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## छत्तीसगढ़ की सांस्कृतिक सरिता खारून : ग्राम खोरपा से नव अन्वेषित प्रतिमाओं के विशेष संदर्भ में

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सूचक शब्द - नदी, खोरपा, मूर्ति, पुरातत्त्व, उत्खनन  
प्रस्तावना - छत्तीसगढ़ राज्य, जिसे प्राचीन काल में

दक्षिण कोसल के नाम से जाना जाता था, भारत के कुछ सौभाग्यशाली राज्यों में एक है जिसकी अपनी बहुत समृद्ध संस्कृति रही है। समृद्धशाली संस्कृति तो बहुत सारे राज्यों की रही है किन्तु उनका संरक्षण नहीं हो सका और समय के साथ-साथ सांस्कृतिक विरासत समाप्त होती चली गई। किन्तु सर्वविदित है कि छत्तीसगढ़ एक वनवासी बाहुल्य राज्य है और इन वनवासी बन्धुओं ने आजतक अपनी सांस्कृतिक विरासत को सुरक्षित रखा है।

छत्तीसगढ़ राज्य पर प्रकृति की भी असीम कृपा है यहाँ का अधिकांश भाग वनाच्छादित है, यहाँ पर पहाड़ों की श्रृंखला भी उपस्थित है साथ ही महानदी, शिवानाथ, खारून, जोंक, हसदो एवं इन्द्रावती जैसी नदियाँ भी प्रवाहित होती हैं। अपनी इसी आदर्श स्थिति के कारण यह क्षेत्र प्रागैतिहासिक काल से ही मानव की शरण स्थली रहा है। पूरे अंचल से आदिमानव के सांस्कृतिक अवशेषों की प्राप्ति हुई है इनमें सिधनपुर<sup>1</sup>, काबरापहाड़<sup>2</sup>, हराडुला, नांदघाट एवं पचराही

छत्तीसगढ़ राज्य ऐतिहासिक एवं पुरातात्विक दृष्टि से एक सम्पन्न प्रदेश है। प्रायः सभी स्थापत्य खण्ड, प्राचीन मंदिर, प्रतिमा एवं भग्नावशेष नदियों के तट पर ही प्राप्त होते हैं एवं कहीं न कहीं इनका संबंध किसी प्राचीन मानवीय सभ्यता से होता है। अतः हम कह सकते हैं कि मनुष्य के क्रमिक एवं सांस्कृतिक विकास में नदी घाटियों की महत्वपूर्ण भूमिका रही है। इसी संदर्भ में छत्तीसगढ़ प्रांत के मध्य भू-भाग में प्रवाहित होने वाली प्रमुख नदी खारून के दाहिने तट पर स्थित ग्राम खोरपा का पुरातात्विक दृष्टि से विशेष स्थान है। खोरपा रायपुर जिले के अभनपुर तहसील के अंतर्गत एक ग्राम पंचायत है। यहाँ से कुछ प्राचीन प्रतिमाएं प्राप्त हुई हैं इन प्रतिमाओं में शैव, वैष्णव एवं शाक्त धर्म के अतिरिक्त कुछ अन्य मूर्तियाँ प्राप्त हुई हैं जो ऐतिहासिक एवं पुरातात्विक महत्व की हैं। ये मूर्तियाँ प्रतिमा लक्षण एवं शिल्पगत विशेषताओं के अनुरूप बनी हैं जिनके कारण अध्ययन की दृष्टि से इनका महत्व और बढ़ जाता है। प्रस्तुत शोधपत्र में मुख्य रूप से पुरातात्विक ग्राम खोरपा की प्रतिमाओं का पुरातात्विक अध्ययन किया गया है एवं इसके माध्यम से इस ग्राम के प्राचीन इतिहास एवं पुरातत्त्व के क्षेत्र में नई कड़ी जोड़ने का प्रयास किया गया है।

जैसे पुरास्थलों का उल्लेख आवश्यक है। पाषाण काल के बाद महापाषाणिक संस्कृति के भी अवशेष यहाँ से प्राप्त हुये हैं। ऐतिहासिक काल में यह क्षेत्र मौर्य, कुषाण, वाकाटक, गुप्त, नल, शरभपुरिय, पाण्डुवंशी एवं कलचुरि जैसे राजवंशों से प्रत्यक्ष तथा अप्रत्यक्ष रूप से शासित रहा। ऐतिहासिक काल में यहाँ पर अनेकों मंदिरों तथा मूर्तियों का निर्माण शासकों के द्वारा कराया गया इसीलिये कला पुरातत्त्व के अध्येताओं के लिए यह प्रदेश स्वर्ग से कम नहीं है।

संस्कृति एवं सभ्यता के विकास में नदियों की प्रमुख भूमिका होती है। नदियों के तट पर प्रायः नगर बसते हैं। यह बात सत्य है कि बड़ी नदियों की तुलना में सहायक या छोटी नदियों के तट पर प्रायः ज्यादा बसाहट देखने को मिलती है इसके पीछे कारण यह है कि बड़ी नदियों की तुलना में प्रायः सहायक नदियों में बाढ़ आदि का खतरा कम रहता है। इसी क्रम में बताना उचित होगा कि छत्तीसगढ़ में प्रवाहित होने वाली अधिकांश नदियाँ छोटी नदियों की श्रेणी में आती हैं और प्रत्येक सरिता सांस्कृतिक रूप से बहुत समृद्ध है। इसी प्रकार की एक नदी खारून है जिसके तट पर बहुत सारे पुरास्थल खोजे गये हैं

और अभी बहुत पुरास्थलों के मिलने की प्रबल संभावना

□ सहायक प्राध्यापक, प्राचीन भारतीय इतिहास, संस्कृति एवं पुरातत्त्व अध्ययनशाला, पं.रविशंकर शुक्ल विश्वविद्यालय, रायपुर (छ.ग.)

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## Article

## The Cultural Study of Tribes and Prehistoric Rock Paintings of Simdega District

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## Abstract

This research paper will mainly consist of the unreported Neolithic site and rock art sites of Simdega district. In this paper there will be the detailed information about the rock paintings. The detailed study will be done of the various figures of the paintings. This paper will also describe the associated remains found along with the rock paintings. The research paper also consists of the developing phase of the rock art which can be seen in the tribal communities. Paper will also consist of the study of saddle quern, its various uses and how it is related to the tribal community. There will be the content about the importance of the rock art in the tribal society. Various rituals are performed on the rock art site by the tribal people till today. This research paper will describe these rituals which are performed by the tribal people. The paper will consist of the study of correlation between the rock art and the various arts forms and cultures present in the tribal community.

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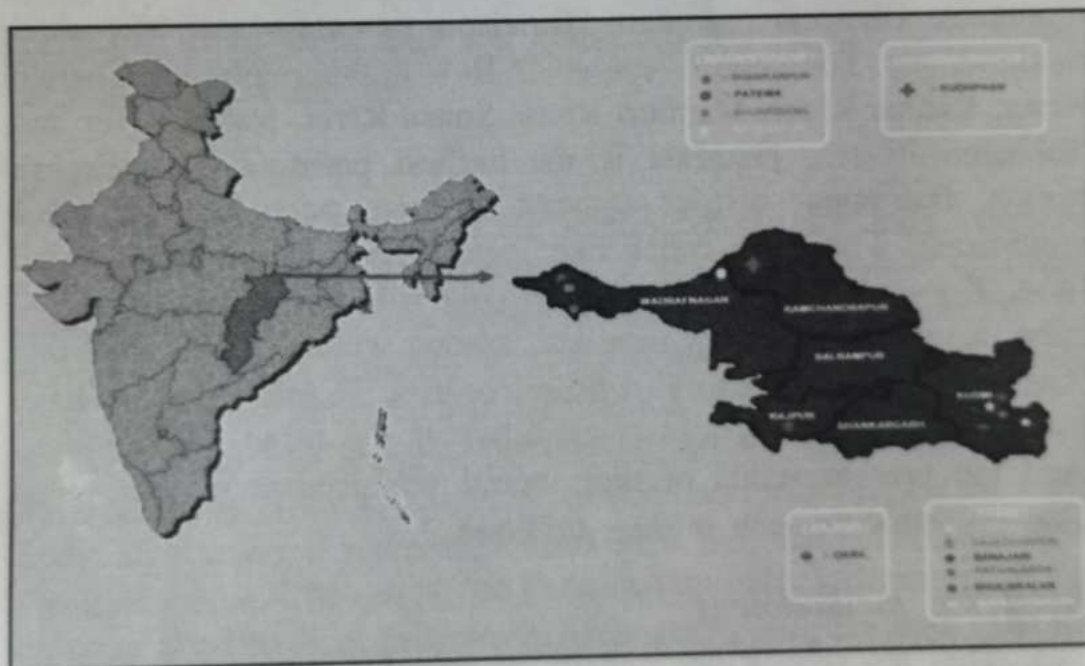
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# The Unexplored Megalithic Sites and Burial Practices of Balrampur Region (Chhatisgarh)

**Dr. Nitesh Kumar Mishra • Anshu Mala Tirkey**  
**• Baleshwar Kumar Besra**



## Abstract

This paper is related to the megalithic culture and the burial practices of various tribes in Balrampur region. It consists of the definition of megalith. The paper deals with the geographical features of the region. As Balrampur region consists of various mountains, rivers and forest, which promotes the survival of various tribal communities. There are detailed information about the burial practices of various tribes and unreported sites. The





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## KALA - VAIBHAV

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प्रधान संपादक  
डॉ. मंगलानंद झा

प्राचीन भारतीय इतिहास, संस्कृति एवं पुरातत्त्व विभाग  
इंदिरा कला संगीत विश्वविद्यालय, खैरागढ़ (छ.ग.)



## Newly Discovered Neolithic Tools from District Jashpur, Chhattisgarh

**Dr. Nitesh Kumar Mishra**

**Anshu Mala Tirkey**

**Baleshwar Kumar Besara**

This paper is related to Neolithic culture in Jashpur region. It consists of the definition of prehistory. The paper deals with the geographical features of the region. As Jashpur region consists of various mountains, rivers and forest, which promotes the survival of prehistoric man. There are detailed information about the Neolithic culture and tools. Few sites are also mentioned in this paper. The paper also focuses on the study of worship, rites and rituals of tribal communities related to Neolithic tools. This paper also contains the medical use of the Neolithic tools among the tribal societies. The Neolithic tools are not only used for human beings but also for the animals as medicine. Continuation could be seen among the tribal people as medicine and they worship the tools as god. Neolithic culture in this region enriches the history of the state and constructs the chronology of the district.

We acquire knowledge of prehistoric age by the archaeological evidences which are scattered all over the world. There is no written evidences of this age, thus the word prehistoric represents the period before history was recorded or before the invention of writing system. Prehistory is also known as "Stone age". Prehistory describes eras where there was human existence, but no records exist about their way of life. On the basis of archaeological evidence, Pleistocene period (30 lakh B.C.) is marked as the evolution of mankind<sup>1</sup>. Our first nearest ancestor was Australopithecus. After Australopithecus, Homo Habilis, Homo erectus and Neanderthal were marked as our ancestors. After all these species the developed human was marked as Homo sapiens. Infact the complete developed human species was known as Homo Sapiens Sapiens<sup>2</sup>. Pleistocene period was marked for the attainment of the evidence of fossils and stone tools. For the study of prehistoric age, the period was divided on the basis of technique and types of the prehistoric tools. First is Paleolithic period then Mesolithic period and the last phase of Stone Age is Neolithic period. Neolithic period was the revolutionary era, when the prehistoric man changed their life style. They started agriculture along with hunting and food gathering. Previously they depend upon nature (man gathered the fruit and roots for their survival) but in this period they won victory upon the nature, they started cultivating and produced their own food. Apart from this they also started domesticating animals for food and other purposes<sup>3</sup>

### **Geographical background**

Jashpur region is one of the districts of Chhattisgarh state. It is the bordering district of northern side of Chhattisgarh state. Geographically Jashpur region is divided into two parts. The northern part of the district is known as 'upper ghat' where as the southern part is known as 'nichghat' Jashpur district is the interconnecting border of Jharkhand and Odisha. There are eight blocks in Jashpur district. Geographically Jashpur region is very rich; it consists of numerous mountains (like Dungul pahar, Deshdekha, Madeshwar and Arra pahar), rivers (like Ib River, Lawa River, Shankh River and Girma River) and forests (like Badalkhol etc.)<sup>4</sup>. There are different kinds of trees, plants, animals, birds and aquatic animals. The geographical features and climatic condition of Jashpur region indicates the survival of prehistoric man. This region consist of not only the historic period but there are also the evidence of prehistoric period scattered all over district. s

### **Literary review**

Archaeologically Jashpur region is very important part of Chhattisgarh state, but also incomplete and nebulous research work has been done. Directorate of Culture and Archaeology Govt. of Chhattisgarh has done the





## NEW EXPLORED ARCHAEOLOGICAL SITE "JAIMARGA"

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Anshu Mala Tirkey\*\*  
Baleshwar Kumar Besra\*\*\*

## ABSTRACT

*Jaimarga is the village which is located in Manora block, district Jashpur in Chhattisgarh state. This village is one of the important prehistoric as well as habitation sites of ethnic groups. Jaimarga consists of the remains of various types of archaeological sites. There is rock painting cave located in the Garh pahar and microliths are the associated materials along with the rock art. There are also the remains of the kiln made by the ancestors of the Agaria tribe. This site named Hethdarn also consists of the menhirs along with the earliest kilns. There are also the remains of various pot shreds, tuyeres, iron ores and iron slags, which points that the iron smelters survived there for a longer duration. This paper will consist of the information of the unreported sites of Jaimarga village. The paper will also describe the present condition of the remains found in this region.*

**Keyword** – Gar pahar, Menhir, Iron slag (Garda pakhna), iron ore (Bicchi pathar), Kiln, tuyere, Agaria, Microliths

Jaimarga is situated in the Jashpur district in Chhattisgarh state. The village Jaimarga is situated in the Manora block. Jaimarga is located 13km away from the sub district headquarter Manora. It is 31km away from the district headquarter Jashpur Nagar. The gram panchayat of Jaimarga is Dadgaon. The geographical area of the village Jaimarga is 585.14 hectares. The name Jaimarga is derived from the word Garhpahar, there are about seven stone placed on the top of the mountain. The word Jaimarga means the "mountain god". The tribal people worship the mountain as because they get stones for making tools and making of megalithic stones, food and for the iron smelters the mountain provide iron ore. According to the folklore of the villagers the seven stone was symbolized as stone of the achievement of their ancestors. Geographically the village Jaimarga is very rich for flora and fauna. There are mountains as the fortification wall of the

village. Village is surrounded from all four sides. The mountain ranges in the village runs from west to east. The mountains are mostly located on the north side. On the eastern side there is Surya pahar, western side consists of Hadi pahar and on the north side there is Khukhara pat pahar. There is "Benjora Nala" flowing animals found in in Jaimarga village. There are wild boar, monkey, jackal, elephant, deer, fox, bear, in this region and it joins the river Lawa River in the south. This village is the bordering part of the Chhattisgarh state. In this region laterite soil is found. There is dense forest in this village. Sakhuwa tree is the main tree which is found in this forest. There are many other trees found in this region like Kusum, Mahuwa, Char and Sal. There are many wild animals like pangolins, snake and porcupine etc.

Jaimarga is the highly tribal populated region. There are various tribes found in this

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**सारांश:** इंटरटेनमेन्ट... इंटरटेनमेन्ट और इंटरटेनमेन्ट डर्टी फिल्म में विद्या बालन का यह संवाद (डायलॉग) वास्तव में फिल्मों को लेकर वर्तमान समय की आवश्यकता है। दैनिक धारावाहिक, नाटक और फिल्मों में दिखाए जाने वाली कई घटनाएँ और कभी-कभी संपूर्ण फिल्म समाज की एक चलचित्र या तस्वीर होती है। कई फिल्मों में दिखलाई जाने वाली घटनाओं में तो दर्शकों द्वारा महसूस किया जाता है कि उक्त घटना तो मेरी जिंदगी में भी घटी है या घट सकती है। साथ ही फिल्मी जगत एक बहुत बड़े दर्शकगण को बांधे रखने का कार्य करती है। यही कारण है कि फिल्मों को उनके सकारात्मक और नकारात्मक प्रभाव को लेकर अनेक समीक्षात्मक मापदंडों से होकर गुजरना पड़ता है कि कहीं हमारे समाज या समाज का कोई वर्ग विशेष पर किसी फिल्म विशेष का नकारात्मक प्रभाव तो नहीं पड़ रहा, इत्यादि। उपरोक्त संपूर्ण प्रकार की बातों से स्पष्ट है कि फिल्म जगत का हमारे मानव समाज में महत्वपूर्ण भूमिका होती है। परंतु इसके साथ ही एक और महत्वपूर्ण सच्चाई यह है कि यदि फिल्मों के सकारात्मक प्रभाव से हमारे समाज को जागरूक करने और उसके प्रभाव को व्यवहार में लाना है तो जिम्मेदारी दोनों तरफ से निभाया जाना आवश्यक है जहाँ फिल्मों को जमीनी स्तर पर अपने प्रभाव को रखना होगा वहीं दर्शकगण (मानव समाज) को भी सकारात्मक चीजों को ग्रहण करके व्यवहार में लाना होगा। उपरोक्त प्रकार के प्रभाव को जानने का प्रयास प्रस्तुत अध्ययन में विभिन्न शोध-तकनीकों द्वारा किया गया है। जिसमें प्राप्त परिणाम अपेक्षाकृत नकारात्मक प्राप्त हुआ। जैसे, अधिकांश दर्शक फिल्म में दिखाए जाने वाले संदेशों के व्यवहार में नहीं लाते।

