve optimum drug therapeutic profile due to immediate nasolacrimal drainage, rapid tearing, and systemic tearing toxicity of the drugs. To achieve better therapeutic outcomes with prolonged release of the therapeutic agents, nano-drug delivery materials have been investigated. These nanocarriers include nanoparticles, solid lipid nanoparticles (SLN), nanostructured lipid carriers (NLC), dendrimers, nanofibers, *in-situ* gel, vesicular carriers, niosomes, and mucoadhesive systems, among others. The nanocarriers carry the potential benefits of site-specific delivery and controlled and sustained drug release profile. In the present article, various nanomaterials explored for treating diabetic retinopathy are reviewed.

Keywords: Diabetic retinopathy, ocular drug delivery, eye, biocompatible, nanomaterials, endophthalmitis.

1. INTRODUCTION

Drug delivery to the ocular segment is a formidable endeavor. The complex anatomical and physiological constraints imposed by the eye barriers render the challenge even more daunting for the drug carrier to reach the posterior segment. Several posterior segment eye disorders occur extensively and are one of the leading causes of visual impairment. These include glaucoma, diabetic retinopathy (DR), diabetic macular edema (DME), age-related macular edema (AMD), retinal vein occlusion, uveitis, cytomegalovirus (CMV) retinitis, and retinitis pigmentosa [1, 2].

Conventional ophthalmic formulations include eye drops, solutions, suspensions, and ointments, which are easy to administer but carry the burden of low ocular bioavailability ($\sim < 1\%$) [3]. Different routes of drug delivery to the eye, such as topical, subconjunctival, suprachoroidal, intravitreal, and periocular, have distinct advantages and limitations. The

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Diabetes has several complications and diabetic retinopathy (DR) is one of its most common and prominent microvascular complications. Chronic hyperglycemia damages the blood-retinal barrier, resulting in ischemic retina alterations [5]. This further results in the proliferation of new weak and leaky vessels, which leads to tractional retinal detachment

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Quorum Sensing in Gram-Negative Bacteria: Strategies to Overcome Antibiotic Resistance in Ocular Infections

Sakshi Tiwari¹, Bina Gidwani², Amber Vyas¹

Affiliations PMID: 37497706 DOI: 10.2174/1566524023666230727094635

Abstract

Truly miraculous medications and antibiotics have helped save untold millions of lives. Antibiotic resistance, however, is a significant issue related to health that jeopardizes the effectiveness of antibiotics and could harm everyone's health. Bacteria, not humans or animals, become antibioticresistant. Bacteria use quorum-sensing communication routes to manage an assortment of physiological exercises. Quorum sensing is significant for appropriate biofilm development. Antibiotic resistance occurs when bacteria establish a biofilm on a surface, shielding them from the effects of infection-fighting drugs. Acylated homoserine lactones are used as autoinducers by gram-negative microscopic organisms to impart. However, antibiotic resistance among ocular pathogens is increasing worldwide. Bacteria are a significant contributor to ocular infections around the world. Gram-negative microscopic organisms are dangerous to ophthalmic tissues. This review highlights the use of elective drug targets and treatments, for example, combinational treatment, to vanquish antibiotic-resistant bacteria. Also, it briefly portrays anti-biotic resistance brought about by gramnegative bacteria and approaches to overcome resistance with the help of quorum sensing inhibitors and nanotechnology as a promising medication conveyance approach to give insurance of antimicrobials and improve pathways for the administration of inhibitors of quorum sensing with a blend of anti-microbials to explicit target destinations and penetration through biofilms for treatment of ocular infections. It centres on the methodologies to sidestep the confinements of ocular anti-biotic delivery with new visual innovation.

Keywords: Antibiotic resistance; Antibiotics; Biofilm; Gram-negative bacteri; Ocular infections; Quorum sensing; Quorum sensing inhibitors.

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Review

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Role and uptake of metal-based nanoconstructs as targeted therapeutic carriers for rheumatoid arthritis

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Abstract

Rheumatoid Arthritis (RA) is a chronic autoimmune systemic inflammatory disease that affects the joints and other vital organs and diminishes the quality of life. The current developments and innovative treatment options have significantly slowed disease progression and improved their quality of life. Medicaments can be delivered to the inflamed synovium via nanoparticle systems, minimizing systemic and undesirable side effects. Numerous nanoparticles such as polymeric, liposomal, and metallic nanoparticles reported are impending as a good carrier with therapeutic properties. Other issues to be considered along are nontoxicity, nanosize, charge, optical property, and ease of high surface functionalization that make them suitable carriers for drug delivery. Metallic nanoparticles (MNPs) (such as silver, gold, zinc, iron, titanium oxide, and selenium) not only act as good carrier with desired optical property, and high surface modification ability but also have their own therapeutical potential such as anti-oxidant, anti-inflammatory, and anti-arthritic properties, making them one of the most promising options for RA treatment. Regardless, cellular uptake of MNPs is one of the most significant criterions for targeting the medication. This paper discusses the numerous interactions of nanoparticles with cells, as well as cellular uptake of NPs. This review provides the mechanistic overview on MNPs involved in RA therapies and regulation anti-arthritis response such as ability to reduce oxidative stress, suppressing the release of proinflammatory cytokines and expression of LPS induced COX-2, and modulation of MAPK and PI3K pathways in Kuppfer cells and hepatic stellate cells. Despite of that MNPs have also ability to regulates enzymes like glutathione peroxidases (GPxs), thioredoxin reductases (TrxRs) and act as an anti-inflammatory agent.

Keywords: Cellular uptake; Metallic nanoparticle; Rheumatoid arthritis; Targeting.

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REVIEW ARTICLE

A Review on digital medicine and its implications in drug development process

Amber Vyas¹, Tanu Bhargava², Surendra Saraf³, <mark>Vishal Jain¹, Darshan Dubey²*</mark>

¹University Institute of Pharmacy, Pt. Ravishankar Shukla University, Raipur (CG) ²Institute of Pharmacy, Vikram University, Ujjain (MP) ³Columbia College of Pharmacy, Tekari, Raipur (CG) *Corresponding Author E-mail: **darshandubey@gmail.com**

ABSTRACT:

A field known as "digital medicine" is focused with using technology as aid for assessment and involvement in the interest of better public health. Digital medical solutions are built on top-notch technology and software that supports the practice of medicine broadly, including treatment, rehabilitation, illness prevention, and health promotion for individuals and across groups. Digital medical products can be used independently or in conjunction with pharmaceuticals, biologics, devices, and other products to enhance patient care and health outcomes. With the use of smart, easily accessible tools, digital medicine equips patients and healthcare professionals to treat a variety of illnesses with high-quality, safe, and efficient measures and data-driven therapies. The discipline of digital medicine includes both considerable professional knowledge and responsibilities linked to the usage of these digital tools. The application of these technologies in digital medicine is supported by the development of evidence. Technology is causing changes in medicine. Wearable and sensors are becoming more compact and affordable, and algorithms are becoming strong enough to forecast medical outcomes. Nevertheless, despite quick advancements, the healthcare sector lags behind other sectors in effectively utilizing new technology. The cross-disciplinary approach necessary to develop such tools, needing knowledge from many experts across many professions, is a significant barrier to entry. The participation in digital medicine programs is optional, complies with all legal requirements and standards, and protects patient data in line with relevant state and federal privacy legislation, just like other data created and maintained in electronic medical records. Aside from helping doctors more correctly titrate dosages and assess how well a treatment works, experts say digital medicine programs hold promise as a solution to the problem of medication adherence.

KEYWORDS: Smart Pills, Digital Tools, Artificial Intelligence, Global Score, Clinical.

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INTRODUCTION:

Products for digital medicine have a lot of potential to advance medical measurement, diagnosis, and therapy. While many other industries have welcomed digital disruption, the healthcare sector has not seen the advantages in outcomes, accessibility, and costeffectiveness long promised by the digital revolution. The regulatory environment, which often prevents progress while health officials strive to lessen adverse consequences, is one of the reasons the healthcare industry lags behind other industries.¹.

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RESEARCH ARTICLE

UV- Spectrophotometric technique- based method development and validation for simultaneous estimation of Ciprofloxacin HCl and Quercetin in bulk powder

Vishal Jain, Sakshi Tiwari, Amber Vyas*

University Institute of Pharmacy, Pt. Ravishankar Shukla University, Raipur (C.G.) *Corresponding Author E-mail: **ambervyas@gmail.com**

ABSTRACT:

Antibiotic resistance is increasing worldwide, especially among ocular pathogens and one of the major reasons for this severity is the formation of biofilm which causes antibacterial specialists like Ciprofloxacin HCl to be ineffective, but combining it with substances that inhibit quorum sensing, a process that leads towards the development of biofilm, such as Quercetin, in a single formulation is an effective way to treat these infections. Aiming to develop and approve a new analytical method for the simultaneous evaluation of ciprofloxacin HCl and quercetin in their mass powder, the current examination is expected to accomplish this. Two strategies-the simultaneous equation approach (I) and the absorbance ratio method (II)-were created and validated in accordance with ICH guidelines for specificity, selectivity, linearity, precision, and accuracy. Quercetin's and Ciprofloxacin HCl's absorbance maxima (\lambda max) were determined to be at 327 nm and 271 nm, respectively, with coefficient correlation values of 0.999 and 0.997. Their isosbestic point was noticed at a maximum wavelength of 283 nm. Both Ciprofloxacin HCl and Quercetin demonstrated linearity in the focus range from 1 µg/ml to 10 µg/ml when absorbances were measured at any of the aforementioned levels. It was discovered that the developed processes were exact and precise with less than 2% relative standard deviation (%RSD). % Recovery studies were found to be 98.62-101.15% for Ciprofloxacin HCl at 271nm, 99.34-100.94% for Quercetin at 327nm, 99.63-104.62%, and 101.23-102.64% for Ciprofloxacin HCl and Quercetin respectively at their isosbestic point. Because it was discovered to be simple, rapid, specific, selective, linear, exact, and based on absorptivity measurements, the established UV Spectrophotometric technique can be used for in vitro depiction and contemporaneous assessment of Ciprofloxacin HCl and Quercetin.

KEYWORDS: Biofilm, Quorum sensing inhibitors, Ciprofloxacin HCl, Quercetin, Simultaneous equation method, Absorbance ratio method.

INTRODUCTION:

Antibiotic resistance is a prevailing issue globally, particularly among ocular pathogens¹. Quorum sensing (QS) is the communication mechanism of bacteria that led to the development of biofilm, which is the significant reason for antibiotic resistance in ocular infections as it hinders the penetration of antibacterial specialists to treat infections². On the basis of various kinds of literature, it was concluded that the combination of antibacterial agents and Quorum sensing inhibitors (QSIs) will be a remarkable strategy to overcome this problem as QSI will hinder the further development of biofilm, and simultaneously antibacterial agents will cure the infection^{3,4}. This theory propels to conduct research on the development and validation of a reasonable new analytical technique for the determination of quercetin (QRT), a naturally occurring flavonoid that serves as a QSI⁵, and ciprofloxacin HCl (CIP HCl)⁶, an antibacterial expert of the fluoroquinolone class that is compelling against both gram-positive and negative pathogens and works by repressing the action of enzymes such as DNA gyrase, topoisomerase-II and IV.

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RESEARCH ARTICLE

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<u>Vishal Jain, Sak</u>shi Tiwari<mark>, Amber Vyas*</mark>

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ABSTRACT:

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Keywords:

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Simultaneous equation method () Absorbance ratio method. ()

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ABSTRACT:

Antibiotic resistance is increasing worldwide, especially among ocular pathogens and dise2df) the major reasons for this severity is the formation of biofilm which causes antibacterial specialists like Ciprofloxacin HCl to be ineffective, but combining it with substances that inhibit quorum sensing, a process that leads towards the development of biofilm, such as Quercetin, in a single formulation is an effective way to treat these infections. Aiming to develop and approve a new analytical method for the simultaneous evaluation of ciprofloxacin HCI and guercetin in their mass powder, the current examination is expected to accomplish this. Two strategies—the simultaneous equation approach (I) and the absorbance ratio method (II)-were created and validated in accordance with ICH guidelines for specificity, selectivity, linearity, precision, and accuracy. Quercetin's and Ciprofloxacin HCI's absorbance maxima (?max) were determined to be at 327 nm and 271 nm, respectively, with coefficient correlation values of 0.999 and 0.997. Their isosbestic point was noticed at a maximum wavelength of 283 nm. Both Ciprofloxacin HCl and Quercetin demonstrated linearity in the focus range from 1 μ g/ml to 10 μ g/ml when absorbances were measured at any of the aforementioned levels. It was discovered that the developed processes were exact and precise with less than 2% relative standard deviation (%RSD). %Recovery studies were found to be 98.62-101.15% for Ciprofloxacin HCl at 271nm, 99.34-100.94% for Quercetin at 327nm, 99.63-104.62%, and 101.23-102.64% for Ciprofloxacin HCl and Quercetin respectively at their isosbestic point. Because it was discovered to be simple, rapid, specific, selective, linear, exact, and based on absorptivity measurements, the established UV Spectrophotometric technique can be used for in vitro depiction and contemporaneous assessment of Ciprofloxacin HCl and Quercetin.

Keywords:

Biofilm () Quorum sensing inhibitors () Ciprofloxacin HCl () Quercetin () Simultaneous equation method () Absorbance ratio method. ()

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RESEARCH ARTICLE

HPTLC Method Development and quantification of marker compound Gallic acid and Piperine in Ayurvedic Polyherbal formulations: *Avipattikar Churna*

Amber Vyas, Umakant Sahu, Vishal Jain*

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ABSTRACT:

Ayurvedic medications are becoming more and more well-liked and accepted globally because they are inexpensive and have no negative side effects. There is a chance that original medications will be adulterated with substances that chemically or physically mimic raw pharmaceuticals because of the increasing demand for herbal raw materials for the production of various classical as well as phytoformulation. Avipattikar Churna is an excellent Ayurvedic formulation for treating health issues resulting from an imbalance of Pitta dosha, such as acidity, heartburn, and indigestion. These issues might arise from bad eating habits, a sedentary lifestyle, or a lack of physical activity. Avipattikar Churna is also beneficial for ailments affecting the digestive and excretory systems' ability to operate normally. It counteracts the gastrointestinal tract's acid secretion and encourages the synthesis of digestive enzymes, which facilitate food absorption. Acid dyspepsia, often known as indigestion, is a condition marked by burning and sour vomit, nausea, heartburn (retrosternal burning), and burning in the throat. Avipattikar Churna is beneficial in treating these symptoms. The standardisation process, which can be carried out using a variety of methods and advanced techniques, conforms the identity, quality, and purity of herbal pharmaceuticals. The HPTLC method is superior to other methods since it may be used with herbal medications and is inexpensive, simple to use, and repeatable. For the purpose of evaluating the quality of Avipattikar Churna and identifying any changes made to the drug's composition, an HPTLC method has been devised. The existence and quantity of the marker compound in the sample are confirmed by the overlap of all relevant spectra with the marker. A gramme of Avipattikar Churna (AVC) methanolic extract contained 2.51 mg of piperine and 2.70 mg of gallic acid, the marker compounds.

KEYWORDS: Avipattikar churna, Gallic aid, Piperine, Marker estimation, Ayurveda, Herbal Medicine.

INTRODUCTION:

In India, the Ayurvedic philosophy first emerged and evolved between 2500 and 500 BC. Ayurveda literally translates to "science of life," since the ancient Indian medical system placed a strong emphasis on understanding human health and illness.¹ Positive health is defined as having a balanced metabolism, as is mentioned. Ayurveda holds that diseases develop naturally as a result of outside influences. Its extensive Sanskrit literature covers every facet of medicine, pharmacy, and illness. The techniques for making various formulations described in traditional literature and included in Schedule I of the Drugs and Cosmetics Act. An Ayurvedic polyherbal composition called Avipattikar Churna (AVC) helps maintain the digestive tract's functioning and alleviate the symptoms of various ailments.² Avipattikara Churna is used in several clinical disorders stated, such as constipation, mutraghata (urine retention), arsha (piles), amlapitta (hyperacidity), agnimandya (digestion impairment), and prameha (diabetic mellitus).^{3, 4} This medication contains natural herbs that reduce stomach acid production and shield the stomach mucosa from harm from the acidic release.⁵ When it comes to treating heartburn and GERD, or gastroesophageal

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NEWS Drug. Phospholipid complex: A novel strategy for Lymphatic Filariasis treatment (AbstractView.aspx?PID=2023-13-2-4) (https://scholar.google.co.in/scholar? q=Drug- Phospholipid complex: A novel strategy for Lymphatic Filariasis treatment)

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<u>REVIEW ARTICLE</u>

Drug- Phospholipid complex: A novel strategy for Lymphatic Filariasis treatment

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ABSTRACT:

One of the most terrifying and ugly forms of filariasis to humans is lymphatic filariasis, where adult worms 7-10 cm long are found in the lymphatic system. Mf continues to multiply in the bloodstream of the host and translocates eventually to the LS. Filariasis-causing parasites block the human blood vessels and lymph nodes. The impasse allows fluid to drain into the terminus of the body and accumulate in tissues, causing severe swelling christened "lymphoedema". LF is caused due Filariodiaceae family roundworms, often these are of three types (Wuchereria bancrofti, Brugia malayi and Brugia timori). All of these are handed down through Anopheles mosquitoes, Aedes mosquitoes and Culex pipiens. In worldwide over 90% of infectious diseases are caused by W. bancrofti. Several synthetic drugs are currently used to treat this disease. However these drugs are not as effective as killing adult worms and at the same time, some side effects are also seen. Conversely, plant actives ingredients complex with phospholipids to form nano-sized vesicles. As parasites live in the small intestine, nanometer-sized phyto vesicles can protect plant actives from deterioration in the stomach and easily reach their target and kill parasites without side effects.

KEYWORDS: Lymphatic filariasis, Lipid-based nanocarriers, Phyto vesicles, Lymphatic transport, MDA, Wuchereria bancrofti.

INTRODUCTION:

Lymphatic Filariasis (LF)

Filariae is a microscopic roundworm parasite that causes a disease called lymphatic filariasis¹. These Mf dwell in tissues and blood of human and migrate to the lymphatic system to become adult worms¹ and blocks the body's lymphatic nodes and vessels. This obstruction results in fluid accumulation in tissues, which can lead to extreme swelling in the limbs and breasts². The disease is significantly progressive as leading to disfiguring elephantiasis in both genders. Elephantiasis is a common name for LF, because of the variation of illnesses where body parts of a person swell to enormous proportions ^{3,4}. The condition is known as elephantiasis because the ensuing skin has an elephant-like texture⁵. The disease is mostly visible in the lower limbs and arms. It also affects breasts in females and scrotum in males. Hydrocele is the predominant manifestation in males and in females loss of respiratory function due to tropical pulmonary eosinophilia (TPE). Patients with filariasis have episodi adenio lymphangitis (ADL)which results in severe pain and immobility. Other health issues brought on by filariasis include endomyno - cardial fibrosis, arthritis and renal failure etc⁶. Generally, it has been seen that this disease affects poor people more. People affected by this disease are alienated from society and while getting treatment for this disease, the poor become poorer. Because of the low socioeconomic position of the community and the poor sanitary conditions that result, the majority of those who are at risk for filariasis live in rural areas. This facilitates the spread of the disease⁷.

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Mechanistic prospective and pharmacological attributes of quercetin in attenuation of different types of arthritis

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Affiliations PMID: 37840879 PMCID: PMC10570262 DOI: 10.1007/s13205-023-03787-6

Abstract

Arthritis is a frequent autoimmune disease with undefined etiology and pathogenesis. Scientific community constantly fascinating quercetin (QUR), as it is the best-known flavonoid among others for curative and preventive properties against a wide range of diseases. Due to its multifaceted activities, the implementation of QUR against various types of arthritis namely, rheumatoid arthritis (RA), osteoarthritis (OA), gouty arthritis (GA) and psoriotic arthritis (PsA) has greatly increased in recent years. Many research evidenced that QUR regulates a wide range of pathways for instance NF- κ B, MAK, Wnt/ β -catenine, Notch, etc., that are majorly associated with the inflammatory mechanisms. Besides, the bioavailability of QUR is a major constrain to its therapeutic potential, and drug delivery techniques have experienced significant development to overcome the problem of its limited application. Hence, this review compiled the cutting-edge experiments on versatile effects of QUR on inflammatory diseases like RA, OA, GA and PsA, sources and bioavailability, therapeutic challenges, pharmacokinetics, clinical studies as well as toxicological impacts. The use of QUR in a health context would offer a tearing and potential therapeutic method, supporting the advancement of public health, particularly, of arthritic patients worldwide.

Keywords: Gout arthritis; Inflammation; Osteoarthritis; Psoriotic arthritis; Quercetin; Rheumatoid arthritis.

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REVIEW ARTICLE

Luliconazole promising drug for Dermatophytes: A Review

Amber Vyas, Vishal Jain

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ABSTRACT:

Background: Dermatophytic infections, primarily affecting keratinized tissues such as skin, hair, and nails, pose significant therapeutic challenges. Luliconazole, a novel imidazole antifungal agent, has garnered attention for its efficacy against these infections. This review article aims to synthesize current knowledge on luliconazole, focusing on its chemical properties, mechanism of action, clinical efficacy, and application in treating dermatophytoses. Methods: A comprehensive review of recent studies and clinical trials involving luliconazole was conducted. Key focus areas included its antifungal spectrum, particularly against dermatophytes like Trichophyton rubrum, Microsporum gypseum, and Epidermophyton floccosum, and its pharmacokinetic properties that contribute to its effectiveness in treating dermatophytic infections. Results: Luliconazole exhibits potent activity against filamentous fungi, including dermatophytes. It interferes with ergosterol synthesis in fungal cell membranes, leading to increased membrane permeability and cell death. Formulated as a 1% topical cream and a 10% solution, luliconazole has shown significant efficacy in treating conditions such as tinea pedis, tinea cruris, and onychomycosis. Clinical studies demonstrate luliconazole's superiority over other antifungals like clotrimazole, with higher cure rates and rapid symptom resolution. Furthermore, its unique molecular structure enhances penetration into the nail plate, making it effective against onychomycosis. Conclusion: Luliconazole represents a significant advancement in antifungal therapy, offering a potent and targeted option for dermatophytosis treatment. Its broad-spectrum activity, combined with favorable pharmacokinetic properties, underscores its potential as a first-line treatment for various dermatophyte-related infections. Future research should focus on long-term efficacy, resistance patterns, and potential systemic applications of luliconazole.

KEYWORDS: Luliconazole, Dermatophytes, Antifungal Agents, Tinea Infections, Onychomycosis, Pharmacokinetics.

INTRODUCTION:

Luliconazole, known by trade names like Luzu among others, is an imidazole antifungal medication used primarily in a 1% topical cream form. It is indicated for the treatment of athlete's foot (tinea pedis), jock itch (tinea cruris), and ringworm (tinea corporis) caused by dermatophytes such as Trichophyton rubrum, Microsporum gypseum, and Epidermophyton floccosum¹.

Luliconazole is a novel, broad-spectrum antifungal that was under development in the United States for the treatment of dermatophytic skin and nail infections. It is particularly potent against filamentous fungi including dermatophytes, and has been formulated in a 10% solution with unique molecular properties allowing it to penetrate the nail plate and achieve fungicidal levels in the nail unit. This makes it a potent compound for the treatment of onychomycosis ^{2,3}.

Chemically, luliconazole belongs to the class of organic compounds known as dichlorobenzenes, and more specifically, it is an imidazole-derivative azole antifungal. The exact mechanism of its antifungal action is not fully determined, but it appears to interfere with ergosterol synthesis in fungal cell membranes via inhibition of C-14

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Keywords: Atopic dermatitis () bioactive () anti-inflammatory () natural products () pathogenesis. ()



Cite this article:

Sahu, Singh, Jain, Joshi and Vyas (2023). Potential of Bioactive Compounds for Atopic Dermatitis. Journal of Ravishankar University (Part-B: Science), 36(2), pp. 1-18.



Potential of Bioactive Compounds for Atopic Dermatitis Ankita Sahu¹, Manju Singh¹, Vishal Jain¹, Veenu Joshi², Amber Vyas^{1*}

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ABSTRACT

Atopic Dermatitis (AD) is a complicated condition that places tremendous physiological and psychological strain on individuals. Natural products have long been used to cure diseases such as cancer, asthma, gastrointestinal disorders, neurological disorders, and infections. The study findings reveal that natural compounds, particularly quercetin, gallic acid, and ginsenosides, have promised preventive effects against atopic dermatitis. The study addresses the medicinal properties of bioactive compounds and emphasizes their ability to exert anti-inflammatory action. These compounds exhibit anti-inflammatory properties by reducing the quantity and functionality of various inflammatory cells such as cytokines neutrophils, monocytes, lymphocytes, Langerhans cells, interleukins (ILs, such as IL-1 IL-5, and IL-4, IL-13, and IL-31), TNF- α , TSLP, and IgE, etc. The studies would pave the way for the development of natural compounds specifically designed to treat atopic dermatitis in humans. Atopic dermatitis is routinely treated using bioactive and phytoconstituents derived from them. As a result, the review emphasizes recent advances in understanding the clinical characteristics, etiology, pathogenesis, treatment with bioactive compounds, and management of atopic dermatitis.

Keywords: Atopic dermatitis, bioactive, anti-inflammatory, natural products, pathogenesis.

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1. Introduction

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Optimization of variables and assessment of *in-vitro* and *in-vivo* antihyperlipidemic activity of Eudragit RS nanoparticles containing simvastatin

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Keywords: Simvastatin Eudragit RS 100 Nanoparticles Hyperlipidemia

ABSTRACT

Simvastatin, a BCS class II drug, is associated with poor aqueous solubility, first-pass metabolism and short half-life. In the present work, nanoparticles were prepared and evaluated. Optimization of formulation and process parameters was done through the use of independent and dependent variables. Preliminary studies were done to determine suitable range of the concentration of Eudragit polymer (10% -30%) and the ratio of drug to polymer (1:1 to 1:5) for the formation of nanoparticles by emulsification and a solvent evaporation technique. Results revealed that the mean size of nanoparticles was affected by stirring speed from 5000 RPM, 8000 RPM, and 12000 RPM. The results of increase in association efficiency and percent yield with increase in amount of drug from 100 mg, 150 mg, and 200 mg in selected range were observed. *In-vitro* release studies showed that two formulations possess highest initial burst and slow sustained drug release. There was 2.93-fold decrease in total cholesterol and 3.27-fold increases in triglyceride level during *in-vivo* study.

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1. Introduction

Nanoparticles are drug carrier system which can be tailored for desired release profiles along with organ-targeted release. However, due to their nano size, these particles are not usually administered intravenously but via alternative routes. According to biopharmaceutical classification (BCS classification), simvastatin (SVS) is a BCS class II drug with poorly aqueous solubility (0.03 mg/mL), low bioavailability (approx. 5%), and short half-life (approx.

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2–3 h) (Devarajan & Sonavane, 2007; Florey, 2008). However, these limitations make it unsuitable for oral administration.

The powerful inhibitor SVS stands for 3-hydroxyy-3methylglutaryl-coenzyme A (HMG-CoA) reductase, which is responsible for converting HMG CoA into mevalonate, an initiator in the production of cholesterol. The system of BCS categorizes SVS as a class 2 medication with low variable absorption and aqueous solubility. SVS additionally experiences intense first-pass metabolism in liver and intestines. For this reason, oral bioavailability of only 5% of SVS is present in its entire form (Jeswani et al., 2021). The underprivileged bioavailability requires the creation of effective distribution method that could enhance the oral SVS's bioavailability. Nanoparticles can be prepared in laboratory using different methods. The method of preparation influences a lot on the properties of nanoparticles, and therefore, the desired properties should be studied and examined critically during the selection of any particular method of preparation. For the formulation of nanoparticles from the polymer matrix, it is essential to select an encapsulation process which fulfills the requirements of an ideal







PARTICUOLOGY

Abbreviations: BCS, Biopharmaceutical classification system; SVS, Simvastatin; PDI, Polydispersity index; CPCSEA, Committee for purpose of control and supervision of experiments on animals; ANOVA, Analysis of variance; SNF, Simvastatin nanoparticles formulation; AE, Association efficiency; SNPs, Simvastatin nanoparticles; SEM, Scanning electron microscopy; TEM, Transmission electron microscopy; DSC, Differential scanning calorimetry; XRD, X-ray diffractometry; Tg, Glass transition temperature; TC, Total cholesterol; HDL, High-density lipoprotein; TG, Triglyceride.

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Optimization of variables and assessment of *in-vitro* and *in-vivo* antihyperlipidemic activity of Eudragit RS nanoparticles containing simvastatin

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RESEARCH ARTICLE

Development of HPLC fingerprinting method via estimation of gallic acid and tannic acid for routine quality control of Ayurvedic formulation Bhuvnesvara vati

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ABSTRACT:

Bhuvnesvara vati is an important Ayurvedic formulation, is official in Ayurvedic formulary of India. The present study is an attempt to develop Fingerprint method for Bhuvnesvara vati with High Performance Liquid chromatography (HPLC) using gallic acid and tannic acid as a standard was developed, which are important and major content in formulation. The RP- HPLC Fingerprinting method was developed for three laboratory batch of Bhuvnesvara vati, its two marketed formulations and for its raw materials Emblica officinalis, Terminalia belerica, Terminalia chebula, Trichyspermum ammi and Aegle marmelus. The concentration of gallic acid present in raw material is found to be 3.174±0.049% w/w in Emblica officinalis, 8.920±0.173% w/w in Terminalia belerica, 4.092±0.117% w/w in Terminalia chebula, 1.831±0.973% w/w in Aegle marmelus and 0.264±0.365% w/w in Trichyspermum ammi. Gallic acid content in three identical laboratory batch of Bhuvnesvara vati BV-I, BV-II and BV-III, was found to be 2.623±0.746%, 2.589±0.356% and 2.632±0.239% w/w respectively. Two marketed formulation of Bhuvnesvara vati M-I and M-II showed gallic acid concentration to be 2.019±0.872 % and 2.019±0.872 % w/w respectively. The concentration of tannic acid present in raw material was found to be 6.172%±0.365w/w in Emblica officinalis, 8.667%±0.0319w/w in Terminalia belerica, 13.956%±0.745w/w in Terminalia chebula, 4.789±0.983% w/w in Aegle marmelus and 0.668±1.002% w/w in Trichyspermum ammi respectively and in three identical laboratory batch of Bhuvnesvara vati BV-I, BV-II and BV-III, was found to be 2.623±0.746%, 2.589±0.356%, 2.632±0.239% w/w respectively. The HPLC method developed for the simultaneous estimation of gallic acid and tannic acid is a simple, rapid and precise for the routine estimation of Bhuvnesvara vati.

KEYWORDS: Ayurvedic formulation, Gallic acid, Tannic acid, Standardization, HPLC.

INTRODUCTION:

Bhuvnesvara vati is official in Ayurvedic formulary of India (2000) and is among the most common formulas, used for diarrhoea in ayurvedic medicine.¹ It has been described in Bhaisajyaratnawali (1961).² As per the Ayurvedic formulary of India (2000) it comprised of the fruits of five medicinally important plants, *Indian gooseberry (Amalaki, Emblica officinalis), Belleric myrobalan (Vibhitaka, Terminalia belerica), Chebulic myrobalan (Haritaki, Terminalia chebula), Yamani (Ajowan, Trichyspermum ammi), Bilvapesika (Bael, Aegle marmelos)* and two mineral ingredients *Saindhava lavan* (rock salt) and *Grahadhoom* (Soot). The most of the Traditional formulation are lacking in their defined quality control parameters and method of its evaluation.^{3,4} The World Health Organization (WHO) in its resolution WHA 31.33 (1978), WHA 40.33 (1987), WHA 42.43 (1989) has emphasized the need to ensure the quality of medicinal plant products by using modern controlled technique and applying suitable standards ^{3,4,5,6}. Chromatography is a powerful

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RESEARCH ARTICLE

In silico Molecular Docking Analysis of some Terpenoids against 3CLpro of SARS-CoV-2

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ABSTRACT:

The recent pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has raised global health concerns. The main viral protease called 3-chymotrypsinlike cysteine protease (3CLpro) plays an important role in viral replication by polyproteins processing that are translated from viral RNA. Therefore, the present in silico docking study aimed to assess the inhibitory actions of various terpenoids against 3CLpro of SARS-CoV-2. Molecular docking was performed using ArgusLab 4.0.1. a computational docking program and the protein-ligand interaction was visualized by using Pymol 1.7 software. The inhibitory activity of terpenoids like abietic acid, ferruginol, rosmarinic acid, zingiberine, sugiol, kaempferol and betulinic acid was tested against 3CLpro (PDB ID: 6M2N) using molecular docking paradigm while antiviral drugs- remdesivir, darunavir and hydroxychlorquine- were used as standards for comparison. All phytoconstituents showed an effective binding interaction with 6M2N, and the binding affinity was ranged from -8.854 to -13.398 as compared to remdesivir, darunavir and hyroxychlorquine. Amongst tested compounds, abietic acid, ferruginol and betulinic acid exhibited promising enzyme interaction. Results indicate that based upon the binding energy of abietic acid, ferruginol and betulinic acid could be efficient SARS-CoV-2 3CLpro inhibitors. This is supported by the fact that the effects of some terpenoidal phytochemicals especially abietic acid, ferruginol and betulinic acid showed promising enzyme interaction as compared to remdesivir and darunavir. Therefore, further studies are warranted to confirm the effectiveness of abietic acid, ferruginol and betulinic acid for the therapy of COVID-19.

KEYWORDS: COVID-19, 3CL^{pro}, terpenoids, molecular docking.

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INTRODUCTION:

The severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) triggered coronavirus disease 2019 (COVID-19) is currently the rapidly spreading disease across the globe. The virus has been mainly emerged as human-to-human contact-transmitted pathogen. Moreover, it can also be spread through the air if respiratory droplets of infected person reach the mouth,

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REVIEW ARTICLE

HPTLC Method Development of Herbal drugs and its Validation: An Overview

Amber Vyas¹, Vishal Jain¹*, Umakant Sahu¹, Narendra Kumar¹, Neelu Joshi²

¹University Institute of Pharmacy, Pt. Ravishankar Shukla University Raipur, Chhattisgarh. ²School of Biotechnology and Bioinformatics, D. Y. Patil Deemed To Be University, Navi Mumbai. *Corresponding Author E-mail: vishaljain123@gmail.com

ABSTRACT:

High Performance Thin Layer Chromatography (HPTLC) is the most potent and sophisticated type of Thin Layer Chromatography (TLC). It uses chromatographic layers with the highest levels of separation, efficiency and employs high-tech equipment for every step of the process, including accurate sample application, standardised reproducible chromatogram development, and software-controlled evaluation. HPTLC is a concept that incorporates both the use of established methodologies for qualitative and quantitative analysis and a widely standardised methodology founded on scientific facts. The resolution can be increased and more exact quantitative measurements, which satisfies all quality standards for today's analytical needs. Development of an analytical technique based on HPTLC and parameter validation in line with practical assessment. It complies with standards while reducing mistakes and inquiries. Quality Control and Quality Assurance of raw materials of Plant Origin can easily and effectively be done qualitative characterization and quantitative determination of mixtures of substances, Chemical Fingerprinting by High Performance Liquid Chromatography. This review article provides fundamental principles, guidance for proper validation practise, aids in selecting the best mobile phase, and clarifies the processes of the analytical process., protocol, separation, resolution, validation process, current advancements, changes made to TLC that led to HPTLC, optimization, process control, automation, and hyphenation.

KEYWORDS: HPTLC method, Method Validation, Drug Evaluation, Standardization.

1. INTRODUCTION:

In recent years, researchers have been using different techniques to create fingerprints of various sample types.^{1, 2} The industry often bases its compliance with QC criteria and current good manufacturing practises on pharmacopoeial standards.^{3,4} Pharmacopoeial standards are required to evaluate and guarantee the quality of drugs distributed on the domestic pharmaceutical market. These standards enable regulators to perform quality control of drugs, drug substances, and excipients used in drug manufacturing and allow consumers to form an independent opinion about the drug quality.⁵ When compared to other techniques, chromatography tools continue to be superior for the analysis of compounds.^{6,7}

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Most pharmacopoeal monographs list chromatography studies as one of the essential identity tests. ^{8,9} Various chromatographic is available to ensure the quality of drugs substances but High-performance thin layer chromatography (HPTLC) is highly feasible, reliable, straightforward, quick, and effective technique for qualitative and quantitative analysis of drug compounds.¹⁰ HPTLC is an analytical technique based on TLC, which has been improved to allow for quantitative analysis of the compounds. The application of HPTLC is widely regarded and approved, and in order to standardise the test procedures, numerous approaches are being developed. HPTLC is one of the chromatographic methods that are accessible and is used for constituent identification, impurity identification and quantification, and active substance quantification.¹¹ When it comes to analytical objectives, HPTLC is one of the best TLC techniques due to its improved accuracy, reproducibility, and ability to document the results when compared to normal TLC. As a result,

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HPTLC Method Development of Herbal drugs and its Validation: An Overview

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Abstract

One of the most often utilized methods for drug discovery is molecular docking. With docking, one may discover new therapeutically relevant molecules by targeting the molecule and predicting the target–ligand interactions as well as different conformation of ligand at various positions. The prediction signifies the effectiveness of the molecule or the developed molecule having different affinity with target. Drug discovery plays an important role in the development of a new drug molecule of different moiety attached to it, which leads us in the management of several diseases.

warning signs. After the docking process, molecular dynamics computational technique helps in the

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KAEMPFEROL: A Key Emphasis on its Counter-Wired Potential

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Abstract:- Kaempferol is a naturally existing flavonol that can be found in plants and other sources. It has a number of health advantages and is a vital component of many products made from plants. The most prevalent polyphenols in the average person's diet are flavonoids, which are mostly found in fruits, vegetables, and plantbased drinks. Kaempferol is well recognized for its antioxidant qualities, which prevent the production of ROS and lipid peroxidation and have a variety of other effects. In addition to being an antioxidant, Kaempferol also possesses functional and nutraceutical qualities that lessen oxidative damage to biological cells. High dosage of flavonoids has been demonstrated in studies to potentially lower the risk of lymphatic filariasis and cancer.

Keywords:- Flavonoids, Antioxidant, Lymphatic Filariasis, Cancer, Nutraceuticals.

I. INTRODUCTION

The use of medicinally active plants in Chhattisgarh, India, remains paramount in traditional medicine to treat various ailments of the nation. Additionally, these plants are essential resources for the development of novel drugs. There is an abundance of enthusiasm for using antioxidants from natural sources rather than synthetic antioxidants in the manufacture of pharmaceuticals. Because antioxidants not only act as antioxidants, but they also have functional and nutraceutical properties that aid in reducing oxidative damage to cells in the human body [1].

Among all the chemical compounds, flavonoids have the highest antioxidative activity. Flavonoids are cleft into a number of groups based on their chemical harmony, namely isoflavonoid, flavones, catechins (flavanols), flavonols, anthocyanins flavanones, chalcones, and neoflavonoids [2]. It is already recognized that polyphenols (such as flavonoids) have antioxidant properties [3]. The shikimate pathway is the best way to synthesize flavonoids [4] a process occurring in plant plastids; [5,6,7]. More than 2000 compounds are known, about 500 of which exist as free aglycones and the rest as C-glycoside (aglycones attached directly to flavonoid skeleton as C-C covalent) or Oglycosides (aglycone combined to hydroxyl oxygen). Although flavonols are lipophilic in nature at their free state as aglycones, most flavonols yielded in plants are bound with sugar moieties, glycosidic form, and are hydrophilic [8]. The existent of hydroxyl functional group in flavonols are essential and potent binding sites for sugar such as O [9]. The most commonly attached sugar to flavonols are monosaccharides such as arabinose, glucose, galactose, xylose, rhamnose and the disaccharide rutinose (formation of β - glycosidic bond to link glucose and rhamnose) [10].

A growing number of studie supports Kaempferol as a breast cancer chemotherapy agent with clear therapeutic benefits [11]. Flavonoids are the most common polyphenols in human diet, which are found in vegetables, fruits and plants-based beverages primarily, and are the key ingredients of numerous plant-based products. Epideminilogical and animal studies show that high doses of flavonoids may scale down the uncertainty of cancer and lymphatic filariasis [12,13]

Kaempferol is most encountered aglycone flavonoid in its glycoside form. This is a tetrahydroxyflavone with four hydroxy groups at 3,5,7 and 4 position. Kaempferol is found in Camelia sinensis (Tea tree) and has various beneficial health effects. Kaempferol (3,5,7-trihydroxy-2-(4-hydroxy phenyl)-4H-chrimen-4-one) is a natural occurring hydrophobic polyphenol aromatic compound with diverse metabolic functions [14]. Apple, tomatoes, green tea, green beans, potatoes, brussels sprouts, spinach, grapes, cucumbers, lettuce, broccoli, peaches, ripe blackberries, onions, raspberries and pumpkins are common sources [15].

Kaempferol is named for German physician, naturalist and historian Engelbert Kaempfer, who worked to spread medicinal awareness and knowledge from Japan to the West in 17th century [16].

As with other nutraceutical and dietary supplements, it is always recommended to consume Kaempferol-rich food as part of an equitable diet rather than relying solely on dietary supplements [17]. Kaempferol strive a protective effect in non mutated cells while inducing apoptosis in these mutant cells these aspects are mainly related to kaempferol's pronounced antioxidant action, i.e., direct action on antioxidant enzymes, effectively inhibiting ROS production and lipid peroxidation, ultimately resulting in a wide OPEN ACCESS
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HPTLC method development and quantification of marker compound eugenol in ayurvedic polyherbal formulations: *Avipattikar churna*

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The popularity and acceptance of ayurveda drugs are increasing day by day worldwide due to their low cost and no side effects. Due to high demand of herbal raw materials for the manufacturing of different classical as well as phytoformulation there is scope for adulteration of original drugs with chemically or physically resemble raw drugs. Standardization process conforms the identity, quality and purity of herbal drugs, which can be done by different procedures and by using sophisticated techniques. HPTLC method has advantages over other techniques due to its suitability for herbal drugs, low cost, reproducibility and it is easy to operate as well. An HPTLC method has been developed for the quality testing of *Avipattikar churna* (AVC) and to discriminate any kind of alteration in drugs composition.

Keywords: Avipattikar churna; HPTLC quantification; Eugenol; marker estimation; ayurveda; herbal medicine.

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FORMULATION, OPTIMIZATION AND CHARACTERIZATION OF ELLAGIC ACID PHYTO-VESICULAR SYSTEM FOR BIOAVAILABILITY ENHANCEMENT

Varsha Rawat^{a*} and Vishal Jain^b

(Received 15 June 2022) (Accepted 11 May 2023)

ABSTRACT

Ellagic acid is a naturally occurring chemical compound found in a variety of fruits and vegetables like blackberries, raspberries, strawberries, pomegranates and cranberries. Antioxidant, antimutagenic and anticancer effects are all included in ellagic acid. Ellagic acid, on the other hand, is poorly absorbed and rapidly removed from the body, making it a challenging drug candidate. To overcome the above limitation, solvent evaporation method was used for the preparation of ellagic acid phytovesicle complex. Several batches were prepared for optimization at varying drug to phospholipid concentration ratios. The optimized formulation was found to have particle size in the range of 122.08 \pm 9.66 nm, zeta potential -36.2mV, entrapment efficiency 95.65 \pm 0.33 % and a drug loading capacity of 22.9%. The *in vitro* release profile of the optimized batch shows maximum release behaviour of up to 69 % at 24 h. The *ex vivo* intestinal permeation, however shows 85.38 % release within 140 minutes.

Keywords: Ellagic acid, phyto-vesicles, solvent evaporation, *In vitro, Ex vivo*

INTRODUCTION

Herbal medicines are in high demand at present, owing to the fact that they have fewer side effects and are not harmful to the environment. Indigenous systems of medicine in India and southeast Asia use herbal medicines (Ayurveda, Unani, Siddha, Chinese and others)¹. In some countries, a herbal is used as a supplement or alternative medicine. Nutraceutical, or food supplement, is the preferred term for a herbal product². It is well known that phytoconstituents can be used for a variety of healthrelated purposes³. Polar or water-soluble molecules make up most of the plant's bioactive constituents (e.g. phenolics, glycosides, tannins and flavonoids)⁴. Due to their high molecular size and poor lipid solubility when taken orally or administered topically, water-soluble phytoconstituents have limited efficacy5. As a result, the bioavailability of phytoconstituents is negatively impacted. Poor absorption is due to high molecular weight and low lipid solubility.

The issue of poor drug absorption is a major one, but there are numerous ways to address it⁶. The idea of forming phyto-vesicles for enhanced medicinal efficacy has been frequently studied and documented in recent years. An appropriate solvent is used to generate a hydrogen bond between stoichiometric concentrations of drug functionality and the polar heads of phospholipids7. The stability of phyto-vesicles is better than that of liposomes because of hydrogen bonding. Fruits and vegetables contain phenolic phytochemicals like ellagic acid, which are significant for their health benefits against oxidation-related chronic diseases like cancer and cardiovascular disease. Either ellagic acid directly counteracts the deleterious effects of oxidative stress or it activates/induces cellular antioxidant enzyme systems, according to several studies. These models can't explain how phytochemicals maintain unique cellular homeostasis and how that leads to their preventive mode of action and therapeutic effects in various biological systems and cell types, which are more comprehensive antioxidant-related functions⁸.

Nanoscale medication delivery has received a lot of attention recently because of the benefits they offer in terms of both pharmacological efficacy and toxicity⁹. It is worthwhile to investigate a nanoscale drug delivery technology for ellagic acid which can overcome the problem of poor intestinal permeability and increase the bioavailability for future therapeutic treatments. Woody plants, berries, grapes and nuts are all sources of ellagic

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A Review on Molecular Docking As an Interpretative Tool for Molecular Targets in Disease Management

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ABSTRACT

One of the most often utilized methods for drug discovery is molecular docking. With docking, one may discover new therapeutically relevant molecules by targeting the molecule and predicting the target-ligand interactions as well as different conformation of ligand at various positions. The prediction signifies the effectiveness of the molecule or the developed molecule having different affinity with target. Drug discovery plays an important role in the development of a new drug molecule of different moiety attached to it, which leads us in the management of several diseases. In silico approach led us to identification of numerous diseases caused by virus, fungi, bacteria, protozoa, and other microorganisms that affect human health. By means of computational approach, we can categorize disease symptoms and use the drugs available for such types of warning signs. After the docking process, molecular dynamics computational technique helps in the simulation of the physical movement of atoms and molecules for a fixed period of time, giving a view of the dynamic evaluation of the system. This review is an attempt to illustrate the role of molecular docking in drug development.

Keywords: molecular dynamics, docking, *in silico*, disease, drug discovery

INTRODUCTION

he computational process of finding the ligand or a moiety that is fit geometrically and energetically to the receptor active site is known as molecular docking. The activity of the drug depends on the molecular affinity of the drug to the receptor (protein) active site. Molecular docking plays a key role in recognition of drug (ligand)-receptor interaction.¹ The free energy modification unassociated and associated states of the drug with the target designates its molecular recognition. Hydrogen bond, electrostatic, Van der Waal, pi-pi, and hydrophobic interaction are significant in molecular recognition. The *in silico* study helps in understanding the nature of these ligand-receptor interactions, which may provide a potential drug molecule.

More and new therapeutic targets are being studied using *in silico* methods such as chemoinformatics, molecular modeling, pharmacophore modeling, homology modeling, and artificial intelligence (AI), which can be explained by recent computer technology advancement and restoration of biological, chemical, and structural data.² It is now possible to conduct virtual screenings of millions of compounds in a definite period, hence diminishing the expenses of hit identification and increasing the probability of finding a desirable drug molecule. In drug development, there are a variety of molecular modeling tools that may be divided into structure-based and ligand-based approaches (Fig. 1).³

Types of Docking

Rigid docking. In this docking process, the target protein and the selected ligand conformations are meant to be rigid. Flexibility in the molecular bond angle, bond length, and torsion angle is not permitted or they are constant. This substantial change at molecular level is not permitted in this type of docking.

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Mechanistic insight on the role of iRhom2-TNF- α -BAFF signaling pathway in various autoimmune disorders

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ARTICLE INFO

Keywords: iRhom2 TNF-α BAFF signaling iRhom1 and iRhom2 receptors Autoimmune diseases

ABSTRACT

iRhom2 is a crucial cofactor involved in upregulation of TNF receptors (TNFRs) and the proinflammatory cytokine tumor necrosis factor (TNF-) from the cell surface by ADAM17. Tumor necrosis factor- α converting enzyme (TACE) is another name given to ADAM17. Many membrane attached biologically active molecules are cleaved by this enzyme which includes TNFRs and the pro-inflammatory cytokine tumor necrosis factor- α . The TNF receptors are of two types TNFR1 and TNFR2. iRhom2 belongs to the pseudo-protease class of rhomboid family, its abundance is observed in the immune cells. Biological activity of ADAM17 is affected in multiple levels by the iRhom2. ADAM17 is trafficked into the Golgi apparatus by the action of iRhom2, where it gets matured proteolytically and is stimulated to perform its function on the cell surface. This process of activation of ADAM17 results in the protection of the organism from the cascade of inflammatory reactions, as this activation blocks the TNF- α mediated secretion responsible for inflammatory responses produced. Present paper illustrates about the iRhom2-TNF- α -BAFF signaling pathway and its correlation with several autoimmune disorders such as Rheumatoid Arthritis, Systemic Lupus Erythematosus, Hemophilia Arthropathy, Alzheimer's disease and Tylosis with esophageal cancer etc.

1. Introduction

Cell signaling is the operation occurring in the cells, which confers the cells with the ability to generate or receive signals in response to the external stimuli or the surrounding environment. Cell to cell communication is established between the cells by extracellular signaling molecules, it can be operated over the distance or between the neighboring molecules (Valls and Esposito, 2022). Receptor proteins play a pre-eminent role in mediation of cell signaling. There are various cell signaling pathways occurring simultaneously involved in maintaining normal physiological conditions such as estrogen signaling pathway, AKK signaling pathway, AMPK (AMP-activated protein kinase) signaling pathway, apoptosis signaling pathway, insulin signaling pathway, JAK-STAT(Janus kinase/signal transducers and activators of transcription) signaling pathway, AMPK (AMP-activated protein kinase) signaling pathway, p53 signaling pathway, toll-like signaling pathway, Notch signaling pathway, VEGF (Vascular Endothelial Growth Factor) signaling pathway, Wnt (Wingless-related integration site) signaling pathway, MAPK (Mitogen-activated protein kinase) signaling pathway and iRhom2-TNF- α-BAFF signaling pathway. iRhom2 is involved in the

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MINI-REVIEW ARTICLE

Treatment of Menopausal Symptoms with Herbal Medicines: A Review

Pranay Wal¹, Indu Singh¹, Deependra Singh², Manju Rawat Singh² and Ankita Wal^{1,*}

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> Abstract: Background: Menopause refers to the natural process of the "cessation of the menstrual cycle." This phase predominantly affects aged women and can lead to various symptoms such as hot flashes, insomnia, night sweats, and sexual dysfunction, among others. Unfortunately, many women remain unaware of this condition, and some even choose to overlook the symptoms. However, those who recognize the symptoms consult with a doctor, who may recommend Hormone replacement therapy (HRT). Initially, Hormone replacement therapy (HRT) can be effective, but prolonged use can result in side effects. To mitigate these effects, there is a need to explore and investigate herbal therapies as an alternative treatment for menopausal symptoms.

> **Objective:** The objective of this review is to explore and summarize various herbs used in managing menopausal symptoms as an alternative to hormone replacement therapy.

ARTICLE HISTORY

Received: May 18, 2023 Revised: August 31, 2023 Accepted: October 02, 2023

DOI:

Methods: For this review, we conducted a literature survey spanning from 1998 to 2023. We used keywords such as menopause, endocrinology, hormone replacement therapy, and herbs used for reducing menopausal symptoms to search databases such as Google Scholar, PubMed, and SciDirect. Relevant data were sourced from various journals like Plos One, JAMA, Frontier, Drug in Context, MDPI, Molecules, BMC Women's Health, Research Gate, Heliyon, Elsevier, Taylor & Francis, Nutrients, JMM, Wiley, OXFORD, Hindawi, Clinical Phytoscience, Pharmaceuticals, 10.2174/0115734048262931231031162923 Phytomedicine, and Menopause: The Journal of The North American Menopause Society.

> Results: The literature review encompassed 40 research articles and 200 review articles, including randomized controlled trials. The findings revealed that several herbal plants, including Curcuma longa, Zingiber officinale, Foeniculum vulgare, Trigonella foenum, Actaea racemosa, Glycyrrhiza glabra, Oenothera biennis, Trifolium pratense, Humulus lupulus, Vitex agnus-castus, Valeriana officinalis, Linum usitatissimum, Cannabis sativa, and Asparagus racemosus, have shown efficacy in treating menopausal symptoms.

> Conclusion: In conclusion, medicinal plants can play a significant role in managing acute menopausal syndrome. The intent of this review is to highlight the most recent research on estrogenic plants for medicinal purposes and their therapeutic impact on cognitive deficiencies brought on by estrogen shortage during menopause and aging.

Keywords: Menopause, endocrinology, hormone replacement therapy, herbs, cognitive deficiencies, hypothalamus.

1. INTRODUCTION

"Menopause" refers to the natural process of the "cessation of the menstrual cycle." It typically occurs in most women between the ages of 45 and 52. The transition from fertility to infertility, known as the menopausal transition, is a natural and unavoidable change that affects all women [1]. By the year 2030, approximately 1.2 billion women worldwide will be menopausal or postmenopausal, with 47 million new women experiencing menopause each year [2].

Endocrinology shows a decrease in Inhibin B from the ovaries, leading to a loss of negative feedback on follicular-stimulating hormone (FSH). Low Anti-Mullerian Hormone (AMH) levels within the ovary facilitate FSH-stimulated follicle growth and estrogen synthesis. However, as follicles are lost, these compensatory mechanisms become insufficient, resulting in unpredictable follicle development and eventually stable but very low estradiol levels in postmenopause [3].

Follicular stimulating hormone (FSH) release is promoted by Gonadotropin hormone-releasing hormone (GnRH). Gonadotropin hormone-releasing hormone (GnRH) is produced by the hypothalamus and transferred through the hypo-

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Plant-Based Approaches for Rheumatoid Arthritis Regulation: Mechanistic Insights on Pathogenesis, Molecular Pathways, and Delivery Systems

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ABSTRACT: Rheumatoid arthritis (RA) is classified as a chronic inflammatory autoimmune disorder, associated with a varied range of immunological changes, synovial hyperplasia, cartilage destructions, as well as bone erosion. The infiltration of immune-modulatory cells and excessive release of proinflammatory chemokines, cytokines, and growth factors into the inflamed regions are key molecules involved in the progression of RA. Even though many conventional drugs are suggested by a medical practitioner such as DMARDs, NSAIDs, glucocorticoids, etc., to treat RA, but have allied with various side effects. Thus, alternative therapeutics in the form of herbal therapy or phytomedicine has been increasingly explored for this inflammatory disorder of joints. Herbal interventions contribute substantial therapeutic benefits including accessibility, less or no toxicity and affordability. But the major challenge with these natural actives is the need of a tailored approach for treating inflamed tissues by delivering these bioactive agentsat an appropriate dose within the treatment regimen for an extended periodof time. Drug incorporated with wide range of delivery systems such as liposomes, nanoparticles, polymeric micelles, and other nano-vehicles have been developed to achieve this goal. Thus, inclinations of modern treatment are persuaded on the way to herbal therapy or phytomedicines in combination with novel carriers is an alternative approach with less adverse effects. The present review further summarizes the significance of use of phytocompounds, their target molecules/pathways and, toxicity and challenges associated with phytomolecule-based nanoformulations.

KEY WORDS: antioxidant, autoimmunity, anti-inflammatory, nanocarriers, rheumatoid arthritis, synovial inflammation

I. INTRODUCTION

Rheumatoid arthritis (RA) is a chronic inflammatory autoimmune disease, which leads to articular damage and co-morbidities in the bone, vascular, metabolic, and psychological systems.¹ It advances with inflammatory flare-ups followed by inflammation in the synovial membrane of the joint, increasing bone and cartilage deterioration with extreme pain. Initially minor joints are affected followed by spread to the larger joints in due course of time, and lastly affects different organs such as heart, skin, kidneys, eyes, and lungs. The proximal interphalangeal and metacarpophalangeal joints are damaged

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Herbal alternatives for oral health: Mechanistic exploration with their market potential

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Abstract. The utilization of customary methods for oral cleanliness maintenance has a long-written history. Herbs are making a comeback all over the world. Herbal extracts have been used in dentistry to alleviate pain as antimicrobial plaque specialists, to delay receptor arrival, and as germicides, cancer prevention agents, antimicrobials, antifungals, antibacterial, antiviral, and analgesics. Current article gives an outline of different natural products used in oral care with their impacts on oral health, restorative actions, applications, and marketed products. This article also highlights mechanistic need of oral cleanliness and the different dental diseases associated with it. The regular phytochemicals could offer a successful anti-microbial and address ways to deal with avoidance and restorative systems for different dental infections. There are different herbal formulations available on the market for oral care such as paste, mouthwash, gargles, gels, etc. creating need for awareness of consumers towards the herbal products. In these review, we have also discussed the commercial aspect of the herbal dental products along with assessment of side effects and toxicity of these herbs.

Keywords: Herbs, Oral care, commercialization, dental diseases.

1. Introduction

Oral problems are a significant health burden for many nations and impact people at all stages of life, resulting in pain, discomfort, deformity, and even death. According to WHO, 3.5 billion individuals are impacted by oral disorders signifying 3 out of 4 people affected in developing countries. Globally, it is estimated 2 billion individuals experience caries of permanent teeth as well as 514 million children suffer from caries of primary teeth(Salari et al. 2022). Oral and dental health is inextricably linked to overall wellness that affects day-to-day life. Speech, food selection, life quality, and well-being are all factors to consider. In light of the incidence of oral illnesses and their effects on people, dental care became very important.

Disease associated with improper dental care and hygiene is one of the world's most influencing diseases. Dental well-being is essential to general prosperity and connects with the norms of life that reach out past the elements of the craniofacial complex(Torwane et al. 2014). The most predominant and considerable oral illnesses all around the world are dental caries (tooth rot), periodontal sickness, tooth loss, herpangina, Thrush, and Canker sores (Janakiram et al. 2020). An oral cavity might be a limited, moderate rot of the teeth and one of the chief normal kinds of plaque-related infection. WHO report claims that around 100% of adults and 60 to 90% of school children are suffering from cavities("Oral Health" n.d.). Improper dental cares enhance the oral microbes that cause oral infections, such as gingivitis, periodontitis, oral candidiasis, and other oral infections. Gingivitis is the initial stage of gum disease, which is caused by a variety of bacterial species. These bacteria enter the crevices between a person's gums, where the toxins are produced leading to irritation and inflammation of the gum tissue nearby. While periodontitis is a serious bacterial infection in which the accumulation of bacteria over gums and teeth forms pus pockets underneath the gum lines, loss, and falling of teeth. On the other hand, candidiasis is a kind of fungal infection caused by Candida. It is also known as oropharyngeal candidiasis or thrush. In these, white patches have appeared in the inner lining of cheeks, tongues, the upper part of mouth, and throat; pain during swallowing and eating. The persistence of these oral disorders leads to chronic diseases like oral cavity arises to ulcers and cancer in the oral cavity; periodontitis leads to rheumatoid arthritis and ostio-arthritis;



Herbal alternatives for oral health: Mechanistic exploration with their market potential

Shradha Devi Dwivedi¹, Madhu Yadav¹, Deependra Singh¹, Manju Rawat Singh¹* ¹University Institute of Pharmacy, Pt. Ravishankar Shukla University, Raipur (C.G), India-492010 *Corresponding author: <u>manjursu@gmail.com</u>

Abstract. The utilization of customary methods for oral cleanliness maintenance has a long-written history. Herbs are making a comeback all over the world. Herbal extracts have been used in dentistry to alleviate pain as antimicrobial plaque specialists, to delay receptor arrival, and as germicides, cancer prevention agents, antimicrobials, antifungals, antibacterial, antiviral, and analgesics. Current article gives an outline of different natural products used in oral care with their impacts on oral health, restorative actions, applications, and marketed products. This article also highlights mechanistic need of oral cleanliness and the different dental diseases associated with it. The regular phytochemicals could offer a successful anti-microbial and address ways to deal with avoidance and restorative systems for different dental infections. There are different herbal formulations available on the market for oral care such as paste, mouthwash, gargles, gels, etc. creating need for awareness of consumers towards the herbal products. In these review, we have also discussed the commercial aspect of the herbal dental products along with assessment of side effects and toxicity of these herbs.