**कुंजी शब्द :** सिनेमा, समाज, सिनेमा का मनोवैज्ञानिक प्रभाव, सिनेमा के वर्तमान स्वरूप।

1. **प्रस्तावना :** फिल्मी जगत और मानव समाज में एक गहरा संबंध होता है या दूसरे शब्दों में कहा जा सकता है कि फिल्मी जगत मानव समाज का ही एक अंग बन चुका है। सिनेमा और समाज में पाए जाने वाले संबंधों में एक महत्वपूर्ण संबंध यह है कि समाज और सिनेमा दोनों का एक-दूसरे पर प्रभाव प्रत्यक्ष होता है। जिंदल, ए. (1960) ने सोशियोलॉजी बुलेटिन में प्रकाशित अपने लेख में स्पष्ट किया कि "आज पूरी तरह से जनसंचार के माध्यम के रूप में फिल्म अत्यधिक महत्व की है और रेडियो की तुलना में अधिक मर्मज्ञ है और संचार के अन्य दो प्रमुख मीडिया को दबाती है।" जहाँ एक ओर समाज और देश में धटित होने वाली घटनाएँ तुरंत किसी न किसी सिनेमा की कहानी या कहानी का हिस्सा बन जाती है। जैसे, कारगील पर बनी फिल्में, अन्ना हजारे के आंदोलन पर बनी सत्याग्रह फिल्म इत्यादि को लिया जा सकता है, वहीं दूसरी ओर फिल्मों में दिखाए जाने वाले घटनाओं को भी समाज के सदस्य तुरंत अपना लेते हैं। इस प्रकार के संबंध से स्पष्ट है कि सिनेमा में दिखाए जाने वाले भूमिकाएँ, फिल्मों की कहानी, फिल्मों में दिखलाए जाने वाले दृश्य इत्यादि कितनी अधिक संवेदनशील हो सकती है। यही कारण है कि फिल्मों को अनेक प्रकार के प्रमाण-पत्रों और समीक्षाओं से गुजारा जाता है जो आवश्यक भी है। इन्हीं समीक्षाओं में फिल्मों में दिखाए जाने संदेशों को, जिससे समाज को लाभ हो सके उन संदेशों को भी महत्व दिया जाता है। सामान्यतः हमारे समाज में लोगों द्वारा बहुआधिक पैसे सिनेमा पर खर्च किया जाता है परंतु उसके बाद भी समाज के लोग उन संदेशों को कितना स्वीकार करते हैं और फिल्मों के सकारात्मक संदेशों को व्यवहार में लाते हैं यह समाज के लोगों पर निर्भर करता है। वहीं फिल्मों, नाटकों में दिखाए जाने वाले घटनाओं में अनेक शोध-कार्य भी संपन्न किए जाते हैं विशेषकर शोध के अनेक पद्धतियों और प्रविधियों के अंतर्गत आने वाले अंतर्वस्तु विश्लेषण में फिल्मों, नाटकों के संवादों का प्रत्यक्ष-अप्रत्यक्ष विश्लेषण करके सामाजिक घटनाओं को समझने का प्रयास किया जाता है। उपरोक्त कारणों के कारण एक ओर फिल्मों में दिखाए जाने वाले घटनाओं को समाज और लोगों के प्रति सकारात्मक होना आवश्यक है दूसरी ओर लोगों को भी फिल्मों में दिखलाए जाने वाले सकारात्मक तथ्यों को अपनाने का प्रयास किया जाना चाहिए और यह प्रभाव दीर्घकालीक होना चाहिए। वर्तमान समय में लोग जब पान सिंह तोमार, बेंडिट क्वीन जैसे फिल्मों से जिनमें आम जनता, आदिवासियों के साथ होने वाले अत्याचारों को दिखाया



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Dr. Shailendra Kumar

## Factors of Modern Social Stratification: An Anthro-Sociological Perspective

Authors **ShailendraKumar**

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[Home](#) > [Ascomycota](#) > [Eurotiales](#) > [Phytopathogenic Fungi](#) > [Aspergillus](#)

## Article

Airborne Aspergillus at some rural areas adjoining to Raipur city (C.G.) India

December 2020 · [FLORA AND FAUNA](#) 26(2)DOI: [10.33451/florafauna.v26i2pp206-208](#)

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## References (12)

## Abstract

Increased urbanization and industrialization in recent time has made a significant impact on air quality of the area. The atmosphere is rich in propagule of different fungal species. The investigation on airborne Aspergillus contribution was conducted in Periphery of Raipur city from February, 2018 to March, 2019 with the help of gravity petriplate containing PDA (Potato Dextrose Agar) medium. In this study, total 11 species of Aspergillus were recorded. The percentage frequency and percentage contribution of different Aspergillus species were different in different seasons. Aspergillus niger was most frequent throughout the year followed by Aspergillus fumigatus, A. flavus, and A. nidulans etc. While Aspergillus clavatus, and A. versicolor, A. aculeatus were the least frequent species. The result indicated the highest percentage contribution of Aspergillus niger (43.29 percent) followed by A. fumigatus (9.02percent), A. flavus (8.42 percent) while A. clavatus (0.21 percent). The objective of the studies was to determine a seasonal variation in concentrations of Aspergillus on the basis of meteorological parameters.

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# Amelioration of Ageing Associated Alterations and Oxidative Inequity in Seeds of *Cicer arietinum* by Silver Nanoparticles

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## Abstract

Metal-based nanoparticles (NPs) have recently been accomplished a great attention worldwide, in various sectors including agriculture due to their beneficial impacts in plant growth, development and stress tolerance. However, it shows dose-dependent response and may vary with type of metal and synthesis procedure followed. Among many, silver

# DIVERSITY OF SOIL AND LEAF SURFACE MYCOFLORA: A SOURCE OF AEROMYCOFLORA

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Microorganisms are introduced into the air from various sources. The important sources of these microorganisms are soil and vegetation of that area. Microorganisms, which are found on plants' surface either as pathogens or as saprophytes, also get suspended in the air. Man-made actions like digging or ploughing the soil may also release soil-borne microbes into the air. The surrounding atmosphere plays an important role as the sources of organisms in the experimental area. The studies were carried out from February 2006 to March 2007. In the present study, aeromycoflora, mycoflora were observed from soil and plant near the experimental sites as their sources. The Potato Dextrose Agar medium containing plates were used for the isolation of mycoflora from their sources around the Panabaras of Rajnandgaon district. During the present study, a total of 22 fungal species of 120 fungal colonies belonging to 14 genera were reported from the soil. While 24 fungal species of 166 fungal colonies belonging to 16 genera were isolated from the leaf surface. *Aspergillus fumigatus* (10.00%) showed the maximum percentage contribution, followed by *Fusarium oxysporium* and *Khuskia oryzae* (8.33%), *Aspergillus japonicus* and *Paecilomyces variotii* (7.5%) and *Alternaria radicina*, *Penicillium notatum* (5.83%) in the soil mycoflora. It is also shown that *Cladosporium cladosporioides* (11.44%) followed by *Aspergillus niger* (9.63%), *A. fumigatus* (6.62%), *Monodictys fluctuata* (6.02%), *Curvularia lunata* (5.42%) and *Aspergillus fumigatus* (4.81%) were the most contributed to leaf surface mycoflora.

**Key Words:** Fungal diversity, aeromycoflora, sources, soil, leaf surface.

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## INTRODUCTION

Fungi are very successful inhabitants of soil due to their high plasticity and their capacity to adopt various forms in response to adverse or unfavorable conditions<sup>1</sup>. The diversity and activity of fungi are regulated by multiple biotic (plants and other organisms) and abiotic (soil pH, moisture, salinity, structure, and temperature) factors<sup>2,3</sup>. Fungi can be found in almost every environment and can live in a wide range of pH and temperature<sup>4</sup>. Fungal populations are strongly influenced by the diversity and composition of the plant community and in return, affect plant growth through mutualism, pathogenicity, and their effect on nutrient availability and cycling<sup>5-7</sup>. The contribution of soil organisms is very significant in many soil functions such as supporting the growth of plants, absorbing, neutralizing and transforming com-

pounds that might otherwise become pollutants in the environment. Soil is a complex habitat for microbial growth and these microbes generally exist as micro-colonies or biofilms on mineral particles, organic matter, and roots. Currently, microorganisms are exploited to get valuable products that include enzymes, secondary metabolites, therapeutic agents and industrial products. Such potential microorganisms are usually isolated from the soil sample. Among such microbes, filamentous fungi dominate our globe as sources of food, plant and animal pathogens, and other worthy products' bio-synthesis.

The phylloplane, the surface of plant leaves, is a complex terrestrial habitat, characterized by a variety of microorganisms, including bacteria, filamentous fungi and yeast. Pathogens, saprobes and epiphytes occur in



## SEASONAL DISTRIBUTION OF AIRBORNE FUNGI AT THE PERIPHERY OF RAIPUR CITY, CHHATTISGARH, INDIA

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Raipur is the capital city of Chhattisgarh state. The city is located centrally in the state of Chhattisgarh. Fungal spores are widely distributed all over the world, which constitute the major component of the air-borne microflora. Various environmental factors affect the distribution of fungi in a particular area. Occurrence and the type of fungal species change with the season and geographical location. Seasonal variation affects the distribution of fungi in a particular area. To investigate this fact, a Survey of air-borne fungi was carried out from March 2018 to February 2019 by using the Gravity petri-plates method containing PDA (Potato Dextrose Agar) medium. The study recorded a total of 35 fungal species belonging to 14 fungal genera. The dominant species noted were *Aspergillus niger*, *A. flavus*, *A. fumigatus*, *A. oryzae*, *Alternaria alternata*, *Cladosporium* sp. *Curvularia lunata*, *Fusarium* sp. and *Phoma pomorum*. It was observed that medical and phytopathological consequences are associated with fungal spores. In that respect, study elucidated the distribution and occurrence of air-borne fungi during the year 2018-2019 at the periphery of Raipur city.

**Key Words:** Airborne fungi, Seasonal distribution, Phytopathological, Fungal spores.

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### INTRODUCTION

Raipur is the capital city of Chhattisgarh state in India. It is situated between 22° 33'N to 21° 14'N Latitude and 82° 6' to 81° 38'E Longitude. The city is located centrally in the state of Chhattisgarh, and now serves as a regional hub for trade and commerce for a variety of local agricultural and forest products. Increased urbanization and industrialization in recent time has made a significant impact on air quality of the area. Seasonal variation affects aero-mycoflora of the area. The microbial population of the atmosphere at any place constitutes its aero-spora. Fungal spores are not equally distributed in the environment; their distribution varies according to geographical location and metrological conditions. The concentration of airborne fungal spores has been linked to wind, humidity, temperature, rainfall, altitude, vegetation and various specific reservoirs of contamination. Also, fungal propagative units may be dispersed in the air by insects<sup>1</sup>. Fungal spores are part of air quality depending on the time of the day, weather, season, climatic conditions, and local source of spores<sup>2</sup>. Based on the microbiological analysis of air samples from inhabited areas, it was reported that airborne fungi

are among the most common organisms correlated with the air pollution that have adverse effects on human health as well as causing plant diseases. In light of the above knowledge, the present investigation on airborne fungal flora is essential to understand the deposition and dissemination of fungal spores at the periphery of Raipur city.

### MATERIALS AND METHODS

#### Description of the study site

The study was conducted at the periphery of Raipur city, Chhattisgarh, India. 4 different villages in surrounding of Raipur city, were selected viz. Chandanidih (21° 15'NL and 81° 32'EL), Zora (21°v23'NL and 81° 71'EL), Boriakala (21° 19'NL and 81° 64'EL) and Dhaneli (21° 33'NL and 81° 65'EL). The present study was conducted for a period of one year that is from March 2018 to February 2019.

#### Sampling and calculation

The culture plate exposure method was adopted for trapping the airborne fungi. PDA (Potato, Dextrose and Agar) was used as a culture medium. 10 ml of sterilized



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## Research article

Carbon dot induces tolerance to arsenic by regulating arsenic uptake, reactive oxygen species detoxification and defense-related gene expression in *Cicer arietinum* LVibhuti Chandrakar<sup>a</sup>, Bhumika Yadu<sup>a</sup>, Jyoti Korram<sup>b</sup>, Manmohan L. Satnam<sup>b</sup>, Amit Dubey<sup>c</sup>, Meetul Kumar<sup>d</sup>, S. Keshavkant<sup>a,e,\*</sup><sup>a</sup> School of Studies in Biotechnology, Pt. Ravishankar Shukla University, Raipur, 492 010, India<sup>b</sup> School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur, 492 010, India<sup>c</sup> Central Laboratory Facility, Chhattisgarh Council of Science and Technology, Raipur, 492 010, India<sup>d</sup> Directorate of International Cooperation, Defence Research and Development Organization, New Delhi, 110 001, India<sup>e</sup> National Center for Natural Resources, Pt. Ravishankar Shukla University, Raipur, 492 010, India

## ARTICLE INFO

## Keywords:

Arsenic  
Carbon dot  
*Cicer arietinum* L.  
Gene expression  
Nanomaterials  
Oxidative damage  
Reactive oxygen species

## ABSTRACT

The scientific and technological applications of one of the nanomaterials viz.; carbon dot (C-dots), having extraordinary properties, is becoming an emerging and ongoing research area in recent times. In the present study, we have evaluated the effectiveness of C-dots in reducing arsenic (As) toxicity by analyzing physiological, biochemical and molecular parameters in *Cicer arietinum* L. The results revealed that As decreased the germination rate, growth, biomass, and membrane stability of the cell to a significant extent. Further, As was taken up by the growing seeds which eventually caused cell death. Levels of reactive oxygen species (ROS), stress markers (malondialdehyde), activities of defensive enzymes (glutathione-S-transferase and pyrroline-5-carboxylate synthetase) and non-enzymatic antioxidant contents (proline and glutathione) were increased under As stress. Moreover, As treatment resulted in the up-regulation of expressions of NADPH oxidase and defense-related genes in *Cicer arietinum* L. However, application of C-dots along with As improved the germination and growth of *Cicer arietinum* L. Exogenous application of C-dots, enhanced the expressions of defense-related genes and, contents of proline and glutathione, thereby causing considerable reductions in ROS, and malondialdehyde levels. Overall, this study suggests the possible involvement of C-dots in lowering the toxic effects of As on biomass by reducing As uptake and, inducing the activities/gene expressions and contents of enzymatic and non-enzymatic antioxidants.

## Author contribution

Vibhuti ChandrakarBhumika YaduJyoti KorramManmohan L. SatnamAmit DubeyMeetul KumarS. Keshavkant.

## 1. Introduction

Arsenic (As) is a non-essential metalloid, which instigates many toxic effects in the living systems (Kidwai et al., 2019). The plant roots absorb As predominantly in its inorganic forms: arsenate ( $\text{As}^{\text{V}}$ ) and arsenite ( $\text{As}^{\text{III}}$ ).  $\text{As}^{\text{III}}$  is considered to be more toxic to plants, since it permeates the membrane and reacts with the sulfhydryl groups of plant proteins

and enzymes, disconcerting energy flow, causing leaking of electrolytes and generating reactive oxygen species (ROS) (Singh et al., 2015). A membrane localized enzyme NADPH oxidase (NOX) is also responsible for the production of ROS in plant cells (Reddy et al., 2015). These ROS oxidize/damage most major cellular bio-polymers such as lipid, protein, etc., resulting in the dysfunction, and sometimes death of the cells. A product of lipid peroxidation reaction; malondialdehyde (MDA) leads to disintegration of cellular organelles, oxidation and dysfunction of proteins and nucleic acids (Singh et al., 2015).

To counter the As stress, plants detoxify this metalloid by promptly converting it into  $\text{As}^{\text{III}}$ , in the cytosol, by arsenate reductase. This  $\text{As}^{\text{III}}$  is then expelled outside of the cell or sequestered into the vacuoles

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## Amelioration of Ageing Associated Alterations and Oxidative Inequity in Seeds of *Cicer arietinum* by Silver Nanoparticles

Jeabunnisha Khan<sup>1</sup> · Jipsi Chandra<sup>1</sup> · Roseline Xalxo<sup>1</sup> · Jyoti Korram<sup>2</sup> · Manmohan L. Satnam<sup>2</sup> · S. Keshavkant<sup>1</sup>

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### Abstract

Metal-based nanoparticles (NPs) have recently been accomplished a great attention worldwide, in various sectors including agriculture due to their beneficial impacts in plant growth, development and stress tolerance. However, it shows dose-dependent response and may vary with type of metal and synthesis procedure followed. Among many, silver nanoparticles (AgNPs) are most frequently used NP in agricultural sector. In the present study, AgNPs were synthesized following both green (gAgNP) and chemical (cAgNP) synthesis processes, characterized by standard methods and were applied to artificially aged *Cicer arietinum* seeds. Initial characterization of synthesized NPs was done by UV–Visible spectroscopy, and concentrations were calculated as 2.7 nmol for gAgNP, while, 5.8 nmol for cAgNP. Furthermore, the presence of different functional groups in synthesized AgNPs was evaluated by fourier transform infrared spectroscopy (1000 and 4000  $\text{cm}^{-1}$ ). However, the particle size of synthesized AgNPs was estimated by dynamic light scattering/ zetasizer (90–120 nm) and transmission electron microscopy (15–60 nm). Synthesized NPs were then assessed for their ameliorative efficiencies against accelerated ageing-induced injuries in *Cicer arietinum* seeds. Experimental results revealed various physiological and biochemical alterations due to accelerated ageing in seeds of *Cicer arietinum* including the over accumulation of reactive oxygen species and consequent decline in the expressions/ activities of key defensive genes. However, exogenous application of AgNPs provided tolerance against ageing-induced damages by compensating the cellular redox homeostasis via up-regulating the levels/ gene expression of antioxidants in *Cicer arietinum*.

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# Molecular strategies to enhance stability and catalysis of extremophile-derived $\alpha$ -amylase using computational biology

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## Abstract

$\alpha$ -Amylase is the most significant glycoside hydrolase having applications in various industries. It cleaves the  $\alpha$ ,1–4 glucosidic linkages of polysaccharides like starch, glycogen to yield a small polymer of glucose in  $\alpha$ -anomeric configuration.  $\alpha$ -Amylase is produced by all the three domains of life but microorganisms are preferred sources for industrial-scale production due to several advantages. Enormous studies and research have been done in this field in the past few decades. Still, it is requisite to work on enzyme stability and catalysis, as it loses its functionality in extreme. As the enzyme loses its structural and catalytic property under extreme environmental conditions, it is mandatory to confer some potential strategies for enhancing enzyme behaviour in such conditions. This limitation of an enzyme can be overcome up to some extent by extremophiles. They serve as an excellent source of  $\alpha$ -amylase with outstanding features. This review is an attempt to encapsulate some structure-based strategies for improving enzyme behaviour thereby enabling researchers to selectively amend any of the strategies as per requirement during upstream and downstream processing for higher enzyme yield and stability. Thus, it will provide some cutting-edge strategies for tailoring  $\alpha$ -amylase producing organism and enzyme with the help of several computational biology tools.