Keywords: Herbs, Oral care, commercialization, dental diseases.

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Review Article

A complex molecular landscape to drug delivery concept for achieving precise therapy in psoriasis

Krishna Yaday^a, Kantrol Kumar Sahu^b, Sucheta^c, Renu Yaday^c, Wasim Raza^d, Sunita Minz^e, Manju Rawat Singh^f, Deependra Singh^f, Madhulika Pradhan^{g,*}

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ARTICLE INFO

Keywords: Psoriasis Molecular pathogenesis Therapeutic target Nanocarriers Novel drug delivery systems

ABSTRACT

Psoriasis is a chronic autoimmune disorder that has a major effect on the quality of life for millions of people throughout the world. The pathogenesis of psoriasis has revealed intricate molecular networks and signaling pathways, opening new avenues for precision medicine. Psoriasis treatments include topical therapy, phototherapy, systemic therapies, and biologics, but achieving optimal outcomes is difficult. Despite advancements in understanding the causes of psoriasis and the development of various treatments, optimizing therapeutic outcomes remains challenging. Managing psoriasis poses challenges in terms of drug delivery and evaluation models. Novel drug delivery systems capable of navigating complex skin barriers and delivering therapeutics precisely to target cells are crucial for advancing treatment options. This article provides an inclusive overview of psoriasis, highlighting recent discoveries and potential therapeutic targets. The article emphasizes the importance of combining different modalities, such as synthetic and herbal agents, with biologics to improve efficacy. Nanocarriers show promise for targeted drug delivery in psoriasis, as they can encapsulate antipsoriatic drugs, biologics, and gene therapies, providing enhanced stability, improved tissue penetration, and precise cellular targeting. These advancements in drug delivery systems have the potential to revolutionize psoriasis treatment by maximizing efficacy while minimizing side effects. The article also discusses the commercial outcomes in psoriasis formulations, including patents related to treatment and ongoing clinical trials, which provide valuable insights into the evolving landscape of psoriasis therapeutics. These insights contribute to the evolving field of psoriasis therapeutics and offer hope for improved outcomes for patients suffering from psoriasis.

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Abbreviations: KCs, Keratinocytes; PUVA, psoralen plus ultraviolet-A radiation; mRNA, Messenger RNA; siRNA, Small interfering RNA; UV-A, Ultraviolet-A; UV-B, Ultraviolet-B; SLN, Solid lipid NPs; NLC, Nanostructuted lipid carriers; TNF, Tumor necrosis factor; IL, Interleukin; IMQ, Imiquimod; MAb, Monoclonal antibodies; PASI, PsO Area and Severity Index; Ig, Immunoglobulin; LFA-3, Lymphocyte Function Associated Antigen 3; BCPI, FDA, Food and Drug Administration; USFDA, United States Food and Drug Administration; JAK, Janus kinase; CDDS, Conventional drug delivery system; NDDS, Novel drug delivery system; VEGF, Vascular endothelial growth factor; TGF, Transforming Growth Factor; DCs, Dendritic cells; pDCs, Plasmacytoid dendritic cells; ZF, Zebrafish; CRISPR/Cas9, clustered regularly interspaced short palindromic repeats and CRISPR-associated protein 9; ZFIN, Zebrafish model organism database; MPO, myeloperoxidase; H&E stain, Hematoxylin and eosin stain.; rRNA, Ribosomal ribonucleic acid; RNA, Ribonucleic acid; DNA, Deoxyribonucleic acid; GFP-labeled, Green fluorescent protein; TEWL, transepidermal water loss; MTX, Methotrexate; TAC, tacrolimus; CLSM, Confocal laser scanning microscopy; QDs, Quantum dots; SC, Stratum corneum; STAT3, signal transducer and activator of transcription 3; DIT, Dithranol; PPI, Polypropylene imine dendrimers; 8-MOP, 8-methoxsalen; STEM, Scanning transmission electron microscopy; PMs, Polymeric micelles; PLNPs, Polymer-lipid NPs; DAPI, 4',6-diamidino-2-phenylindole; sEVs, Small extracellular vesicles; EVs, Extracellular vesicles; MNP, Microneelle patch; QBD, Quality by design; IFNs, interferons; TLRs, Toll-like receptors; AMPs, antimicrobial peptides; CCL, C–C motif ligand; NEs, Nanoemulsions.

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Gene Reports



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Revolutionizing genetic diagnostics: Innovative techniques for inherited disease detection

Shradha Devi Dwivedi, Sachin Dev Yadav, Divya Sahu, Deependra Singh, Manju Rawat Singh *

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ARTICLE INFO

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Keywords:

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Crisper technology

ABSTRACT

Genetic inheritance refers to the process by which traits and characteristics are passed from one generation to the next through the transmission of genetic information. This information is stored in the form of DNA (deoxyribonucleic acid), which is organized into structures called genes. Genetic hereditary disorders can be broadly classified into four categories on the basis of mode of inheritance and location of genes or chromosomes, they are: x-linked dominant, x-linked recessive, autosomal dominant and autosomal recessive. A specific diagnostic method is necessary for the diagnosis of inherited disorders. For instance, ARMPCR (amplification refractory mutation system polymerase chain reaction) is used to identify sickle cell anaemia, Breast cancer by crisper technology, and HIV (human immunodeficiency virus) can be detected by sandwich ELISA (enzyme linked immunosorbent assay) test. Mutation on FMR1 alleles in Fragile-X syndrome can be determined by TP-PCR (Triplet Repeat Primed-Polymerase Chain Reaction). Alteration on FBN1 gene in Marfan syndrome can be identified by a FISH (fluorescence in situ hybridization) test. All these tests are highly specific in nature, which depend upon genomic sequences, temperature, blood count and many more. To get a deeper comprehension of hereditary problems, we have expanded on a numerous methods and diagnostic criteria in this study. This study discusses many techniques for quickly and precisely identifying genetically inherited disorders.

1. Introduction

According to the National Human Genome Research Institute, genetic disorders result from a deviation from the usual sequence of DNA, either whole or partially. Genetic inheritance may be caused via mutations in a single gene (monogenic disorder), multiple genes (multifactorial inheritance disorder), or a combination of gene mutations and environmental factors and alterations in the number or structure of entire chromosomes (damage to chromosomes) (*Genetic Disorders*, n.d.). Genetic inheritance can be categorized based on various factors, including the mode of inheritance, the number of genes involved, and the location of genes on chromosomes. They are classified into four main types: Autosomal Dominant Inheritance is a type of genetic transmission pattern associated with traits or disorders determined by a single gene located on an autosomal chromosome, meaning it is not linked to the sex chromosomes. In this mode of inheritance, the presence of a dominant allele is sufficient to express the associated trait. The dominant allele is denoted by a capital letter (e.g., A), while the recessive allele is denoted by a lowercase letter (e.g., a). Individuals with an autosomal dominant trait have a 50 % chance of passing the trait to each of their offspring,

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Abbreviations: AIDS, acquired immune deficiency syndrome; AIDS, human immunodeficiency virus infection and acquired immune deficiency syndrome; APTT, activated partial thromboplastin time; ARMPCR, amplification refractory mutation system polymerase chain reaction; ART, antiretroviral therapy; ASD, autism spectrum disorders; BAC, bacterial artificial chromosomes; CAPS, cleaved amplified polymorphic sequences; CBC, complete blood count; cfDNA, circulating cell free DNA; CGG, cysteine-guanine-guanine; CRISPER, clustered regularly interspaced short palindromic repeats; ELISA, enzyme-linked immunosorbent assay; FISH, fluorescence in situ hybridization; FMR1, fragile-X mental retardation; FMRP, fragile-X mental retardation protein; FT, fibrinogen test; FXPOI, fragile-X primary ovarian insufficiency; FXTAS, fragile-X-associated tremor/ataxia syndrome; Glu, glutamic acid; HIV, human immunodeficiency virus; miRNA, micro-RNA; MLPA, multiplex ligation-dependent probe amplification; NIPT, non-invasive prenatal testing; OD, optical density; PCR-RFLP, polymerase chain reaction-restriction fragment length polymorphism; PM, premutation; PT, prothrombin time; QF-PCR, quantitative fluorescence polymerase chain reaction; SCA, sickle cell anaemia; SMA, spinal muscular atrophy; SMN, survival motor neuron; TP-PCR, triplet repeat primed-polymerase chain reaction; US, ultrasonography; Val, valine; WBCs, white blood cells.

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Nutraceuticals Unveiled a Multifaceted Neuroprotective Mechanisms for Parkinson's Disease: Elixir for the Brain

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ABSTRACT

Introduction: Nutraceuticals are food-derived products offering supplementary health benefits. These nutraceuticals have been found effective in the treatment of the Parkinson's disease (PD) as they possess multifaceted effects against neurodegeneration. Nutraceuticals have proven their safety and efficacy in several pre-clinical and clinical trials against PD, however, still there is an urgent need to report the health benefits of nutraceuticals on a broader platform and evaluate their complete molecular mechanism against PD.

Area covered: The review emphasizes the role of nutraceuticals in combating pathogenic mechanisms associated with PD. These include, mitochondrial dysfunction, protein ubiquitination, oxidative stress, excitotoxicity, neurotransmitter imbalance, neuroinflammation, inhibition of PPAR- Υ /PGC-1 α /NRF-2, and PON2 signaling pathways. The review also includes pre-clinical and clinical aspects of nutraceuticals in balancing the impaired gut-brain axis in PD.

Expert opinion: In recent years there have been many reports on neuroprotective potential of PD. The growing interest showed that various supplements, including polyphenols, vitamins, minerals, and the Mediterranean diet, can aid promising therapeutic properties for relieving PD symptoms. However, at present, there is no specific nutraceutical that has been designed to treat the symptoms of PD. Future studies on nutraceuticals may focus on developing individualized as well as customized therapies using specialized nutraceuticals based on epigenetics and the expression of PD.

KEYWORDS

Parkinson's disease; oxidative stress; nutraceuticals; PPAR-PGC-1\alpha/NRF-2; gut-brain axis

Introduction

Preferential death of dopamine (DA)-releasing neurons in the substantia nigra pars compacta (SNpc) results in a decreased level of DA in its striatal projections, leading to Parkinson's disease (PD).^[1] Apart from DA's depletion, motor symptoms such as dyskinesia, tremor, rigidity, and postural inabilities, and non-motor symptoms such as sleep alteration, hypotension, urinary retention, and gastrointestinal (GI) alterations have been found clinically

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Review > Recent Adv Drug Deliv Formul. 2024;18(1):12-20. doi: 10.2174/0126673878277455240214110033.

Technical Considerations, Applications, and Benefits of Organogels in Topical Drug Delivery Systems

Abhishek Yadav ¹, Vikas Jhawat ¹, Rahul Pratap Singh ¹, Sunita Chauhan ¹, <u>Rohit Dutt</u> ², Rajesh Goyal ³, Deependra Singh ⁴

Affiliations PMID: 38385494 DOI: 10.2174/0126673878277455240214110033

Abstract

Organogels represent semi-solid systems where an organic liquid phase is entrapped within a threedimensional network formed by self-assembled, crosslinked, or entangled gelator fibers. These versatile materials find applications in a wide range of fields, including chemistry, pharmaceuticals, cosmetics, biotechnology, and food technology. Notably, in pharmacology, they serve as valuable platforms for drug and vaccine delivery, facilitating the transport of active ingredients through various routes such as transdermal, oral, and parenteral. However, their previous utility as drug delivery systems was hindered by the toxicity associated with the organic solvents used. The pharmacokinetics of medications delivered via organogels are primarily influenced by the distinctive properties of these materials, specifically their "high permeability and poor aqueous solubility," which can impact the bioavailability of the drugs. Organogels can be employed topically or for the controlled release of medications through cutaneous administration and percutaneous absorption, expanding their scope of application beyond conventional drug delivery methods. Organogels hold significant promise as drug delivery vehicles due to their biocompatibility, non-irritating properties, and thermoremanent characteristics. They enable the formulation of diverse drug delivery systems by incorporating both hydrophilic and hydrophobic bioactive compounds within the gel matrix. This comprehensive review offers an overview of organogels, encompassing their nature, synthesis, characterization, and properties. Special attention is directed towards cutting-edge technologies employed in designing organogels as potential controlled delivery systems, with a focus on their emerging therapeutic applications.

Keywords: Organogels; bioavailability.; drug delivery; skin permeation; solubility; topical route.

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Authors: Shikha Srivastava Arun Parihar Manju Deependra S University Institute of Pharmacy Drugs Testing Laboratory Ayum Anusandhan Kendra Rainur Singh Deependra S	ing
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Abstract The crisis of COVID-19 pandemic, has shaken up the whole world with its power of transmission and unknown treatment strategy. A disease that starts with fever, cold, and cough leads to extreme fatigue, loss in breathing capacity, alveolar damage, and eventual death. The disease forced human beings to stay at home to protect humankind. Due to the serious nature of this COVID- 19 pandemic, humankind was forced to understand the plausible cause and methods to reduce the spread and find out the best possible therapeutic regimen. Thus, the present review provided new insight into the history, symptoms, pathogenesis, diagnosis, clinical research, and follow-up treatment strategies of COVID-19. Further, In order to deal with such a pandemic situation, we have even introduced a novel concept of natural therapy based on medicinal plants for repurposing it as potential as a therapeutic warrior against COVID-19.	
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Novel Coronavirus: An Overview of the History, Pathophysiology, Diagnosis, and Management of the Pandemic COVID-19 Catastrophe, with Special Emphasis on Herbal Treatment Alternatives

In Press, (this is not the final "Version of Record"). Available online 18 July, 2024

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Review Article

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Abstract

The crisis of COVID-19 pandemic, has shaken up the whole world with its power of transmission and unknown treatment strategy. A disease that starts with fever, cold, and cough leads to extreme fatigue, loss in breathing capacity, alveolar damage, and eventual death. The disease forced human beings to stay at home to protect humankind. Due to the serious nature of this COVID- 19 pandemic, humankind was forced to understand the plausible cause and methods to reduce the spread and find out the best possible therapeutic regimen. Thus, the present review provided new insight into the history, symptoms, pathogenesis, diagnosis, clinical research, and follow-up treatment strategies of COVID-19. Further, In order to deal with such a pandemic situation, we have even introduced a novel concept of natural therapy based on medicinal plants for repurposing it as potential as a therapeutic warrior against COVID-19.

Keywords: COVID-19, Coronavirus, pathogenesis, diagnosis, treatment strategies.

Home / Micro and Nanosystems, Volume 16, Number 1

Development and *In vitro* Assessment of Topical Microemulsion Based Pluronic-Lecithin Organogel for the Management of Arthritic Pain

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Authors: Yadav, Abhishek; Jhawat, Vikas; Singh, Rahul P.; Chauhan, Sunita; Dutt, Rohit; Goyal, Rajesh; Singh, Deependra Source: Micro and Nanosystems, Volume 16, Number 1, 2024, pp. 36-45(10)
Publisher: Bentham Science Publishers
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Background: Topical delivery of NSAIDs through organogels might transport lornoxicam to the site of action, minimizing gastrointestinal problems and adverse effects.

Methods: In the current investigation, a lecithin organogel containing lornoxicam was made by microemulsion method. For this purpose, a certain amount of pure soya lecithin was dispersed in suitable isopropyl myristate as a dispersant and emulsifier at room temperature to form the oily phase. The lecithin was completely dissolved in the combination by the next morning. Sorbic acid was then added to the mixture as a preservative, Pluronic F-127 and potassium sorbate were weighed out, and then they were mixed with cold water to create an aqueous phase, and menthol was added. On the next morning, lornoxicam, the active component, became soluble in polyethylene glycol-400 and combined with the lecithin isopropyl palmitate mixture. The oily portion was agitated using a mechanical stirrer at 400 rpm while the aqueous phase was introduced gradually.

Results: The lornoxicam organogel preparation was it was assessed for its physical appearance, organoleptic characteristics, consistency, gelation temperature, drug content, and in vitro release studies. The active ingredient content of formulation F5 was the highest at 93.33. Formulations F4 and F5 were selected for kinetic studies because they had all physical characteristics under reasonable limits, the active ingredient level was the greatest, and the active ingredient release was the fastest in eight hours.

Conclusion: The transdermal organogel formulation of lornoxicam was found to be effective for topical distribution of the drug and when administered topically, it has strong anti-inflammatory and anti-rheumatic action.

Keywords: NSAIDs; Pluronic; arthritis; lecithin; organogels; pain management; topical delivery

Document Type: Research Article

REVIEW ARTICLE



Role and uptake of metal-based nanoconstructs as targeted therapeutic carriers for rheumatoid arthritis

Shradha Devi Dwivedi¹ · Anita Bhoi² · Madhulika Pradhan³ · Keshav Kant Sahu² · Deependra Singh¹ · Manju Rawat Singh¹

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Abstract

Rheumatoid Arthritis (RA) is a chronic autoimmune systemic inflammatory disease that affects the joints and other vital organs and diminishes the quality of life. The current developments and innovative treatment options have significantly slowed disease progression and improved their quality of life. Medicaments can be delivered to the inflamed synovium via nanoparticle systems, minimizing systemic and undesirable side effects. Numerous nanoparticles such as polymeric, liposomal, and metallic nanoparticles reported are impending as a good carrier with therapeutic properties. Other issues to be considered along are nontoxicity, nanosize, charge, optical property, and ease of high surface functionalization that make them suitable carriers for drug delivery. Metallic nanoparticles (MNPs) (such as silver, gold, zinc, iron, titanium oxide, and selenium) not only act as good carrier with desired optical property, and high surface modification ability but also have their own therapeutical potential such as anti-oxidant, anti-inflammatory, and anti-arthritic properties, making them one of the most promising options for RA treatment. Regardless, cellular uptake of MNPs is one of the most significant criterions for targeting the medication. This paper discusses the numerous interactions of nanoparticles with cells, as well as cellular uptake of NPs. This review provides the mechanistic overview on MNPs involved in RA therapies and regulation anti-arthritis response such as ability to reduce oxidative stress, suppressing the release of proinflammatory cytokines and expression of LPS induced COX-2, and modulation of MAPK and PI3K pathways in Kuppfer cells and hepatic stellate cells. Despite of that MNPs have also ability to regulates enzymes like glutathione peroxidases (GPxs), thioredoxin reductases (TrxRs) and act as an anti-inflammatory agent.

Keywords Rheumatoid arthritis · Metallic nanoparticle · Targeting · Cellular uptake

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Introduction

Rheumatoid Arthritis (RA) is a chronic systemic autoimmune disorder. It is characterized by the destruction of bone and cartilage inflammation at a synovial site, leading to enhanced mortality disability and reduced quality of life. (Song et al. 2021; Devi Dwivedi et al. 2023) Out of 100,000 of the total population, 40 persons are affected by RA, more significant than 0.5 to 1%. It commonly starts at the age of 40 to 60 years (Zheng et al. 2021). According to the Global Burden of Disease 2010, the prevalence of RA in women is almost three times greater than in males which is usually one female in 28 and one male in 59. RA can develop at any stage of life. Women between the ages of 30 and 60 are more likely than males to acquire RA (Brennan-Olsen et al. 2017). Advancement in RA therapy was associated with the joint damage, inhibition, control the progression of disease



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Keywords Rheumatoid arthritis · Metallic nanoparticle · Targeting · Cellular uptake

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Formulation and characterization of Liposomal Fluconazole Transdermal Patch

PDF (https://jchr.org/index.php/JCHR/article/view/4473/2920)

Keywords:

metabolic degradation, liposomal formulation, antifungal medication, liposomal fluconazole transdermal patch

Amol Chandekar, Bindesh Thakkar, <mark>Amber Vyas,</mark> Vishal Jain, Mohan Kale, Kshitij Thorat, Shweta Shelke, Saniya Nachan, Gautami Telang, Atul Tripathi

Abstract

Introduction

Fluconazole, a prominent triazole antifungal medication, is utilized to manage a broad range of Candida infections. It has been approved by the FDA for various systemic and superficial fungal conditions, including vaginal, oropharyngeal, and esophageal candidiasis. The effectiveness of fluconazole can be significantly improved through innovative drug delivery systems.

Objectives

The main objective of this study is to develop and characterize a liposomal fluconazole transdermal patch aimed at enhancing drug delivery. This involves improving systemic absorption, reducing gastrointestinal side effects, and preventing metabolic degradation.

Methods

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Regulatory Frameworks for Integrated Medicine Management in USA, Europe, Japan, and China

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Formulation and characterization of Liposomal Fluconazole Transdermal Patch

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KEYWORDS	ABSTRACT:
metabolic	Introduction
degradation,	Fluconazole, a prominent triazole antifungal medication, is utilized to manage a broad range of
liposomal	Candida infections. It has been approved by the FDA for various systemic and superficial fungal
formulation,	conditions, including vaginal, oropharyngeal, and esophageal candidiasis. The effectiveness of
antifungal	fluconazole can be significantly improved through innovative drug delivery systems.
medication,	Objectives
liposomal	The main objective of this study is to develop and characterize a liposomal fluconazole transdermal
fluconazole	patch aimed at enhancing drug delivery. This involves improving systemic absorption, reducing
transdermal	gastrointestinal side effects, and preventing metabolic degradation.
patch	Methods
	This research involved the development of a liposomal formulation using a thin film hydration
	method and its subsequent incorporation into a transdermal patch. The patch was made using a
	matrix composed of glycerine, gelatin, and hydroxypropyl methylcellulose (HPMC). Key
	parameters measured included drug content, moisture content and uptake, uniformity of weight,
	thickness, antifungal activity, and in-vivo drug release.
	Results
	The developed transdermal patches demonstrated promising pharmacokinetic properties. Key
	findings include: Uniformity of Weight: Patches showed high uniformity with percentages ranging
	from 93±0.4% to 96±0.3%. Thickness: The patches maintained consistent thickness measurements,
	varying from 4.1±0.03 mm to 4.3±0.04 mm. Moisture Content and Uptake: Moisture content was
	low, with percentages around 0.57±0.005% to 0.82±0.006%, and moisture uptake also remained
	under 1%. Drug Content: Drug content was robust across different formulations, ranging from
	84±0.5% to 89±0.4%. In-vitro Drug Release: Drug release showed increasing absorbance over time,
	with significant releases observed at 30 minutes, 1 hour, and 2 hours, confirming a sustained release
	profile. Antifungal Activity: The patches displayed effective antifungal properties, with zones of
	inhibition indicating fungistatic activity against Candida albicans.
	Conclusion
	The liposomal fluconazole transdermal patch represents a significant advancement in antifungal
	medication delivery. It not only reduces the side effects associated with oral administration but also
	enhances bioavailability and effectiveness. The patches demonstrated a consistent and controlled
	release of fluconazole, improved drug content uniformity, and effective antifungal activity, making
	them a viable alternative to traditional fluconazole treatment methods. This innovation is expected
	to improve patient compliance and overall treatment outcomes for fungal infections.



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Skill test battery in Kho-Kho for women

Rinku Tiwari, Reeta Venugopal and Aniksha Varoda

Abstract

The purpose of the study was to develop test for assessment of skill ability of women Kho-Kho players. Kho-Kho playing ability demands speed, agility, coordination, balances and flexibility. The test items constructed were administered to 60 female Kho-Kho players, age range between 17 to 25 years. Factor analysis was employed to analyze the data. Two factors were identified offensive skill test with five items and defensive skill test with three items. The test constructed will help the coaches, trainer and teachers for selection, of the players, to monitor performance to predict the performance and for other purposes.

Keywords: Kho-Kho, indigenous sports and women players

Introduction

Skill test is a tool which can be used to assess performance of a player and provides unbiased and validated evaluation. Skill test assess a player in variety of positions and situations which actually occurs during play. This kind of tests which assess skill outcomes in games and sports are used by coaches and researchers, to estimate player's ability and also for talent identification. Sports specific technical skill test is important to differentiate among the players of different caliber and also useful in predicting performance ^[1].

Kho-Kho is one of the popular traditional sports in India. The origin of Kho-Kho is difficult to trace, but many historians believe, that it is a modified form of 'Run Chase', which in its simplest form involves chasing and touching a person ^[2]. KhoKho is a traditional Indian sport that dates back to ancient India and is believed to have been mentioned in the Mahabharata, an epic that narrates the war between two sets of royal cousins ^[3].

With its origins in Maharashtra, Kho-Kho in ancient times, was played on 'raths' or chariots, in premorden times and was known as Rathera ^[2, 3]. The present form of the game, played by individuals on foot, was invented in 1914 by Pune's Deccan Gymkhana club12 Kho-Kho is a tag game where one team tries to chase and touch the members of the other team while the other team tries to avoid being touched ^[4, 5, 6].

Like other indigenous games, Kho-Kho is simple, inexpensive and enjoyable and game of high alertness. The game demands high level of physical fitness specifically speed, agility and endurance, dodging and feinting along with mental toughness. Kho Kho is widely played across South Asia and also has a presence in some regions outside South Asia, such as South Africa and England ^[4]. It is a competitive game and has been demonstrated at the 1936 Berlin Olympics and the 1982 Asian Games ^[5]. It is also a medal sport in the South Asian Games ^[2] The first league of its kind called Ultimate Kho-Kho was launched in India in August 2021(1) Kho-Kho has been recognized by the International Kho-Kho Federation (IKF) and is played at the national and international levels ^[3, 4]. In India, the Kho-Kho Federation of India (KKFI) governs the sport and organizes national championships and selection trials for international competitions ^[5, 6, 7].

Assessing sports-specific technical skills plays a vital role in classifying players, selecting individuals for teams, and designing effective training programs ^[7, 8, 9]. The evaluation of these skills provides insights into an athlete's unique abilities and their capacity to perform in specific positions. Consequently, researchers continuously strive to develop comprehensive tests that accurately assess performance across a wide range of sports and games ^[10, 11, 12]. Skill test in Kho-Kho for different age and gender have developed. Test items ewer also developed for female players in Kho-Kho and other indigenous sports like Kabaddi ^[14, 15, 16].

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IMPACT OF SAHAJA YOGA MEDITATION ON INTELLIGENCE IN RELATION TO DIFFERENT AGE GROUPS

Pooja Sonkar, Dr. Rajeev Choudhary

¹² school of studies in Physical Education, Raipur

Abstract:

Objective: This study on SYM (Sahaja Yoga Meditation) was administered with a aim to investigate the significant impact of a meditation method named Sahaja Yoga Meditation (SYM) on cognitive intelligence, with a focus on understanding its effects across different age groups.

Introduction: Sahaja Yoga Meditation (SYM), a practice established by Dr. Nirmala Chandrika Prasad Srivastava in 1970, is known for its significant potential and required benefits in promoting mental and spiritual well-being. SYM emphasizes achieving a state of thoughtless awareness or mental silence, which is recognised a shape of advanced meditation practices. Previous research conducted on Sahaja Yoga Meditation has suggested that SYM could positively influence psychological and physiological health. However, its specific impact on cognitive intelligence remains underexplored. This study seeks to address this gap by assessing the significant relationship between the variables, SYM and intelligence in varying age groups.

Materials and Methods: The study involved 300 participants, divided into SYM practitioners and non-practitioners, with 150 subjects in each group. Participants / subject were divided equality into two age groups: 20-30 years and 30-40 years. Intelligence was data were collected systematically adoptability standard procedure from different colleges and SYM centres in Raipur, Chhattisgarh. Statistical technique named, between-between two-way factorial Analysis of Variance (ANOVA) was employed to find out the significant effects of SYM and age on intelligence.

Results: The analysis showed that SYM practitioners exhibited significantly higher intelligence scores compared to non-practitioners across both age groups. Specifically, SYM practitioners scored an average of 63.97 and 65.05 in the 20-30 and 30-40 age groups, respectively, while non-practitioners scored 41.24 and 44.14. The results of the two-way ANOVA indicated a substantial effect of SYM on intelligence (F = 760.038, p < 0.05), with a Effect Size (Partial Eta Squared value) of .72, suggesting that SYM accounts for 72% of the change/variance in intelligence (F = 6.343, p = 0.012), but there no interactional impact of Sahaja Yoga Meditation and different age group on depended variable, intelligence (F = 1.332, p = 0.249).

Conclusion: The study provides significant proof that Sahaja Yoga Meditation positively impacts cognitive intelligence, with significant improvements observed among practitioners compared to non-practitioners. The benefits of SYM appear consistent across different selected age groups, suggesting its broad applicability as a cognitive enhancement tool. These findings underscore the potential of SYM to support intellectual development and cognitive health. Research in future my explore the long-term effects of SYM and investigate the underlying mechanisms driving these cognitive benefits.

Keywords: Sahaja Yoga Meditation, Intelligence, Age Groups, Cognitive Performance, Wechsler Adult Intelligence Scale, Meditation Techniques

Sahaja Yoga, established in 1970 by Dr. Nirmala Chandrika Prasad Srivastava, is practiced freely in over 140 countries, including India. Seasoned practitioners of Sahaja Yoga Meditation have reported numerous advantages leading to enhanced overall well-being in contemporary times [Rathor et al., 2020]. Sahaja Yoga has shown the ability to mitigate depression and potentially alleviate anxiety. Furthermore, engaging in Sahaja Yoga practice correlates with enhanced subjective well-being and psychological wellness [Hendriks, 2018]. Inner conflicts have ceased, leaving us with a tranquil and conscious mind. Within every individual, there exists a system of nerves and sensory organs known as channels (Nadis) and

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Introduction:

Sahaja Yoga (SY) is an exceptional meditation technique encompassing both spiritual and practical dimensions. While traditionally acknowledged for promoting spiritual and mental health, SY is also linked to nuanced effects on certain physiological systems [Yalta et al., 2011]. Sahaja Yoga Meditation (SYM) is notably intriguing as a method of meditation because it instructs practitioners to attain a condition of mental silence or thoughtless awareness, where thoughts are either suppressed or significantly diminished. This state is recognized as the ultimate objective of meditation, as delineated in ancient yoga texts [Barrós-Loscertales et al., 2021].



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Abstract: Various types of literature reviews and bibliometric analysis have been conducted to identify, access, or synthesize the findings, recurring themes, emerging patterns, research gaps, and employed methodologies within the domains of Sahaja Yoga Meditation (SYM) and Meditation Studies. In recent years, advancements in technology have empowered researchers to scrutinize literature about Sahaja Yoga Meditation and Meditation in a more reliable and objective manner. The primary objective of this investigation is to provide an exhaustive exposition of Sahaja Yoga Meditation (SYM) and meditation research through bibliometric methodologies. Additionally, this study seeks to visually represent and unveil the evolving conceptual and intellectual landscape within this scholarly arena. To achieve these objectives, the investigator conducted a co-occurrence analysis and generated visual maps using articles sourced from PubMed. Employing VOS viewer software, a series of bibliometric analyses were undertaken. In the Sahaja Yoga Meditation research, meticulous co-occurrence analysis of 111 keywords revealed pivotal associations. "Humans", "Adults," "Yoga," and "Meditation" were predominant. Gender, age, and neurological aspects were evident. This analysis outlines key dimensions. Within meditation research, an analysis of 9,675 keywords identified 19 critical themes. "Meditation", "Humans," "Gender," "Age Group," "Mindfulness," and "Psychological Aspects" featured prominently. This comprehensive analysis of bibliometric analysis offers important and valuable insights in relation to both fields, guiding further exploration. The paper illuminates the complex realm of Sahaja Yoga Meditation (SYM) and general meditation research, revealing their multifaceted aspects, including diverse populations, demographics, neuroscience, therapy, and research methods. These insights aid researchers in mapping trends and guiding future meditation studies, offering a valuable contribution through bibliometric analysis.

Keywords: Co-occurrence, Network visualization, Overlay visualization, Density visualization

Introduction:

Meditation, an encompassing term that encompasses a diverse array of practices, primarily centers on the introspective exploration of both the body and the mind. In the context of Western approaches, the primary objective of most meditation methods revolves around attaining enhanced command over attention and emotions, thereby fostering a more harmonious, stress-free, and healthier lifestyle. In contrast, yoga encompasses many techniques, with meditation (referred to as dhyana in classical yoga) occupying a central position. Delving into the origins of yoga, the inaugural known treatise, , "The Yoga Sutras of Patanjali," underscores the fundamental tenet that "Yoga is the suppression of the modifications of the mind [1]. Meditation encompasses a diverse array of contemplative techniques, , each geared towards enhancing consciousness, fostering inner harmony, and alleviating stress, among other objectives. The profound impact of meditation on consciousness and awareness has ignited the curiosity of neuroscientists, prompting extensive investigations into its effects on the human brain. Extensive research within the realm of neuroscience has unveiled intriguing correlations between the transformative experiences brought forth by meditation practices and the consequential structural and functional alterations within the brain This revelation emerges through both longitudinal studies, which chart the evolution of meditative experiences over time, and cross-sectional studies, where distinctions in brain structure and function surface when comparing seasoned meditators to neophytes or individuals who abstain from meditation altogether [2].

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The Influence of Sahaja Yoga Meditation on Perceived Freedom: A Gender-Based Analysis

Prof. Rajeev Choudhary

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Abstract

This study examines the impact of Sahaja Yoga Meditation (SYM) on freedom in relation to gender, positioning it within the broader framework of sustainable development. Yoga and meditation are recognized and known for their significant benefits in enhancing cognitive function, emotional stability, and overall health. Among various meditative practices, SYM uniquely fosters a state of thoughtless awareness, facilitating self-regulation and emotional resilience. This research employs a 2 x 2 factorial design, including 400 subjects from Chhattisgarh State, stratified by gender and meditation practice. Freedom was assessed using the Sustainable Development Survey Scale (SDSS). The results reveal that SYM practitioners exhibit significantly higher freedom scores than non-practitioners, indicating the transformative role of meditation in fostering autonomy and self-expression. Statistically Significant gender differences were also observed, with female participants reporting greater levels of perceived freedom compared to their male counterparts. However, related to interaction between gender and meditation practice was not found statistically significant, suggesting that the benefits of SYM in enhancing freedom are universally experienced across genders. The findings underscore the neurocognitive and psychological mechanisms through which SYM influences self-awareness and emotional regulation. Additionally, the study highlights the relevance of SYM in achieving Sustainable Development Goals (SDGs), particularly in promoting mental well-being and gender equality. These results significantly contribute to the growing body of literature advocating for the integration of the practice of meditation into mental health and sustainable development policies. Future research should explore the long-term implications of SYM on freedom, incorporating diverse cultural and demographic variables to further elucidate its transformative potential.

F Impact of Sahaja Yoga Meditation on Equality in Relation to Gender

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Impact of Sahaja Yoga Meditation on Equality in Relation t

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The present study investigated the significant impact of SYM on gender equi influence on psychological constructs such as self-awareness, emotional n resilience. Gender equality, a pivotal component of social justice and sust necessitates not only structural reforms but also psychological and behavioura entrenched biases. The study employed a 2 x 2 factorial design to assess and impact of SYM on the perception the selected variable named equality among Chhattisgarh, stratified by gender (male and female) and meditation practice (practitioners). Participants with a minimum of five years of consistent SYM p ensuring homogeneity in meditative experience. The Sustainable Development was utilized to measure perceived freedom, an essential indicator of gend analysed using a two-way factorial ANOVA to determine and to find out meditation and gender, also their interaction effects on equality perceptions. I SYM practitioners, irrespective of gender, exhibited significantly higher compared to non-practitioners, indicating the meditation's role in fostering a Female practitioners demonstrated a marginally greater inclination towa comparison to their male counterparts, suggesting potential gender-specifi challenging social conditioning. Furthermore, neurophysiological insights sugge prefrontal cortex activation, reducing implicit biases and fostering inclusive Vishuddhi and Agnya chakras, associated with communication and perception, dismantling prejudices and promoting collective harmony. These findings unde as an intervention for advancing gender equality by cultivating cognitive fle self-awareness. The study highlights the necessity of integrating medi educational and policy frameworks to complement structural efforts aimed at research should explore the intersection of SYM with neuropsychology and gen holistic interventions for fostering societal transformation.

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MAPPING THEMATIC TRENDS IN SUSTAINABLE DEVELOPMENT GOALS LITERATURE: A BIBLIOMETRIC STUDY RAJEEV CHOUDHARY*

ABSTRACT

This research paper employs a comprehensive bibliometric analysis to explore the thematic trends and research dynamics within the realm of SDGs (Sustainable Development Goals). Using data retrieved from the Web of Science Core Collection up to March 12, 2024, the researcher analysed 35,586 records to identify key research areas, emerging topics, and gaps in the SDG literature. The study utilized VOS viewer 1.6.19 software to create network, overlay, and density visualizations showing the relationships and prominence of various SDG keywords. The findings reveal that "SDG," "Sustainable Development," "Governance," and "Sustainability" are the most central terms, indicating a strong focus on these core concepts. Key analytical tools and evaluative measures such as "Indicators," "Trade-offs," and "Science" frequently co-occur, highlighting their importance in SDG research. Emerging areas of interest, particularly "Climate Change" and "Energy," are identified through overlay visualizations, reflecting their increasing relevance in the global sustainability agenda. Density visualizations pinpoint well-established research areas, with significant clusters in health, education, and governance, while identifying less explored topics like sustainable tourism and global governance. The analysis underscores the necessity for integrated policy approaches that account for the interdependencies among SDG targets. It also stresses the critical role of effective monitoring and data collection systems in ensuring substantive progress. By mapping the current state of SDG research, this study provides a strategic framework for future research directions, emphasizing the need to address identified gaps and enhance the overall impact of sustainable development efforts. This work serves as an important and valuable resource for academicians, researchers, and policymakers aiming to fructiferous and advance the global sustainability agenda. Keywords: Sustainable Development Goals (SDGs), Sustainable Development, Governance. Indicators, Trade-offs.

1. INTRODUCTION

The history of sustainable development has often revolved around efforts centred on a single important point, sidelining other elements. Typically, these efforts involved a narrow range of participants and overlooked the present need for systemic changes. In the 1990s, Agenda 21 implementation focused on governments addressing transnational environmental issues and international development through trade policies. This led to new trade agreements and UN conventions on various ecological challenges. However, the Johannesburg Summit introduced a different approach, emphasizing voluntary transnational partnerships involving UN agencies, international organizations, donors, and NGOs, with less emphasis on policy coherence [Horan, 2019].

The SDGs (Sustainable Development Goals) offer a comprehensive, evidence-driven framework of targets and indicators designed to facilitate national planning and reporting [Allen et al., 2019]. The SDG systems model is structured around the interplay among SDG targets. Through correlation analysis, pairs of globally representative synergies and trade-offs are identified and converted into directional connections that influence the model's development. These connections are subsequently merged into the initial SDG systems model [Anderson et al., 2022].

The primary aim of the SDGs is theoretically centred around achieving "sustainable development." However, there's a common interpretation of "development" that aligns with the ongoing growth trajectories of "developed" nations, primarily focusing on GDP expansion, rather than emphasizing the fundamental concept of enhancing overall quality of life [Kubiszewski et al., 2022]. Within the 2030 Agenda, the UN (United Nations) has expressly made it mandatory for Member States to implement new regulatory frameworks regarding non-financial reporting practices within their jurisdictions [Pizzi et al., 2021].

The United Nations General Assembly embraced the 2030 Agenda in September 2015, outlining an ambitious vision to effect transformative change to achieve a sustainable future by 2030.

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Kho Athletes

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Correlating Physical Fitness and Performance Met Athletes

Harshita Tripathi^{1*}, Dr. Pankaj Pandey², Dr. Rajeev Ch

^{1*}Research Scholar, Amity University, Noida, Uttar Pradesh, In ²Assitant Professor, Amity University, Noida, Uttar Pradesh, In ³Professor in Physical Education, Pt. Ravi Shankar University, Raipur

Abstract

Kho-Kho, a dynamic indigenous sport, demands exceptional agility, velocity, endurance, limited scientific inquiry has explored the physiological determinants influencing play investigates the interplay between key fitness parameters and performance indicators in co athletes, focusing on resting heart rate (RHR), reaction time, speed, Body Mass Index (E strength. A cohort of 30 female players, aged 18-25 years and actively competing at the u selected through purposive sampling, with standardized protocols employed for assessment. revealed that agility and speed exhibit the most pronounced relationship with performance, in the sport. A lower RHR correlated with superior endurance, enabling sustained high explosive strength augmented sprinting prowess and rapid directional shifts, both integ Additionally, reaction time emerged as a pivotal factor in executing swift gameplay maneu the necessity of sport-specific conditioning regimens that prioritize agility, cardiovascula power, equipping coaches and sports scientists with empirical insights to refine training meti capabilities, and foster talent identification.

Keywords: Kho-Kho, agility, speed, explosive strength, reaction time, sports physiology, pe

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Regular Physical Exercise And Self Acceptance In Elderly Women: An Experimental Study

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Abstract: In positive mental health, self-acceptance promotes inner harmony, reduces anxiety and depression, and enhances personal growth and life satisfaction, laying the foundation for meaningful relationships and overall emotional resilience. Hence self acceptance is an integral part of positive mental health. Studies in this area have strongly advocated the benefits of regular physical exercise in enhancing mood states but its efficacy in improving self-acceptace component of positive mental health is not conclusive with a lack of scientific studies in the elderly population. 100 elderly women from Raipur district of Chhattisgarh were selected purposively. Only those women with low levels of self-acceptance were selected. 50 elderly women were placed in the experimental group while the remaining 50 elderly women constituted the control group. To assess self-acceptance in elderly females, a positive mental health inventory of Agashe and Helode (2007) was used. The results reveal a significant increase in self acceptance of elderly women of the experimental group during the 06 months study period (F=48.11, p < .01). Although a significant difference in self acceptance of elderly women was also observed (F=10.49, p<.01) but it lacks uniformity. The gain score comparison further revealed that the self acceptance of elderly women from the experimental group was increased significantly as compared to elderly women in the control group. It was concluded that the sixmonth interventional physical exercise program proved effective in improving the self-acceptance component of positive mental health among elderly women. Therefore, integrating a structured physical exercise routine into their daily lives is recommended to promote greater self-acceptance.

Index Terms - Interventional physical exercise program, Elderly women, self-acceptance

Introduction

A key component described in positive mental health is self-acceptance. The meaning of the term self-acceptance is accepting our strengths, weaknesses and shortcomings. Self-acceptance is recognition of work done by a person irrespective of achievements, mistakes during their work or criticism made by others. With a fair amount of self-acceptance, a person can face life challenges with confidence and honesty because of fair knowledge of own weaknesses and strengths. There is no condition involved in self-acceptance which is the opposite of self-esteem where a comparison of a person's achievements is made with the yardstick of some norms. When a person develops self-acceptance, he consolidates his mental state which is essential for optimism, resilience and emotional balance. When a person accepts himself, his reliance on others for approval is less because he is not afraid of rejection. Hence self-acceptance, allows us to live a happy life while handling challenges effectively and thereby grow continuously as human being. Strupp and Hadley (1977) also conceived mental health in its positive perspectives. This model has considered self-acceptance, ego strength and philosophy of human nature/life as the major components of positive mental health. In positive mental health, self-acceptance promotes inner harmony, reduces anxiety and depression, and enhances personal growth and life satisfaction, laying the foundation for meaningful relationships and overall emotional resilience. Hence self-acceptance is an integral part of positive mental health.

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ORIGINAL ARTICLE



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Achieving structural, photoluminescence, temperature dependent photoluminescence and thermo-luminescence properties of SrAl₂O₄:Dy³⁺Eu³⁺ phosphor for WLED application

Akshkumar Verma¹ · Dipti Sahu¹ · D. P. Bisen¹ · Nameeta Brahme¹ · Priya Barik² · I. P. Sahu² · Chandni Kumari³ · Prerna Gupta⁴

2023-24

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Abstract

We present the SrAl₂O₄:Dy, SrAl₂O₄:Eu, & SrAl₂O₄:Dy³⁺Eu³⁺ phosphors and these samples were prepared by using the urea fuel combustion method at 550 °C. X-ray diffraction pattern indicates monoclinic structure and good crystallinity, Result of Scanning Electron Microscopy (SEM) and Energy Dispersive X-ray (EDX) spectra is exhibited synthesized compound were pure and overall good morphology. By the Brunauer-Emmett-Teller (BET) surface area analyzer, surface area was found 30.462 m²/g of SrAl₂O₄:Dy_{0.03}Eu_{0.04}. homogeneity, rotational, and vibrational properties were also investigated by FTIR and Raman spectroscopy. By the help of UV-visible spectroscopy band gap (~5 eV) was calculated. The photoluminescence properties were studied of SrAl₂O₄:Dy_x, SrAl₂O₄:Eu_x, & SrAl₂O₄:Dy_{0.03}Eu_x (x = 0.01 to 0.05) samples. In this order, we have found best $SrAl_2O_4:Dy_{0.03}Eu_{0.04}$ photoluminescent sample rather than other samples. The CIE-1931 color coordinate (0.3103, 0.3035), CCT (6914 K), CRI (94), and color purity (89.1%) were calculated of the SrAl₂O₄:Dy_{0.03}Eu_{0.04} phosphor. Temperature-dependent photoluminescence spectra were measured of SrAl₂O₄:Dy_{0.03}Eu_{0.04} phosphor by 395 nm excitation wavelength. Thermoluminescence glow curve were measured of synthesized phosphors and it is exposed to UV radiation (254 nm). Thermo-luminescence trapping parameters, activation energy and average frequency factor were calculated by Chens peak shape method. The obtained SrAl₂O₄Eu_{0.05}Dy_{0.04} is fine phosphor and it has good PL, TL properties due to perfect doping concentration of Dy and Eu, higher elemental purity and perfect crystalline morphology. Therefore, SrAl₂O₄-based phosphor activated by Dy and Eu metals may be used for future prospective WLEDs applications.

Highlights

- 1. First time SrAl2O4:Dy3+Eu3+nano phosphor synthesis by urea fuel combustion route.
- 2. Crystallinity, Particle Size, morphology, and Surface area estimated by XRD, SEM, and BET.
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ORIGINAL ARTICLE



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ORIGINAL ARTICLE



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ACS APPLIED OPTICAL MATERIALS

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Unveiling the Potential of Sm³⁺ Doped Li₂SrSiO₄ Phosphor for UVC Dosimetry: Comprehensive Analysis with Synthesis, Morphological, Elemental and Thermoluminescence Studies

Kanchan Tiwari,* Balgopal Sharma, Nameeta Brahme, Durga Prasad Bisen, Tripti Richhariya, Dipti Sahu, Kiran Verma, Garima Dewangan, and Akesh Kumar

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Sm³⁺ doped Li₂SrSiO₄ (LSS) phosphors using the solid-state reaction method was done. Phase identification, morphological and elemental analysis was investigated using X-ray diffraction, FESEM and EDX analyses, respectively. The experiments provided the proof of existence of constituent elements and surface morphology of phosphor under different magnification. Sm³⁺ doped Li₂SrSiO₄ phosphor's thermoluminescence properties are reported for the first time. Thermoluminescence experiments were conducted, and the highest intensity was observed at 1 mol % doping concentration of Sm³⁺ contained a single glow curve at ~238 °C. Furthermore, the study revealed that TL intensity exhibited a linear relationship with UV-C irradiation, and also, repeatability, fading, and filter analysis were probed. Fading tests, $T_m - T_{etco}$ method and E_a –



and filter analysis were probed. Fading tests, $T_m - T_{stop}$ method and $E_a - T_{stop}$ methods suggested the existence of a single trap. Various other methods were performed to evaluate the kinetic parameters and their reliability in estimating trapping parameters for a single glow curve. These findings collectively support the potential of LSS:Sm³⁺ phosphor for UVC dosimetry, marking a significant contribution to the understanding of its TL properties and defect states.

KEYWORDS: Thermoluminescence, UVC dosimetry, Kinetic Parameters, Activation Energy, Frequency Factor, Inorganic Phosphor, Glow Curve

1. INTRODUCTION

Thermoluminescence (TL) is an important kind of luminescence processe in which the sample absorbs energy from ionizing or nonionizing radiation and then releases that energy as visible light after thermal stimulation.¹ The emission is exhibited due to structural defects brought on by doping in the host lattice. Such defects get located in the band gap and can drastically change the luminescence characteristics of materials by trapping charge carriers in localized energy levels.² Hence, by evaluating the kinetic parameters of the lattice using TL, the formation of electronic trap levels caused by dopant ions can be studied. Applications of TL include radiation dosimetry in the environment, medical diagnostics, radiology, cosmic radiation detection, bone dosimetry, toxicity studies, aeroplane safety, accidental dosimetry and personal dosimetric monitoring.^{3,4}

To determine, anticipate or restrict the impact of radiation, a dosimeter is used to measure the energy deposited in a living or nonliving object from a radiation field.⁵ A commercial dosimeter needs to have a decent effective atomic number, a

low rate of fading, sensitivity, thermal and chemical stability, as well as a commercial shape and size according to uses. For dosimetric applications, a lot of commercial materials such as $CaSO_4:Dy$, LiF:Mg-Ti, LiF:Mg-Cu-P, CaF₂, Li₂B₄O₇:Cu, Li₂B₄O₇:Mn, BeO and Al₂O₃:C, K₂Ca₂(SO₄)₃:Eu,Ce are used.⁴⁻⁶ Commercial dosimeters made with LiF:Mg,Ti and LiF:Mg,Cu,P are known as TLD-100 and TLD-100H respectively.⁷ These materials are still being thoroughly studied today with various doped impurities since doping increases the defects levels and trapping centers, which helps to improve the luminescence characteristics and dosimetric behavior.⁶ As well, the scientific community is constantly investigating TL in novel materials in search of better and more effective

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Article

Synthesis

Unveiling the Potential of Sm³⁺ Doped Li₂SrSiO₄ Phosphor for UVC Dosimetry: Comprehensive Analysis with Synthesis, Morphological, Elemental and Thermoluminescence Studies

Kanchan Tiwari,* Balgopal Sharma, Nameeta Brahme, Durga Prasad Bisen, Tripti Richhariya, Dipti Sahu, Kiran Verma, Garima Dewangan, and Akesh Kumar

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ABSTRACT: In the pr Sm ³⁺ doped Li ₂ SrSiO ₄ method was done. Ph analysis was investigat analyses, respectively. T constituent elements different magnification. nescence properties are	esent study, the successful synthesis of a series (LSS) phosphors using the solid-state react ase identification, morphological and elemened using X-ray diffraction, FESEM and E he experiments provided the proof of existence and surface morphology of phosphor un Sm^{3+} doped Li ₂ SrSiO ₄ phosphor's thermolu reported for the first time. Thermoluminesce	of ion htal DX e of der mi- nce + 1	Li ₂ SrSiO ₄ : S	Sm ³⁺ Phosphor	

experiments were conducted, and the highest intensity was observed at 1 mol % doping concentration of Sm^{3+} contained a single glow curve at ~238 °C. Furthermore, the study revealed that TL intensity exhibited a linear relationship with UV-C irradiation, and also, repeatability, fading, and filter analysis were probed. Fading tests, $T_m - T_{\text{stop}}$ method and $E_a - T_m$ methods were n

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KEYWORDS: Thermoluminescence, UVC dosimetry, Kinetic Parameters, Activation Energy, Frequency Factor, Inorganic Phosphor, Glow Curve

1. INTRODUCTION

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To determine, anticipate or restrict the impact of radiation, a dosimeter is used to measure the energy deposited in a living or nonliving object from a radiation field.⁵ A commercial dosimeter needs to have a decent effective atomic number, a

low rate of fading, sensitivity, thermal and chemical stability, as well as a commercial shape and size according to uses. For dosimetric applications, a lot of commercial materials such as $CaSO_4:Dy$, LiF:Mg-Ti, LiF:Mg-Cu-P, CaF₂, Li₂B₄O₇:Cu, Li₂B₄O₇:Mn, BeO and Al₂O₃:C, K₂Ca₂(SO₄)₃:Eu,Ce are used.⁴⁻⁶ Commercial dosimeters made with LiF:Mg,Ti and LiF:Mg,Cu,P are known as TLD-100 and TLD-100H respectively.⁷ These materials are still being thoroughly studied today with various doped impurities since doping increases the defects levels and trapping centers, which helps to improve the luminescence characteristics and dosimetric behavior.⁶ As well, the scientific community is constantly investigating TL in novel materials in search of better and more effective

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Spectroscopic investigation by incorporation of charge compensator ions in CaBaSiO₄: Dy³⁺ phosphors for solid-state lighting applications

Original Paper Published: 29 April 2024

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Abstract

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Unveiling the Potential of Sm³⁺ Doped Li₂SrSiO₄ Phosphor for UVC Dosimetry: Comprehensive Analysis with Synthesis, Morphological, **Elemental and Thermoluminescence Studies**

2023-24

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Home Journal of Materials Science: Materials in Electronics Article

Studies on structural, photo and thermoluminescence properties of Sm³⁺ activated Ca₃MgSi₂O₈ phosphors for solid-state lighting

Published: 05 May 2024

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Abstract

The samarium activated orange-red-emitting calcium magnesium orthosilicates $[Ca_3MgSi_2O_8:xSm^{3+} (CMSOSM)]$ phosphors with different concentration were synthesized by solid-state reaction method. The monoclinic crystal structure with P21/c space group was confirmed by the PXRD technique. Under the excitation at 405 nm, characteristics emission spectra of Sm³⁺ ions in orange-red region were recorded at 565 nm, 570 nm, 602 nm, and 648 nm due to the transition of ${}^4G_{5/2} \rightarrow {}^6H_{5/2}$, ${}^6H_{7/2}$, ${}^6H_{9/2}$ respectively. The critical doping



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ORIGINAL PAPER



Spectroscopic investigation by incorporation of charge compensator ions in CaBaSiO₄: Dy³⁺ phosphors for solid-state lighting applications

2023-24

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Abstract: In this research paper, we present a study on the preparation and spectroscopic properties of Dy^{3+} -doped calcium barium ortho-silicate (CaBaSiO₄) phosphor. The phosphors were synthesized using the solid-state reaction route. The obtained powders underwent characterization through X-ray diffraction (XRD) and Furrier transform infrared (FTIR), confirming phase purity and the presence of functional groups, respectively. Energy-dispersive X-ray (EDX) reveals the elemental composition of the material under examination. The spectroscopic properties of Dy^{3+} in CaBaSiO₄ phosphor were investigated through emission and excitation spectra analysis. The emission spectra exhibit two peaks in the blue region at 482 nm and in the yellow region at 574 nm under UV excitation with a wavelength of 349 nm. Both emission peaks are attributed to the ${}^{4}F_{9/2} \rightarrow {}^{6}H_{15/2}$ and ${}^{4}F_{9/2} \rightarrow {}^{6}H_{13/2}$ characteristic transitions of the Dy^{3+} ion. The critical distance was calculated using the Blasse equation. Monovalent ions were added to the host as charge compensator ions to enhance the luminescence intensity. The CIE chromaticity coordinates were determined from the emission spectra, affirming that the CaBaSiO₄ phosphor is a suitable candidate for solid-state lighting applications, particularly in w–LEDs.

Keywords: Ortho-silicate; Phosphors; Photoluminescence; Charge compensator ion; w-LEDs

1. Introduction

In the current scenario, the development of highly efficient phosphors is a topic of research due to its widespread use in various areas such as optoelectronic devices, solid-state lasers, scintillation, etc. Researchers have focused on preparing such novel phosphor materials that exhibit excellent luminescent behavior. Nowadays, phosphors have been considered as one of the basic sources of solidstate lighting (SSL) technology. The white light-emitting diode (w-LED) is a new trend and the most usable device in SSL systems because it converts electrical energy into visible light [1]. Other advantages of w-LEDs include long life durability, environment-friendliness, high reliability, low power consumption, etc. [2]. Recently, phosphor materials have been used as the main source of intelligent LEDs. This intelligent LED technique has many advantages, such as they are energy saving, highly efficient, comfortable to use, and are safe in operation [3].

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Nakamura et al. reported phosphor-based w-LEDs for the first time in 1997, opening a new window for research in this field [4]. Recently, two approaches for enhanced production of white light is trending among researchers: (i) the combination of blue light-emitting InGaN chip with yellow phosphor (YAG:Ce) and (ii) UV-LED with blue, green, and red phosphors. Yet, it is evident that high color tolerance and low color rendering index (CRI) are the drawbacks of these two approaches, which are responsible for the reduction in luminescence efficiency [5, 6]. Thus, the main aim of researchers is to develop white lightemitting novel phosphors that overcome the above-mentioned drawbacks. Therefore, phosphors with less complex compositions, high brightness, and good color purity are the fundamental components focused for white light emission [7].

To achieve these characteristics, alkaline earth silicate phosphors play a key role as a host on account of their stable crystal structure, and high thermal and chemical behavior [8]. Recently, alkaline earth silicates have been widely studied as light-emitting phosphor materials. Among the different alkaline earth silicates such as Indian J Phys (November 2024) 98(12):3967–3980 https://doi.org/10.1007/s12648-024-03165-9

ORIGINAL PAPER



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Investigation of photoluminescence and thermoluminescence properties of UV& γ irradiated Li₄SrCa(SiO₄)₂:Dy³⁺ phosphor

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ABSTRACT

A series of Dy³⁺-activated Li₄SrCa(SiO₄)₂ phosphors were synthesized using a high-temperature solid-state reaction method. The crystal structure, surface morphology, elemental analysis and vibrational modes of synthesized phosphor were studied using X-ray Diffraction, Scanning electron microscope, Energy dispersive X-ray spectroscopy and Raman Spectroscopy technique, respectively. Luminescence properties of Li4SrCa(SiO4)2:Dy3+ phosphors were analyzed by photoluminescence (PL) and thermoluminescence (TL) techniques. Photoluminescence spectra of Dy³⁺ doped Li₄SrCa(SiO₄)₂ phosphors were efficiently excited in the range of 300-400 nm and exhibited two emission peaks, positioned at 481 nm (blue) and 575 (yellow) due to ${}^{4}F_{9/2} - {}^{6}H_{15/2}$ and ${}^{4}F_{9/2} - {}^{6}H_{13/2}$ transitions, respectively, under excitation wavelength of 348 nm. CIE colour coordinate (x = 0.2983, y = 0.3151), Colour purity (13.3%), and CCT (7550 K) of the material were calculated which indicated that the prepared phosphor can be used as a white light-emitting phosphor. The TL glow curves of the synthesized phosphor were recorded using a Nucleonix 1009I TLD reader. All synthesized Li₄SrCa(SiO₄)₂:4mol%Dy³⁺ phosphors were exposed to UV rays (254 nm) and γ -rays (⁶⁰Co source). Maximum TL intensity was found for 40 min under UV irradiation (254 nm), and for γ irradiation (dose rate 8 kGy). Trapping parameters like activation energy, frequency factor and order of kinetics were calculated by Chen's peak shape method. The activation energy vs. T_{stop} method verifies the existence of overlapping peaks. In this work the long-lasting glow characteristics of prepared samples using fading measurements, and along with the TL emission spectrum were also investigated. Overall Li4SrCa(SiO4)2:Dy3+ phosphor revealed that the prepared phosphor can be used for excellent WLED phosphor and TLD material for both UV & y based TL dosimetric applications.