**Keywords**  $\alpha$ -Amylase · Computational biology · Extremophiles · Glycoside hydrolase · Structural insights

## Introduction

Enzymes are the most vital bio-product needed for sustaining life on earth. In recent years,  $\alpha$ -amylase has significantly replaced the chemical hydrolysis of starch in industries.  $\alpha$ -Amylase ( $\alpha$ -1,4-glucan 4-glucanohydrolase, EC 3.2.1.1) is an endo-acting hydrolyzing enzyme responsible for the breakdown of  $\alpha$ ,1–4 glucosidic linkages of starch and other related polysaccharides to yield maltooligosaccharides,

glucose, and limit dextrin in an  $\alpha$ -anomeric form (Machius et al. 1995; Yadav 2012; Al-Dhabi et al. 2020; Abd-Elaziz et al. 2020; Janeček and Zámocká 2020). The total contribution of  $\alpha$ -amylases in the enzyme market is about 30% and hence occupies the second position after proteases (Wu et al. 2018; Allala et al. 2019; Wang et al. 2019a; Abd-Elaziz et al. 2020). It is synthesized by microorganisms, plants, and animals. But for large-scale production, microorganisms are generally selected. Microorganisms are preferred because they offer cheaper large-scale production, ease of genetic engineering approaches, enormous strain availability etc. (Abdel-Fattah et al. 2013; Abd-Elhalem et al. 2015; Afrisham et al. 2016). It is extensively used in several industries and plays a substantial role in them (Table 1).

Despite having lots of industrial applications there are certain shortcomings related to the use of  $\alpha$ -amylase. They tend to drop their structural conformations, stability, and catalysis when allowed to work in extreme conditions (Ahmed et al. 2020). To overcome this sensitivity of  $\alpha$ -amylase towards harsh conditions, researchers are seeking sources living in extreme environmental conditions. Extremophiles are the organism inhabiting such harsh environment

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Nisha Gupta, Esmil Beliya have contributed equally as first author.

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## Carbon dot induces tolerance to arsenic by regulating arsenic uptake, reactive oxygen species detoxification and defense-related gene expression in *Cicer arietinum* L

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### Abstract

The scientific and technological applications of one of the nanomaterials viz.; carbon dot (C-dots), having extraordinary properties, is becoming an emerging and ongoing research area in recent times. In the present study, we have evaluated the effectiveness of C-dots in reducing arsenic (As) toxicity by analyzing physiological, biochemical and molecular parameters in *Cicer arietinum* L. The results revealed that As decreased the germination rate, growth, biomass, and membrane stability of the cell to a significant extent. Further, As was taken up by the growing seeds which eventually caused cell death. Levels of reactive oxygen species (ROS), stress markers (malondialdehyde), activities of defensive enzymes (glutathione-S-transferase and pyrroline-5-carboxylate synthetase) and non-enzymatic antioxidant contents (proline and glutathione) were increased under As stress. Moreover, As treatment resulted in the up-regulation of expressions of NADPH oxidase and defense-related genes in *Cicer arietinum* L. However, application of C-dots along with As improved the germination and growth of *Cicer arietinum* L. Exogenous application of C-dots, enhanced the expressions of defense-related genes and, contents of proline and glutathione, thereby causing considerable reductions in ROS, and malondialdehyde levels. Overall, this study suggests the possible involvement of C-dots in lowering the toxic effects of As on biomass by reducing As uptake and, inducing the activities/gene expressions and contents of enzymatic and non-enzymatic antioxidants.

**Keywords:** Arsenic; Carbon dot; *Cicer arietinum* L.; Gene expression; Nanomaterials; Oxidative damage; Reactive oxygen species.

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## Aspects and Recent Trends in Microbial $\alpha$ -Amylase: a Review

Jai Shankar Paul<sup>1</sup> · Nisha Gupta<sup>1</sup> · Esmil Beliya<sup>1,2</sup> · Shubhra Tiwari<sup>1</sup> ·  
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### Abstract

$\alpha$ -Amylases are the oldest and versatile starch hydrolysing enzymes which can replace chemical hydrolysis of starch in industries. It cleaves the  $\alpha$ -(1,4)-D-glucosidic linkage of starch and other related polysaccharides to yield simple sugars like glucose, maltose and limit dextrin.  $\alpha$ -Amylase covers about 30% shares of the total enzyme market. On account of their superior features,  $\alpha$ -amylase is the most widely used among all the existing amylases for hydrolysis of polysaccharides. Endo-acting  $\alpha$ -amylase of glycoside hydrolase family 13 is an extensively used biocatalyst and has various biotechnological applications like in starch processing, detergent, textile, paper and pharmaceutical industries. Apart from these, it has some novel applications including polymeric material for drug delivery, bioremediating agent, biodemulsifier and biofilm inhibitor. The present review will accomplish the research gap by providing the unexplored aspects of microbial  $\alpha$ -amylase. It will allow the readers to know about the works that have already been done and the latest trends in this field. The manuscript has covered the latest immobilization techniques and the site-directed mutagenesis approaches which are readily being performed to confer the desirable property in wild-type  $\alpha$ -amylases. Furthermore, it will state the inadequacies and the numerous obstacles coming in the way of its production during upstream and downstream steps and will also suggest some measures to obtain stable and industrial-grade  $\alpha$ -amylase.

**Keywords**  $\alpha$ -Amylase · Biocatalyst · Drug delivery · Glycoside hydrolases · Glycosidic linkage

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## Nanotechnology: an efficient approach for rejuvenation of aged seeds

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**Abstract** Modern agricultural efforts are now in search of an efficient, eco-friendly and sustainable approach for enhanced crop production. Nearly 50–60% of seeds lost occurs due to improper technical handling. Seed deterioration manifests itself as reduction in the rate of germination and growth with increased susceptibility to biotic and abiotic stresses. Furthermore, seed ageing is another economic and scientific issue that is associated with an array of internal (structural, physiological and genetic) and external (storage temperature and relative humidity) factors. Reactive oxygen species (ROS) are believed to be a key player in ageing phenomenon. However, hydrated storage, or ROS blockers are a few of the conventionally used methods to minimize the ageing process. Recently, exogenous applications of different inorganic nanoparticles (metal and metal oxide) are suggested to revitalize and revive aged seeds. Owing to their special properties of nano-size with high surface area they easily penetrate the seed coat. Exposure of nanoparticles has been suggested to neutralize the excess of ROS to a level that initiates hormonal signaling to support early emergence of radicles from the seeds. Nanotechnology has been well explored to enhance the crops nutritional quality, livestock productivity, plant protection from various stressors and in enhancement of seed quality via nanopesticides and nanofertilizers. Aiming at sustainable agriculture practices with fewer inputs, maximum benefits, ecologically safe and compatible technique the nanotechnology is an efficient approach to counteract problems of seed ageing incurring during

storage, which is relatively less explored and unresolved conventionally, in general.

**Keyword** Ageing · Deteriorative reactions · Nanoparticles · Oxidative stress · ROS

### Introduction

Seeds represent reproductive stage in the life cycle of plants. It is used as major planting material for the production of next season crop; therefore, high yield and, production of viable and vigorous seeds are necessary. Followed by harvesting, crop seeds are stored under ambient conditions for few weeks to years, depending upon requirement. Germination is the very first step to determine seeds viability and vigor, consequently growth in the soil for successful crop establishment (Panda and Mondal 2020). Seed vigor is an important determinant for rapid and homogeneous radicle emergence. Longevity determines the vigor index (VI) that depends upon seeds physiology, genetic makeup and pace of deterioration that prevails during storage (Zinsmeister et al. 2020). Additionally, numerous other factors regulating vigor of seeds, directly or indirectly, includes environmental temperature, relative humidity (RH), moisture and oil content, pathogen attack, mechanical damage, storage time, and gaseous exchange (Solberg et al. 2020).

Generation and accretion of reactive oxygen species (ROS) has widely been known as the key issues leading to seed deterioration during ambient storage (Chandra et al. 2018; Kurek et al. 2019). Inequity in growth hormones and enzymes, impaired metabolism, disturbed cellular membranes and cytoplasmic glassy state during storage is caused by over-produced ROS. These physiological

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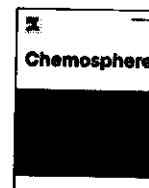
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# Mechanisms underlying the phytotoxicity and genotoxicity of aluminum and their alleviation strategies: A review

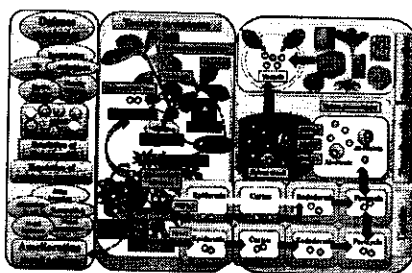
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## HIGHLIGHTS

- Trivalent cationic form of Al is potential toxicants to plant in acidic environment.
- Al disturbs cell metabolism and redox homeostasis, leading to oxidative stress.
- Plants have various inherent defence strategies to circumvent Al toxicity.
- Modulation in gene expressions under Al stress is a key mechanism of its tolerance.
- Exogenously added elements and nanoparticles also act as toxicity ameliorant.

## GRAPHICAL ABSTRACT



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## ABSTRACT

Aluminum (Al) is considered as a potential limiting factor for plant growth in acidic environment. At lower concentration, Al promotes plant growth by facilitating the phosphorous availability, while, at higher concentration, it causes rhizotoxicity by inhibiting the nutrient transportation system. Cellular membrane is identified as the first site of Al toxicity, which is consequent to Al-induced reactive oxygen species prompted lipid catabolism. Among all the soluble forms, the trivalent cationic form ( $Al^{3+}$ ) of Al is most toxic. Though, the ability to ascribe Al-tolerance is very complex, exclusion is an extensively established process contributing to  $Al^{3+}$  detoxification. Alteration in pH at root apex/rhizosphere, exudation of chelating agents, cell wall immobilization, and Al efflux have been recognized as probable methods for exclusion of Al, which is highly dependent on concentrations of organic acids, and plant species. Additionally, exogenous applications of boron, silicon, calcium, etc., in Al-stressed plant species can form a conjugate with it, thereby reducing its bioavailability/toxicity. Moreover, nanoparticles (NPs) are emerging tools in agricultural sector, which are found to be relatively more effective in mitigation of metal stress compared to their bulk materials. This review exhibits the fundamental approaches of Al phytotoxicity and endows with a comprehensive knowledge of the cellular and metabolic processes underlying toxic impacts along with ameliorative efficiencies of various potential agents including NPs. Additionally, it also elucidates the molecular mechanisms, future research prospects and challenges in effective alleviation mechanisms for enhancing plant Al-tolerance, to improve the growth and yields of susceptible-species on acidic soil.

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## Research paper

# Physicochemical studies on the micellization of anionic surfactants in the presence of long alkyl chain ionic liquid

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## ABSTRACT

The physicochemical properties on micellization of anionic surfactant, sodium dodecyl sulphate (SDS) and lithium dodecyl sulphate (LDS) in the presence of imidazolium-based ionic liquid 1-decyl-3-methylimidazolium tetrafluoroborate [Dmim][BF<sub>4</sub>] have been studied using surface tension and conductivity techniques. The interfacial and thermodynamic parameters have also been determined. FTIR has studied the aggregation behavior while aggregation number and Stern-Volmer constant is determined by fluorescence measurement. The current results indicate that the addition of [Dmim][BF<sub>4</sub>] to the anionic surfactant leads to a dramatic decrease in the CMC. The interaction of human serum albumin with micellar solution of SDS and LDS have been examined.

## 1. Introduction

The micellar properties of anionic surfactants with ionic liquids (ILs) have received much attention due to their immense potential applications in scientific and industrial fields [1,2]. ILs are generally defined as compounds structurally composed of cation and anion with a melting point below 100 °C. They are recognized with unique properties such as non-volatility, non-flammability and chemical stability [3–5]. All these unique properties make them desirable and convenient over conventional solvents [6,7].

Surfactants are remarked as amphiphilic molecules with various interfacial and aggregation-like properties [8–10]. This empowers them with much concerning chemical, pharmaceutical and industrial field perspectives [12,13]. Surfactants self-assemble in aqueous media to form nano-sized aggregates called micelles and the specific concentration at which micelles forms is known as critical micelle concentration (CMC) [14,15]. Surfactant has two identical parts, i.e., a hydrophobic chain located at the micelle core and the hydrophilic head group is situated at a surface that is in contact with water [16,17]. The amphiphilic nature of surfactant depends on additives and temperature, which strongly influence the CMC of surfactant [18,19].

Micellar properties of anionic surfactants with imidazolium-based IL play an essential role in many fields, i.e., industrial fields, chemical engineering, biochemistry and material science [16–19]. Extensive research has been conducted on the studies based on ILs and anionic

surfactants, signifying that the ILs act as co-surfactant or co-solvent [18–21]. Chabba *et al.* [13] studied the interaction of imidazolium-based IL with sodium dodecyl benzenesulfonate (SDBS) using surface tension, fluorescence, dynamic light scattering (DLS) and small-angle neutron scattering (SANS) where the results show that aggregation number of SDBS increased in the presence of long alkyl chain IL in comparison to other short alkyl chains ILs, which confirms the strong synergistic interactions prevailing the oppositely charged SDBS and IL. Javadian *et al.*, [17] investigated the effect of four cationic imidazolium-based ILs, i.e., 1-butyl-3-methylimidazolium bromide (BmimBr), 1-butyl-3-methyl-imidazolium chloride (BmimCl), 1-hexyl-3-methylimidazolium bromide (BmimBr) and 1-hexyl-3-methylimidazolium chloride (BmimCl) on micellization behavior of sodium dodecyl sulfate (SDS). The results showed that the CMC value of the anionic surfactant, SDS decreases in the presence of the most extended alkyl chain length IL, i.e., 1-hexyl-3-methyl-imidazolium chloride. At the same time, the aggregation number was found to be higher. No other significant changes have been observed in the presence of shorter alkyl chain length IL. The interaction between imidazolium-based IL and cationic, anionic and non-ionic surfactants were studied by Ghosh *et al.* [19] by using surface tension, conductivity, fluorescence and FTIR technique. SDS, cetyltrimethylammonium bromide (CTAB), and polyoxyethylene lauryl ether (Brij-35) has been investigated in the presence of 1-ethyl-3-methylimidazolium bromide [Emim][Br]. The effect of [Emim][Br] on micellization behaviour of 1-butyl-3-methylimidazolium octylsulphate [Bmim]

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# Spectroscopic detection of $\text{Hg}^{2+}$ in water samples using fluorescent carbon quantum dots as sensing probe

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**Abstract.** Mercury ( $\text{Hg}^{2+}$ ) is remarked as toxic and hazardous element to global environment. Here, carbon quantum dots (CQDs) were synthesized by simple microwave assisted technique for  $\text{Hg}^{2+}$  detection in water samples *via* fluorescence quenching and FT-IR spectroscopic approach. The morphology and chemical structure of synthesized CQDs was investigated by TEM, FT-IR,  $^{13}\text{C}$ -NMR, fluorescence and UV-vis spectroscopic technique. The resultant CQDs bears spherical morphology with an average size of 2–4 nm. The binding parameters, as Stern-Volmer quenching constant ( $K_{sv}$ ) and binding constant for CQDs-Hg system was investigated by fluorescence method, whereas UV-vis techniques was employed for determination of thermodynamic parameters, as Gibb's free energy ( $\Delta G$ ), enthalpy ( $\Delta H$ ) and entropy ( $\Delta S$ ) at three different temperature (295, 298 and 305 K). Moreover, selectivity assay for  $\text{Hg}^{2+}$  detection has been studied in presence of other metal ions by FT-IR as well as fluorescence spectroscopy. Analytical assay was also successfully applied for  $\text{Hg}^{2+}$  in spiked water samples collected from different areas of Chhattisgarh, with 98–99 recovery %. The detection of  $\text{Hg}^{2+}$  has been demonstrated in the range of 0 to 5.0  $\mu\text{M}$  with 3.25 nM detection limit. The present method is found to be simple, highly sensitive and selective for sensing of  $\text{Hg}^{2+}$  in aquatic environmental samples using CQDs as sensing probe.

**Keywords:** Carbon quantum dots, FT-IR, fluorescence, UV-vis, mercury, sensor


## 1. Introduction

Mercury ( $\text{Hg}^{2+}$ ) is considered as one of the most toxic heavy metal due to its bioaccumulation nature which causes serious harmful effects to human health even at very low concentration [1–3].  $\text{Hg}^{2+}$  ions accumulates in human organisms, such as lungs, kidney and liver which causes acute or chronic poisoning to the organs ultimately leading to death [4, 5].  $\text{Hg}^{2+}$  are generally exposed into environment from industrial and domestic wastewater [6, 7]. The contamination of drinking water by water-soluble  $\text{Hg}^{2+}$  ions is still the most common health hack. Therefore, accurate monitoring of  $\text{Hg}^{2+}$  is highly required in order to protect the human health and environment [8, 9]. Literature survey highlights that a variety of methods have been used for  $\text{Hg}^{2+}$  detection includes atomic adsorption spectroscopy (AAS), inductively coupled plasma mass spectrometry (ICPMS), ion selective electrode, gas chromatography (GC) and surface enhanced Raman scattering (SERS) [6–9]. They have wide

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# A simple and cost-effective paper-based and colorimetric dual-mode detection of arsenic(III) and lead(II) based on glucose-functionalized gold nanoparticles†

Bhuneshwari Sahu, Ramsingh Kurrey, Manas Kanti Deb, \* Kamlesh Shrivastava, Indrapal Karbhal and Beeta Rani Khalkho

We report a simple and cost-effective paper-based and colorimetric dual-mode detection of As(III) and Pb(II) based on glucose-functionalized gold nanoparticles under optimized conditions. The paper-based detection of As(III) and Pb(II) is based on the change in the signal intensity of AuNPs/Glu fabricated on a paper substrate after the deposition of the analyte using a smartphone, followed by processing with the ImageJ software. The colorimetric method is based on the change in the color and the red shift of the localized surface plasmon resonance (LSPR) absorption band of AuNPs/Glu in the region of 200–800 nm. The red shift ( $\Delta\lambda$ ) of the LSPR band observed was from 525 nm to 660 nm for As(III) and from 525 nm to 670 nm for Pb(II). The mechanism of dual-mode detection is due to the non-covalent interactions of As(III) and Pb(II) ions with glucose molecule present on the surface AuNPs, resulting in the aggregation of novel metal nanoparticles. The calibration curve gave a good linearity range of 20–500  $\mu\text{g L}^{-1}$  and 20–1000  $\mu\text{g L}^{-1}$  for the determination of As(III) and Pb(II) with the limit of detection of 5.6  $\mu\text{g L}^{-1}$  and 7.7  $\mu\text{g L}^{-1}$  for both metal ions, respectively. The possible effects of different metal ions and anions were also investigated but did not cause any significant interference. The employment of AuNPs/Glu is successfully demonstrated for the determination of As(III) and Pb(II) using paper-based and colorimetric sensors in environmental water samples.