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ABSTRACT

A series of Dy3+-activated Li4SrCa(SiO4)2 phosphors were synthesized using a high-temperature solid-state reaction method. The crystal structure, surface morphology, elemental analysis and vibrational modes of synthesized phosphor were studied using X-ray Diffraction, Scanning electron microscope, Energy dispersive X-ray spectroscopy and Raman Spectroscopy technique, respectively. Luminescence properties of Li4SrCa(SiO4)2:Dy3+ phosphors were analyzed by photoluminescence (PL) and thermoluminescence (TL) techniques. Photoluminescence spectra of Dy³⁺ doped Li₄SrCa(SiO₄)₂ phosphors were efficiently excited in the range of 300-400 nm and exhibited two emission peaks, positioned at 481 nm (blue) and 575 (yellow) due to ${}^{4}F_{9/2}$ - ${}^{6}H_{15/2}$ and ${}^{4}F_{9/2}$ - ${}^{6}H_{13/2}$ transitions, respectively, under excitation wavelength of 348 nm. CIE colour coordinate (x = 0.2983, y = 0.3151), Colour purity (13.3%), and CCT (7550 K) of the material were calculated which indicated that the prepared phosphor can be used as a white light-emitting phosphor. The TL glow curves of the synthesized phosphor were recorded using a Nucleonix 1009I TLD reader. All synthesized Li₄SrCa(SiO₄)₂:4mol%Dy³⁺ phosphors were exposed to UV rays (254 nm) and γ-rays (⁶⁰Co source). Maximum TL intensity was found for 40 min under UV irradiation (254 nm), and for γ irradiation (dose rate 8 kGy). Trapping parameters like activation energy, frequency factor and order of kinetics were calculated by Chen's peak shape method. The activation energy vs. T_{stop} method verifies the existence of overlapping peaks. In this work the long-lasting glow characteristics of prepared samples using fading measurements, and along with the TL emission spectrum were also investigated. Overall Li₄SrCa(SiO₄)₂:Dy³⁺ phosphor revealed that the prepared phosphor can be used for excellent WLED phosphor and TLD material for both UV & y based TL dosimetric applications.

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Study of morphological, elemental, optical and excitation wavelength dependent red photoluminescence in Eu³⁺ doped Li₂SrSiO₄ for solid state lighting

Kanchan Tiwari^{a,*}, B.G. Sharma^a, <u>Nameeta Brahme^b</u>, D.P. Bisen^b, Tripti Richhariya^c, Anita Verma^c, Somnath Sahu^d, Akash Sinha^c

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ARTICLE INFO

Keywords: Luminescence Trivalent europium Lithium strontium silicate Photoluminescence CCT CIE LER

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1. Introduction

Through the centuries, various lighting technologies have been used. Man has utilized natural sunlight to fire, then electricity-based lighting appliances for his needs. Since lighting is now a basic human need, there is always space for advancement, new technology and the adoption of better and less expensive options [1]. Nowadays, LEDs are extensively used in a variety of applications, including displays, fluorescence microscopy, plant development, automotive headlights, optical waveguides, flashlights, solid state lasers, sensors, general illumination in homes and more [2-4]. The development of solid state lighting technology, particularly phosphor-converted white light emitting diodes (pc-WLED), has gained significant attention in recent years due to its advantages over conventional incandescent and fluorescent lamps, including low energy consumption, high energy efficiency, environmental friendliness due to mercury-free production, improved lifetime, compact design and high brightness [2,5,6].

In order to create pc-WLEDs, two primary techniques are used: first, a blue LED chip is combined with a yellow phosphor and second, a near ultraviolet (n-UV) LED chip is combined with tricolour (blue, green and red) phosphors [2,5]. The first technique uses a mixture of yellow-emitting $Y_3Al_5O_{12}$:Ce $^{3+}$ (YAG: Ce $^{3+}$) phosphors and blue-emitting GaN chips, whose application is limited by their low colour rendering index (CRI) and high correlated colour temperature

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OPTICAL MATERIALS

Investigation of Latent Fingerprint Detection and Cheiloscopy Development Using Li₂SrSiO₄:Tb³⁺ Phosphor for Forensic-Based Applications

Kanchan Tiwari,* Bal Gopal. Sharma. Nameeta Brahme.* Durga Prasad Bisen, Tripti Richhariya, Anita Verma, Somnath Sahu, Raunak Tripathi, and Akash Sinha

Read Online

Cite This: ACS Appl. Opt. Mater. 2024, 2, 433-444 Supporting Information ACCESS III Metrics & More Article Recommendations Photoluminescence ABSTRACT: Inorganic phosphors with rare-earth metal doping LSS:x mol% doped Tb have recently been created and used in hot topics including phosphor-converted light-emitting diodes (pc-LEDs), counterfeit prevention, cheiloscopy (lip print detection), and fingerprint visualization. Using the Pechini sol-gel process, a silicate-based rare-earth metal-doped Li₂SrSiO₄:Tb³⁺ (LSS:Tb) green-emitting phosphor was synthesized, and its characteristics were determined by X-ray diffraction, scanning electron microscopy, Fourier transform infrared spectroscopy, and photoluminescence studies. Through the JCPDS file, the prepared phosphor's structure was **Finger print and Lip** 450 500 550 600 650 700 print Detection confirmed. Photoluminescence studies displayed the characteristic Doping of Tb³⁺ Wavelength (nm) emission peaks of Tb3+ under an excitation wavelength of 254 nm.

Implementation of the powder dusting method using LSS:3 mol % Tb phosphor on the latent fingerprint displayed good selectivity and contrast. Along with this, latent fingerprints were also detected on different surfaces to see the practicality of the prepared phosphor. Under UV irradiation, the level 1-3 structural properties of latent fingerprints and the level 1-6 detection of lip prints were distinguished and probed. The obtained results indicated that the synthesized phosphor could be used for fingerprint and lip print detection.

KEYWORDS: photoluminescence, latent fingerprint detection, lip print detection, cheiloscopy, Pechini sol-gel synthesis

1. INTRODUCTION

The long story of that inescapable mark of identity of fingerprints has been told and retold for many years and in many texts. These features are present on the palm side of each person's hands and on the soles of each person's feet in the friction ridge skin, which leaves behind impressions of its shapes when it comes into contact with an object. The impressions from the last finger joints are known as fingerprints. If you have fingers, you will definitely have a specific fingerprint.¹⁻³ Not only humans but also animals have distinct fingerprints, which enables researchers to study and investigate their DNA, habitant, griping techniques, evolution over different circumstances, hand proportion and body size, or/and their age.4-6 It is an interesting fact that no two people have the same fingerprints, which is supported by the fact that fingerprints are a unique identifier on their own and are made up of a set of haphazard ridges and furrows that appear between 6 and 25 weeks of human fetal (embryonic) development. Eccrine glands, which generate salt, a mixture of water, and sweat, are typically responsible for the natural secretion that occurs on the feet and hands. When a person contacts any surface with hands, this chemical phenomenon creates a particular pattern on it.7,8 Today, the fingerprint identification technology is utilized in controlling gadgets, smart phones, mobile payment, access control, and time attachment.9 The most effective method and primary course in the forensic science department for identifying crime scenes as physical evidence of a person in the 19th century was latent fingerprint (LFP) examination.^{3,10,11} The LFPs that were observed at the crime scenes are exceptional but undetectable to the naked eye, making them difficult for investigators to see. Hence, there is a space for advanced technologies.^{12,13} These circumstances demonstrate the value of LFP detection as a forensic science tool for identifying an individual's information and catching criminals.^{3,14} Lip print detection is another fascinating and new area of forensic science for personal identification.¹⁵ In forensic investigations, the identification of

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Investigation of Latent Fingerprint Detection and Cheiloscopy Development Using Li₂SrSiO₄:Tb³⁺ Phosphor for Forensic-Based Applications

2023-24

Kanchan Tiwari,* Bal Gopal. Sharma, Nameeta Brahme,* Durga Prasad Bisen, Tripti Richhariya, Anita Verma, Somnath Sahu, Raunak Tripathi, and Akash Sinha



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Article

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CHAPTER 10

Other emerging applications of mechanoluminescence and outlook

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10.1 Introduction

The wonder of light discharge from a solid in response in response to a mechanical input is known as mechanoluminescence (ML). ML has proven to be a significant phenomenon for monitoring, not only from the perspective of comprehending the microscopic and microscopic characteristics of a crystal but also for other possible applications [1]. Writing these few sentences is equivalent to revealing only three cards from a deck of cards while neglecting the fact that there is a full deck available to be shuffled, played, explored, and combined to discover potential ideas and applications for mankind. Here, in this chapter, some of the potential applications of ML are discussed in upcoming sections.

10.2 History of ML applications

In 1605 Francis Bacon reported the first instance of sparking light while crushing sugar crystals, during the initial era of ML research. Later, studies investigated many salts, sugars, halides, and many more available natural stones. However, it was first thought that weak and unreproducible ML could constrain significant applications of ML but then to find and use powerful, dependable ML in applications, improving intensity was not a key section of focus [2]. Chandra et al. [3,4] have reported four generations of ML research:

- i. The pre-PMT (photomultiplier tube) generation (from the beginning to 1950);
- ii. The early post-PMT generation (from 1951 to 1990);
- iii. The late post-PMT generation (from 1990 to the present); and
- iv. The future generation of ML (yet to come).

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Photoluminescence studies of Eu³⁺ doped bismuth silicate based phosphor for plant grow LEDs

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ARTICLEINFO

Keywords: Solid state reaction Photoluminescence Plant grow LEDs Energy transfer Luminescence material Far red emission

ABSTRACT

Artificial red lights of good quality are essential for indoor plant growth as it has a wide spectrum effects on photosynthesis rate and photomorphogenic processes of organic plant growth cycle. In present work we report on Eu^{3+} doped $Bi_4Si_3O_{12}$ (BSO) phosphor for spectroscopic implication in smart plant grow LEDs. Eu^{3+} activated series of $Bi_4Si_3O_{12}$ phosphor have been prepared via traditional solid-state reaction method. Crystal structure and phase formation characterization is determined by using X-ray diffraction (XRD). Photoluminescence spectra of prepared phosphor shows broad excitation spectra ranging from 200 to 530 nm. The optimal Eu^{3+} doping concentration observed at 3 mol%. Emission spectra observed under the excitation of 270 nm shows broad emission band at 469 nm along with other characteristic peak at 500 nm-710 nm. Observed emission peaks at 622 nm, 656 nm and 702 nm were chosen opt for plant grow lights. The phytochrome PFR absorption spectra of plants matches well with the emission band of our Eu^{3+} doped BSO phosphor and can be considered as a viable choice for solid state lighting and plant grow light LEDs.

Introduction

Long-lasting phosphor is been researched and developed through many decades due to its various applications [1]. Many investigations on rare earth activated inorganic phosphors have been performed in recent years for their wide application in display devices, solar cell coating, solid state lasers, lightning gadgets, and so on [2]. Bismuth compound as a host material has gained very little attention despite of its promising features for optical application. Consequently, instead of optical devices, the majority of photoactive properties of bismuth materials have been used for catalytic or electrochemical applications [3]. A lot of effort has recently been done in the subject of smart agriculture. As plants use, different light spectrums for the growth of their different parts. Plants are less sensitive to light than humans. Blue and red light spectra are the most efficient for photosynthesis. Red light (629-662 nm) is required for stem development, leaf expansion, blooming, and seedling growth. Blue light (400-530 nm) impacts chlorophyll concentration and leaf thickness, while light of (430-470 nm) range is beneficial to vegetative development. Plant grows best under mix of red and blue light [4,5]. The ideal ratio is somewhere in between 5:1 red to blue. Present work is been carried out on Eu doped BSO as a suitable candidate for designing suitable light emitting phosphor which can effectively used indoor LEDs for plant growth [6].

Experimental details

Materials were synthesized by solid-state reaction method. Initial raw materials Bi_2O_3 , SiO_2 , Eu_2O_3 (99.9%) were weighed according to stoichiometric ratio and mixed homogenously with the help of an agate mortar for 2 hrs. Each of the prepared materials was placed in an alumina crucible for heating at 750 °C for approximately 8 h before being grounded in an air environment. The obtained samples were again reheated for 5 h at a temperature 100 °C higher than the initial synthesized temperature and used for further analysis.

The phase formation of the prepared phosphor is confirmed using an Advance Bruker AXS-D8 diffractometer with Cu K α radiation. The XRD data were taken in the $10^{\circ} \le 20 \le 80^{\circ}$ range. The photoluminescence studies were monitored using a spectroflurophotometer RF-5301PC (Shimadzu) equipped with a 150 W xenon lamp used as a source of excitation [7].

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Photoluminescence studies of Eu³⁺ doped bismuth silicate based phosphor for plant grow LEDs

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ARTICLEINFO

Keywords: Solid state reaction Photoluminescence Plant grow LEDs Energy transfer Luminescence material Far red emission

ABSTRACT

Artificial red lights of good quality are essential for indoor plant growth as it has a wide spectrum effects on photosynthesis rate and photomorphogenic processes of organic plant growth cycle. In present work we report on Eu^{3+} doped $Bi_4Si_3O_{12}$ (BSO) phosphor for spectroscopic implication in smart plant grow LEDs. Eu^{3+} activated series of $Bi_4Si_3O_{12}$ phosphor have been prepared via traditional solid-state reaction method. Crystal structure and phase formation characterization is determined by using X-ray diffraction (XRD). Photoluminescence spectra of prepared phosphor shows broad excitation spectra ranging from 200 to 530 nm. The optimal Eu^{3+} doping concentration observed at 3 mol%. Emission spectra observed under the excitation of 270 nm shows broad emission band at 469 nm along with other characteristic peak at 500 nm-710 nm. Observed emission peaks at 622 nm, 656 nm and 702 nm were chosen opt for plant grow lights. The phytochrome PFR absorption spectra of plants matches well with the emission band of our Eu^{3+} doped BSO phosphor and can be considered as a viable choice for solid state lighting and plant grow light LEDs.

Introduction

Long-lasting phosphor is been researched and developed through many decades due to its various applications [1]. Many investigations on rare earth activated inorganic phosphors have been performed in recent years for their wide application in display devices, solar cell coating, solid state lasers, lightning gadgets, and so on [2]. Bismuth compound as a host material has gained very little attention despite of its promising features for optical application. Consequently, instead of optical devices, the majority of photoactive properties of bismuth materials have been used for catalytic or electrochemical applications [3]. A lot of effort has recently been done in the subject of smart agriculture. As plants use, different light spectrums for the growth of their different parts. Plants are less sensitive to light than humans. Blue and red light spectra are the most efficient for photosynthesis. Red light (629-662 nm) is required for stem development, leaf expansion, blooming, and seedling growth. Blue light (400-530 nm) impacts chlorophyll concentration and leaf thickness, while light of (430-470 nm) range is beneficial to vegetative development. Plant grows best under mix of red and blue light [4,5]. The ideal ratio is somewhere in between 5:1 red to blue. Present work is been carried out on Eu doped BSO as a suitable candidate for designing suitable light emitting phosphor which can effectively used indoor LEDs for plant growth [6].

Experimental details

Materials were synthesized by solid-state reaction method. Initial raw materials Bi_2O_3 , SiO_2 , Eu_2O_3 (99.9%) were weighed according to stoichiometric ratio and mixed homogenously with the help of an agate mortar for 2 hrs. Each of the prepared materials was placed in an alumina crucible for heating at 750 °C for approximately 8 h before being grounded in an air environment. The obtained samples were again reheated for 5 h at a temperature 100 °C higher than the initial synthesized temperature and used for further analysis.

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Exploration of crystal structure, and luminescence behaviors of Terbium-activated CaWO₄ phosphor

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ARTICLE INFO

Keywords: Rietveld refinement method UV-Visible absorbance spectra Photoluminescence behavior CIE Chromaticity coordinates Thermoluminescence spectroscopy

ABSTRACT

This manuscript includes structural, optical, photoluminescence, and thermoluminescence behaviors of Terbium incorporated CaWO₄ samples with nominal compositions of Ca_{1-x}Tb_{2x/3}WO₄ (x = 0.01, 0.02, 0.03, 0.04, 0.05) prepared by the traditional solid-state reaction route. Results found from the Rietveld refinements of X-ray diffraction patterns confirmed that all the samples have tetragonal crystal structures with I4₁/a space group. The variation of unit cell volume with the compositions shows an anomaly at x = 0.03. Band gap energy values of these synthesized samples are found from the UV–Visible absorbance spectra with increasing order. Photoluminescence behaviors, as well as the FWHM values, are analyzed from the excitation along with the emission spectra. Critical quenching concentration at x = 0.03 with a critical energy transfer distance of ~ 20 Å caused by the dipole-dipole interactions is found in these spectra. CIE Chromaticity coordinates are indicated the green emission color of all the prepared samples with high color purity, correlated color temperature, color rendering index, and luminous efficiency of radiation wavelength. PL decay analyses of the phosphors are carried out and the average lifetime values are calculated. Thermoluminescence spectroscopy of x = 0.03 irradiating by 15 min of UV dose is described as the lower UV dosimetry and second-order kinetics of the material.

1. Introduction

Over the last few decades, phosphors having luminescent nature are used in the light emitting diodes rather than the conventional lighting devices [1]. They have good luminescence properties, different types of colors of emission, considerable efficiencies, excellent operating conditions, fewer pollutions, low power utilization, wide uses in lighting applications, and many more important features [2–3]. Therefore, several pieces of research are going on by scientists to synthesize phosphors with improved luminescence properties. Material scientists are involved to explore these types of phosphors like nitrates, molybdates, silicates, aluminates, oxides, and tungstates with enhanced photoluminescence behaviors [4]. It has been studied that metal tungstates with scheelite structures have wide emission ranges, good efficiencies, and self-activating behaviors and can be utilized in the lighting devices such as LEDs, FEDs, and display screens [5–6]. Among all the metal tungstates, Calcium tungstates have prominent properties in photoluminescence and thermoluminescence spectroscopy, blue emission color with extensive emission range in UV–Visible region, a great value in color purity & quantum efficiency, less optical loss, appropriately correlated color temperature value [7]. Hence Calcium tungstate acts as a suitable host material for the light emitting diodes [8]. Moreover, past investigations are revealed that doping of different rare earth materials with CaWO₄ can be improved luminescence properties by producing various paths for energy transfer and reducing the critical quenching concentration of the material [9–10].

Photoluminescence behaviors with orange-red emission color of Smdoped CaWO₄ are discussed extensively by Kaur et al. [11]. Du et al. explained the yellow emission color of Dy-doped CaWO₄ and also their optical behaviors [12]. Zhang et al. prepared Eu and Tb-doped CaWO₄ phosphors and investigated that they have red as well as green emission colors respectively [13]. However, the reason the behind energy transfer

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1. Introduction

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Luminescence investigation of CaY₂Al₄SiO₁₂:Dy³⁺ phosphor synthesized by sol-gel method

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Funding information

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Abstract

Dy3+-doped CaY2Al4SiO12 phosphors were prepared using the sol-gel method. Xray diffraction (XRD), field emission scanning electron microscopy (FESEM), and energy dispersive spectroscopy analyses (EDS) were used to analyse the crystal structure, morphology, and elemental composition of the prepared samples. The luminescence behaviour of the sample was investigated using photoluminescence (PL) and thermoluminescence (TL) techniques. The prepared CaY2Al4SiO12:xDy3+ phosphor showed a characteristic blue and yellow emission at ~480 and 583 nm, respectively, with an excitation wavelength of 350 nm. The most intense PL emission was found for a 4 mol% doping concentration of Dy3+ ions. The CIE diagram of the phosphor showed bluish-white colour emission. For TL studies, the prepared phosphors were irradiated with a 60 Co γ (gamma) source and the TL glow curve of the CaY2Al4SiO12:0.04Dy3+ phosphor showed three overlapped peaks. For the Gaussian peaks, Chen's peak shape method was applied to determine the kinetic parameters of the samples.

KEYWORDS

phosphor, photoluminescence, sol-gel method, thermoluminescence, XRD

1 1 INTRODUCTION

In recent decades a marked evolution has been noticed in the field of optical and luminescence applications using phosphor materials [1, 2]. Garnet-based phosphor materials show superb luminescence characteristics, high thermal stability, good chemical, and physical stability, and other energy-efficient properties. Garnet acquires a cubic crystal structure with complicated positioning of different cations in the unit cell. The affability of the garnet structure allows the substitution of ions at the dodecahedral, octahedral, and tetrahedral sites. Garnet phosphor material can be used in different fields such as laser and white light-emitting diodes (WLEDs). For example, the yttrium aluminium garnet (YAG) host with lanthanide ions is a broadly used phosphor material for solid-state lighting applications [1-3].

Garnet-based phosphors have been explored by many research groups. Singh et al. and Katelnikovas et al. investigated the

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KEYWORDS

phosphor, photoluminescence, sol-gel method, thermoluminescence, XRD

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Thermoluminescence studies of Sm³⁺ doped ZnB₂O₄ phosphor

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Abstract: Solid-state reaction method was used to prepare the rare earth Sm^{3+} doped ZnB_2O_4 phosphors. The structural characterization of Sm^{3+} doped ZnB_2O_4 samples was recorded by Xray diffraction (XRD) technique. A single phase structure similar to the standard JCPDS files-39-1126 was recorded using XRD. The graph plotted between TL intensity and temperature for different UV dose was recorded. The highest TL intensity was recorded for 20 minutes of UV dose. On further increase in the exposure dose, decrease in TL intensity was observed. The thermo-luminescence was recorded with varying percentage of Sm3+. The at most TL intensity was obtained with 3 mol% of Sm3+. The thermo-luminescence spectra of ZnB2O4 and Sm3 doped ZnB2O4 phosphors were a lso studied.

Keywords: Zinc tetra borate, Thermo-luminescence, Phosphors, XRD.

1.Introduction

The phenomenon to produce light by thermal stimulation of radiation, from the previously irradiated material is called as thermo-luminescence (TL)[1, 2]. It is a comparatively simple technique to obtain information about point defects from a naturally occurring or artificially created material, when heated. By using this technique the changes in the defect concentration of insulators can be recorded. In diagnostic radiology and radiotherapy, TL dosimetry is very well defined techniques to detect the exposure doses to the patients. Hence it is a most widely used and very important part of the radiation dosimetry. TL technique could be an interesting area of research to calculate the doses variation during radiation processing applications: such as radiotherapy, food irradiation and medical product sterilization. The crystalline or polly-crystalline materials are commonly used for executing TL due to their opaqueness and high scattering of light. In the crystalline materials, the light emitted inside the layer has a grim chance to be gathered by the photon detector in compare to the light emitted near its surface. The ideal TL dosimeter material must be transparent to light and have ability to store the radiation. So, a material with good storage capacity, great sensitivity and good optical transparency may be required.

Since long, for luminescence applications, the researchers were using different rare earth ions doped zinc borates phosphors as host materials [3-7]. The rare earth activator ions, Sm3+, Eu3+, Tb3+, and Dy3+ can produce light in the visible range [8-15]. Incorporation of rare earth to zinc borate makes the material good for dosimetry application also. Zinc borate (boron-based inorganic material) showed excellent luminescence efficiency, wide band gap. It is also a low toxic, low cost and thermally stable material. Samarium (4f5) is the transition ion which has the specific advantage and has received much attention [16, 17]. The TL properties of a TL material are largely affected by the preparation method, and also the addition of impurities [18]. In this work undoped and different concentration of Sm3+ doped ZnB2O4 phosphors, their TL properties and the X- ray diffraction, EDS is also studied.



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Thermoluminescence studies of Sm³⁺ doped ZnB₂O₄ phosphor

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Abstract: Solid-state reaction method was used to prepare the rare earth Sm^{3+} doped ZnB_2O_4 phosphors. The structural characterization of Sm^{3+} doped ZnB_2O_4 samples was recorded by Xray diffraction (XRD) technique. A single phase structure similar to the standard JCPDS files-39-1126 was recorded using XRD. The graph plotted between TL intensity and temperature for different UV dose was recorded. The highest TL intensity was recorded for 20 minutes of UV dose. On further increase in the exposure dose, decrease in TL intensity was observed. The thermo-luminescence was recorded with varying percentage of Sm3+. The at most TL intensity was obtained with 3 mol% of Sm3+. The thermo-luminescence spectra of ZnB2O4 and Sm3 doped ZnB2O4 phosphors were a lso studied.

Keywords: Zinc tetra borate, Thermo-luminescence, Phosphors, XRD.

1.Introduction

The phenomenon to produce light by thermal stimulation of radiation, from the previously irradiated material is called as thermo-luminescence (TL)[1, 2]. It is a comparatively simple technique to obtain information about point defects from a naturally occurring or artificially created material, when heated. By using this technique the changes in the defect concentration of insulators can be recorded. In diagnostic radiology and radiotherapy, TL dosimetry is very well defined techniques to detect the exposure doses to the patients. Hence it is a most widely used and very important part of the radiation dosimetry. TL technique could be an interesting area of research to calculate the doses variation during radiation processing applications: such as radiotherapy, food irradiation and medical product sterilization. The crystalline or polly-crystalline materials are commonly used for executing TL due to their opaqueness and high scattering of light. In the crystalline materials, the light emitted inside the layer has a grim chance to be gathered by the photon detector in compare to the light emitted near its surface. The ideal TL dosimeter material must be transparent to light and have ability to store the radiation. So, a material with good storage capacity, great sensitivity and good optical transparency may be required.

Since long, for luminescence applications, the researchers were using different rare earth ions doped zinc borates phosphors as host materials [3-7]. The rare earth activator ions, Sm3+, Eu3+, Tb3+, and Dy3+ can produce light in the visible range [8-15]. Incorporation of rare earth to zinc borate makes the material good for dosimetry application also. Zinc borate (boron-based inorganic material) showed excellent luminescence efficiency, wide band gap. It is also a low toxic, low cost and thermally stable material. Samarium (4f5) is the transition ion which has the specific advantage and has received much attention [16, 17]. The TL properties of a TL material are largely affected by the preparation method, and also the addition of impurities [18]. In this work undoped and different concentration of Sm3+ doped ZnB2O4 phosphors, their TL properties and the X- ray diffraction, EDS is also studied.



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Long Lasting Persistent Photo-Luminescence Properties of $Eu_xM_{1-x}MgAl_{10}O_{17}(M = Ba, Ca, Sr, Zn)$ Phosphors

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Abstract. In this work, the $Eu_xM_{1-x}MgAl_{10}O_{17}[M = Ba, Ca. Sr, Zn, and <math>x = 0.05$)] phosphors were prepared through a combustion route technique. The complexing reagents namely urea (fuels) were used to synthesis for $Eu_xBa_{1-x}MgAl_{10}O_{17}$ (BAM: Eu), $Eu_xCa_{1-x}MgAl_{10}O_{17}$ (CAM: Eu), $Eu_xSr_{1-x}MgAl_{10}O_{17}$ (SAM:Eu), and $Eu_xZn_{1-x}MgAl_{10}O_{17}$ (ZAM:Eu) phosphors. The crystallinity of the synthesized compound, elemental analysis and surface morphology were measured using the PXRD FE-SEM, and FTIR spectroscopy respectability. The average crystallite size ($<D_s>$) of BAM: Eu, CAM:Eu, SAM: Eu, and ZAM: Eu were found 80, 30, 29, and 26 nm respectively. The photoluminescence emission spectra of phosphor were found broadband by the monitoring using common excitation (350 nm) and emission (450 nm). The CIE-1931 color- coordinates were calculated for each sample in the blue region. The overall PL emission was found near the blue [BAM: Eu, SAM: Eu, and ZAM: Eu] and blue-red [CAM:Eu] regions with high quantum efficiency and high color purity. Long-lasting PL decay was also recorded of samples with respect to all samples BAM:Eu was calculated from 0.46 to more than 40 min. Therefore, the BAM: Eu and other synthesized phosphors would be used as a blue-emitting phosphor in widely varying fields of lightings.

Keywords: Combustion route, Hexa-aluminate, Photo-luminescence, Long lasting PL Decay, Luminescence efficiency,

1. Introduction

The rare-earth ions and transition metals doped with aluminates, phosphate, silicates, borate, fluorides, sulphates, sulphites, perovskites, and metal oxides-based phosphors were synthesized by various synthesis method. Because the new generation of lighting technology is totally based on long-afterglow phosphors due to their potential application in emergency exit routes of traffic signs, textile printing, painting, decoration, lighting for household lamps, special lighting for synthetic crop production, and lighting for planting. Therefore, those excellent phosphors should have high quantum efficiency, maximum thermal stability, optimum brightness, eco-friendly, low energy consumption, long life span, and Corrosion-free emission. [1-5]. The hexa-aluminates (BaAl₁₂O₁₉, SrAl₁₂O₁₉, CaAl₁₂O₁₉, BaMgAl₁₀O₁₇, SrMgAl₁₀O₁₇, CaMgAl₁₀O₁₇, and ZnMgAl₁₀O₁₇ etc.) are long afterglow phosphors and they have high quantum efficiency. Interestingly, the aluminates are relatively easier were prepared by combustion route with lower cost than other materials (silicates, phosphate, borate, fluorides, sulphates, sulphites) and methods (solid state reaction, Sol-gel, Co-Precipitation, and Wetchemical method etc.) [6-8]. Combustion synthesis is a novel technique that has been applied to the

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Structural, photoluminescence, and thermoluminescence behaviors of Samarium doped CaWO₄ phosphor

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ARTICLEINFO

Keywords: Rietveld refinement UV–Visible absorbance spectroscopy Photoluminescence CIE Chromaticity Thermoluminescence spectra

ABSTRACT

This manuscript reports the crystal structure, photoluminescence and thermoluminescence behavior of Samarium doped CaWO₄ i.e., Ca_{1-x}Sm_{2x/3}WO₄ (x: 0.01, 0.02, 0.03, 0.04, 0.05) synthesized by conventional solid state reaction method. The X-ray diffraction data are analyzed using Rietveld refinement method and showed that samples exhibit cento-symmetric tetragonal crystal structure with $I4_1/a$ (No. 88) space group. The unit cell volumes are increased with rising Sm composition. The energy bandgaps of the phosphors are observed by the UV–Visible absorbance spectroscopy and found to be directly proportional to the cell volume. Photo-luminescence properties are considered from the excitation as well as emission spectra. These spectra resulted that the critical quenching concentration occurred at x = 0.02 due to the dipole–dipole interactions with critical energy transfer distance of 20 Å. The color purity and correlated color temperature values of the sample can be measured from the CIE Chromaticity. It is also described the orange-red emission color of the phosphors. Lower UV dosimetry with second order kinetics is obtained from the thermoluminescence spectra of x = 0.02 with 30 min UV radiation.

1. Introduction

Now-a-days phosphors are used as luminescent materials in light emitting diodes due to their significant features like excellent luminescence behavior with various emission colors, less power consumption, good efficiency, extensive operation lifetimes, negligible pollution, and broad applicability in lighting as well as displays than the conventional lighting devices. Hence many researchers are paying attention to prepare these types of phosphors with great luminescence behaviors [1]. In last few years, several investigations are going on to find out the most appropriate phosphors with various emission colors. Among all the phosphors i.e., aluminates, silicates, molybdates, nitrates, tungstates and oxides; scheelite type tungstates are more efficient because of their self-activated nature, broad emission band and applications in LEDs, FEDs, display devices etc. [2-3]. Calcium tungstate as a host lattice attracts much more attention because of its good photoluminescence and thermoluminescence behaviors, low optical loss, broad emission seen in UV-Visible range, high color purity, suitable correlated color temperature, naturally occurring phenomenon and can be appropriately used in the LEDs [4–5]. Also, the luminescence behaviors can be enhanced by incorporating rare earth elements in to the host material with the formation of various energy transfer paths and decreasing the critical quenching concentration. From the literature it has been observed that different rare earth ions are doped in Calcium Tungstate for the further analysis of the improved luminescence behaviors [6–7].

Europium and Terbium doped CaWO₄ phosphors have been prepared by Zhang et al. and red as well as green emission colors are shown by the material correspondingly [8]. A brief study on optical properties with yellow emission color of Dysprosium doped CaWO₄ is done by Du et al. [9]. Also Kaur et al. are analysed the photoluminescence properties of Samarium doped CaWO₄ [10]. But there is a lack of evidence on the energy transfer mechanism as well as the thermoluminescence behaviors of this material. However, thermoluminescence properties of CaWO₄ with different rare earth ions are also analyzed extensively [11–12]. Trap deepness and order of kinetics of Europium and Dysprosium doped CaWO₄ are discussed by Gayatri Sharma et al. [13] and

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Investigation of photoluminescence, thermoluminescence, and energy transfer mechanism in Ce/Dy co-doped Sr₂Al₂SiO₇

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Keywords: Photoluminescence Thermoluminescence Energy transfer Dosimetry

ABSTRACT

In the present manuscript, we report the luminescence properties and energy transfer mechanism of Ce/Dy codoped Sr₂Al₂SiO₇ (SASO) phosphors prepared through the solid-state reaction method. Phase identification was done through a powder X-Ray diffraction tool and the obtained diffractogram confirms the formation of the desired phase. The Photoluminescence excitation and emission spectra of the prepared samples were investigated. Photoluminescence studies revealed that the luminescence intensity rises with increasing Dy concentration and optimized intensity was observed at 1 mol%. The energy transfer in the host has been attained successfully to produce color tunability. The Commission International de l'Eclairage (CIE) chromaticity coordinates and correlated color temperature (CCT) has been calculated. The energy transfer mechanism is further investigated via Thermoluminescence (TL) spectra. Further, the TL properties of synthesized phosphors were analyzed via the glow curve method along with varying UV doses. As compared to the single-doped phosphors, the TL glow curve indicates that very high intensity is observed at very low UV doses and the major TL peak is located in a higher temperature region. The calculated kinetic parameter indicates that Ce/Dy co-doped SASO has both shallow and deeper traps. All these findings suggest the potential applicability of synthesized phosphors as a low UV dosimeter.

1. Introduction

White light-emitting diodes (WLEDs) are the most striking topic of research in the field of solid-state lighting and display technologies. Several attempts had already been made, and many others have been continued by many researchers, to develop an efficient, single-phase white light-emitting phosphor [1]. Until now, three well-known methods are considered the most convenient methods to achieve WLEDs. One of these methods is combining a blue-emitting LED chip with Ce3+-activated Y3Al5O12. Nevertheless, this method is accompanied by several drawbacks, such as poor thermal stability and chemical durability, a low color rendering index (CRI), and a low correlated color temperature (CCT) [2]. To overcome these drawbacks, another method is employed in substitution of this method by integrating tri-color (Red, Green, and Blue) and UV LED chip. Still, the major issue with this method is the reabsorption of blue light, which takes place through red and green light. This has a significant impact on luminous efficiency. Another approach is to use blue LED to stimulate single-phase yellow phosphor or mixed-phase red and green phosphor [3,4]. Thus, the task of achieving an efficient single-phase white light-emitting phosphor remains same. Nowadays, phosphor-converted (PC) LEDs get much attention in display technology due to their various advantages over traditional technology. For the development of a single-phase white light emitting diode, currently, the most widely used method is the introduction of a sensitizer and an activator into a single host. The phosphor prepared by this method may be efficiently able to generate white light via energy transfer between the sensitizer and activator [5].

For the choice of dopants, among the 14 rare earth ions, the trivalent cerium ion drew considerable attention. Trivalent cerium shows intense broadband spectra in the visible region due to its parity allowed $5d \rightarrow 4f$

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In the present manuscript, we report the luminescence properties and energy transfer mechanism of Ce/Dy codoped Sr₂Al₂SiO₇ (SASO) phosphors prepared through the solid-state reaction method. Phase identification was done through a powder X-Ray diffraction tool and the obtained diffractogram confirms the formation of the desired phase. The Photoluminescence excitation and emission spectra of the prepared samples were investigated. Photoluminescence studies revealed that the luminescence intensity rises with increasing Dy concentration and optimized intensity was observed at 1 mol%. The energy transfer in the host has been attained successfully to produce color tunability. The Commission International de l'Eclairage (CIE) chromaticity coordinates and correlated color temperature (CCT) has been calculated. The energy transfer mechanism is further investigated via Thermoluminescence (TL) spectra. Further, the TL properties of synthesized phosphors were analyzed via the glow curve method along with varying UV doses. As compared to the single-doped phosphors, the TL glow curve indicates that very high intensity is observed at very low UV doses and the major TL peak is located in a higher temperature region. The calculated kinetic parameter indicates that Ce/Dy co-doped SASO has both shallow and deeper traps. All these findings suggest the potential applicability of synthesized phosphors as a low UV dosimeter.

1. Introduction

White light-emitting diodes (WLEDs) are the most striking topic of research in the field of solid-state lighting and display technologies. Several attempts had already been made, and many others have been continued by many researchers, to develop an efficient, single-phase white light-emitting phosphor [1]. Until now, three well-known methods are considered the most convenient methods to achieve WLEDs. One of these methods is combining a blue-emitting LED chip with Ce3+-activated Y3Al5O12. Nevertheless, this method is accompanied by several drawbacks, such as poor thermal stability and chemical durability, a low color rendering index (CRI), and a low correlated color temperature (CCT) [2]. To overcome these drawbacks, another method is employed in substitution of this method by integrating tri-color (Red, Green, and Blue) and UV LED chip. Still, the major issue with this method is the reabsorption of blue light, which takes place through red and green light. This has a significant impact on luminous efficiency. Another approach is to use blue LED to stimulate single-phase yellow phosphor or mixed-phase red and green phosphor [3,4]. Thus, the task of achieving an efficient single-phase white light-emitting phosphor remains same. Nowadays, phosphor-converted (PC) LEDs get much attention in display technology due to their various advantages over traditional technology. For the development of a single-phase white light emitting diode, currently, the most widely used method is the introduction of a sensitizer and an activator into a single host. The phosphor prepared by this method may be efficiently able to generate white light via energy transfer between the sensitizer and activator [5].

For the choice of dopants, among the 14 rare earth ions, the trivalent cerium ion drew considerable attention. Trivalent cerium shows intense broadband spectra in the visible region due to its parity allowed $5d \rightarrow 4f$

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Structural, Compositional and Photoluminescence Studies of Li4SrCa(SiO4)2: Eu3+ Red Phosphor Synthesized by Solid State Reaction Method

2023-24

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Abstract

In this paper, Eu^{3+} doped phosphor Li₄SrCa(SiO₄)₂ is successfully synthesized via a solid-state reaction method at high temperatures. Structure characterization is determined using X-ray diffraction (XRD). Surface morphology was analyzed using Field emission scanning electron microscopy(FESEM). The EDX spectra confirm the elements present in Li₄SrCa(SiO₄)₂:Eu³⁺ phosphor. Photoluminescence(PL) spectra of Li₄SrCa(SiO₄)₂:Eu³⁺ phosphor was efficiently excited by UV range 220-450nm and under the excitation 395nm phosphors shows good intensity with an orange-red intense peak at 591nm and 619 nm was due to ${}^{4}D_{0}{}^{-7}F_{1}$ and ${}^{4}D_{0}{}^{-7}F_{2}$ transition respectively. Commission International del' Eclairage (CIE) color coordinate was calculated, which confirms the Eu3+ doped phosphor with a CIE value of (x=0.6259, y=0.3737). This phosphor is considered to be a new promising orange-red emitting phosphor for WLEDs application. This phosphor may be used for solid-state lighting.

Keywords: Solid state reaction, X-ray diffraction, FESEM, EDX, Photoluminescence.

Introduction

Luminescence is the most attractive phenomenon of light which is shown by the phosphor when the charge carriers are excited by some higher energy[1]. These phosphors can be named luminescent materials and rare-earth-doped luminescent materials are studied in many fields such as; display devices, LEDs, FEDs and fluorescence labels, solar cells etc[1–3]. In present days, increasing demand for developing white light emitting diodes (WLEDs) due to their long lifetime, high quantum yield, better optical properties, saving energy, reliability, safety and environmental friendly characteristics[3–5].

There are two different approaches that can be used for fabricated phosphor-converted white-lightemitting diodes(pc-WLEDs), which are fabricated by using blue LED chip and commercial yellow phosphor $Y_3Al_5O_{12}$: Ce³⁺ (YAG: Ce³⁺) phosphor. However, due to the deficiency of the red component, the phosphor emits cold white light with high correlated color temperature (CCT >4500 K) and poor color rendering index (CRI) which is generally unappealing for home use[6,7]. In this way, to overcome these problem pc-WLED devices can also be fabricated by another method where combines the tri-color RGB (red, green, and blue) phosphors with nearultraviolet(350-410nm) LED chips[6–8]. Therefore, the supplement of the red component plays a very important role for generation of warm white light. According to the composition of phosphor

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Luminescence studies of Sm³⁺ doped CdB₄O₇ phosphors

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ABSTRACT

Rare earth Sm3+-doped cadmium tetra borate (Cd B4O7) phosphors were synthesized by solid-state reaction method. X- ray diffraction (XRD) technique was used for the structural characterization of the prepared phosphors, whereas EDS was used for elemental composition confirmation. The diffraction pattern of the prepared samples is well matched with the standard XRD (JCPDS file no. 30-0204). Photoluminescence emission and excitation spectra for pure and rare earth (Sm3+)-doped Cd B4O7 phosphor were obtained. The emission spectra of Sm³⁺-doped Cd B₄O₇ showed a characteristic intense emission band at 608 nm along with less intense band at 561 nm and 644 nm under the excitation wavelength of 403 nm. The doping percentage was varied from 1 mol% to 4 mol% of Sm³⁺. The photoluminescence intensity of 2 mol% of Sm³⁺was found to be highest. From the CIE diagram of the Sm3+ doped Cd B4O7 phosphor showed the calculated color coordinates in the orange region. The thermoluminescence studies of pure and Sm3+doped samples were carried out. The results of both the samples showed good TL response. The highest TL intensity was observed for 2 mol% of Sm3+ concentration. The optimized UV exposure time was 25 min. Nearly 66% linear relation was recorded for total TL intensity and UV exposure time. The TL spectra fall in the orange region, similar to the recorded PL emission spectra.

1 Introduction

Many oxides, sulfides, selenides, tellurides, arsenides, phosphides borates, sulfates, fluorides, and silicates are the important luminescence materials that have been developed and used over many decades [1]. The optical properties of CdS/ZnS were studied most in earlier times [2]. The boratebased phosphors were studied extensively due to their use in industries and mineralogy. Borate

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RESEARCH ARTICLE

IUMINESCENCE WILEY The Journal of Biological and Chemical Luminescence 378 iO₁₂:Dy³⁺ phosphor

Luminescence investigation of CaY₂Al₄SiO₁₂:Dy³⁺ phosphor synthesized by sol-gel method

2023-24

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Abstract

Dy³⁺-doped CaY₂Al₄SiO₁₂ phosphors were prepared using the sol-gel method. Xray diffraction (XRD), field emission scanning electron microscopy (FESEM), and energy dispersive spectroscopy analyses (EDS) were used to analyse the crystal structure, morphology, and elemental composition of the prepared samples. The luminescence behaviour of the sample was investigated using photoluminescence (PL) and thermoluminescence (TL) techniques. The prepared CaY₂Al₄SiO₁₂:xDy³⁺ phosphor showed a characteristic blue and yellow emission at ~480 and 583 nm, respectively, with an excitation wavelength of 350 nm. The most intense PL emission was found for a 4 mol% doping concentration of Dy³⁺ ions. The CIE diagram of the phosphor showed bluish-white colour emission. For TL studies, the prepared phosphors were irradiated with a ⁶⁰Co γ (gamma) source and the TL glow curve of the CaY₂Al₄SiO₁₂:0.04Dy³⁺ phosphor showed three overlapped peaks. For the Gaussian peaks, Chen's peak shape method was applied to determine the kinetic parameters of the samples.

KEYWORDS

phosphor, photoluminescence, sol-gel method, thermoluminescence, XRD

1 | INTRODUCTION

In recent decades a marked evolution has been noticed in the field of optical and luminescence applications using phosphor materials [1, 2]. Garnet-based phosphor materials show superb luminescence characteristics, high thermal stability, good chemical, and physical stability, and other energy-efficient properties. Garnet acquires a cubic crystal structure with complicated positioning of different cations in the unit cell. The affability of the garnet structure allows the substitution of ions at the dodecahedral, octahedral, and tetrahedral sites. Garnet phosphor material can be used in different fields such as laser and white light-emitting diodes (WLEDs). For example, the yttrium aluminium garnet (YAG) host with lanthanide ions is a broadly used phosphor material for solid-state lighting applications [1–3].

Garnet-based phosphors have been explored by many research groups. Singh et al. and Katelnikovas et al. investigated the luminescence behaviour of the CaY₂Al₄SiO₁₂:Pb²⁺ and yellowemitting CaY₂Al₄SiO₁₂:Ce³⁺ garnet phosphors respectively [4, 5]. Similarly YAG:Dy [6, 7], Lu₁Gd₂Ga₂Al₃O₁₂:Dy [8], CaY₂Al₄SiO₁₂:Eu_{0.03} (CYASG:Eu) [9], Nd-doped YAG nano-powders [10], and Pr³⁺-Cr³⁺ and Tb³⁺-Cr³⁺ co-doped Y₃Al₂Ga₃O₁₂ (YAGG) phosphors [11] have been studied by other research groups. Trivalent dysprosium is the most preferred rare earth ion for producing white light-emitting luminescence materials. To explore specific luminescence host materials with better enhancement in intensity, trivalent dysprosium ions play a vital role [12].

In the present study, we synthesized CaY₂Al₄SiO₁₂:xDy³⁺ phosphors using the sol-gel reaction method. The luminescence behaviour of the CaY₂Al₄SiO₁₂:xDy³⁺ phosphors was studied in detail via the combined techniques of XRD, FESEM, EDS, photoluminescence excitation/photoluminescence (PLE/PL) spectroscopy, and thermoluminescence (TL) spectroscopy.

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RESEARCH ARTICLE



Luminescence investigation of CaY₂Al₄SiO₁₂:Dy³⁺ phosphor synthesized by sol-gel method

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Abstract

 Dy^{3+} -doped CaY₂Al₄SiO₁₂ phosphors were prepared using the sol-gel method. Xray diffraction (XRD), field emission scanning electron microscopy (FESEM), and energy dispersive spectroscopy analyses (EDS) were used to analyse the crystal structure, morphology, and elemental composition of the prepared samples. The luminescence behaviour of the sample was investigated using photoluminescence (PL) and thermoluminescence (TL) techniques. The prepared CaY₂Al₄SiO₁₂:xDy³⁺ phosphor showed a characteristic blue and yellow emission at ~480 and 583 nm, respectively, with an excitation wavelength of 350 nm. The most intense PL emission was found for a 4 mol% doping concentration of Dy³⁺ ions. The CIE diagram of the phosphor showed bluish-white colour emission. For TL studies, the prepared phosphors were irradiated with a ⁶⁰Co γ (gamma) source and the TL glow curve of the CaY₂Al₄SiO₁₂:0.04Dy³⁺ phosphor showed three overlapped peaks. For the Gaussian peaks, Chen's peak shape method was applied to determine the kinetic parameters of the samples.

KEYWORDS

phosphor, photoluminescence, sol-gel method, thermoluminescence, XRD

1 | INTRODUCTION

In recent decades a marked evolution has been noticed in the field of optical and luminescence applications using phosphor materials [1, 2]. Garnet-based phosphor materials show superb luminescence characteristics, high thermal stability, good chemical, and physical stability, and other energy-efficient properties. Garnet acquires a cubic crystal structure with complicated positioning of different cations in the unit cell. The affability of the garnet structure allows the substitution of ions at the dodecahedral, octahedral, and tetrahedral sites. Garnet phosphor material can be used in different fields such as laser and white light-emitting diodes (WLEDs). For example, the yttrium aluminium garnet (YAG) host with lanthanide ions is a broadly used phosphor material for solid-state lighting applications [1–3].

Garnet-based phosphors have been explored by many research groups. Singh et al. and Katelnikovas et al. investigated the luminescence behaviour of the CaY₂Al₄SiO₁₂:Pb²⁺ and yellowemitting CaY₂Al₄SiO₁₂:Ce³⁺ garnet phosphors respectively [4, 5]. Similarly YAG:Dy [6, 7], Lu₁Gd₂Ga₂Al₃O₁₂:Dy [8], CaY₂Al₄SiO₁₂:Eu_{0.03} (CYASG:Eu) [9], Nd-doped YAG nano-powders [10], and Pr³⁺-Cr³⁺ and Tb³⁺-Cr³⁺ co-doped Y₃Al₂Ga₃O₁₂ (YAGG) phosphors [11] have been studied by other research groups. Trivalent dysprosium is the most preferred rare earth ion for producing white light-emitting luminescence materials. To explore specific luminescence host materials with better enhancement in intensity, trivalent dysprosium ions play a vital role [12].

In the present study, we synthesized CaY₂Al₄SiO₁₂:xDy³⁺ phosphors using the sol-gel reaction method. The luminescence behaviour of the CaY₂Al₄SiO₁₂:xDy³⁺ phosphors was studied in detail via the combined techniques of XRD, FESEM, EDS, photoluminescence excitation/photoluminescence (PLE/PL) spectroscopy, and thermoluminescence (TL) spectroscopy. J Mater Sci: Mater Electron (2023) 34:644 2023-24

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Yttrium aluminum garnet based novel and advanced phosphor synthesized by combustion route activated by Dy, Eu, and Tb rare earth metals

Akshkumar Verma^{1,*} , D. P. Bisen¹, Nameeta Brahme¹, Ishwar Prasad Sahu², and Arun Kumar Singh³

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ABSTRACT

In the present studies, rare earth (Dy, Eu, and Tb) activated garnet-based (Y₃Al₅O₁₂) phosphors were prepared using the combustion method at 550 °C. The formation of the compounds has been checked by powder X-ray diffraction and structural parameters were calculated. The crystallite/particle size has been measured using Scherrer formula as well as by transmission electron microscopy which show that the size of the particles is in the nanorange. In the photoluminescence emission spectra, YAG:Dy0.05 emits two distinctive colors: blue and yellow, YAG:Eu_{0.05} emits red color, whereas YAG:Tb_{0.02} emits green phosphor. Thus, the combination of rare earth (Dy0.05, Eu0.05, Tb0.02) with garnet gives BYRG (blue-yellow-red-green) emissions can produce white light. These discussed phosphors exhibit a strong absorption between 340 and 400 nm. The energy transfer mechanism was also discussed. The higher luminescence color purity (95.68%), Color Rendering Index (95), Correlated Color Temperature (5287 K), and Quantum efficiency (93.7%) are calculated, therefore, synthesized $Y_3Al_5O_{12}Dy_{0.05}Eu_{0.05}Tb_{0.02}$ phosphor material can be used as a WLED phosphor materials in solid-state lighting system.

1 Introduction

There are diverse field of Luminescence, luminescent materials and applications. Modern lighting system totally depends on advanced and novel materials for great efforts for enhancing display quality and visibility [1–3]. In the present scenario, the need and requirement of novel phosphor is one of the most important and urgent challenges to synthesize luminescent material for white light emitting diodes (WLED) for solid lighting devices [4–6]. Other requirement should be fulfillment by modern technology like that maximum quantum efficiency, high

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Yttrium aluminum garnet based novel and advanced phosphor synthesized by combustion route activated by Dy, Eu, and Tb rare earth metals

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ABSTRACT

In the present studies, rare earth (Dy, Eu, and Tb) activated garnet-based (Y₃Al₅O₁₂) phosphors were prepared using the combustion method at 550 °C. The formation of the compounds has been checked by powder X-ray diffraction and structural parameters were calculated. The crystallite/particle size has been measured using Scherrer formula as well as by transmission electron microscopy which show that the size of the particles is in the nanorange. In the photoluminescence emission spectra, YAG:Dy_{0.05} emits two distinctive colors: blue and yellow, YAG:Eu_{0.05} emits red color, whereas YAG:Tb_{0.02} emits green phosphor. Thus, the combination of rare earth (Dy0.05, Eu0.05, Tb0.02) with garnet gives BYRG (blue-yellow-red-green) emissions can produce white light. These discussed phosphors exhibit a strong absorption between 340 and 400 nm. The energy transfer mechanism was also discussed. The higher luminescence color purity (95.68%), Color Rendering Index (95), Correlated Color Temperature (5287 K), and Quantum efficiency (93.7%) are calculated, therefore, synthesized Y₃Al₅O₁₂Dy_{0.05}Eu_{0.05}Tb_{0.02} phosphor material can be used as a WLED phosphor materials in solid-state lighting system.

1 Introduction

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Structural and luminescence studies of Eu³⁺ doped K₂BaSr(PO₄)₂ phosphor

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Abstract. Eu3+ doped K2BaSr(PO4)2 phosphor which gave red emission, was successfully synthesized by using the solid-state reaction method. The X-ray powder diffraction technique determined the crystal structure and the photoluminescence (PL), and thermoluminescence (TL) were also measured. The XRD pattern of prepared K2BaSr(PO4)2 is good matched with the COD CIF File number 00-100-7161. The structure of the phosphor is orthorhombic. The crystallite sizes are evaluated from diffraction peaks using the Scherrer formula. In PL emission, two peaks are found at 592 nm and 614 nm at 395 nm excitation wavelength. The as-developed phosphor can be used in the development of WLEDs.

Keywords. Photoluminescence; Thermoluminescence; K2BaSr(PO4)2 :Eu3+; WLED

1. Introduction

In recent years, most researchers concentrated on the luminescence properties of inorganic phosphors. Because these phosphors are a variety of applications such as illumination, near-infrared detection, display, plant growth, etc, which require different luminescent properties [1-4]. Phosphates are widely used as ideal hosts for luminescent samples because of their merits like various structures, mild synthesis conditions, high emission efficiency, and excellent thermal/chemical stabilities [5, 6]. Rare earth-doped phosphates are extensively used in white light-emitting diodes (WLED) because by changing of doping concentration emission colours can be tuned [7,8].

Trivalent rare earth ions (Ln3+) have high atomic number and unique electronic configurations [Xe]4fn (n = 0-14). From ultraviolet (UV) to near-infrared (NIR), rare earth luminescent materials have a wide range of fascinating optical properties. In rare-earth doped phosphor, excitation, and emission can be tuned through the change of doping concentration which impacts the long luminescent lifetimes, and excellent photostability. In every area of photonics and optoelectronics, including lighting, sensing, displays, energy saving, optical information storage, and healthcare, rare earth luminous materials are used [8, 9].

The activator Eu³⁺ is widely used for the preparation of fluorescent and phosphorescent materials because it has high atomic number and their transition reveals both orange and red emissions, may be due to f-f transitions which is also used in WLEDs [8, 10]. Thus, the PL intensity is based on Eu³⁺ local site symmetry, and their electronic energy level structure. The transitions in Eu3+ are hypersensitive and they depend on the chemical environments. Doping of Eu3+ in phosphate host gives red-orange emitting luminescent materials. These red-light emitting materials mixed with green phosphor and placed on the blue LED make the WLEDs. WLEDs with good CRI are a challenging task for researchers. Past several years, many scientists were focused to synthesized silicate phosphors for the development of WLEDs but their efficiencies are not good [11 - 13]. Nowadays researchers are focused on rare earth-doped phosphates which are simply synthesized and their developed WLEDs have high CRI [14-16].



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arXiv:2311.13850 (astro-ph)

[Submitted on 23 Nov 2023]

Weak secondary cyclotron line in eclipsing High Mass X-ray Binary Cen X-3

Pravat Dangal, Ranjeev Misra, Nand Kumar Chakradhari, Yashpal Bhulla

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We report the time resolved spectroscopy result from two observations of Cen X-3, over one binary orbit with ASTROSAT and two binary orbit with NuSTAR. NuSTAR covered two intensity states where the light curve showed transition in count rate from first to second binary orbit by a factor of ~ 3 . A phenomenological model comprising of partially absorbed powerlaw with smoothed high energy cutoff, cyclotron absorption ~ 24 keV and 6.4 keV iron emission gave good fit for ASTROSAT observation. NuSTAR spectra required two additional emission components, a broad one ~ 5.7 keV and a narrow one ~ 6.9 keV. A weak secondary absorption feature at ~ 11.6 keV and ~ 14.5 keV was seen in the residuals of the spectral fit for ASTROSAT and NuSTAR data respectively. The secondary absorption energy showed no correlation with the cutoff energy. Its strength varied within 0.1 to 0.6 keV with its width ~ 1.6 keV. Its energy and optical depth showed linear positive correlation with the fundamental cyclotron line

JOURNAL ARTICLE

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Search for merger ejecta emission from late-time radio observations of short GRBs using GMRT ³

Ankur Ghosh ☎ , C S Vaishnava , L Resmi , Kuntal Misra , K G Arun , Amitesh Omar , N K Chakradhari

Monthly Notices of the Royal Astronomical Society, Volume 527, Issue 3, January 2024, Pages 8068–8077, https://doi.org/10.1093/mnras/stad3614

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ABSTRACT

In some cases, the merger of two neutron stars can produce a rapidly rotating and highly magnetized millisecond magnetar. A significant proportion of the rotational energy deposited to the emerging ejecta can produce a late-time radio brightening from interacting with the ambient medium. Detection of this late-time radio emission from short GRBs can have profound implications for understanding the physics of the progenitor. We report the radio observations of five short GRBs – 050709, 061210, 100625A, 140903A, and 160821B using the legacy Giant Metrewave Radio Telescope (GMRT) at 1250, 610, and 325 MHz frequencies and the upgraded-GMRT (uGMRT) at band 5 (1050–1450 MHz) and band 4 (550–900 MHz) after \sim 2–11 yr from the time of the burst. The GMRT observations at low frequencies are particularly important to detect the signature of merger ejecta emission at the peak. These observations are the most delayed searches associated with some GRBs for any late-time low-frequency emission. We find no evidence for such an emission. We find that none of these GRBs is consistent with maximally rotating magnetar with a rotational energy of $\sim 10^{53}$ erg. However, magnetars with lower rotational energies cannot be completely ruled out. Despite the nondetection, our study underscores the power of radio observations in the search for magnetar signatures associated with short GRBs.

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Macromolecular Symposia / Volume 413, Issue 1 / 2200212

Research Article

To Study the Effect of Nanoparticle TiO_2 on Sodium (Na⁺) – Ion Conducting Solid Polymer Electrolyte System: [80PEO:20NaPF₆]

Manju Sahu, Niranjan Kumar, R. C. Agrawal, Y. K. Mahipal 🔀

First published: 21 February 2024 https://doi.org/10.1002/masy.202200212 Citations: 1

Abstract

To study the effect of nanofiller particle TiO₂ on sodium (Na⁺) – ion conducting solid polymer electrolyte (SPE) film: [80PEO:20NaPF₆] and nanocomposite polymer electrolyte (NCPE): [80PEO:20NaPF₆] + *x*TiO₂, where *x* = 1–9 wt. (%) have been prepared. SPE film composition: [80PEO:20NaPF₆] selects as Ist-phase host and nano-sized (<100 nm) filler materials TiO₂ as IInd-phase dispersoid. Both SPE and NCPE films have been prepared by the hot-press technique. Filler particle-dependent conductivity study reveals the NCPE system: [80PEO:20NaPF₆] + 8TiO₂ as the highest conducting composition with $\sigma_{rt} - 3.53 \times 10^{-6}$ S cm⁻¹, which is approximately one order of magnitude higher than the SPE optimum conducting composition (OCC) (σ_{rt}) $\approx 7.78 \times 10^{-7}$ S cm⁻¹. Ion transport properties for both SPE and NCPE system have been evaluated in terms of ionic conductivity (σ) and total ionic (t_{ion})/cationic (t_{+}) transference numbers using combined AC/DC techniques in order to evaluate its usefulness in all-solid-state battery applications. Structural/thermal properties have been characterized using X-ray diffraction (XRD) and differential scanning calorimetry (DSC) techniques. A cyclic voltammetry (CV) study has been performed in SPE and NCPE OCC film to evaluate the electrochemical performance for battery application.