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## 1. Introduction

Consumption of drinking water contaminated with toxic metals such as arsenic (As) and lead (Pb) has deadly effects on human beings.<sup>1</sup> There are four different types of oxidation states of As (−3, +3, 0, and +5) that are possible to be found in nature, amongst which As(III) is known as the most hazardous one. Exposure to As can cause a variety of diseases, including abdominal pain, vomiting, diarrhea, nausea, depigmentation, hyper pigmentation, keratosis, blackfoot, peripheral vascular disorder, and several types of cancer.<sup>2,3</sup> Pb is another toxic metal found in the crust of earth, water, and soil, and potentially affects almost every system such as reproductive, neurological, hematopoietic, hepatic, and renal in the human body.<sup>4</sup> Pb can even cause cancer owing to its excessive accumulation in the human body.<sup>4</sup> In order to ensure water quality, different regulatory agencies have been set a tolerance limit for these contaminants in water bodies.<sup>5–7</sup> These guidelines define the

mandatory quality standards of water intended for human consumption. In India, the ground waters of Chhattisgarh and West Bengal states are exceedingly contaminated with As, which exceed the World Health Organization's (WHO) drinking water guidelines (10  $\mu\text{g L}^{-1}$ ).<sup>8</sup> Therefore, the detection of As(III) and Pb(II) in water samples is important to know the mechanism pathway of these pollutants entering into different compartments of the environment.

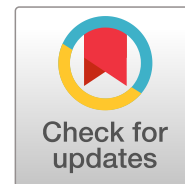
Several advanced analytical methods exist for the detection of As(III) and Pb(II) in water samples. Among them, UV-Vis spectrophotometry,<sup>5,6</sup> hydride generation-atomic absorption spectrometry,<sup>7,8</sup> graphite furnace-atomic absorption spectrometry,<sup>9,10</sup> inductive coupled plasma hyphenated with atomic emission spectrometry,<sup>11,12</sup> inductively coupled plasma hyphenated with mass spectrometry,<sup>13</sup> atomic fluorescence spectrometry,<sup>14,15</sup> and cyclic voltammetry<sup>16,17</sup> are the most widely used. The advanced instruments are costly, sensitive, have high consumption, require professional operators and other expensive instruments as well as complex sample pretreatment processes. Furthermore, these conventional methods are not economical because heavy metal elements are rarely discovered in the environment during routine inspections.<sup>6–8</sup> Therefore, creating a simple and low-cost approach to meet practically the requirements for the detection of heavy

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## Au–Ag core–shell composite nanoparticles as a selective and sensitive plasmonic chemical probe for L-cysteine detection in *Lens culinaris* (lentils)

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### Abstract

The present work reported is a simple and selective method for the colorimetric detection of L-cysteine in *Lens culinaris* (or lentils) using Au–Ag core–shell (Au core Ag shell) composite nanoparticles as a chemical probe. The phenomenon is based on the color change of composite nanoparticles from yellowish brown to light blue, followed by a shift of the localized surface plasmon resonance (LSPR) absorption band in the UV-visible region (*i.e.*, 200–800 nm) with the addition of L-cysteine into the solution of bimetallic nanoparticles. The mechanism for the detection of L-cysteine is based on the electrostatic interaction of the metal ion with the thiol group of the amino acid, which causes the red shift of the LSPR band at 685 nm. The size distribution, morphology, composition and optical properties of the Au–Ag core–shell composite nanoparticles were characterized by transmission electron microscopy (TEM), dynamic light scattering (DLS), energy dispersive X-ray diffraction (EDX), UV-visible spectrophotometer and Fourier transform infrared spectroscopy (FTIR) techniques. An excellent



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**RSC Advances**

## A simple and cost-effective paper-based and colorimetric dual-mode detection of arsenic(III) and lead(II) based on glucose-functionalized gold nanoparticles†



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[Bhuneshwari Sahu](#),<sup>a</sup> [Ramsingh Kurrey](#),<sup>a</sup> [Manas Kanti Deb](#), <sup>\*a</sup> [Kamlesh Shrivastava](#),<sup>a</sup> [Indrapal Karbhal](#)<sup>a</sup> and [Beeta Rani Khalkho](#)<sup>a</sup>

[Author affiliations](#)

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Environmental Research

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# Biogenic secondary organic aerosol formation in an urban area of eastern central India: Seasonal variation, size distribution and source characterization

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## ARTICLE INFO

### Keywords:

Biogenic secondary organic aerosols  
Biogenic volatile organic compounds  
Gas chromatography mass spectrometry  
Size-distribution  
Eastern central India

## ABSTRACT

Samples of ambient aerosols were collected at an urban site of eastern central India from monsoon to summer 2016–17 for the characterization of biogenic secondary organic aerosols (BSOA). The BSOA tracers derived from isoprene,  $\alpha/\beta$ -pinene and  $\beta$ -caryophyllene in size-distributed aerosols were studied. Concentrations of total SOAI (Isoprene secondary organic aerosols) were found more abundant than  $\alpha/\beta$ -pinene in summer, while contradictory trends were found in the winter season, where SOAM (monoterpene derived SOA) and SOAS (sesquiterpenes derived SOA) were dominated. Size-distribution study revealed that most of the BSOA were formed in the aerosol phase and dominated in fine mode, except cis-pinonic acid. They were formed in the gaseous phase and partitioned onto the aerosol phase. The alkaline nature of mineral dust particles that triggered the adsorption of gaseous species onto pre-existing particles could be the reason for bimodal size distribution with major coarse mode peak and minor fine mode peak. Temporal variations suggest that the BSOA must be derived from terrestrial vegetation and biomass burning. The isoprene SOC (secondary organic carbon) contributed 0.91%, 1.38%, 0.88% and 1.04% to OC during winter, summer, post-monsoon and monsoon season, respectively. The isoprene SOC in fine mode was found to be higher than the coarse mode.

## Credit author statement

Mithlesh Mahilang: Analyzed samples and interpreted the data, Writing – original draft. Manas Kanti Deb: Conceptualization, Methodology, Supervision. Shamsh Pervez: Writing, Reviewing and Editing. Vikas Kumar Jain: Writing, Reviewing and Editing. Swapnil Tiwari: Took care of the revised manuscript review and language editing.

## 1. Introduction

Organic aerosols are released in the atmosphere from anthropogenic as well as natural sources. Vehicular emissions, industrial emissions and biomass burning are anthropogenic sources, while fungal spores, detritus and bacteria are natural sources of organic aerosols (Paduan et al., 2020; Lee et al., 2014). Besides, the terrestrial vegetation also contributes towards natural sources of organic aerosols via secondary organic aerosol (SOA) formation. Isoprene, monoterpenes and sesquiterpenes are some volatile organic compounds (VOCs) derived from

vegetation (Bao et al., 2008). Globally about 1000 Tg yr<sup>-1</sup> VOCs are emitted from vegetation. Among these VOCs, the isoprene was reported as the highest (50%) contributor followed by monoterpenes (15%) and sesquiterpenes (3%) (Glasius and Goldstein, 2016). VOCs have a very short lifetime in the atmosphere. The VOCs contain unsaturated hydrocarbons having double bonds and hence are extremely sensitive towards atmospheric oxidants. When it interacts with atmospheric oxidants (NO<sub>x</sub>, OH and O<sub>3</sub>) a series of heterogeneous reactions are initiated that cause SOA formation (Kang et al., 2018). The atmospheric chemistry of biogenic volatile organic compounds (BVOC) and biogenic secondary organic aerosols (BSOA) formation are altered as a result of the interactions between BVOC and anthropogenic gaseous pollutants (NO<sub>x</sub> and SO<sub>2</sub>) (Mahilang et al., 2020a). Many researchers in their field studies have discussed the importance of the biogenic-anthropogenic and SOA formation (Hoyle et al., 2011; Glasius et al., 2011; Shilling et al., 2013; Xu et al., 2015; Mahilang et al., 2020a). They concluded that NO<sub>x</sub> and SO<sub>2</sub> have “anthropogenic enhancement” effect on BSOA formation. SOA has a negative impact on the Earth's climate because it

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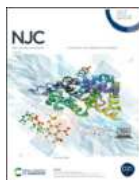
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**New Journal of Chemistry**

## A simple and convenient dry-state SEIRS method for glutathione detection based on citrate functionalized silver nanoparticles in human biological fluids†



[Beeta Rani Khalkho](#),<sup>a</sup> [Ramsingh Kurrey](#),<sup>\*a</sup> [Manas Kanti Deb](#), <sup>\*ab</sup> [Indrapal Karbhal](#),<sup>a</sup> [Bhuneshwari Sahu](#),<sup>a</sup> [Shubhra Sinha](#),<sup>a</sup> [Yaman Kumar Sahu](#)<sup>ab</sup> and [Vikas Kumar Jain](#)<sup>c</sup>

[Author affiliations](#)

### Abstract

Surface-enhanced infrared absorption spectroscopy (SEIRS) using a dry-state method was established for the ultra-sensitive detection of glutathione using citrate functionalized silver nanoparticles (AgNPs) in human biological blood and serum samples. The signal intensity of glutathione was enhanced due to the hot-spots created by the aggregation of AgNPs causing the effective absorption of electromagnetic radiation in the IR region for molecular vibrations. The study revealed that the possibility of the interaction of silver with glutathione might rule out structural orientation, energy and affinity as the reason for the detection. The selective determination of glutathione was experimentally confirmed by performing controlled testing with other amino acids. The absorption peak at  $3257.84\text{ cm}^{-1}$  ( $\text{NH}_3^+$ ) was used for the quantitative analysis of glutathione when AgNPs were used as a chemical sensor in dry state SEIRS. A pre-treatment process was employed for human biological samples such as blood and serum in order to determine glutathione using AgNPs coupled with dry-state SEIRS analysis. A linear range was obtained for the quantitative determination of glutathione in human biological samples from  $10$  to  $100\text{ }\mu\text{g mL}^{-1}$  with a correlation coefficient ( $R^2$ ) of  $0.993$ . The limit of detection was  $1.74\text{ }\mu\text{g mL}^{-1}$  and the limit of quantification was  $5.30\text{ }\mu\text{g mL}^{-1}$ . The advantages of using the presented dry-state

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**New Journal of Chemistry**

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## Review

## Biogenic secondary organic aerosols: A review on formation mechanism, analytical challenges and environmental impacts



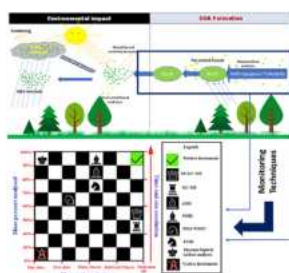
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## HIGHLIGHTS

- The BSOA exhibit distinct day and nighttime formation mechanism.
- Analytical advancements and their ability to examine SOA are compiled and compared.
- SOA can cause significantly enhanced radiating forcing.
- Anthropogenic gaseous pollutants have strong influence over BSOA formation.
- Meteorological variables can effectively control BSOA formation.

## GRAPHICAL ABSTRACT



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## Keywords:

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Volatile organic compounds  
Cloud condensation nuclei  
Tracers

## ABSTRACT

The review initiates with current state of information on the atmospheric reaction mechanism of biogenic volatile organic compounds (BVOCs) and its fate in the atmosphere. The plants release BVOCs, i.e., isoprene, monoterpenes, and sesquiterpenes, which form secondary organic aerosols (SOA) upon oxidation. These oxidation reactions are primarily influenced by solar radiations along with other meteorological parameters viz.; temperature and relative humidity, therefore, the chemistry behind SOA formation is different during day than the night time. The review throws light upon the day and nighttime formation mechanism of SOA, recent advancements in the analytical techniques available for the measurements, and its impact on the environment. Studies have revealed that day time SOA formation is dominated by OH and O<sub>3</sub>, however, NO<sub>x</sub> initiated SOA production is dominated during night. The formation mechanism addresses that the gaseous products of VOCs are firstly formed and then partitioned over the pre-existing particles. New particle formation and biomass-derived aerosols are found to be responsible for enhanced SOA formation. 2-Dimensional gas chromatography-mass spectrometer (2D-GC/MS) is observed to be best for the analysis of organic aerosols. Radiative forcing (RF) SOA is observed to be a useful parameter to evaluate the environmental impacts of SOA and reviewed studies have shown mean RF in the ranges of  $-0.27$  to  $+0.20$  W m<sup>-2</sup>.

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## Review

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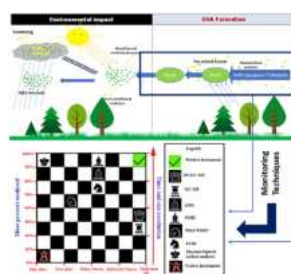
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## Bioaccessibility features of particulate bound toxic elements: Review of extraction approaches, concentrations and health risks

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Princy Dugga<sup>a</sup>, Sushant Ranjan Verma<sup>a</sup>, Aishwaryashri Tamrakar<sup>a</sup>, Sheeba Shafi<sup>c</sup>,  
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## ARTICLE INFO

## Keywords:

Metal toxicity

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## ABSTRACT

For a better and accurate risk assessment of metal toxicity, the concentration of the bioaccessible fraction (BAF) is more relevant than the total metal concentration. This review describes different extraction methods with different leaching agents for various chemical forms of elements such as As, Cd, Cr, Cu, Fe, Mn, Ni, Pb and Zn in ambient particulate matter (APM). Several leaching agents simulating the human body fluids have been developed to determine the bioaccessible metal fractions in APM. This study aims to enhance the knowledge of the bioaccessible concentrations and its impact on human health, documented for different locations worldwide. Furthermore, this study disclosed that confined observations have been found concerning the application and evolution of standard methods for the estimation of biologically relevant elements in ambient particulate matter. This review also revealed that human body simulated fluids like lung and gastric fluids, on comparing to water, provide more realistic values of bioaccessible fractions of potentially toxic elements (PTEs) in assessing human health risks.

## 1. Introduction

Ambient air pollutants, addressed with associated health risks in previous research publications, are mainly the components of inhalable air masses that pass through the human respiratory system, followed by deposition in the lower respiratory tract and lungs [1–4]. After inhalation, airborne particles with an aerodynamic diameter  $\leq 10 \mu\text{m}$  ( $\text{PM}_{10}$ ) is easily transported in the upper respiratory tract, while particles with an aerodynamic diameter  $\leq 2.5 \mu\text{m}$  ( $\text{PM}_{2.5}$ ) penetrate deeper into the lungs and can penetrate the alveolar regions. In this body region, the chemical components of the particles start interacting with blood plasma [5–8]. Researchers have developed the capability of measuring air toxins at human breathing levels (personal exposure assessments), but uncertainty still exists in evaluating the relationship between measured concentration levels of air toxic components and observed associated health effects among the exposed community [9–13]. However, the bioaccessible fraction (BAFs) of particulate toxic elements have more realistic feature

to link it with risk assessment than to the total elemental concentrations [14–20]. These BAFs are more likely soluble in human body fluids and possess cardio-respiratory effects being capable of inducing pulmonary toxicity [21,22]. According to Smichowski et al. [23], the bioaccessibility of metals, characterized by their ability to be absorbed by a living system, is a primary consideration for the assessment of environmental risk. The abundance of potentially bioavailable metals depends on the properties of the substance, different types of the composition of solvents used as leaching agents, and the conditions of particular extraction [18,19, 24–29].

The present study summarizes the extraction protocols, leaching agents involved in extractions, outcomes of research publications on soluble toxic fractions in different regions of the world and associated health risks. Different leaching agents, reported for the extraction of BAFs of particulate toxic elements as well as other fractions belonging to carbonate-bound, oxide- and refractive- origin, were also summarized in the study. A collection of recently published one hundred twenty one

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# Adsorption of industrial dyes on functionalized and nonfunctionalized asphaltene: A combined molecular dynamics and quantum mechanics study

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## ABSTRACT

Dyes are major water pollutants due to their large-scale industrial applications. Dyes adversely impact both aquatic and human health. Thus, they require efficient removal from water bodies. Adsorption is an effective method for removing dyes from polluted water. In this study, we simulated the adsorption of bromophenol blue, methylene blue, and methyl orange by asphaltene and its functionalized version. Adsorption was simulated using molecular dynamics (MD) and density functional theory (DFT) calculations. Our results indicated that functionalized and nonfunctionalized dyes have varying interaction energies depending on the nature of the dye. MD simulations indicated that methylene blue tends to have a stronger interaction with asphaltene than the other dyes. Methyl orange bound more strongly with the functionalized asphaltene (FASP) than with the other dyes. Bromophenol blue dye demonstrated weak interaction with both types of asphaltene. DFT calculations were conducted to understand the nature and strength of the interactions between the dyes and asphaltene. In this study, we also analyzed binding energy, electrostatic potential, frontier molecular orbitals, and noncovalent interactions. The DFT and MD analyses supported the experimental finding that FASP is a better adsorbent of dyes than nonfunctionalized asphaltene.

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## 1. Introduction

Solid deposition is a significant problem in crude oil production, transportation, and storage operations. It severely affects the petroleum industry and causes massive economic loss. Wax deposits comprise high molecular weight n-alkanes (n-paraffins), long iso- and cycloalkanes, and high molecular weight polyaromatics. Asphaltene is a major component of petroleum fluids and heavy crude oils. Asphaltenes are polyaromatic heterocyclic macromolecules consisting of carbon, hydrogen, and lesser quantities of other elements such as nitrogen, sulfur, and oxygen atoms [1].