Conflict of Interest

The authors declare no conflict of interest.

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Effect of TiO₂ on ion transport properties and dielectric relaxation of sodium ion-conducting novel PEO/PAN-blended solid polymer electrolyte

Article Published: 16 March 2023 Volume 38, pages 2506–2518, (2023) Cite this article

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Niranjan Kumar, Dinesh K. Sahu & Y. K. Mahipal 🖂

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Abstract

In the present manuscript, a comprehensive study of temperature-dependent ionic conductivity, dielectric behaviour, and thermal, structural, and morphological characteristics of nano-composite polymer electrolyte (NCPE) films has been performed. NCPE films were prepared by hot-press method from a blend of two polymers, Poly (ethylene oxide) (PEO) and Poly (acrylonitrile) (PAN), complexed with sodium perchlorate (NaClO₄) complexing salt and titanium dioxide (TiO₂) nanofiller. Electrochemical Impedance Spectroscopy (EIS) has been used to investigate electrical and dielectric properties and their correlations. The effect of TiO₂ concentration on ionic conductivity and dielectric relaxation has been investigated at different temperature ranges. Both the smoother surface and the



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Volume 83, Part 1, 2023, Pages 33-38

Electrical and thermal analysis on Na⁺ - ion conducting novel blended solid polymer electrolyte membranes

Niranjan Kumar, Manju Sahu, Y.K. Mahipal Ӓ 🖾

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Abstract

In this study, the hot press method has been used to synthesize a blended solid <u>polymer</u> <u>electrolyte</u> (BSPE), containing poly (ethylene oxide) and <u>polyacrylonitrile</u> (PEO/PAN) matrix complexed with <u>sodium</u> perchlorate (NaClO₄) salt. The film with varying salt concentration has been prepared, in which the BSPE OCC (optimum conducting composition) film exhibits the highest <u>ionic conductivity</u> is $(\sigma_{rt}) \sim 2.10 \times 10^{-6}$ Scm⁻¹ at room temperature. X-ray diffraction (XRD), <u>Impedance Spectroscopy</u> (IS), <u>Differential Scanning Calorimetry</u> (DSC) and <u>Thermal Gravimetric Analysis</u> (TGA) techniques have been adopted for the characterization. These investigations are demonstrated their utility and potential for all-solid-state device applications.

Introduction

Materials Today: Proceedings 83 (2023) 69-74

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Physical and electrical property studies on sodium (Na⁺) – Ion conducting Nano-Composite Polymer Electrolyte membranes

Manju Sahu^a, Niranjan Kumar^a, Dinesh Kumar Sahu^b, R.C. Agrawal^a, Y.K. Mahipal^{a,*}

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Nano - Composite Polymer Electrolytes Ion transport properties All-solid-state battery Differential Scanning Calorimetry

ABSTRACT

Present work reports that Polymer Electrolyte Membranes: [97PEO: $3NaCOOCH_3$] dispersed with ceramic filler SiO_2 have been synthesized using the hot-press casting technique. Ion transport properties have been evaluated in terms of the essential ionic conductivity (σ) and total ionic (t_{ion}) / cationic (t_{+}) transference numbers using different ac/dc techniques to evaluate its usefulness in all-solid-state battery applications.

Structural/thermal properties have been characterized using X-ray Diffraction (XRD), Differential Scanning Calorimetry (DSC) and Thermal Gravimetric Analysis (TGA) techniques. The thermal laminated pouch cell has been fabricated and tested by sandwiching the best optimized NCPE film between MnO₂ cathode and Graphite anode. Cyclic Voltammetry study of NCPE film exhibits good electrochemical behaviour and is more suitable for battery fabrication.

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1. Introduction

Modern electrochemical power sources, viz. batteries, fuel cells, super-capacitors etc., developed by Polymer electrolyte membranes have great technological attention. Solid Polymer Electrolytes have several advantages over conventional solid/liquid/ aqueous electrolyte systems [1-4]. These include size/shape flexibility, intimate electrode/ electrolyte contact/ compatibility, more comprehensive temperature range of operation, larger recharge cyclability, longer shelf life etc. In 1973, the first Solid Polymer Electrolytes (SPEs) film, that is, Poly (ethylene oxide) PEO complexed with alkali metal salt, was reported by Fenton et al. [5]. The first solid polymer electrolyte SPE film: PEO: Li*-ionic saltbased battery, was practically demonstrated by Armand et al. in 1979 [6]. Polymer electrolyte materials with different mobile ion species viz. H⁺, Ag⁺, Cu⁺, Li⁺, Na⁺, K⁺, Mg²⁺, Zn²⁺ etc., have been investigated and tested for their applications in electrochemical power sources [7-14]. However, most modern portable batteries are primarily based on Li*-ion conducting polymer electrolytes and Lithium metal electrodes. Lithium chemicals are known for

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their several limitations. They are more reactive, difficult to handle in open ambience, toxic, expensive, low natural abundance etc.; hence, the batteries based on these chemicals involve several safety and environmental issues [15–16]. Thus, most of the researchers mainly focus their work on non-lithium-based battery technology [17–20], such as Na-ion batteries (NIBs), as compared to Li-ion batteries due to the materials advantages and low-cost resources [21–24]. The present paper reports the synthesis of Na⁺-ion conducting Nano-Composite Polymer Electrolyte (NCPE) films: [97PEO:

Nano-Composite Polymer Electrolyte (NCPE) films: [97PEO: 3NaCOOCH₃] + xSiO₂ in varying filler concentrations. These films were prepared by a completely dry/solution-free hot-press casting technique. The hot-press technique has advantages over traditional film casting procedures such as sol-gel and solution cast. Hot – press film casting technique is solvent-free, more rapid and costeffective. Optimum Conducting Composition (OCC) NCPE film has been identified. NCPE OCC film was subjected to materials characterization and ion transport properties studies to evaluate its usefulness in all-solid-state battery applications. Materials and thermal property studies have been characterized by X-ray Diffraction (XRD), Differential Scanning Calorimetry (DSC), Thermal Gravimetric Analysis (TGA) and ion transport mechanism have been measured by AC Impedance Spectroscopy (IS). Finally, an

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International Research Journal of Multidisciplinary Scope (IRJMS)

Efficacy of GSR Biofeedback Relaxation on Aggression and Blood Pressure in Patients with Type II Diabetes Mellitus: A Randomized Controlled Trial

Abstract

To verify the effect of GSR biofeedback (GSR-BF) relaxation training on aggression, blood pressure, and blood glucose levels, we conducted a randomized controlled trial among type II diabetes patients (TIIDPs). 228 TIIDP were selected from the various hospitals of Raipur, Chhattisgarh. Sixty participants who were found to have scores above the 75th percentile on the aggression inventory were included in the sample. Participants with higher aggression were invited for intervention and out of them, 50 randomly divided into two groups: the biofeedback relaxation group and the sham-control group. The 25 TIIDPs in the treatment group were given training on the use of the GSR-BF device for the management of stress parameters, with a total of 20 sessions (30 minutes each). The 25 TIIDPs in the control group didn't receive any training on biofeedback relaxation. Aggression, blood pressure, and blood glucose were assessed before and after the intervention. Aggression was recorded on follow-up too. The SPSS 16th version was used for the analysis. The GSR-BFgroup reported a significant change in systolic blood pressure (p = 014), blood glucose levels (P = 005) and in the dimensions of aggression (p = 001) on the post-intervention test. On the other hand, the control group reported a moderate increase in aggression. The biofeedback group had a significant reduction in the levels of aggression and blood pressure, while the control group had a significant increase in aggression. These findings will be helpful for the promotion of overall health in hyperglycemic TIIDPs.

Keywords: Aggression, blood pressure, GSR biofeedback, hyperglycaemia, relaxation.

Author(s): Yanjana, Alka Chandrakar, Priyamvada Shrivastava, Manoj K Sahu, Antony Wilson MJ, Sannet Thomas, Mahendra Kumar* Volume: 5 Issue: 2 Pages: 73-81 DOI: https://doi.org/10.47857/irjms.2024.v05i02.0295

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Assessing The Psychometric Properties of The Internet Addiction Test (IAT) Among Indian School Students

Aarti Mishra Pt. Ravishankar Shukla University, Raipur, India

Priyamvada Shrivastava Pt. Ravishankar Shukla University, Raipur, India

Mahendra Kumar AIBAS, Amity University Chhattisgarh, Raipur, India

DOI: https://doi.org/10.55489/njcm.140820233024

Keywords: Reliability, Validity, Internet Addiction Test

ABSTRACT

Background: Internet addiction is found to be a growing global problem and India is not exceptional. Adolescents are more over addicted to internet and suffering with mental confusions and deviation in behaviour. Several instruments have been developed for assessment of Internet addiction. Internet Addiction Test (IAT) is the most widely used tool to assess internet addiction, but psychometric properties of the IAT have not yet been examined in the Indian adolescence. The aim was to examine the validity and reliability of the 20-item Internet Addiction Test in Indian School Students.

Methodology: Seven hundred fifty-two students from a CBSE school of Raipur, India was randomly selected in our study. The reliability and validity of IAT was examined. Confirmatory factor analysis was used to examine the structural validity of IAT.



Pankaj Barik & Prof. Meeta Jha Social Vision, Vol: 10 Issue: 4 January - March, 2024, Pages: 14-32 ISSN 2349-0519 RNI: APENG/2014/56403 General Impact Factor (2017): 2.3222 Cosmos Impact Factor (2018): 3.631

Job Stress and Coping Mechanism among Police Personnel during COVID 19 in Odisha

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² Professor in Psychology, School of Studies in Psychology (SoS), Pt. Ravishankar Shukla University, Raipur (C.G.)

ABSTRACT

Stress is an inevitable part of life. When a person believes that the demands made of them exceed their ability to cope, they experience stress. The technical name of these demands is 'stressors'. All job holders encounter stress to some extent however Police personnel tend to impose a high degree of stress and a multiplicity of stressful situations which can affect physical, psychological, social, emotional, and interpersonal relationships. This study focused on identifying the stress and coping strategies adopted by Odisha Police during the COVID-19 pandemic in the implementation of law enforcement duty, shutdown, and night curfew. Due to substantial stress, police personnel may face tension, burnout, conflict, frustration, and anxiety. There are various exercises and coping strategies available to cope with stress. The descriptive statistical techniques, t-ratio, ANOVA, Pearson's product moment coefficient of correlation and regression analysis will be used to summarize the collected data. SPSS 20th version was used for the statistical analysis of the data. The present study will provide technical support to the police and to some with advance situations demine the dischause of their

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EVALUATING THE IMPLEMENTATION OF INDIVIDUAL FOREST RIGHTS UNDER THE RECOGNITION OF FOREST RIGHTS ACT, 2006 IN KANKER DISTRICT OF CHIIATTISGARII

BY

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ABSTRACT:

The Recognition of Forest Rights Act, 2006 (FRA) was a landmark legislation aimed at addressing the historical injustices faced by forest-dependent communities in India by recognizing and vesting individual and community forest rights.the Government of India gave the responsibility of its implementation to Ministry of Tribal Affairs by amending the Allocation of Business Rules, 1961⁵. One of the key provisions of the Act is the recognition of individual forest rights (IFRs), which entitle individuals from Scheduled Tribes and Other Traditional Forest Dwellers (OTFDs) to claim rights over forest land they have been cultivating or dwelling on for generations. This paper explores the implementation of IFRs under the FRA, with a specific focus on Kanker district in Chhattisgarh, a region rich in forest resources and inhabited by various indigenous communities.

The study aims to evaluate the effectiveness of the Act's implementation by assessing the processes of claim recognition, the challenges faced by communities in accessing these rights, and the overall impact of IFRs on local livelihoods and forest conservation practices. By reviewing government records, conducting field surveys, and interviewing stakeholders including local forest dwellers, government officials.

By providing a detailed analysis of the ground-level realities in Kanker, this research contributes valuable insights into the broader debate on the effectiveness of the FRA in fostering socio-economic justice and forest conservation in India.

Keywords: Forest right act, Ministry of Tribal Affairs, Scheduled Tribes and Other Traditional Forest Dwellers

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 पं.02 अंगठ-05 हायता करके उस पर अपना अधिकार जमाना चाहता था। धनपा क दिन आधी रात को भवानी के यहाँ जोर जबरदस्ती करता सहाय विधवा धनपतिया को काटती है और अपने को वारि नपति के बाहुपाश से मुक्त करती है। भवानी धनपतिया की करतती ते नसी संघ वाधा धनपतिया को काटती है और अपने को वारि नपति के बाहुपाश से मुक्त करती है। भवानी धनपतिया की करतत ते ते नसी है इसके ही नियत में खोट है। असहाय भवानी इस घटना क खूवा घूंट खामोशी से पि लेती है। मुसे यहां वेदल्यास महाभारत आदि पर्व में विधवा के लिए क या संदर्भ बताना आवश्यक लगता है। उत्सुमामिष भूमौ प्रार्थयत्ति व्यथा खगा: पार्थ यत्ति जनः सर्वे पति ही र्घ सियमा" अर्थात : जैसे पक्षी पृथ्वीपर डाले हुए मास के टुकडे तेने के लिए झपडते ते उसी प्रकृतार सब लोग विधवा छी को क उत्सुमामिष भूमौ प्रार्थयत्ति व्यथा खगा: पार्थ यत्ति जनः सर्वे पति ही रिख भा" अर्थात : जैसे पक्षी पृथ्वीपर डाले हुए मास के टुकडे तेने के लिए झपडते है. उसी प्रकृतार सब लोग विधवा छी को क तत्ता चाहते है। विधवा भवानी के महनत से फसल उच्छी आई थी : विदा या माँगने के लिए बेचारी कहा कहा दौडी थी। पंचायत न्यायमर्ती के पास गई पर कीसीने उसे न्याय नही दिया। सभी ने व धनपति के लोगो ने आग लगाते हुये किसी ने नही देखा। गाँववाले खाआओं बाधाएँ पी लेकिन कि सामने झकी नही। अपार जीवट पाया है औरत ने अपने कि को महरों जीना ने लाक का कुंजडिन की तरह हल हेंगा खीच सकती है। दाय माँगने के लिए बेचारा जीवा के तर हाह है माम्हण औरत ने जपने के अमरदों जीनि नी बिखा ही कि द्यार भू के का कुंजडिन की तरह हल हेंगा खीच सकती है। या देते। बुर दुसरे ही दिन कल्तवाले खेत में अपने अपने लडक साथ हेंगा खीच रति ही ता यहा लि की हैं। मार की करत ही के अपर वेल की तरह हल हेंगा या स्वलती है। स्वयत्त के की तरह हल हें तो वा दा नी की तरह बी हिं विधव की ति जा के औरत बैल की तरह ही व्य व्य त्य त्य से य वत्त है। ब द दुसरे ही दिन कल्तवाले खेत में अपने अपने लडक सा है ता तत्त हैं। ब द दुसरे ही दिन कल्तवाले खेत में अपने अपने लडक या के तत्त है के सरा को तो तो तत्त बी करता ता साथ नही हो स्व य त्य तत्त है। करा ता तत्त है। वहा करता है। ता का करा ही है स्वर य रा तत्त ही ता सरा की वही त्य वत्त की तर हा करता ही। ब द दुसरे ही या कातर हा हा साम क	Social stigma and questions of mental health or transgender individuals in India Dr.Disent Kumar Sahu Assistant Professor Pt. Ravishankar Shukla university, Raipur (C.G.) Abstract -In India, transgender individuals have alway been on the margins. However, the public and scholarly discourse has been impacted by the growing worr about their identity and mental health issues. The transgender community faces a variety of physics health and mental problems in addition to the long standing discrimination and stigma attached to then Historically, among all the LGTBIQ+ populations i India, the most stigma, prejudice, and marginalisatio have been experienced by persons with diverse sexue orientations and gender identities. Individuals who ider tify as transgender, intersex, or queer face significar health consequences due to being denied access the health and social marginalisation are caused by both in ternal and external pressures, a lack of health infrastru- ture, and other factors. The aim of this article is to do scribe how the absence of healthcare and societal stigm affect transgender, people's poor ment- health and social marginalisation are caused by both in ternal and external pressures, a lack of health infrastru- ture, and other factors. The aim of this article is to do scribe how the absence of healthcare and societal stigm affect transgender, people inside. This review study aim to highlight the issues surrounding the external and in tremal stigma and mental health status of transgender individuals in India. Keywords: Transgender, Social Stigma, Internal Stig- ma, Mental Health Introduction-Gender-varied men and transgender people with a variety of South Asian identities, such as h iras and kothis, who are severely stigmatised in India society, can be found in India. Although probably a underestimate, 488,000 of India's 1.25 billion citizer were believed to be transgender in 2011 (Thompson al, 2019). Given that transgender people in India aknown to be a heterogeneous group. Many indigeno gender-diver
४) विधवा - सुयकात त्रिपाठा निराला ५) एक औरत एक जिंदगी - रामदरश मिश्र पृ ४६,४७,५२,५४	sources of income for Hijras are sex work, many (begging from people or merchants) and doli-badhai
६) साहित्य कुंज अतरजाल	Multidisciplinary and Indering E-Journal

396 शोध आतेख आधुनिक टेक्नोलॉजी और किसान . संभावनाएं और चुनीतियाँ (छत्तीसगढ़ राज्य के विशेष संदर्भ में) / फलेन्द्र कुमार एवं प्रे. एल. एस. गजपाल ুমাই ঐক নাম বিভিন্ধনা দ্যীৰুৱা ৰিজী বাংলিয়া কৈনৰুক ট্ৰিয়ে অনুবাং বিদীগাঁক ৰান নাহিত বিদীয়াক নিতৃতা বিদীয়াক কেতেৱা কি п सम्पादकीय -विमर्श -विधाएँ -परिचय -विविधा -विशेषांक ~ ताजा अंक -सम्पादक : माणिक-जितेन्द्र यादव C Fisher 152

शोध आलेख : आधुनिक टेक्नोलॉजी और किसान : संभावनाएं और चुनौतियाँ (छत्तीसगढ़ राज्य के विशेष संदर्भ में) फलेन्द्र कुमार एवं <u>प्रो. एल. एस. गजपाल</u>

; राज्यतन भयनी मादी (छ रनिवार जून ३०, २०२४)

आधुनिक टेक्नोलॉजी और किसान : संभावनाएं और चुनौतियाँ (छत्तीसगढ़ राज्य के विशेष संदर्भ में) - फलेन्द्र कुमार एवं प्रो. एल. एस. गजपाल



Mural work on wall . size 5x10 ft

थोध सार : कृषि क्षेत्र के सुधार में प्रौद्योगिकी ने महत्वपूर्ण भूमिका निभाई है, डिजिटल प्रौद्योगिकी के आगमन के साथ, दायरा व्यापक हो गया है। कृषि में नद् कृषि पद्धतियों में विकास हो रहा है. जिससे नुकसान कम हो रहा है और दक्षता बढ़ रही है। वर्तमान युग में कृषि में नई-नई प्रणातियों एवं मशीनरी का प्रयो रहा है। इससे पहले जब कोई तकनीक नहीं थी, किसानों को कृषि के सभी पहलुओं को मैन्युअल रूप से करना पड़ता था। लेकिन अब तकनीक ने बहुत आर दिया है। प्रस्तुत अध्ययन छ.ग. राज्य के चार जिलों के 8 गांव पर आधारित है। अध्ययन का उदेश्य किसानों में आधुनिक टेक्नोलॉजी के संभावनाओ एवं चुनौ अध्ययन करना है। चयनित उत्तरदाताओं से प्राथमिक आंकड़ों को एकल विषय अध्ययन एवं साक्षात्कार के माध्यम से एकत्र किया गया है। इस अध्ययन से, ज्ञ है कि खेती में तकनीकों के प्रयोग से किसानों की उत्पादकता और आय में वृद्धि हो रही है। हालांकि, इस प्रक्रिया में कई चुनौतियाँ भी हैं। कृषकों के पास त संगठनों को आधुनिक तकनीक के उपयोग के लिए किसानों को प्रेरित करने, तकनीकी ज्ञान को बढ़ावा देने. और संभावित समस्याओं का समाधान करने सक्रिय भूमिका निभानी चाहिए।

AB & Social Works

बीज शब्द : कृषि विकास. खेती. आधुनिक. टेक्नोलॉजी. किसान, कृषक, स्कनीकी सायि डिजिटल, ग्रामीण।

मूल आलेख :

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Leisure Time and Social development: Contemporary Issues and Challenges

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Abstract:

Today's era is the era of consumerism driven by technology. It has made human beings very materialistic. To fulfill these materialistic needs, we work day and night like a machine. This means less leisure time with family, friends and society. Lack of investment of time and energy in nurturing personal, family and social life can lead, and in many cases, have led to negative outcomes. At personal level, mental and physical well-being is affected. Lack of leisure time can lead to stress and unhealthy lifestyle which in long term can give rise to serious conditions like depression, hyper tension, and heart stroke. The family is affected as well. Lack of engagement between spouses can lead to disintegration and break-down of family structure. This has serious consequences for children within the family. This leads us to think about nature of development. Economic as well as social development is important for development and happiness of individual, family, and the society. In this research paper, we assess the relationship between leisure time and social development. This research paper is based on secondary sources.

Keywords:

1. Introduction

Leisure provides rest and relaxes of people lives. People use their leisure time in a variety of different activities. Leisure has impacts on the formation and accumulation of human capital. Leisure is associated with ongoing personal development during adulthood. Leisure activities will increase individual's creativity. On the other extreme hand, often long working hours and heavy workload is a reason for suicide because workload creates pressure and pressure creates frustration and frustration creates unhappy life and unhappy life creates loneliness and loneliness result in suicide.

According to the ILO report works in informal employment work more likely to work for excessive hours because they are outside labor law protection. The survey showed that regular wage or salaried employees worked for longer duration 53-56 hours than the selfemployed 46-54 hours and casual works 43-48 hours. Many Indian companies are exploiting our country's week corporate employee working hour policies. Most Indian companies make their employees work for at least 9.5 to 12 hours daily and sometimes even 6 days a week, especially multinational companies. This is due to a common belief that more working hours means higher productivity for the company, but in reality it only means faster employee exhaustion. Most employees after working for 10 hours a day and traveling to workplace from home and vice versa for at least 2 hours daily hardly have any strength left in them. Most people also suffer from health problems due to the long hours, so they cannot participate in social activities. Multiple studies have shown that working for longer hours severely affects the physical and mental health of employees, especially those that require sitting in the same place continuously. There are many countries abroad that have much less

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बी.एड. प्रशिक्षण महाविद्यालयों में अध्ययरत पुरुष एवं महिला प्रशिक्षार्थियों के मध्य संवेगात्मक परिपक्वता का एक तुलनात्मक अध्ययन

* प्रीति सिंह

सारांश

प्रस्तुत अध्ययन में बी.एड. प्रशिक्षण महाविद्यालयों में अध्ययनरत पुरुष बी.एड. प्रशिक्षार्थी एवं महिला बी.एड. प्रशिक्षार्थी के मध्य संवेगात्मक परिपक्वता का तुलनात्मक अध्ययन किया गया है। संवेगात्मक परिपक्वता से तात्पर्य अपनी और दूसरों की भावनाओं को समझने और प्रबंधित करने की क्षमता से है। संवेगात्मक परिपक्वता का अर्थ है संतुलित व्यक्तित्व। एक शिक्षक का संवेगात्मक रूप से परिपक्व होना आवश्यक है। अध्ययन का उद्देश्य बी.एड. प्रशिक्षण महाविद्यालयों में अध्ययनरत पुरुष बी.एड. प्रशिक्षार्थी एवं महिला बी.एड. प्रशिक्षार्थी के मध्य संवेगात्मक परिपक्वता, एवं संवेगात्मक परिपक्वता के विभिन्न आयाम सांवेगिक स्थिरता, सांवेगिक प्रगति, सामाजिक समायोजन, व्यक्तित्व एकीकरण, और अनाश्रित को ज्ञात करना है। अध्ययन हेतु रायपुर जिले में स्थित बी.एड. प्रशिक्षण महाविद्यालयों में अध्ययरत 30 पुरुष बी.एड. प्रशिक्षार्थी एवं 30 महिला बी.एड. प्रशिक्षार्थी का चयन संभाव्य न्यादर्श से किया गया है। प्रदत्तों के संकलन हेतु डॉ. यशवीर सिंह एवं डॉ. महेश भार्गव द्वारा निर्मित संवेगात्मक परिपक्वता मापनी का प्रयोग किया गया है। प्रदत्तों का सांख्यिकीय विश्लेषण करने पर परिणाम प्राप्त हुआ कि पुरुष बी.एड. प्रशिक्षार्थी एवं महिला बी.एड. प्रशिक्षार्थी के मध्य संवेगात्मक परिपक्वता में सार्थक अंतर नहीं है। इसी प्रकार पुरुष बी.एड. प्रशिक्षार्थी एवं महिला बी.एड. प्रशिक्षार्थी के मध्य संवेगात्मक परिपक्वता के विभिन्न स्थिरता, सांवेगिक प्रगति, सामाजिक समायोजन, व्यक्तित्व एकीकरण, अनाश्रित में भी सार्थक अंतर नहीं है। इसी

प्रस्तावना

संवेग आंतरिक भावों का बाह्य प्रकाशन है। भावों का तीव्र होना ही वास्तव में संवेग है। संवेग मानव जीवन के लिए महत्वपूर्ण है। संवेग व्यक्ति को समुचित विचार किए बिना कार्य करने को उत्तेजित करते हैं तथा उस उत्तेजना में व्यक्ति प्रशंसनीय एवं निंदनीय दोनों ही प्रकार के कार्य करता है। व्यक्ति अपने जीवन में समय-समय पर अनेक भावों का अनुभव करता है जैसे भय, क्रोध, प्रेम, घृणा, हर्ष, क्षोभ, दया, कामुकता आदि। संवेग के उदय होने पर व्यक्ति में आंतरिक शक्ति का संचार होता है तथा वह ऐसे कार्य को भी कर दिखाता है जो सामान्य परिस्थिति में संभव नहीं होता है। बालक में जन्म से ही कुछ न कुछ संवेग होते है। शैशवावस्था से संवेगात्मक विकास प्रांरभ हो जाता है जो कि प्रौढावस्था तक चलता रहता है। संवेगात्मक विकास प्रौढ़ावस्था आंरभ होने तक पूर्ण हो चुका होता है। इस समय तक संवेगात्मक परिपक्वता आ जाती है। यह वह समय होता है जब व्यक्ति अपने संवेगों पर नियन्त्रण रखना सीख जाता है एवं अपने निर्णय विवेक के आधार पर लेना प्रांरभ कर देता है। समय, स्थान व अवसर को ध्यान में रखते हुए व्यक्ति उचित ढंग से संवेगों की अभिव्यक्ति करता है। इसे ही संवेगात्मक परिपक्वता कहा जाता है। इस प्रकार जो व्यक्ति अपने संवेगों पर उचित अंकूश रखते हुए उन्हें भली-भांति अभिव्यक्त कर सके उसे संवेगात्मक रूप से परिपक्व कहा जा सकता है।

संबंधित शोध अध्ययन

सुब्बारायण एवं विश्वनाथन (2011) ने कॉलेज के छात्रों की संवेगात्मक परिपक्वता पर एक अध्ययन करके निष्कर्ष निकाला कि कॉलेज के छात्रों की संवेगात्मक परिपक्वता बेहद अस्थिर होती है। लिंग, समुदाय और परिवार के प्रकार का कॉलेज के छात्रों की संवेगात्मक परिपक्वता में कोई भूमिका नहीं है। कॉलेज के छात्र जो अलग- अलग धर्मों के हैं, उनके संवेगात्मक परिपक्वता में महत्वपूर्ण अंतर है। सिंह, कौर एवं दुरेजा (2012) ने विश्वविद्यालय के छात्रों के बीच संवेगात्मक परिपक्वता का अध्ययन करके निष्कर्ष ज्ञात किया कि पुरुष खिलाडियों और महिला खिलाडियों के बीच भावनात्मक अस्थिरता. भावात्मक प्रतिगमन, सामाजिक कुसमायोजन, व्यक्तित्व विघटन, स्वतंत्रता की कमी, और संवेगात्मक परिपक्वता के संबंध में महत्वपूर्ण अंतर है। नुजहत (2013) ने भारत के कश्मीर विश्वविद्यालय में पुरुष और महिला दूरस्थ शिक्षार्थियों की संवेगात्मक परिपक्वता का तुलनात्मक अध्ययन करके बताया कि विश्वविद्यालय के पुरुष दूरस्थ शिक्षार्थियों एवं महिला दूरस्थ शिक्षार्थियों के संवेगात्मक परिपक्वता में कोई खास अंतर नहीं है एवं महिला दूरस्थ शिक्षार्थियों में पुरुष दूरस्थ शिक्षार्थियों की तुलना में संवेगात्मक अस्थिरता होती हैं। रानी एवं कुमारी (2014) ने डी.एड. विद्यार्थियों की संवेगात्मक परिपक्वता का उनके समायोजन के संबंध में एक

^{*} सहायक प्राध्यापक, अध्यापक शिक्षा संस्थान, पं.रविशंकर शुक्ल विश्वविद्यालय, रायपुर, छ.ग.

विद्यार्थियों की शैक्षिक चिंता का उनकी शैक्षिक उपलब्धि पर पड़ने वाले प्रभाव का अध्ययन

<u>डॉ. प्रीति सिंह</u> सहायक प्राध्यापक अध्यापक शिक्षा संस्थान पं. रविशंकर शुक्ल विश्वविद्यालय रायपुर, छ.ग.

शोध सार -

प्रस्तुत अध्ययन में विद्यार्थियों की शैक्षिक चिंता का उनकी शैक्षिक उपलब्धि पर पड़ने वाले प्रभाव का अध्ययन किया गया हैं। अध्ययन हेतु छत्तीसगढ़ राज्य के दुर्ग जिले के शहरी एवं ग्रामीण क्षेत्र में स्थित उच्चतर माध्यमिक विद्यालयों के कक्षा ग्यारहवीं में अध्ययरत विद्यार्थियों का चयन न्यादर्श स्तरीकृत विधि से किया गया हैं। विद्यार्थियों की शैक्षिक चिंता का मापन करने के लिए सूद एवं आनंद द्वारा निर्मित शैक्षिक चिंता सूची एवं शैक्षिक उपलब्धि का मापन विद्यार्थियों के द्वारा पूर्व कक्षा में प्राप्त किए गए प्राप्तांको के आधार पर किया गया हैं । प्राप्त आंकड़ों का सांख्यकीय विश्लेषण एक दिश प्रसरण विश्लेषण से करने पर परिणाम प्राप्त हुआ कि शहरी क्षेत्र में स्थित उच्चतर माध्यमिक विद्यालय के कक्षा ग्यारहवीं में अध्ययनरत विद्यार्थियों की शैक्षिक चिंता का उनकी शैक्षिक उपलब्धि पर सार्थक प्रभाव पाया गया हैं एवं ग्रामीण क्षेत्र में स्थित उच्चतर माध्यमिक विद्यालय के कक्षा ग्यारहवीं में अध्ययनरत विद्यार्थियों की शैक्षिक चिंता का उनकी शैक्षिक उपलब्धि पर सार्थक प्रभाव पाया गया हैं एवं ग्रामीण क्षेत्र में स्थित उच्चतर माध्यमिक विद्यालय के कक्षा ग्रारहवीं में अध्ययनरत विद्यार्थियों की शैक्षिक चिंता का उनकी शैक्षिक उपलब्धि पर सार्थक प्रभाव पाया गया हैं।

बीज शब्द - शैक्षिक चिंता, शैक्षिक उपलब्धि, कक्षा ग्यारहवीं, उच्चतर माध्यमिक विद्यालय, शहरी क्षेत्र, ग्रामीण क्षेत्र।

प्रस्तावना -

वर्तमान समय में शिक्षा प्राप्त करने में विद्यार्थी अधिक परिश्रम करते हैं। उनकी कोशिश शत प्रतिशत अंक प्राप्त करने की होती है। विद्यार्थी अपने शैक्षिक प्रदर्शन के प्रति चिंतित दिखाई देते हैं, विद्यार्थियों की सफलता का आकलन उनकी शैक्षिक उपलब्धि से किया जाता है। शैक्षिक उपलब्धि से तात्पर्य छात्रों के द्वारा शिक्षा के क्षेत्र या अपने विषय में विशिष्टता प्राप्त करने से हैं। अनेक अध्ययन से ज्ञात होता है कि छात्रों के शैक्षिक उपलब्धि पर अनेक कारक का प्रभाव पड़ता हैं, जैसे - बुद्धि, शिक्षकों की उम्मीद, अहं शक्तित, चिंता,



Shodh-Rityu तिमाही शोध-पत्रिका

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तकनीकी सम्पादक अनिल जाधव, मुंबई

पत्राचार हेतु पता– महाराणा प्रताप हाउसिंग सोसाइटी, हनुमान गढ़ कमान के सामने, नांदेड–431605 दफन हो जाती हैं विडम्बना तो यह है कि जब किसान इन सब समस्याओं को आला अफसरों के सामने रखते हैं तो उन्हें फर्जी मुकदमें में फँसाकर अनधिकृत रूप से डरा धमकाकर परेशान किया जाता हैं शिवमूर्ति जी अपने उपन्यास में इस समस्या को इस प्रकार दिखाते हैं—''दरअसल, सीजन की शुरुआत में तो नहर में पानी आया नहीं। कुछ बरसात हो गई थी और कुछ अपने पम्पिंग सेट और ट्यूबवेल से लोगों ने धान की लगवाही पूरी की। करीब दस दिन बाद नहर में पानी आया और आया तो इतनी तेजी से चढ़ा कि नहर की पटरी कट गई। बनकट और मदरहवा दोनों गाँवों की सिंवार रात—भर में डबाडब भर गई। लगाए गए धान की फसल डूब गई। डूबी हुई फसल के नुकसान की भरपाई के लिए सिंचाई विभाग से मुआवजा माँगने की आवाज उठने लगी। उसी माँग की काट के लिए नहर विभाग ने किसानों के खिलाफ नहर काटने का मुकदमा लिखा दिया है।'⁶

अतः हम कह सकते हैं कि स्वतन्त्रता से पूर्व और पश्चात हिन्दी कथाकारों के द्वारा किसानों और मजदूरों की दुर्दशा का जो चित्रण किया गया है वे सभी समस्याएं आज भी व्याप्त हैं। इन समस्याओं पर हमारे देश के सभी बुद्धिजीवी वर्ग को गहन रूप से चिंतन करके इनकी दुर्दशा को सुधारने का प्रयास करना चाहिए।

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अध्यापक शिक्षा संस्थान, पंरविशंकर शुक्ल विश्वविद्यालय रायपुर

प्रस्तावना-वर्तमान समय में शिक्षा में संचार एवं तकनीकी का प्रसार हो रहा हैं। समाज आधुनिकीकरण की प्रक्रिया से गुजर रहा है। प्रतिस्पर्धा का भी समय चल रहा है। ऐसे समय में अधिकांश व्यक्ति किसी न किसी प्रकार से चिंतित दिखाई देते हैं। कई बार यह चिंता प्रेरणास्त्रोत भी होती है एवं कई बार यह तनाव का कारण भी हो सकती है। इसी प्रकार जब विद्यार्थी अध्ययन कर रहे होते है तब उन्हें पढ़ाई एवं परीक्षा की चिंता होती है। चिंता अधिक होने पर यह व्यक्ति को भय एवं असुरक्षा की भावना से जकड़ लेती हैं। चिंता दो रूपों में दिखाई देती हैं प्रथम समग्र चिंता के रूप में जो व्यक्तित्व की विशेषता है। इसकी अधिक मात्रा व्यक्तित्व में दोष एवं समायोजन की समस्या उत्पन्न करती हैं। दूसरे रूप में चिंता किसी समस्या या परिस्थिति के संबंध में होती हैं। विद्यार्थी की शिक्षा के प्रति चिंता इसी प्रकार की चिंता हैं जो उसकी अपनी शिक्षा के संबंध में देखी जाती है। शिक्षा प्राप्त करते समय विद्यार्थियों के समक्ष कई प्रकार की समस्याएँ आती हैं। जब इन समस्याओं का समाधान उन्हें नहीं मिल पाता तब वे चिंतित हो जाते हैं। शैक्षिक चिंता का भी स्तर होता हैं–उच्च, मध्यम, निम्न। शैक्षिक चिंता विद्यार्थियों की सफलता के लिए प्रेरक है या तनाव का कारण। यह उनकी शैक्षिक उपलब्धि का आकलन कर ही ज्ञात किया जा सकता है। शैक्षिक उपलब्धि से ही विद्यार्थियों की सफलता ज्ञात होती हैं। शैक्षिक चिंता का शैक्षिक उपलब्धि के साथ संबंध को ज्ञात करने के लिए इस अध्ययन को करने की आवश्यकता अनुभव की गई।

संबंधित अध्ययन –दत्ता एवं गोगोई (2015) ने शैक्षिक उपलब्धि पर शैक्षिक चिंता का प्रभाव अध्ययन किया। अध्ययन से निष्कर्ष प्राप्त किया कि छात्रों में शैक्षिक चिंता का औसत स्तर हैं। शैक्षिक चिंता का औसत स्तर लड़के और लड़कियों के साथ–साथ एकल और संयुक्त परिवार के छात्रों में लगभग समान था। जब छात्र परीक्षा से पहले और परीक्षा के दौरान चिंतित होते है, तो परीक्षा की चिंता उनके प्रदर्शन पर महत्वपूर्ण और प्रभावी प्रभाव डालती हैं। ओकोगु एवं अन्य (2016) ने परीक्षा की चिंता और छात्रों का शैक्षिक प्रदर्शन : सामाजिक अध्ययन दृष्टिकोण पर अध्ययन करके निष्कर्ष निकाला कि परीक्षा संबंधी चिंता उच्च संस्थानों के छात्रों के बीच एक सामान्य घटना हैं, जिसके परिणामस्वरूप छात्रों का शैक्षिक प्रदर्शन खराब होता हैं। आलम (2017) ने मुर्शिदाबाद जिले के स्कूली छात्रों के बीच शैक्षिक चिंता और शैक्षिक उपलब्धि के बीच संबंध का अध्ययन कर निष्कर्ष में बताया कि चिंतित छात्रों ने स्कूल में अच्छा प्रदर्शन नहीं किया। उच्च और निम्न चिंतित छात्रों की शैक्षिक उपलब्धि में भी कमी आई। लेकिन मध्यम रूप से 🛆 gimrj12@gmail.com 💪 +91 9273759904

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An Estimator of Population Variance Using Multi-Auxiliary Information

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Abstract:

In this article, an estimator of population variance using multi-auxiliary information has been proposed. It is seen that under certain conditions, the proposed estimator is less biased and more efficiency than existing estimators. Theoretical results are supported numerically. Moreover, a simulation study also has been made.

Keywords: Multi-auxiliary variables, Variance, Bias, Mean Squared Error (MSE), Relative efficiency, Simulation technique.

1. Introduction

For estimating population parameters, information is highly used in sample surveys. Estimators so defined, are by ratio, regression and product methods of estimation. Srivastava (1967, 71), Ray and Sahai (1980), Gupta and Adhvaryu (1982) and others have proposed various ratiocum product type estimators for population mean but theoretically they are equally efficient as regression estimator. Rao (1969) studied using real populations and found that ratio estimator is more precise. But Ratio estimator is generally biased. Reddy (1974) proposed a transformed ratio estimator which is unbiased up to first order of approximation. Similarly, for estimating population variance, Isaki (1983) proposed ratio and regression type estimators when population variance of auxiliary variable X is known. Das and Tripathi (1978), proposed generalised estimators for population variance. Further, Yadav and Kadilar (2014). Swain (2015) and Olayiwola et al. (2021) suggested more general estimators but for optimum choice of contents involved in the estimators, all are equally efficient.

Let Y and X_i be study and auxiliary variables, taking values Y_j and X_{ij} , (i = 1, 2, ..., p, j = 1, 2, ..., N) respectively, on unit U_j of a population $U = (U_1, U_2, ..., U_N)$. Let

$$S_{i}^{2} = \frac{1}{N-1} \sum_{j=1}^{N} (Y_{j} - \overline{Y})^{2}$$

and $S_{i}^{2} = \frac{1}{N-1} \sum_{j=1}^{N} (X_{ij} - \overline{X}_{i})^{2}$

be the population variances of variables Y and X_i correspondingly. Further, let a sample of size n be taken values from the population by simple random sampling without replacement procedure. Let (y_i, x_g) , (i = 1, 2, ..., p, j = 1, 2, ..., n) be sample units, then unbiased estimators of S_i^2 and S_{ij}^2 are given by

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On The Estimation of Population Mean using Multi-Auxiliary Information on Two Occasions

Abstract

In this paper we deal with an estimator of finite population mean on the current (second) occasion using multi-auxiliary information in successive sampling over two occasions. Properties of the suggested estimator has been discussed and it is seen that the proposed estimatoris more efficient than all the existing estimators for optimal choice of constants included in the estimators. We have also given the numerical illustration to compare the efficiency of the proposed estimator with all the existing estimators.

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PHYSICAL ACTIVITY LEVEL AND OBESITY AMONG UNIVERSITY TEACHERS OF CHHATTISGARH

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ABSTRACT

Sedentary life style leads to reduction in energy regulatory ability, resulting in positive energy balance and weight gain. Obesity is a medical condition in which excess body fat is accumulated to the extent that it may have a negative effect on health (WHO, 2015). The objective of the present study was to find out the physical activity levels and obesity among university teachers of Chhattisgarh. A Total sample of 520 (n=254 male & n=266 female) teachers from different colleges & universities of Chhattisgarh was selectedfollowing the purposive sampling method for the study, age range of the subjects was between 30 to 65 years. Physical activity level (PAL) was assessed with the help of self-constructed questionnaire. Anthropometric measurements (weight, height, waist circumference and hip circumference) were taken with standard methods. BMI and Waist, Hip Ratio were calculated to find out prevalence of obesity. The result of the study revealed that 76.35 percent of subjects were involved in mild physical activity, 3.65 percent of subjects in moderate physical activity (PA), and only 0.96 percent of subjects were involved in vigorous physical activity, whereas 19.04 percent subjects were not involved in any kind of physical activity. 41-50 age group of the participants showed higher obesity problems, it seems the 41-50 age groupis at risk for the development of the hypo-kinetic problems, like obesity. More number of female teachers (54.3) were found to have obesity problems as compared to male teachers (45.7). There is effect of age and gender in the physical activity pattern as well as prevalence of obesity. It was interesting to note that 62.9% of science teachers were obese as compared to the other subjects. It is recommended that future study can be conducted with larger population and intervention programs can be planned to change the lifestyle and to increase engagement in physical activity.

Key Words: Physical activity, obesity, university teachers.

INTRODUCTION

Body composition is important factor in the assessment of health and fitness; hence Obesity was a part of hypo-kinetic disease for the present of study. Obese is a medical condition in which excess body fat has accumulated to the extent that it may have a negative effect on health. People

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ABSTRACT

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Assessment of Acetylcholinesterase Activity Using the Gold Nanocluster–MnO₂ Nanosheet Pair for Detection of Paraoxon

Pinki Miri, Manmohan L. Satnami*, Sanjay Ghosh*, Rekha Nagwanshi, Indrapal Karbhal, Vishal Jain, Yogyata Chawre, Ankita Beena Kujur, Akash Sinha, Kallol K. Ghosh, Shamsh Pervez, and Bhanushree Gupta



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Chemistry & Biodiversity / Volume 22, Issue 1 / e202400966

Research Article

Influence of Essential Oil Composition on Antioxidant and Antibacterial Activities of Three Cultivars of *Cymbopogon Flexuosus*: *In Vitro* and *In Silico* Study

Nikita Raghuvanshi, Bhanushree Gupta 🔀, Veenu Joshi, Surendra Singh Bisht, Madhu Manikpuri, Kamlesh Shukla, Dharmendra Khokhar, Namrata Singh, Kallol Kumar Ghosh

First published: 07 September 2024 https://doi.org/10.1002/cbdv.202400966

Abstract

The present study investigates and compares the chemical composition, antioxidant, and antibacterial properties of lemongrass essential oils (LEOs) extracted from fresh leaves of three cultivars of *C. flexuosus*: Krishna (CF-KA), Cauvery (CF-CA), and Nima (CF-NI), grown in Chhattisgarh plains. Analysis through gas chromatography techniques revealed that citral content was highest in CF-NI (79.82±1.00 %), followed by CF-KA (69.75±2.70 %) and CF-CA (54.75±1.22 %). *In vitro* antioxidant experiments demonstrated that CF-CA had better scavenging capacity in DPPH (SC₅₀=164.55±9.35 µg/mL) and ABTS (SC₅₀=4.76±0.57 GEAC/g) free radical scavenging assays. The *in vitro* antibacterial experiments against *Staphylococcus aureus* (MTCC3160) and *Escherichia coli* (MTCC1687) demonstrated CF-NI's enhanced antibacterial efficacy with significant inhibition zones and low MIC values. *In silico* molecular docking results revealed that LEO compounds like caryophyllene oxide, humulene epoxide, β -caryophyllene etc. have better binding affinities towards targeted protein molecules responsible for bacterial cell mechanisms and production of reactive oxygen species (ROS) compared to their native ligands. Variations in biological activities among cultivars were potentially linked to the proportion of phytoconstituents in their chemical composition.

Graphical Abstract

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Research Article

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Abstract

The present study investigates and compares the chemical composition, antioxidant, and antibacterial properties of lemongrass essential oils (LEOs) extracted from fresh leaves of three cultivars of *C. flexuosus*: Krishna (CF-KA), Cauvery (CF-CA), and Nima (CF-NI), grown in Chhattisgarh plains. Analysis through gas chromatography techniques revealed that citral content was highest in CF-NI (79.82 \pm 1.00 %), followed by CF-KA (69.75 \pm 2.70 %) and CF-CA (54.75 \pm 1.22 %). *In vitro* antioxidant experiments demonstrated that CF-CA had better scavenging capacity in DPPH (SC₅₀=164.55 \pm 9.35 µg/mL) and ABTS (SC₅₀=4.76 \pm 0.57 GEAC/g) free radical scavenging assays. The *in vitro* antibacterial experiments against *Staphylococcus aureus* (MTCC3160) and *Escherichia coli* (MTCC1687) demonstrated CF-NI's enhanced antibacterial efficacy with significant inhibition zones and low MIC values. *In silico* molecular docking results revealed that LEO compounds like caryophyllene oxide, humulene epoxide, β -caryophyllene etc. have better binding affinities towards targeted protein molecules responsible for bacterial cell mechanisms and production of reactive oxygen species (ROS) compared to their native ligands. Variations in biological activities among cultivars were potentially linked to the proportion of phytoconstituents in their chemical composition.

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Q

হ্যায বিদর্গ

इक्कीसवीं सदी की हिन्दी कविता में संभावना एवं चुनौतियाँ

डॉ. गिरजाशंकर गौतम

सहायक प्राध्यापक, हिन्दी पंडित रविशंकर शुक्ल विश्वविद्यालय, रायपुर छत्तीसगढ़

शोध सार : आज के कवि में लोक और वर्तमान परिस्थितियों की गहरी समझ होने के वैचारिक प्रतिबद्धता का स्वरूप अनेक रूपों में दिखाई देता है। कवि सामाजिक, सांस्कृतिक तथा राजनीतिक विसंगतियों को उजागर करता है। आज की कविता पूँजीवाद, जातिवाद सामंतवाद, छद्म समाजवाद से रुबरु होने के बावजूद चेतना जागृत करने में सक्षम नहीं प्रतीत हो रहा है तथापि समाज में मानुजता, संवेदनशीलता स्थापित करने की अदम्य जिजीविषा विद्यमान है।

शब्द संकेत : अभिव्यक्ति, गरीबी, जीवन संघर्ष, लोकजीवन, चेतना, छंद, विमर्श, चुनौतियाँ, संभावनाएँ, नैनो टेक्नोलॉजी ।

प्रस्तावना : कविता सदियों से व्यक्ति और समाज की चेतना और उसके उतार-चढ़ाव को व्यक्त करती आ रही है । यह आदिम काल से लोकमानस, लोक संस्कृति और लोकचेतना की अभिव्यक्ति का सशक्त माध्यम रही है । भारतीय साहित्य परम्परा में संस्कृत ग्रंथ 'ऐतरेय ब्राह्मण' में महीदास कहते हैं कि शिल्प दो प्रकार के होते हैं - देव शिल्प और मानुष शिल्प । देवशिल्प देवताओं द्वारा रचा गया और मानुष शिल्प मनुष्यों द्वारा रचा जा रहा है। 'छंद' या 'कविता' मानुष शिल्प है। आच्छादित करने के कारण इसे 'छंद' कहा जाता है। 'छंद' का जन्म व्यक्ति की जगत चिंता और संवेदना से हुआ है। भारतीय काव्य परम्परा में कविता का जन्म वाल्मीकि की सांसारिक चिंता के कारण हुआ भी माना जाता है। उनके मुखश्री से प्रस्फुटित श्लोक 'मा निषाद...' प्रकृति और मानव को सुरक्षित रखने का प्रयास है ।

'ऐतरेय ब्राह्मण' में काव्यकला के इस दर्शन को समझने के लिए ऋषि शुनः शेप की कथा पढ़ी-समझी जा सकती है। इच्छवाकु वंश के राजा वैधस के पुत्र हरिश्चंद्र जो सत्यवादी हरिश्चद्र के रूप में जाने जाते हैं, उन्होंने एक बार प्रतिज्ञा की, कि मैं अपने पुत्र रोहित की बलि दे दूंगा; लेकिन वे प्रतिज्ञा पूरी नहीं कर पा रहे थे। जब यह बात हरिश्चंद्र के पुत्र रोहित को पता चली तो उन्होंने 'बलिपुरुष' बनने से वचने के लिए अपने स्थान पर अन्य की खोज शुरू की। पाँच वर्ष जंगल में भटकते रहे, एक दिन उनकी भेंट ब्राह्मण अजीगर्त से हुई। अजिगर्त का परिवार अकाल और भूख से व्याकुल था। अजीगर्त ने अपने तीन बेटों में से मंझले बेटे शुनःशेप को सौ गाय लेकर रोहित को सौंप दिया।

रोहिताश्व शुनःशेप को अपने विकल्प में बलि चढ़ाने के लिए साथ ले आए। हरिश्चंद्र के नरवेध यज्ञ में बलि पुरुष 'शुनःशेप' को एक खंभे से बाँध दिया गया। विश्वामित्र ऋषि भी उस यज्ञ में आमंत्रित थे। शुनःशेप ने अपनी रक्षा हेतु उनसे प्रार्थना की। ऋषि विश्वामित्र ने कहा- मैं तुम्हें बचा सकता हूँ, मैं तुम्हें वाणी देता हूँ। तुम वरुण की स्तुति करो। तुम्हारे बंधन खुल जाएँगे। शुनःशेप ने सूक्त पढ़ा, उनके पाश खुल गए।'¹ कहने का आशय यह है कि काव्य सदियों से रक्षा-कवच बनकर संसार को संताप, अकाल मृत्यु और पाप से बचा लेता है; या यूँ कहें बेहतर समाज को निर्माण करता रहा है ।

> 'कहते हैं जब लव कुश ने / राम को / वाल्मीकि रामायण सुनायी / वह सुखद अचरज में, पड़ गए / बोले / जैसा मैंने जीवन जिया / यह काव्य / उससे श्रेष्ठ हैं / 'इससे मेरा अभ्युदय होगा'/ यह नहीं कि कविता / अतिशय कथन करती /

फेसबुक, एक्स, ब्लॉग,वाट्सएप्प, टेलीग्राम, यूट्यूब कविता' के सरलतम, सुलभ प्लेटफॉर्म हैं, जहाँ विमर्शों के भैंवरजाल में अन्छेकवि और अन्छी कविता खोजना, पढ़ना कठिन से रस है। या यूं कहें की तीन दशकों में उपजे विभिन्न विमर्श समाज के बडे स्तर पर नहीं ना पा रहे हैं। अस्मिता-विमर्श्व 'अस्मिता' तक सीमित हो जा रहे हैं।



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हार कर रूख हुआ / दस के बदले बारह जोड़ी लेता हूँ /

दो दिन के दो सुबह उपराहा पाता हूँ /

इसी उम्र में दो उम्र जीवन पाता हूँ।''6

इक्कोसवीं शताब्दी की अनेक असंगतियों के बीच परम्परा, लोक विश्वास और आध्यात्मिक मूल्य हमें भरोसा देते हैं। हताशा से बाहर लाकर समाज के निर्माण का स्पेस तैयार करते हैं-

'हताज्ञा से एक व्यक्ति बैठ गया था /

व्यक्ति को में नहीं जानता था / हताशा को जानता था / इसलिए मैं उस व्यक्ति के पास गया / मैंने हाथ बढ़ाया / 'मेरा हाच पकड़कर वह खड़ा हुआ/वह मुझे नहीं जानता था/ मेरे हाच बढ़ाने को जानता था / हम दोनों साथ चले /

हम एक दूसरे को नहीं जानते थे / साथ चलने को जानते थे।⁷ एक तरह से विनोद कुमार शुक्ल की कविताएँ आज के लोकजन की ध्वनि हैं। वे देश-काल के द्वन्द्व में फँसे मनुष्य की यातना को, उसके स्रोत को पहचानती है। वह बताती है कि बाजार में दिख रही

है तंदूर में वनती रोटी, सबके हिस्से की वनती हुई रोटी नहीं है।

हम सभी जानते हैं कि दुनियाँ के 10 प्रतिशत अमीरों द्वारा 90 प्रतिशत संसाधनों का उपयोग किया जाता है। हम एक जैसी कॉलोनी बनाने के मोह में सभ्यता की विविधता और शैलियों को खत्म कर रहे हैं। भाषाएँ, बोलियाँ, प्रजातियाँ लगातार लुप्त हो रही हैं। प्रांतवाद, अलगाववाद, बढ़ रहा है। एक देश दूसरे देश का हित नहीं सोच पा रहे हैं। पंध, मजहब, आतंकवाद बढ़ रहा है, आणविक युद्ध की धमकियाँ डराने, धमकाने, चमकाने का नया औजार बन चुका है। शक्ति के समीकरण लगातार बन बिगड़ रहे हैं। बहुत सारे लोगों को बहुत समय के लिए बेवकूफ बनाया जा रहा है-

'जंगल जो जानता था जंगल होना / आदमी जो जानता था सबसे पहले आदमी होना / ठसे कैसी शिक्षा देते रहे कि एक दिन / अपने घर पर हमला देख वह छोड़कर लड़ना / करने लगा बंद दरवाज़े के पीछे छुपकर प्रार्थना / आज वह सीख रहा है / सभ्य बनने के सारे तरीके / सीख रहा है/जीवनभर गुलाम बने रहने के सारे हुनर/सीख रहा है। जल जंगल ज़मीन के साथ कैसा बेचा जाता है ज़मीर । भाषा, बोली, अपनी पहचान इंसानी मूल्य / सब कुछ गिरवी रखकर / सीख रहा है बेईमान होने की कला।¹⁸

इस कविता में इक्कीसवीं सदी की विशेषताएँ और विद्रुपताओं का विरोधाभासी चित्र देखा जा सकता है। यह सदी त्वरित गति से बदलाव की सदी है। परिवेश और पर्यावरण दोनों बदल रहे हैं लोक-जीवन, लोक-व्यवहार और लोककला की परम्परा बदल रही हैं या संकट में हैं। एकांत श्रीवास्तव अपनी 'कन्हार' कविता में लिखते हैं –

'खेत जाते किसानों के कंधों पर झूलने लगे ट्रांजिस्टर टी. वी. वीडियो के शोरगुल में लगा दम लोक कलाओं का कला छोड़ लोक कलाकार सब खेतिहर मजूर हुए।'⁹ ये सब खेतिहर मजदूर मजदूरी करते अभावों से रोज लड़ते हैं। भूख और दरिद्रता, गरीबी,बेरोजगारी, संसाधनों की कमी इन्हें पलायन करने को मजबूर करती हैं। इस तरह के दृश्य रेलवे-स्टेशन, बस-अड्डों पर सहज ही दिख जाते हैं जिसमें बूढ़े-बच्चे, महिलाएँ सभी शामिल हैं-

'बच्चे काम पर जा रहे हैं

हमारे समय की सबसे भयानक पंक्ति है यह भयानक है इसे विवरण की तरह लिखा जाना लिखा जाना चाहिए इसे सवाल की तरह काम पर क्यों जा रहे हैं बच्चे ?¹⁰

आज के कवियों की नजर से ये नज़ारे बच नहीं पाते हैं वे पूरे तेज और तेवर के साथ उसे अभिव्यक्ति देते हैं। इनमें ठोसपन और ठसक विद्यमान है। कवियों के समक्ष चुनौती यह है कि कविता ख़बर न बने, वह भावभांगिमा, भाषा, अर्थ से अपनी पहचान बनाये रखे। 'बाह्य जीवन की नाना विभीषिकाएं जब मनुष्यता को पूरी तरह निगल लेने को आतुर हों, सामाजिक चेतना सम्पन्न यथार्थवादी रचनाकार का दायित्व है की वह उनसे जूझे और उनकी असलियत को उद्घाटित करते हुए अपने रचना धर्म को सार्थक करे।'¹¹

निष्कर्ष- विगत दशक में यह भी देखने में आया है कि साहित्य में नवोदित कवियों और कविताओं के समीक्षा और मूल्यांकन में चुप्पी सी है, अच्छी कविताओं पर भी प्रतिक्रियायें उदास दिखती हैं। इक्कीसवीं सदी के तीसरे दशक में चार पीढ़ी के लगभग चार सौ से अधिक कवि लेखन कर रहे हैं, ऐसे में आलोचना के नए औज़ार, नए अनुभव, नई संवेदना, नए संदर्भ, नए रास्ते आलोचकों और पाठकों को भी देखना-ताखना चाहिए। समयाभाव से ग्रस्त कविता के लिए यह चुनौती है संवेदन-शक्ति बनाए रखते हुए लोगों को आकर्षित कर सके। संदर्भ :

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and restoring balance. This

article delves into how yoga, meditation, and pranayama contribute to mental health improvement by reducing stress, enhancing emotional regulation, improving self-awareness, and fostering a sense of inner peace. It explores the scientific evidence supporting their efficacy and discusses the role these practices play in managing common mental health challenges like anxiety, depression, and burnout. The paper

also highlights the accessibility of these practices and their ability to promote holistic well-being. Join for free



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Prominent Perspective on Existing Biological Hallmarks of Alzheimer's Disease

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Affiliations PMID: 38591203 DOI: 10.2174/0115680266292514240404040341

Abstract

Biomarkers are the most significant diagnosis tools tending towards unique approaches and solutions for the prevention and cure of Alzheimer's Disease (AD). The current report provides a clear perception of the concept of various biomarkers and their prominent features through analysis to provide a possible solution for the inhibition of events in AD. Scientists around the world truly believe that crucial hallmarks can serve as critical tools in the early diagnosis, cure, and prevention, as well as the future of medicine. The awareness and understanding of such biomarkers would provide solutions to the puzzled mechanism of this neuronal disorder. Some of the argued biomarkers in the present article are still in an experimental phase as they need to undergo specific clinical trials before they can be considered for treatment.

Keywords: Alzheimer's disease; biomarkers; diagnosis.; neurodegenerative diseases; tau protein; βamyloid peptide.

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Optimization of variables and assessment of *in-vitro* and *in-vivo* antihyperlipidemic activity of Eudragit RS nanoparticles containing simvastatin

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