The self-aggregation of the polyaromatics ring in asphaltene causes low solubility, high viscosity, and recovery problems. These issues lead to reservoir plugging and pipeline fouling [2–4]. The

high molecular weights of the self-aggregates are soluble in toluene, pyridine, and benzene. However, they are insoluble in n-pentane and n-heptane and suspend in crude oil [5]. Asphaltenes are a highly polar portion of the petroleum crude matrix. Crude oil has extremely delicate ratios of polar to nonpolar atoms in which they are characterized by fused ring aromaticity, small aliphatic side chains and polar heteroatom containing functional groups with varying molecular weights [6]. The structure and properties of asphaltene depend on the type of employed n-alkane, precipitation timing, stirring time, and crude oil source. In general, n-heptane precipitates high molecular weight asphaltenes. Conversely, n-pentane precipitates low molecular weight asphaltene. In addition, asphaltenes contain trace concentrations (i.e., ppb levels) of V and Ni metals in the form of porphyrins. However, these porphyrins do not influence the functionalization and adsorption processes.

Asphaltene is widely used in roofing, road construction, corrosion inhibition, curing agents, and waterproofing [7]. Recently,

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# Detection of flonicamid insecticide in vegetable samples by UV–Visible spectrophotometer and FTIR

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## ABSTRACT

In the present study, the synthesis of 4,4'-(4-dimethylamino)cyclohexane-2,5-vinylidene)methylene))bis-(N,N-dimethylaniline) violet color dye by the hydrolyzed of Flonicamid in basic medium ( $\text{OH}^-$ ) followed by bromination and leucocrystal violet, as well as the synthesis of violet crystal by environmental samples (i.e., cucumber, tomato, bottle gourd, soil, and water). Characterization for the synthesis of violet crystal dye by using UV–Vis spectrophotometer and FTIR methods. As a result, the UV–Vis absorption spectrum was observed at 580 nm. The limit of detection and limit of quantification was observed at  $0.007 \mu\text{g mL}^{-1}$  and  $0.025 \mu\text{g mL}^{-1}$  respectively. We have also conformational studied the functional group (such as an N–H symmetric band are  $1654.85 \text{ cm}^{-1}$ , symmetrical stretching C–N is  $1417.46 \text{ cm}^{-1}$ , NH and C–N band  $1321.34 \text{ cm}^{-1}$ , C–C stretching is  $1035.81 \text{ cm}^{-1}$ , a carbonyl group is  $785.61 \text{ cm}^{-1}$ ) involved in the complexation between flonicamid and bromination by FTIR method. This system has been successfully applied for the detection of flonicamid in various environmental sample i.e., cucumber, tomato, bottle gourd, soil, and water. This method advances in simple, selective, and rapid as well as economic for the determination of flonicamid insecticide in vegetable and fruit samples.

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## 1. Introduction

The pesticide is an important management tool to boost reproductivity, improve crop yield and reduce post-harvest losses [1–3]. In modern agriculture pesticides (i.e., herbicides, fungicides, and insecticides) are widely used in environmental fields due to its high efficiency to control pest, easy synthesis, and low cost [4–6]. The overuses of pesticides disturb the ecosystem and can have an adverse effect on the environment and also affect human health as well. It causes cancer, eye damage, skin rashes, headache, lacrimation, sweating, vomiting, diarrhea, lung edema etc. [7–10]. Flonicamid is a systemic insecticide and chemically known as N-(cyanomethyl)-4-(tri-fluoromethyl) nicotinamide. It kills insects like aphids, whiteflies, thrips, and grasshoppers by disrupting their chordotonal organ which affects their movement and hearing which in turn affect their feeding. It is used to control pests in apples, wheat, peaches potatoes, cotton seeds and various vegetables (European Food Safety Authority 2015). From the reviews of

literature and survey flonicamid insecticide is rapidly used to kill pests in various vegetables which are commonly used in our day to day life.

In past decades many techniques and methods are used to detect different pesticides but they all are costly and time-consuming. To eradicate the problems due to pesticides and to protect the ecosystem, many simple, and sensitive methods have been developed for the detection of pesticides such as liquid chromatography [11], gas chromatography-mass spectroscopy [12], high performance-liquid chromatography [13], infrared spectroscopy [14], fluorescence analysis [15,16], UV–Visible spectroscopy [17,18].

Ko et al. [19] reported a method for detection of flonicamid residue in using LC–MS/MS. Kodamdaram et al. [20] determined flonicamid residue in okra fruit samples LC–MS/MS in different field. Zhang et al. [21] reported a method for the determination of Flonicamid in plants by Liquid Chromatography–Tandem Mass Spectrometry and obtained residue in all samples. Lee et al. [22] reported the uses of coupling reaction to detect insecticides. Morita et al. [23] have reported a novel inhibitory effect of flonicamid on aphid feeding. Guo et al. [24] applied liquid chromatography-tandem mass spectrometry for the determination of flonicamid in apple and cucumber samples and also determined its metabolites. Khattoon et al. [25], Nirmal et al. [26], Wani et al. [27], and Khattoon et al. [28] reported bromination and other organic synthesis

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From the journal:

**New Journal of Chemistry**

## Inkjet-printed paper-based electrochemical sensor with gold nano-ink for detection of glucose in blood serum †



[Tushar Kant](#),<sup>a</sup> [Kamlesh Shrivastava](#),<sup>ID</sup> <sup>\*a</sup> [Kavita Tapadia](#),<sup>b</sup> [Rama Devi](#),<sup>b</sup> [Vellaichamy Ganesan](#),<sup>ID</sup> <sup>c</sup> and [Manas Kanti Deb](#),<sup>ID</sup> <sup>a</sup>

[Author affiliations](#)

### Abstract

Herein, an inkjet-printed paper electrode (PPE) with gold nanoparticle (AuNP)-ink as a non-enzymatic electrochemical sensor for detection of glucose in blood serum is reported. In this work, a green method is used for the synthesis of the aqueous AuNP-ink and the electrode is fabricated on a paper substrate using an office desktop inkjet-printer. The developed AuNP-ink is stable and has a surface tension and viscosity of 70.2 mN m<sup>-1</sup> and 2.1 mPa s (2% aqueous AuNP ink). The PPE with AuNPs is sintered at 100 °C for 30 min to obtain a conductive film for electrochemical sensing. The prepared AuNP-PPE is employed as a working electrode in cyclic voltammetry (CV) for the sensitive measurement of glucose in blood serum. The fabricated AuNP-PPE demonstrated excellent electrochemical activity and rapid electron transfer kinetics towards the oxidation of glucose. A wide linear range, 0.05–35 mM, with a limit of detection of 10 μM is observed for the determination of glucose. The advantages of using the AuNP-PPE in electrochemical measurements are that it is flexible, user-friendly, biodegradable, economic and enzyme-free with respect to the commercially available electrochemical sensors.

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From the journal:

## New Journal of Chemistry

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[Check for updates](#)

[Tushar Kant](#),<sup>a</sup> [Kamlesh Shrivastava](#),<sup>\*a</sup>  [Kavita Tapadia](#),<sup>b</sup> [Rama Devi](#),<sup>b</sup> [Vellaichamy Ganesan](#),<sup>c</sup>  and [Manas Kanti Deb](#),<sup>a</sup> 

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From the journal:

**New Journal of Chemistry**

## Temperature-programmed nitridation of monodispersed VO<sub>x</sub> nanoparticles into nanocrystalline superconducting oxygen-doped vanadium nitride†



[Khemchand Dewangan](#),  <sup>\*a</sup> [Dadan Singh](#),  <sup>a</sup> [Sandeep Kumar Singh Patel](#)  <sup>b</sup> and [Kamlesh Shrivastava](#)  <sup>\*c</sup>

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### Abstract

A two-stage synthesis process was employed to prepare high-quality nanocrystalline vanadium nitride (VN) for superconducting applications. Firstly, monodispersed amorphous VO<sub>x</sub> nanoparticles were obtained *via* thermal-decomposition of the vanadium(III) acetylacetonate [V(acac)<sub>3</sub>] precursor in phenyl ether using oleylamine as a surface stabilizing agent. In the second stage, VO<sub>x</sub> nanoparticles were nitrided using a temperature-programmed reduction reaction at 700 °C under an NH<sub>3</sub> atmosphere. Finally, at room temperature a nano-sized nitride sample was oxygen passivated by flowing 0.1% O<sub>2</sub>-containing N<sub>2</sub> gas before removing from the furnace to avoid bulk-oxidation of nanocrystals. X-ray diffraction (XRD) peak reflection confirms the formation of phase-pure VN. The transmission electron microscopy (TEM) image displays that the particles are non-agglomerated and have a size distribution of 17.71 ± 3.59 nm. X-ray photoelectron spectroscopy (XPS) study provides evidence that the main oxidation state of vanadium lies between (III) and (0) in the sample. However, it also appears that vanadium located on the surface of VN nanocrystals is oxidized during the passivation. Hence, the present synthesis strategy leads to oxygen-doping on the surface of VN nanoparticles that results in the formation of a vanadium oxide/oxy-nitride thin-layer on the surface. In addition, the temperature-dependent magnetization study of the product exhibits an abrupt decrease in the magnetization



# N-Doped Carbon Quantum Dot-MnO<sub>2</sub> Nanowire FRET Pairs: Detection of Cholesterol, Glutathione, Acetylcholinesterase, and Chlorpyrifos

Lakshita Dewangan, Jyoti Korram, Indrapal Karbhal, Rekha Nagwanshi, and Manmohan L. Satnam\*



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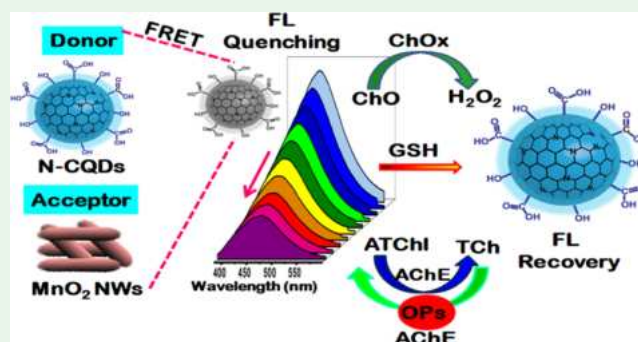
Article Recommendations



Supporting Information

**ABSTRACT:** Nitrogen-doped carbon quantum dots (N-CQDs) were synthesized by hydrothermal treatment of citric acid and triethylamine. The fluorescence resonance energy transfer (FRET)-based fluorescence “switch-off-on” of N-CQD (energy donor) in the presence of MnO<sub>2</sub> nanowires (energy acceptor) has been successfully applied to fabricate a fluorometric probe for detection of cholesterol (ChO), glutathione (GSH), acetylcholinesterase (AChE), and chlorpyrifos. MnO<sub>2</sub> nanowires (MnO<sub>2</sub> NWs) significantly quenched the blue fluorescent emission of N-CQDs by the phenomenon of FRET. The redox reactions of MnO<sub>2</sub> with H<sub>2</sub>O<sub>2</sub> and thiolated compounds resulted in the decomposition of MnO<sub>2</sub> nanowires (brown) to give Mn<sup>2+</sup> ions (colorless), which induced the fluorescence recovery of N-CQDs (turn-on). The interruption of the FRET phenomenon of N-CQD–MnO<sub>2</sub> NW composites by the produced H<sub>2</sub>O<sub>2</sub> from the reaction of cholesterol oxidase in the presence of cholesterol, and thiocholine from the reaction of acetylthiocholine in the presence of acetylcholinesterase, causes FL recovery of N-CQDs. The inhibition of AChE by chlorpyrifos induces FL quenching (turn-off) of N-CQD–MnO<sub>2</sub> NW composites. The decomposition of MnO<sub>2</sub> NWs into Mn<sup>2+</sup> in the presence of glutathione resulted in the subsequent FL recovery of N-CQDs. The sensing system shows a sensitive response to cholesterol, glutathione, and chlorpyrifos pesticide, giving LODs and LOQs of 4.89 nM, 7.52 nM, 0.01 μM and 14.83 nM, 22.80 nM, 0.03 μM, respectively. The practical applicability of the proposed probe has been verified by detecting the ChO and GSH in human plasma with satisfactory results.

**KEYWORDS:** N-CQDs, MnO<sub>2</sub> nanowires, cholesterol oxidase, cholesterol, glutathione, acetylcholinesterase, chlorpyrifos



## 1. INTRODUCTION

Currently, most research studies have been focused on the eco-friendly synthesis and optical, electronic, and biochemical applications of N-CQDs.<sup>1–4</sup> The doping of nitrogen into carbon frameworks through bottom-up strategies has shown excellent performance in many areas, i.e., biosensing<sup>5</sup> and bioimaging.<sup>6–8</sup> The stabilization of the exciton of the CQDs by passivation of surface-active sites through nitrogen doping can effectively improve their emission properties, low toxicity, and high stability. The photoluminescence quantum yield of the N-doped CQDs is much larger than that of undoped CQDs.<sup>9,10</sup> Significant attention has been paid to the development of N-CQD-based assays for fluorescence turn off–on sensing and detection of biomolecules, i.e., acid phosphatase,<sup>11</sup> thiol-containing compound,<sup>12,13</sup> acetylcholinesterase,<sup>14</sup> uric acid,<sup>15</sup> ascorbic acid,<sup>16,17</sup> peroxidase,<sup>18</sup> glucose,<sup>19</sup> alkaline phosphatase,<sup>20</sup> and aflatoxin B<sub>1</sub>.<sup>21</sup> Phyto-derived N-CQDs have also been used for degradation of safranin-O dye.<sup>22</sup>

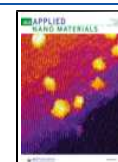
The fluorescence resonance energy transfer (FRET) phenomenon between donor and acceptor molecules has been widely studied because of the conjunction of quantum

dots and nanomaterials with biomolecules for the construction of absolute sensors. The FRET induced by nanomaterials such as silver nanoparticles,<sup>23</sup> gold nanoparticles,<sup>24</sup> g-C<sub>3</sub>N<sub>4</sub>,<sup>25</sup> and molybdenum sulfide<sup>26</sup> has been used for fluorescence sensing and detection of numerous analytes.<sup>27,28</sup> Recently, Yan et al.<sup>29</sup> developed the MnO<sub>2</sub> nanosheet-carbon dots sensing platform for determination of organophosphorus pesticide in the linear range of 0.05–5 ng mL<sup>–1</sup>, with a low detection limit of 0.015 ng mL<sup>–1</sup>. The inner filter effect of MnO<sub>2</sub> NS/BNQD has been applied for detection of glutathione with the limit of detection of 160 nM in the range of 0.5–250 μM.<sup>30</sup> The nanowire and nanorod morphology shows a higher surface area than those of nanosheets and bulk commercial MnO<sub>2</sub>.<sup>31,32</sup> With the

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## Colorimetric Determination of L-Cysteine in Milk Samples with Surface Functionalized Silver Nanoparticles

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### Abstract

A simple, selective and sensitive method is proposed for determination of cysteine (Cys) in milk samples using ionic liquid functionalized silver nanoparticles (ILs-AgNPs) as a colorimetric probe. ILs-AgNPs was synthesized by simple reduction method using silver nitrate as a precursor and sodium borohydride as a reducing agent and functionalized with ILs to prevent particles from self-aggregation. The sensing mechanism has been dependent on the color change of ILs-AgNPs and red shift of absorption band from 395 nm to 500 nm in the visible region, which is found proportional to the concentration of target analyte in sample. ILs-AgNPs was characterized in absence and presence of Cys by UV-vis, fourier transforms-infrared (FTIR) spectroscopy, transmission electron microscope (TEM) and dynamic light scattering (DLS). The linear range was acquired in the range of 0-100 ng mL<sup>-1</sup>, with correlation coefficient ( $R^2$ ) of 0.996 and limit of detection (LOD) of 4.2 nM. The binding mechanism and interactions between Cys and ILs-AgNPs was confirmed by calculating the binding constant and thermodynamic parameters such as enthalpy ( $\Delta H$ ), entropy ( $\Delta S$ ) and Gibb's free energy ( $\Delta G$ ). The use of ILs-AgNPs exhibited high colorimetric selectivity for Cys in milk samples in presence of other amino acids. This proposed strategy possessed the advantages of simplicity and selectivity, hence is applied for analysis of Cys in milk samples.

**Keywords:** Ionic liquid-silver nanoparticles; colorimetric probe; milk samples; spectroscopy; thermodynamic parameters.

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# Exploring spectroscopic insights into molecular recognition of potential anti-Alzheimer's drugs within the hydrophobic pockets of $\beta$ -cycloamylose

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## ABSTRACT

Over the years, reports on quantitative analysis of complexation between anti-Alzheimer's drugs and  $\beta$ -cycloamylose ( $\beta$ -CA) are lacking. Hence, a new kind of investigation on host-guest complexation of two novel and potential anti-Alzheimer's drugs referred to as compounds **1** and **2** with  $\beta$ -CA has been studied for a range of temperatures (293, 298, 305 K) using spectroscopic techniques at physiological pH. The evaluated association constant ( $K_a$ ) and thermodynamic parameters [Gibb's free energy ( $\Delta G$ ), enthalpy ( $\Delta H$ ) and entropy ( $\Delta S$ )] for these relatively novel host-guest complexes accessed a clear indication for the development of inclusion complexes (ICs) between them. The validation of such novel ICs has been critically accounted from FTIR,  $^1\text{H}$  NMR, COSY and NOESY spectroscopy. These new set of ICs were found to have 1:1 stoichiometry via Job's plot for both the inclusions (compound **1** +  $\beta$ -CA and compound **2** +  $\beta$ -CA) and association constant ( $K_a$ ) advocates the highest stability for compound **2** +  $\beta$ -CA. Highlighting the biochemical approach of these novel ICs, they were individually incorporated within  $\beta$ -CA for studying their inhibitory effect on mitochondrial respiratory rate and their respective  $\text{IC}_{50}$  values were also calculated. The outcome of the present study conveys superiority of such ICs in enriching the anti-Alzheimer's drugs properties so they could have profound application in *in vivo* analysis.

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## 1. Introduction

Investigations related to host-guest complexation which could specifically serve the bio-medical region related to controlled drug delivery and the pharmacological aspects are exceptionally promising nowadays. [1,2] Supramolecular chemistry is the proficient ground base for this study where host and guest molecules dimensionally fit together ascertaining to the formation of chemically stable inclusion complexes (ICs) pertaining to outstanding merits. [3,4]

The excellent molecular selectivity of  $\beta$ -cycloamyloses ( $\beta$ -CAs) also known as cyclodextrins highlighted them as promising host constituent in comparison to  $\alpha$  and  $\gamma$  CAs. [5,6] The exceptional structural features

of  $\beta$ -CAs such as shallow truncated cone, exclusive amphiphilic nature, cyclized and constrained conformation endowed them with the affinity to form complexes with versatile guest species such as metal ions, ionic liquids (ILs), drugs, neurotransmitters etc. [7–9] The specific driving forces involved in such complexes are particularly van der Waals, dipole-dipole, electrostatic and hydrogen bonding [10,11]. Pertaining to their merits,  $\beta$ -CAs are now a subject of interest in biomedical science, molecular sensing, nano-devices, cell imaging etc. [12–15]

Roy et al., have significantly studied supramolecular chemistry by forming ICs of CAs and drugs consequently modifying their physico-chemical properties. They allowed interaction of sulfacetamide sodium drug [16] and nortriptyline hydrochloride drug [17] with  $\beta$ -CA where these compounds were found to possess advantageous properties over parent drug molecules. Such ICs were resistant to any chemical modification and also regulated drug overdose. The ICs were characterized by  $^1\text{H}$  NMR,  $^{13}\text{C}$  NMR and FTIR techniques. Recently, Nowakowski et al.

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# Novel Formation of Au/Ag Bimetallic Nanoparticles by a Mixture of Monometallic Nanoparticles and Their Application for Rapid Detection of Lead in Onion Sample

Sushama Sahu<sup>a</sup>, Srishti Sharma<sup>a</sup>, Kallol K. Ghosh<sup>a,\*</sup>

<sup>a</sup>School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur-492010 (C.G.), India

## Abstract


The exposure, accumulation and contamination of heavy metals to humans and ecosystem through vegetables are serious health threats. One of the most important ingredients of foods i.e, onion uptake poisonous heavy metal lead (Pb) from soil significantly. Herein, we report a facile synthesis of gold/silver (Au/Ag) bimetallic nanoparticles (BNPs) for colorimetric determination of Pb<sup>2+</sup> in onion (*Allium cepa* L.) samples. The mechanism for selective determination of Pb<sup>2+</sup> from sample solution is confirmed by red shift of localized surface plasmon resonance (LSPR) band of BNPs in the visible region. The size, shape, composition and surface modification of BNPs are determined using UV-Vis, transmission electron microscope (TEM), Fourier transform infra-red (FTIR) and energy dispersive X-ray (EDX) spectroscopy. The linear range for determination of Pb<sup>2+</sup> is 10-100 ng mL<sup>-1</sup> with limit of detection and limit of quantification of 5.28 and 17.62 ng mL<sup>-1</sup>, respectively. The good recovery percentage of 95.8 to 96.6% showed the selectivity of the method for Pb<sup>2+</sup> determination from complex sample matrices. The advantageous features of proposed method are ease of operation, simplicity, selectivity and their reproducibility for the determination of Pb<sup>2+</sup> in onion samples.

**Keywords:** Au/Ag bimetallic nanoparticles; lead ion; onion; colorimetric sensor; spectroscopy.

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# Thermodynamic investigation of the interaction between ionic liquid functionalized gold nanoparticles and human serum albumin for selective determination of glutamine†

Sushama Sahu, Reshma, Srishti Sharma, Indrapal Karbhal and Kallol K. Ghosh \*

The excellent biocompatible and monodispersed gold nanoparticles (AuNPs) functionalized by amino based ionic liquid (IL) have been synthesized for the demonstration of their interaction with human serum albumin (HSA). Amino based IL stabilizes the surface of AuNPs and provides a colorimetric sensor platform. The size of synthesized IL–AuNPs was identified by use of transmission electron microscopy (TEM) and dynamic light scattering (DLS) techniques. Molecular interaction of functionalized AuNPs with HSA have been investigated using multispectroscopic techniques, such as UV–Vis, fluorescence and Fourier transform infra-red (FT-IR) spectroscopy. The fluorescence and synchronous fluorescent intensity together indicated that IL–AuNPs exhibits a strong ability to quench the intrinsic fluorescence of HSA via a dynamic quenching mechanism. Moreover, the binding constant ( $K_a$ ), Stern–Volmer quenching constant ( $K_{SV}$ ) and different thermodynamic parameters, namely Gibb's free energy ( $\Delta G$ ), enthalpy ( $\Delta H$ ) and entropy ( $\Delta S$ ) have been evaluated at different temperatures. This interactive study focuses on the nature of surface modification of IL–AuNPs via HSA for selective detection of glutamine (Glu) with a lower limit of detection of 0.67 nM in the linear range of 10–100 nM for Glu.

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## 1. Introduction

Serum albumins are proteins found in blood plasma which account for about 60% of the total protein corresponding to a concentration of 42 g L<sup>−1</sup> and are ultimately responsible for about 80% of the osmotic pressure of blood.<sup>1–3</sup> Both bovine serum albumin (BSA) and human serum albumin (HSA) are thiol containing proteins.<sup>4</sup> HSA consists of 585 amino acids and the main binding sites are located at hydrophobic cavities in their subdomains, such as tryptophan (Trp-214) and tyrosine (Tyr-411) residues.<sup>5</sup> HSA has a tendency to interact with positively charged species due to its negative charges at pH 7.8 and the isoelectric point (pI) of HSA is found to be 4.9, hence it shows roll on distribution, transportation and metabolism functions in pharmaceuticals.<sup>5,6</sup> HSA is considered as biodegradable and non-antigenic, hence, it is widely used for the preparation of microsphere and nanosphere sized nanoparticles (NPs).<sup>7</sup>

Understanding the interaction of NPs with serum albumin is an important aspect in nanobiology, nanomedicine and nanotoxicology. The assembled HSA–NPs exhibits enhanced

permeability and retention effect (EPR effect), hence, it enables too passive tumor targeting in cancer therapy.<sup>8</sup> Additionally, albumin molecules possess many functional groups which helps them in binding to the surface of other bio-active ligands, such as different amino acids found in human blood.<sup>7,9</sup> Hence, it is necessary to study the interaction ability of HSA towards NPs as they may be a key for many bio-medical issues.

From past decades, NPs have been targeted as a novel and innovative nanomaterials due to their unique properties and potential applications with high chemical reactivity.<sup>8</sup> There nano size enables them to interact with other biomolecules, drugs *etc.* making them applicable in areas such as catalysis or microelectronics.<sup>10</sup> Metal NPs are extensively used in therapeutic and diagnosis due to their excellent properties, such as minimal size, high stability, large surface area, suspension reactivity and tunable water solubility.<sup>11</sup> Mostly, metal NPs include gold (Au), silver (Ag), copper (Cu) and iron (Fe). Among these, Au has been studied extensively in many fields, as optical absorption study, self assembled monolayers, immunoassay and resonance light scattering spectroscopy, due to their inert and relatively less cytotoxicity.<sup>12</sup> Nowadays, ionic liquid (IL) are also becoming a subject of interest for the functionalization of metal NPs due to their extraordinary physical, chemical and biodegradable properties.<sup>13</sup> Therefore, the study of the interaction of IL–AuNPs to serum albumins for selective sensing of amino acids could be critically significant.

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## PAPER

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# Thermodynamic investigation of the interaction between ionic liquid functionalized gold nanoparticles and human serum albumin for selective determination of glutamine†

Sushama Sahu, Reshma, Srishti Sharma, Indrapal Karbhal and Kallol K. Ghosh \*

The excellent biocompatible and monodispersed gold nanoparticles (AuNPs) functionalized by amino based ionic liquid (IL) have been synthesized for the demonstration of their interaction with human serum albumin (HSA). Amino based IL stabilizes the surface of AuNPs and provides a colorimetric sensor platform. The size of synthesized IL–AuNPs was identified by use of transmission electron microscopy (TEM) and dynamic light scattering (DLS) techniques. Molecular interaction of functionalized AuNPs with HSA have been investigated using multispectroscopic techniques, such as UV-Vis, fluorescence and Fourier transform infra-red (FT-IR) spectroscopy. The fluorescence and synchronous fluorescent intensity together indicated that IL–AuNPs exhibits a strong ability to quench the intrinsic fluorescence of HSA via a dynamic quenching mechanism. Moreover, the binding constant ( $K_b$ ), Stern–Volmer quenching constant ( $K_{SV}$ ) and different thermodynamic parameters, namely Gibbs free energy ( $\Delta G$ ), enthalpy ( $\Delta H$ ) and entropy ( $\Delta S$ ) have been evaluated at different temperatures. This interactive study focuses on the nature of surface modification of IL–AuNPs via HSA for selective detection of glutamine (Glu) with a lower limit of detection of 0.67 nM in the linear range of 10–100 nM for Glu.

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# Multi-spectroscopic monitoring of molecular interactions between an amino acid-functionalized ionic liquid and potential anti-Alzheimer's drugs†

Srishti Sharma,<sup>a</sup> Manoj Kumar Banjare,<sup>ab</sup> Namrata Singh,<sup>cf</sup> Jan Korábečný,<sup>de</sup> Kamil Kuča<sup>\*df</sup> and Kallol K. Ghosh<sup>ib</sup>  <sup>a</sup>

Inhibiting the formation of amyloid fibrils is a crucial step in the prevention of the human neurological disorder, Alzheimer's disease (AD). Ionic liquid (IL) mediated interactions are an expedient approach that exhibits inhibition effects on amyloid fibrils. In view of the beneficial role of ILs, in this work we have explored complexation of anti-Alzheimer's drugs (*i.e.*, tacrine and PC-37) and an amino acid-functionalized IL [AIL (4-PyC8)]. Maintaining standard physiological conditions, the binding mechanism, thermo-dynamical properties and binding parameters were studied by employing UV-vis, fluorescence, FTIR, <sup>1</sup>H NMR, COSY and NOESY spectroscopy. The present investigation uncovers the fact that the interaction of anti-Alzheimer's drugs with 4-PyC8 is mediated through H-bonding and van der Waals forces. The Benesi–Hildebrand relation was used to evaluate the binding affinity and PC-37 showed the highest binding when complexed with 4-PyC8. FTIR spectra showed absorption bands at 3527.98 cm<sup>-1</sup> and 3527.09 cm<sup>-1</sup> for the PC-37 + 4-PyC8 system which is quite promising compared to tacrine. <sup>1</sup>H-NMR experiments recorded deshielding for tacrine at relatively higher concentrations than PC-37. COSY investigations suggest that anti-Alzheimer's drugs after complexation with 4-PyC8 show a 1 : 1 ratio. The cross-peaks of the NOESY spectra involve correlations between anti-Alzheimer's drugs and AIL protons, indicating complexation between them. The observed results indicate that these complexes are expected to have a possible therapeutic role in reducing/inhibiting amyloid fibrils when incorporated into drug formulations.

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## 1. Introduction

In the last few decades, targeted drug delivery has become a crucial issue in the bio-medical field as it provides the undeniable advantage of minimizing the associated after-effects of

drugs like psychotic illness, overstimulation and other dysfunctions.<sup>1,2</sup> Generally, drugs interact with surfactants, ionic liquids (ILs), cyclodextrins and other carriers to promote their controlled and specific delivery.<sup>3–5</sup> Earlier ILs were recognized only as better alternatives to volatile organic solvents with superior properties.<sup>6</sup> However, the better biodegradability and non-toxic profile of functionalized ILs have attracted biochemists, ecologists and medical scientists worldwide. Recent studies conducted on ILs with incorporated functional groups have proved their biological efficacy, inhibiting or enhancing enzyme activities.<sup>7</sup> Garcia *et al.* have studied such biodegradable and amino acid-functionalized ILs (AILs), which possess a superior surface activity and a very low critical micelle concentration (CMC).<sup>8</sup> Functionalization of ILs with amide groups leads to the elevation of their thermal stability and enhancement of their self-aggregation properties due to the elongation of the alkyl chain and escalated antimicrobial activity. Recently, our research group has reported the synthesis of a series of unique ILs derived from an amphiphilic pyridinium oxime moiety, which were examined on the grounds of biodegradability using a closed bottle test.<sup>9</sup> In addition to the aforementioned interesting properties, reports also evidence ILs' remarkable inhibitory effects for amyloid fibrils (nearly

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† Electronic supplementary information (ESI) available: Fig. S1: Absorbance spectra (A and C) and Benesi–Hildebrand plots (B and D) for the interaction of anti-Alzheimer's drugs (1.0 mM) (A and B) tacrine and (C and D) PC-37 in the presence of increasing concentrations of 4-PyC8 at physiological conditions. Fig. S2: Plots of log[(I<sub>0</sub> - I)/I] against log[4-PyC8], respectively, for (A) tacrine and (B) PC-37 at different concentrations of 4-PyC8 (0.1 mM) at pH 7.4 and 37 °C. Fig. S3: <sup>1</sup>H NMR spectra of the complexes of [A] PC-37 + 4-PyC8 and [B] tacrine + 4-PyC8. See DOI: 10.1039/d0ra06323a





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# Influence of fireworks emission on aerosol aging process at lower troposphere and associated health risks in an urban region of eastern central India

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## ARTICLE INFO

## Keywords:

Deepawali festival  
Size-distribution  
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Inhalation dose  
Potential penetration  
Health impacts

## ABSTRACT

To study the influence of fireworks in atmospheric aerosols and their effect on health during the extreme firework days, fireworks tracer metals and carbonaceous species in size-distributed aerosols in the lower troposphere at Raipur in eastern central India were investigated during the 2018 Deepawali festival. Aerosol samples were collected, before Deepawali period (BDP,  $n = 5$ ), during Deepawali period (DDP,  $n = 5$ ) and after Deepawali period (ADP,  $n = 5$ ). Bimodal size-distribution with intense fine mode peak was found for Na during DDP. Bimodal distribution with fine mode intense peak was found for K during DDP. The bimodal size distribution of K was found common for other events because of biomass burning emissions, whereas high intense peak during DDP indicated mixed sources from biomass burning and fireworks. During DDP, K and Ca were well correlated ( $r^2 = 0.93$ ) together. Strong metal-metal correlations were found between the following pairs, Zn–Fe, Cu–Fe and Cu–Ca, which indicated the similar firecrackers burning source. The atmospheric aging of aerosols was also found significantly high during fireworks days. Aging of aerosols were higher because of heterogeneous reactions of  $\text{SO}_2$  and  $\text{NO}_x$  on aerosols directly emitted from fireworks. The observed high values of inhalation dose of elemental carbon during DDP period imposed higher risk of respiratory diseases. This study has provided carbonaceous fractions composition data as a tool to detect the aging processes of fireworks in ultra-fine, fine and coarse mode particles during the extreme firework days. Inhalation doses were calculated to establish potential influence on human health.

## 1. Introduction

Atmospheric aerosols released from firecrackers burning in special occasion or festival time around the world have acquired greater attention such as Guy Fawkes night in the United Kingdom (Allan et al., 2010), Deepawali festival in India, Lantern festival in China, New Year's celebration in United States, Firecrackers festival of Taiwan, Maltese archipelagos festas celebration and Las Fallas celebration of Spain (Moreno et al., 2007; Wang et al., 2007; Camilleri and Vella, 2010; Do et al., 2012; Nirmalkar et al., 2016; Li et al., 2017). In spite of eye-catching colorful visual appearance in the sky with the continuous sound of detonation of firecrackers, this short-term emission, results in large airborne gaseous as well as particle pollutants in the troposphere (Pongpiachan et al., 2017; Bencardino et al., 2018). This emission leads to serious environmental implications, which results in the deterioration of health quality and life expectancy. For instance, due to severe

airborne pollution in China, the government has declared a ban on manufacturing, sales and bursting of firecrackers in some cities from 1993 to 2006 to overcome such situations (Han et al., 2007). In New Delhi worst atmospheric condition was observed during November 2017, because of sudden rise in particulate matters due to local as well as transported pollutants, which reduced the visibility to less than 50 m, and people faced health problems like coughing, eyes watering, difficulties in breathing and headaches. Apropos to the above government declared a health emergency in Delhi during November 2017 (Terry et al., 2018). Conticini et al. (2020) conducted a correlation-based study between the fatality rate of Severe Acute Respiratory Syndrome CoronaVirus 2 (SARS-CoV2) and the level of atmospheric pollution. They reported study site with high atmospheric pollution were having high fatality rate in the people suffering from SARS-CoV2 viral infection.

Carbonaceous aerosols have drawn greater attentions of researchers

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# Influence of fireworks emission on aerosol aging process at lower troposphere and associated health risks in an urban region of eastern central India

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# A KBr-impregnated paper substrate as a sample probe for the enhanced ATR-FTIR signal strength of anionic and non-ionic surfactants in an aqueous medium†

 Ramsingh Kurrey,<sup>\*a</sup> Manas Kanti Deb,<sup>ID</sup> <sup>\*a</sup> Kamlesh Shrivastava,<sup>ID</sup> <sup>a</sup> Jayant Nirmalkar,<sup>b</sup> Bhupendra Kumar Sen,<sup>c</sup> Mithlesh Mahilang<sup>a</sup> and Vikas Kumar Jain<sup>d</sup>

Herein, we report a KBr-impregnated paper substrate as a sample probe to enhance the attenuated total reflection-Fourier transform infrared (ATR-FTIR) signal strength of anionic surfactants (AS) and non-ionic surfactants (NS) in an aqueous solution. The mechanism for the sensing of AS and NS is based on the strong interaction of surfactants with the silicate groups ( $\text{SiO}_4^{4-}$ ) of the KBr-impregnated paper substrate. The role of  $\text{SiO}_4^{4-}$  on the surface of the paper is to enhance the adsorption of AS and NS, resulting in improved IR signal intensities for the target analytes. The improved signal intensity at  $1253\text{ cm}^{-1}$  ( $\text{SO}_4^{2-}$ , symmetric stretching) for AS and  $1114\text{ cm}^{-1}$  (C–O–C, stretching vibration) for NS were selected for quantification. SEM-EDX was employed to determine the elemental compositions of pre- and post-adsorbed AS and NS on glass fibre filter paper (GFF). The linear range for the determination of AS and NS was  $10\text{--}100\text{ }\mu\text{g L}^{-1}$  with a method detection limit (MDL) of  $4\text{ }\mu\text{g L}^{-1}$  and method quantification limit (MQL) of  $12\text{ }\mu\text{g L}^{-1}$ . The good relative recovery of 71.4–109.7% and the interference studies showed the selectivity of the method for the determination of AS and NS in environmental water and commodity samples. The advantages of this method include its cost-effectiveness, enhanced sensitivity, disposability and accessibility of the paper substrate.

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## Introduction

Surfactants are surface active compounds that reduce the surface tension between two interfaces, and thus used as detergents, foaming agents, dispersants, emulsifiers and wetting agents.<sup>1</sup> Surfactants are generally amphiphilic in nature, containing both hydrophobic tail (water-insoluble) and hydrophilic head (water-soluble) groups. Based on their characteristic behavior, these compounds can be classified as anionic, cationic, non-ionic and amphoteric surfactants. Anionic surfactants (AS) are comprised of molecules such as soap (aliphatic carboxylic acid), alkyl sulphates, alkyl sulfonates, and alkyl benzene sulfonates. Non-ionic surfactants

contain no charged groups and can be used to separate grease from clothes, such as household cleaners and dish soap.<sup>2</sup> Furthermore, mixed surfactant systems often also show synergistic behavior such as low critical micelle concentration (CMC) and surface-interfacial tension, resulting in a reduction in the total amount of surfactant used in a particular application, which consequently reduces both their cost and environmental impact.<sup>3</sup> The entry of surfactants into the human body can disrupt the activity of enzymes and normal physiological functions.<sup>4</sup> An earlier work reported that the absorption of anionic and non-ionic surfactants such as linear alkyl benzene sulfonate (LABS) and alkylphenol ethoxylate, respectively, through the skin can cause irritation, liver damage and other chronic symptoms.<sup>5,6</sup> Therefore, the determination of AS and NS in different water (river water, raw water, and sewage water) and commodity samples is important to prevent the entry of these surfactants into the water supply network.

Several spectrophotometric methods using active substances such as methylene blue, disulphine blue, cobalt thiocyanate and bismuth have been reported for the determination of AS and NS in a variety of samples.<sup>7,8</sup> These methods are based on the formation of an ion-pair association complex between surfactants and dyes. The ion-pair complex is then extracted with a toxic solvent such as chloroform, benzene and toluene,

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contain no charged groups and can be used to separate grease from clothes, such as household cleaners and dish soap.<sup>2</sup> Furthermore, mixed surfactant systems often also show synergistic behavior such as low critical micelle concentration (CMC) and surface-interfacial tension, resulting in a reduction in the total amount of surfactant used in a particular application, which consequently reduces both their cost and environmental impact.<sup>3</sup> The entry of surfactants into the human body can disrupt the activity of enzymes and normal physiological functions.<sup>4</sup> An earlier work reported that the absorption of anionic and non-ionic surfactants such as linear alkyl benzene sulfonate (LABS) and alkylphenol ethoxylate, respectively, through the skin can cause irritation, liver damage and other chronic symptoms.<sup>5,6</sup> Therefore, the determination of AS and NS in different water (river water, raw water, and sewage water) and commodity samples is important to prevent the entry of these surfactants into the water supply network.

Several spectrophotometric methods using active substances such as methylene blue, disulphine blue, cobalt thiocyanate and bismuth have been reported for the determination of AS and NS in a variety of samples.<sup>7,8</sup> These methods are based on the formation of an ion-pair association complex between surfactants and dyes. The ion-pair complex is then extracted with a toxic solvent such as chloroform, benzene and toluene,

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## Review

## Biogenic secondary organic aerosols: A review on formation mechanism, analytical challenges and environmental impacts



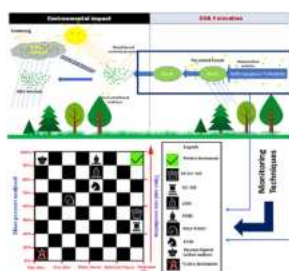
Mithlesh Mahilang, Manas Kanti Deb\*, Shamsh Pervez

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## HIGHLIGHTS

- The BSOA exhibit distinct day and nighttime formation mechanism.
- Analytical advancements and their ability to examine SOA are compiled and compared.
- SOA can cause significantly enhanced radiating forcing.
- Anthropogenic gaseous pollutants have strong influence over BSOA formation.
- Meteorological variables can effectively control BSOA formation.

## GRAPHICAL ABSTRACT



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## ABSTRACT

The review initiates with current state of information on the atmospheric reaction mechanism of biogenic volatile organic compounds (BVOCs) and its fate in the atmosphere. The plants release BVOCs, i.e., isoprene, monoterpenes, and sesquiterpenes, which form secondary organic aerosols (SOA) upon oxidation. These oxidation reactions are primarily influenced by solar radiations along with other meteorological parameters viz.; temperature and relative humidity, therefore, the chemistry behind SOA formation is different during day than the night time. The review throws light upon the day and nighttime formation mechanism of SOA, recent advancements in the analytical techniques available for the measurements, and its impact on the environment. Studies have revealed that day time SOA formation is dominated by OH and O<sub>3</sub>, however, NO<sub>x</sub> initiated SOA production is dominated during night. The formation mechanism addresses that the gaseous products of VOCs are firstly formed and then partitioned over the pre-existing particles. New particle formation and biomass-derived aerosols are found to be responsible for enhanced SOA formation. 2-Dimensional gas chromatography-mass spectrometer (2D-GC/MS) is observed to be best for the analysis of organic aerosols. Radiative forcing (RF) SOA is observed to be a useful parameter to evaluate the environmental impacts of SOA and reviewed studies have shown mean RF in the ranges of  $-0.27$  to  $+0.20 \text{ W m}^{-2}$ .

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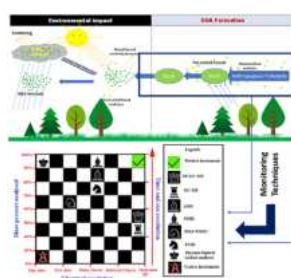
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**Food safety monitoring of phenthoate pesticide using smartphone-assisted  
paper-based sensor with bimetallic Cu@Ag core-shell nanoparticles**

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## Review Article

## Advances in flexible electronics and electrochemical sensors using conducting nanomaterials: A review

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## ABSTRACT

Today, more attention is given towards the design and development of flexible printed electronics and sensor for a wide range of applications using conducting nanomaterials (NMs) as functional material. In this review, we discussed the general synthesis methods of NMs, preparation of conducting nano-ink, techniques for impregnation of NMs on substrates, and activation of conductive surface. Moreover, NMs functionalized substrate is designed as per the requirement of applications such as electronic circuit, solar cells, wearable devices, touch pad etc., and also as a flexible electrode in electrochemical analysis of chemical substances in variety of samples. Additionally, the flexible devices are inexpensive, portable, lightweight, reduction of waste materials, and design the device as per necessity of the market.

## 1. Introduction

The “nano” term is originated from the Greek word and meaning is “small”. The placement of term in metric scale is 1 nm ( $10^{-9}$  m), which is not visible by the naked eye. On this scale, substances with at least one lateral dimensions ranging between 1 and 100 nm are typically known as a nanostructured material and offering specific name such as “nanoparticles, nanotubes, nanorods, nanofibers, nanoplates etc.”, according to structural and dimensional evolution of materials [1]. These nanostructured materials have property of quantum effects due to the discontinuous behavior of localized electrons in atom and phenomenon is used for biomedical and analytical applications. Moreover, due to the high surface to volume ratio of nanomaterials (NMs), they are extensively employed in electronic industry for the development of conductive functional materials for electronic applications [2–6].

Fundamental research and the development in science and technology mainly comprises of cost reduction, waste management, and well being of human. Even now the electronic devices are being produced by expensive material with low capacity and turn out a very high wastage of materials. Recently, scientists from research institutes and industries have been given considerable attention towards the advancement and use of conducting nanomaterials for electronic

applications [7–9]. Thus, ink made of conducting nanomaterials have better possibilities for producing low cost, lightweight, stable, and easily accessible electronics [10].

Organometallic compounds [11], metal precursors [12] and metal NMs [13,14] are mainly used for the preparation of conducting ink. To date, many metals NMs such as gold (Au) [15,16], silver (Ag) [13,17–19], copper (Cu) [20–25], carbon and graphene [17, 26–29] are frequently employed because of their good electronic conductivity, high stability as well as cost-effective and eco-friendly which provide them potentials for commercial applications. For such reasons, noble metals have been widely used for the synthesis of conducting ink [30,31]. In addition, different metal oxide like vanadium oxide ( $V_2O_5$ ) [32], nickel oxide (NiO) [33] and indium tin oxide (ITO) etc. [34] have been also investigated for the preparation of conducting ink. One additional characteristic of NMs is that the melting point reduces the size of materials due to the high surface energy; and therefore, annealing or sintering process helps in forming a dense layer of NMs on the solid surface. Moreover, mixing or hybridization of two or several appropriate nanomaterials in controlled manner also enhances electronic conductivity and stability of nanomaterials to fabricate on the different substrates for numerous applications. In this review article, we have summarize the different synthesis processes of conducting NMs,

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## Phytochemical screening and determination of phenolics and flavonoids in *Dillenia pentagyna* using UV-vis and FTIR spectroscopy

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### ABSTRACT

Here, we report an ultrasonic-assisted extraction (UAE) of phytochemicals from bark, leaves, sepals, fruits, and seeds of *Dillenia pentagyna* (Roxb) using different organic solvents such as chloroform, ethanol, and n-hexane. The preliminary phytochemical screening results showed that the ethanolic extract is enriched with phenolics, flavonoids, tannin, saponin, alkaloid, and terpenoids. The profiling of phytochemicals is carried out employing UV-Vis and Fourier-transform infrared (FTIR) spectroscopy analyses. The higher amount of phenolic compounds obtained in the ethanolic extract of bark and leaves as compared to other parts of the plant. Consequently, a higher amount of total flavonoid compounds unveiled in the bark of targeted species. The ethanolic extract of bark and leaves showed good free radical scavenging activity using DPPH with inhibition percentage of  $90.58 \pm 1.89\%$  and  $76.46 \pm 1.58\%$ , respectively, in comparison to standard ascorbic acid at  $10 \mu\text{g/mL}$ . Moreover, the half-maximal inhibitory concentration ( $\text{IC}_{50}$ ) value of bark and leaves are  $5.64$  and  $6.54 \mu\text{g/mL}$ , respectively, in comparison to standard ascorbic acid. With the best of our knowledge, it is the first report pertaining to characterization and quantification of phenols and flavonoids as well as the investigation of the medicinal property in *D. pentagyna*.

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### 1. Introduction

There are about 300,000 plant species whose phytochemicals with diverse structures and properties are elucidated [1]. These phytochemicals are divided into two major categories, firstly primary metabolites such as carbohydrates, lipids, proteins; and secondly, secondary metabolites like alkaloids, terpenoids, and phenolic compounds. The primary metabolites are responsible for the growth and development of plants; whereas secondary metabolites play an important role in defense mechanisms against the environmental pollutants, insects, and other foreign threats to the plant [2]. Among, these phenolic compounds and flavonoids are considered to be a very important class of biomolecules having a significant medicinal property for the human being. The basic structure of phenolic compounds (gallic acid, caffeic acid, ferulic acid, protocatechuic acid, and coumaric acid) consists of a phenolic ( $\text{C}_6\text{H}_5\text{OH}$ ) ring, the carboxylic acid ( $-\text{COOH}$ ) and hydroxyl groups ( $-\text{OH}$ ). Moreover, flavonoids are polyphenols that contain at least two phenolic rings and further categorized into different sub-class such as

flavonols, flavonones, flavones, flavanolols, flavan-3-ols, and isoflavones [3–5]. The antioxidant activity of phenolic compounds and flavonoids is directly proportional to the presence of the hydroxyl ( $-\text{OH}$ ) group in the sample. Further, the positions of hydroxyl groups also affect the ability of free radical scavenging activity [6,7]. The phenolic compounds have already been shown many pharmacological activities such as antimicrobial, antioxidants, anticancer, and antidiabetic [8–10].

Nowadays, the entry of toxic substances through food and drinking water generates free radicals which induce several diseases in the human body. It is due to the free radicals of reactive oxygen species attack on fatty acids, DNA, proteins, lipids, and initiate a rapid destructive chain reaction to damage the cell membranes [11]. The phenolic compounds and flavonoids play a significant role in preventing the damage caused by free radicals [12,13]. Thus, the characterization and determination of phytochemicals such as phenolic compounds and flavonoids in plant samples are essential to know the mechanism of these compounds against various biological activities. Here, different plant parts of *Dillenia pentagyna* (Roxb.) is chosen for the extraction and determination of bioactive components, and free radical scavenging activity of phenolic compounds and flavonoids is investigated.

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# CdTe QD-based inhibition and reactivation assay of acetylcholinesterase for the detection of organophosphorus pesticides†

Jyoti Korram,<sup>a</sup> Lakshita Dewangan,<sup>a</sup> Indrapal Karbhal,<sup>a</sup> Rekha Nagwanshi,<sup>b</sup> Sandeep K. Vaishnav,<sup>ac</sup> Kallol K. Ghosh<sup>ib</sup> <sup>a</sup> and Manmohan L. Satnami<sup>ib</sup> <sup>\*a</sup>

An enzyme immobilized glutathione (GSH)-capped CdTe quantum dot (QD)-based fluorescence assay has been developed for monitoring organophosphate pesticides. In principle, GSH-capped CdTe QDs exhibit higher sensitivity towards H<sub>2</sub>O<sub>2</sub> produced from the active enzymatic reaction of acetylcholinesterase (AChE) and choline oxidase (CHOx), which results in the fluorescence (FL) “turn-off” of the GSH-capped CdTe QDs. A “turn-on” FL of the CdTe QDs at 520 nm was recovered in the presence of organophosphate (OP). The FL changes of the GSH-capped CdTe QD/AChE/CHOx biosensor reasonably correspond to the amount of OP pesticides. The detection limit of the CdTe/AChE/CHOx biosensor towards paraoxon, dichlorvos, malathion and triazophos was  $1.62 \times 10^{-15}$  M,  $75.3 \times 10^{-15}$  M,  $0.23 \times 10^{-9}$  M and  $10.6 \times 10^{-12}$  M, respectively. The GSH-capped CdTe QDs/AChE/CHOx biosensor was applied as a FL nanoprobe for assaying the enzymatic activity of AChE. The inhibited AChE was reactivated up to 94% using pyridine oximate (2-PyOx<sup>−</sup>), and functionalized pyridinium oximates (4-C<sub>12</sub>PyOx<sup>−</sup> and 4-C<sub>18</sub>PyOx<sup>−</sup>) of varying chain lengths. It was found that the reactivation potency of the tested oximes varied with the chain length of the oximes. This biosensing system offers the promising benefit for the determination of the OP pesticides in food, water and environmental samples.

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## Introduction

In the current scenario, the determination of acetylcholinesterase (AChE) activity is of paramount importance due to pharmacological and toxicological concerns.<sup>1</sup> AChE is the major enzyme that hydrolyzes acetylcholine, a key neurotransmitter for synaptic transmission, into acetic acid and choline. Mild inhibition has been shown to have therapeutic relevance in Alzheimer's disease (AD), myasthenia gravis, and glaucoma among others.<sup>2,3</sup> In contrast, the strong inhibition of AChE can lead to cholinergic poisoning.<sup>4</sup> To combat this, AChE reactivators have been developed to remove the offending AChE inhibitors, restoring acetylcholine levels to normal.<sup>5,6</sup> It is really challenging to design a nanoprobe for monitoring AChE activity in the presence of reversible (carbamate, acridine) and irreversible (organophosphorus) inhibitors. The probe reported thus far can determine the inhibition<sup>7</sup> of AChE, and is limited to

monitoring percentage reactivation of organophosphorus-inhibited enzyme.

With high sensitivity and simplification, fluorescence-based sensors have been widely applied as one of the most commonly used sensing candidates for environmental monitoring,<sup>8</sup> food safety<sup>9</sup> and quality control.<sup>10</sup> Quite recently, many optical<sup>11–13</sup> and electrochemical<sup>14–16</sup> methods/biosensors have been applied to determine pesticide residues in food samples. Various kinds of materials have been widely employed for the fabrication of a fluorescence (FL) sensing platform, including fluorescent dyes,<sup>17</sup> semiconductor nanomaterials,<sup>18</sup> metal nanomaterials,<sup>19,20</sup> carbon quantum dots (CQD),<sup>21</sup> and rare earth materials.<sup>22</sup> It is also very critical to design a proper recognition unit that can be combined with the FL probe for responding to the fluorescent “turn-off”, “turn-on”, or “ratiometric” signal. Carbon quantum dots have been extensively investigated for probing AChE and the detection of organophosphorus (OP) pesticides.<sup>23–25</sup> We have developed a FRET-based CQD–AuNP system for the detection of pesticides, along with monitoring the inhibition and reactivation of AChE.<sup>26</sup>

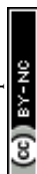
Biosensors based on CdTe QDs have been developed due to their unique electronic and optical properties, such as their broad absorption spectra, narrow and symmetric emission bands, less environmental sensitivity, and high quantum yield.<sup>27–32</sup> These advantages of the CdTe QDs in the narrow emission band have enabled the sensitive detection of trace

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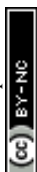
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# CdTe QD-based inhibition and reactivation assay of acetylcholinesterase for the detection of organophosphorus pesticides†

Jyoti Korram,<sup>a</sup> Lakshita Dewangan,<sup>a</sup> Indrapal Karbhal,<sup>a</sup> Rekha Nagwanshi,<sup>b</sup> Sandeep K. Vaishnav,<sup>ac</sup> Kallol K. Ghosh<sup>ib</sup> <sup>a</sup> and Manmohan L. Satnam<sup>i</sup> <sup>ib</sup> <sup>★a</sup>

An enzyme immobilized glutathione (GSH)-capped CdTe quantum dot (QD)-based fluorescence assay has been developed for monitoring organophosphate pesticides. In principle, GSH-capped CdTe QDs exhibit higher sensitivity towards  $\text{H}_2\text{O}_2$  produced from the active enzymatic reaction of acetylcholinesterase (AChE) and choline oxidase (CHOX), which results in the fluorescence (FL) “turn-off” of the GSH-capped CdTe QDs. A “turn-on” FL of the CdTe QDs at 520 nm was recovered in the presence of organophosphate (OP). The FL changes of the GSH-capped CdTe QD/AChE/CHOX biosensor reasonably correspond to the amount of OP pesticides. The detection limit of the CdTe/AChE/CHOX biosensor towards paraoxon, dichlorvos, malathion and triazophos was  $1.62 \times 10^{-15}$  M,  $75.3 \times 10^{-15}$  M,  $0.23 \times 10^{-9}$  M and  $10.6 \times 10^{-12}$  M, respectively. The GSH-capped CdTe QDs/AChE/CHOX biosensor was applied as a FL nanoprobe for assaying the enzymatic activity of AChE. The inhibited AChE was reactivated up to 94% using pyridine oximate ( $2\text{-PyOx}^-$ ), and functionalized pyridinium oximates ( $4\text{-C}_{12}\text{PyOx}^-$  and  $4\text{-C}_{18}\text{PyOx}^-$ ) of varying chain lengths. It was found that the reactivation potency of the tested oximes varied with the chain length of the oximes. This biosensing system offers the promising benefit for the determination of the OP pesticides in food, water and environmental samples.

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## Introduction

In the current scenario, the determination of acetylcholinesterase (AChE) activity is of paramount importance due to pharmacological and toxicological concerns.<sup>1</sup> AChE is the major enzyme that hydrolyzes acetylcholine, a key neurotransmitter for synaptic transmission, into acetic acid and choline. Mild inhibition has been shown to have therapeutic relevance in Alzheimer's disease (AD), myasthenia gravis, and glaucoma among others.<sup>2,3</sup> In contrast, the strong inhibition of AChE can lead to cholinergic poisoning.<sup>4</sup> To combat this, AChE reactivators have been developed to remove the offending AChE inhibitors, restoring acetylcholine levels to normal.<sup>5,6</sup> It is really challenging to design a nanoprobe for monitoring AChE activity in the presence of reversible (carbamate, acridine) and irreversible (organophosphorus) inhibitors. The probe reported thus far can determine the inhibition<sup>7</sup> of AChE, and is limited to

monitoring percentage reactivation of organophosphorus-inhibited enzyme.

With high sensitivity and simplification, fluorescence-based sensors have been widely applied as one of the most commonly used sensing candidates for environmental monitoring,<sup>8</sup> food safety<sup>9</sup> and quality control.<sup>10</sup> Quite recently, many optical<sup>11–13</sup> and electrochemical<sup>14–16</sup> methods/biosensors have been applied to determine pesticide residues in food samples. Various kinds of materials have been widely employed for the fabrication of a fluorescence (FL) sensing platform, including fluorescent dyes,<sup>17</sup> semiconductor nanomaterials,<sup>18</sup> metal nanomaterials,<sup>19,20</sup> carbon quantum dots (CQD),<sup>21</sup> and rare earth materials.<sup>22</sup> It is also very critical to design a proper recognition unit that can be combined with the FL probe for responding to the fluorescent “turn-off”, “turn-on”, or “ratiometric” signal. Carbon quantum dots have been extensively investigated for probing AChE and the detection of organophosphorus (OP) pesticides.<sup>23–25</sup> We have developed a FRET-based CQD–AuNP system for the detection of pesticides, along with monitoring the inhibition and reactivation of AChE.<sup>26</sup>

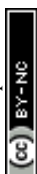
Biosensors based on CdTe QDs have been developed due to their unique electronic and optical properties, such as their broad absorption spectra, narrow and symmetric emission bands, less environmental sensitivity, and high quantum yield.<sup>27–32</sup> These advantages of the CdTe QDs in the narrow emission band have enabled the sensitive detection of trace

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† Electronic supplementary information (ESI) available: Data relating to the optical properties, fluorescence lifetimes, and reactivation of AChE are available. See DOI: 10.1039/d0ra03055d





# Interaction of Folic Acid with $\text{Mn}^{2+}$ Doped CdTe/ZnS Quantum Dots: In Situ Detection of Folic Acid

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To utilize the nanomaterials as an effective carrier for the drug delivery applications, it is important to study the interaction between nanomaterials and drug or biomolecules. In this study GSH functionalized  $\text{Mn}^{2+}$ -doped CdTe/ZnS QDs has been utilized as a model nanomaterial due to its high luminescence property. Folic acid (FA) gradually quenches the FL of GSH functionalized  $\text{Mn}^{2+}$ -doped CdTe/ZnS QDs. The Stern-Volmer quenching constant ( $K_{sv}$ ), binding constant ( $K_s$ ) and effective quenching constant ( $K_a$ ) for the FA-QDs system is calculated to be  $1.32 \times 10^5 \text{ M}^{-1}$ ,  $1.92 \times 10^5$  and  $0.27 \times 10^5 \text{ M}^{-1}$ , respectively under optimized condition (Temp. 300 K, pH 8.0, incubation time 40 min.). The effects of temperature, pH, and incubation time on FA-QDs system have also been studied. Statistical analysis of the quenched FL intensity versus FA concentration revealed a linear range from  $1 \times 10^{-7}$  to  $5.0 \times 10^{-5}$  for FA detection. The LOD of the current nano-sensor for FA was calculated to be  $0.2 \mu\text{M}$ . The effect of common interfering metal ions and other relevant biomolecules on the detection of FA ( $12.0 \mu\text{M}$ ) have also been investigated. L-cysteine and glutathione displayed moderate effect on FA detection. Similarly, the common metal ions ( $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$ ) produced minute interference while  $\text{Zn}^{2+}$ ,  $\text{Cu}^{2+}$  and  $\text{Fe}^{3+}$  exert moderate interference. Toxic metal ions ( $\text{Hg}^{2+}$  and  $\text{Pb}^{2+}$ ) produced severe interferences in FA detection.

**Keywords**  $\text{Mn}^{2+}$ -doped CdTe/ZnS QDs · Detection of folic acid · LOD · Fluorescence quenching

## Introduction

Folic acid (FA) is an essential biomolecule comprised of a pterin heterocycle, a *p*-aminobenzoyl moiety, and of L-glutamic acid. FA, also known as folate, folacin, or vitamin B9, can advance the red platelets and is recognized as an anti-anemia element [1]. Due to essential role of folate in DNA biosynthesis, requirements for this vitamin rises significantly during rapid cell growth of the embryo [2]. In vivo, FA is reduced on the pterin ring at 5, 6, 7 and 8th positions by dihydrofolate reductase to produce biologically active

tetrahydrofolate (THF) [3]. THF and its subordinates are co-factors in single carbon exchange reaction and are required in the biosynthesis of purines, thymidylate, and various amino acids [4, 5]. Human unable to produce folate denovo and depend completely on their diet to avail this vitamin [6]. Folate nutritional status is reliant on intake with food and supplements, and on the bioavailability of the different ingested forms [7]. Since FA is crucial for the proper functioning of various physiological processes in humans, it is vital to design simple, selective and sensitive techniques to detect folic acid in biological system.

During the previous decades, semiconductor nanocrystals (quantum dots, QDs) have gained incredible interest because of their exceptional optical and electronic properties, originating from their substantial surface-to volume ratio and confinement effect, and have demonstrated to be promising in various applications including biological markers [8–14], light-emitting diodes [15, 16] or solar cells [17]. One essential subgroup of QDs are those doped with a small extent of dopants to change their optical, electronic and magnetic properties for different desired applications [18–20]. These doped QDs

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## Research article

Carbon dot induces tolerance to arsenic by regulating arsenic uptake, reactive oxygen species detoxification and defense-related gene expression in *Cicer arietinum* LVibhuti Chandrakar<sup>a</sup>, Bhumika Yadu<sup>a</sup>, Jyoti Korram<sup>b</sup>, Manmohan L. Satnam<sup>b</sup>, Amit Dubey<sup>c</sup>, Meetul Kumar<sup>d</sup>, S. Keshavkant<sup>a,e,\*</sup><sup>a</sup> School of Studies in Biotechnology, Pt. Ravishankar Shukla University, Raipur, 492 010, India<sup>b</sup> School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur, 492 010, India<sup>c</sup> Central Laboratory Facility, Chhattisgarh Council of Science and Technology, Raipur, 492 010, India<sup>d</sup> Directorate of International Cooperation, Defence Research and Development Organization, New Delhi, 110 001, India<sup>e</sup> National Center for Natural Resources, Pt. Ravishankar Shukla University, Raipur, 492 010, India

## ARTICLE INFO

## Keywords:

Arsenic  
Carbon dot  
*Cicer arietinum* L.  
Gene expression  
Nanomaterials  
Oxidative damage  
Reactive oxygen species

## ABSTRACT

The scientific and technological applications of one of the nanomaterials viz.; carbon dot (C-dots), having extraordinary properties, is becoming an emerging and ongoing research area in recent times. In the present study, we have evaluated the effectiveness of C-dots in reducing arsenic (As) toxicity by analyzing physiological, biochemical and molecular parameters in *Cicer arietinum* L. The results revealed that As decreased the germination rate, growth, biomass, and membrane stability of the cell to a significant extent. Further, As was taken up by the growing seeds which eventually caused cell death. Levels of reactive oxygen species (ROS), stress markers (malondialdehyde), activities of defensive enzymes (glutathione-S-transferase and pyrroline-5-carboxylate synthetase) and non-enzymatic antioxidant contents (proline and glutathione) were increased under As stress. Moreover, As treatment resulted in the up-regulation of expressions of NADPH oxidase and defense-related genes in *Cicer arietinum* L. However, application of C-dots along with As improved the germination and growth of *Cicer arietinum* L. Exogenous application of C-dots, enhanced the expressions of defense-related genes and, contents of proline and glutathione, thereby causing considerable reductions in ROS, and malondialdehyde levels. Overall, this study suggests the possible involvement of C-dots in lowering the toxic effects of As on biomass by reducing As uptake and, inducing the activities/gene expressions and contents of enzymatic and non-enzymatic antioxidants.

## Author contribution

Vibhuti Chandrakar, Bhumika Yadu, Jyoti Korram, Manmohan L. Satnam, Amit Dubey, Meetul Kumar, S. Keshavkant.

## 1. Introduction

Arsenic (As) is a non-essential metalloid, which instigates many toxic effects in the living systems (Kidwai et al., 2019). The plant roots absorb As predominantly in its inorganic forms: arsenate (As<sup>V</sup>) and arsenite (As<sup>III</sup>). As<sup>III</sup> is considered to be more toxic to plants, since it permeates the membrane and reacts with the sulfhydryl groups of plant proteins

and enzymes, disconcerting energy flow, causing leaking of electrolytes and generating reactive oxygen species (ROS) (Singh et al., 2015). A membrane localized enzyme NADPH oxidase (NOX) is also responsible for the production of ROS in plant cells (Reddy et al., 2015). These ROS oxidize/damage most major cellular bio-polymers such as lipid, protein, etc., resulting in the dysfunction, and sometimes death of the cells. A product of lipid peroxidation reaction; malondialdehyde (MDA) leads to disintegration of cellular organelles, oxidation and dysfunction of proteins and nucleic acids (Singh et al., 2015).

To counter the As stress, plants detoxify this metalloid by promptly converting it into As<sup>III</sup>, in the cytosol, by arsenate reductase. This As<sup>III</sup> is then expelled outside of the cell or sequestered into the vacuoles

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## Research article



# Carbon dot induces tolerance to arsenic by regulating arsenic uptake, reactive oxygen species detoxification and defense-related gene expression in *Cicer arietinum* L

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# Amelioration of Ageing Associated Alterations and Oxidative Inequity in Seeds of *Cicer arietinum* by Silver Nanoparticles

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## Abstract

Metal-based nanoparticles (NPs) have recently been accomplished a great attention worldwide, in various sectors including agriculture due to their beneficial impacts in plant growth, development and stress tolerance. However, it shows dose-dependent response and may vary with type of metal and synthesis procedure followed. Among many, silver nanoparticles (AgNPs) are most frequently used NP in agricultural sector. In the present study, AgNPs were synthesized following both green (gAgNP) and chemical (cAgNP) synthesis processes, characterized by standard methods and were applied to artificially aged *Cicer arietinum* seeds. Initial characterization of synthesized NPs was done by UV–Visible spectroscopy, and concentrations were calculated as 2.7 nmol for gAgNP, while, 5.8 nmol for cAgNP. Furthermore, the presence of different functional groups in synthesized AgNPs was evaluated by fourier transform infrared spectroscopy (1000 and 4000 cm<sup>-1</sup>). However, the particle size of synthesized AgNPs was estimated by dynamic light scattering/ zetasizer (90–120 nm) and transmission electron microscopy (15–60 nm). Synthesized NPs were then assessed for their ameliorative efficiencies against accelerated ageing-induced injuries in *Cicer arietinum* seeds. Experimental results revealed various physiological and biochemical alterations due to accelerated ageing in seeds of *Cicer arietinum* including the over accumulation of reactive oxygen species and consequent decline in the expressions/ activities of key defensive genes. However, exogenous application of AgNPs provided tolerance against ageing-induced damages by compensating the cellular redox homeostasis via up-regulating the levels/ gene expression of antioxidants in *Cicer arietinum*.

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# Amelioration of Ageing Associated Alterations and Oxidative Inequity in Seeds of *Cicer arietinum* by Silver Nanoparticles

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## Abstract

Metal-based nanoparticles (NPs) have recently been accomplished a great attention worldwide, in various sectors including agriculture due to their beneficial impacts in plant growth, development and stress tolerance. However, it shows dose-dependent response and may vary with type of metal and synthesis procedure followed. Among many, silver nanoparticles (AgNPs) are most frequently used NP in agricultural sector. In the present study, AgNPs were synthesized following both green (gAgNP) and chemical (cAgNP) synthesis processes, characterized by standard methods and were applied to artificially aged *Cicer arietinum* seeds. Initial characterization of synthesized NPs was done by UV–Visible spectroscopy, and concentrations were calculated as 2.7 nmol for gAgNP, while, 5.8 nmol for cAgNP. Furthermore, the presence of different functional groups in synthesized AgNPs was evaluated by fourier transform infrared spectroscopy (1000 and 4000 cm<sup>-1</sup>). However, the particle size of synthesized AgNPs was estimated by dynamic light scattering/ zetasizer (90–120 nm) and transmission electron microscopy (15–60 nm). Synthesized NPs were then assessed for their ameliorative efficiencies against accelerated ageing-induced injuries in *Cicer arietinum* seeds. Experimental results revealed various physiological and biochemical alterations due to accelerated ageing in seeds of *Cicer arietinum* including the over accumulation of reactive oxygen species and consequent decline in the expressions/ activities of key defensive genes. However, exogenous application of AgNPs provided tolerance against ageing-induced damages by compensating the cellular redox homeostasis via up-regulating the levels/ gene expression of antioxidants in *Cicer arietinum*.

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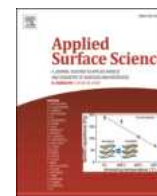
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Full Length Article

# Architecture of NaFe(MoO<sub>4</sub>)<sub>2</sub> as a novel anode material for rechargeable lithium and sodium ion batteries

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## ABSTRACT

In recent decades, particular focus has been given to enhance the capacity of LIBs and SIBs either by developing new materials or by modifying existing materials. Hence, we have demonstrated a new anode material i.e. sodium iron molybdate [NaFe(MoO<sub>4</sub>)<sub>2</sub>] for both LIBs and SIBs. NaFe(MoO<sub>4</sub>)<sub>2</sub> has been successfully synthesized by solid-state combustion technique and tested as a promising new anode material for both LIBs and SIBs. A detailed analysis of the crystal structure has been performed using DFT calculations. NaFe(MoO<sub>4</sub>)<sub>2</sub> crystallizes in the monoclinic phase with the space group C2/c (#15). FESEM also shows highly crystalline monoclinic shaped crystals of micron size. When evaluated as an anode material for LIBs, NaFe(MoO<sub>4</sub>)<sub>2</sub> electrode exhibited electrochemical capacity of 920 mAhg<sup>-1</sup> in the second cycle at the current density of 50 mA g<sup>-1</sup>. Though capacity decreases on further cycling, the coulombic efficiency was maintained at 99% for 50 cycles. Significantly, a high discharge capacity of 100 mAhg<sup>-1</sup> was maintained at a very high rate of 1 Ag<sup>-1</sup>. On the other hand, we have also tested NaFe(MoO<sub>4</sub>)<sub>2</sub> for SIBs which shows excellent reversible specific capacity i.e. 100 mAhg<sup>-1</sup> at the current density of 100 mA g<sup>-1</sup> even after 500 cycles. This novel system has shown good stability for LIBs and SIBs which is hitherto unattempted.

## 1. Introduction

Considering the anticipated future energy demands and environmental impacts, it is imperative to search for efficient, renewable, and sustainable solutions to circumvent these challenges. Attempts to develop low cost, environmentally friendly energy storage systems with high energy capacity is a topic of relentless research for the past two decades [1–3]. Amidst various promising energy storage systems, lithium-ion batteries (LIBs) stands out as a good contender for green energy storage owing to its advanced energy storage, long lifespan, and environmental friendliness [4–6]. However, natural lithium sources are very limited to compete with the rapidly developing electronics market demands. Notably, lithium and sodium have similar electrochemical properties. Hence, alternatively, Sodium-ion batteries (SIBs) attracted

huge interest, thanks to their low cost and the natural availability of sodium in the earth crust. In commercial LIBs, conventional graphite has been used as anode material since it has the advantages of relatively low cost, high energy and power density as well as very long cycle life. Unfortunately, graphite has some limitations in charge performance and operational safety, and that remain as a concern for their use in next-generation batteries [7]. Hence, developing alternative anode materials with high energy density and prolonged cyclic stability are very crucial. Even though, a lot of improvements have been made in embryonic new anode materials for LIBs, severe capacity fading, lower practical specific capacity, and high cost of these materials impede the improvement of LIBs. In this context, new generation metal oxides are considered to be potential candidates in terms of their higher energy density, rate capability as well as long term cyclic stability over graphite

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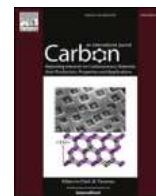
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## Research Article

## Laser patterning of boron carbon nitride electrodes for flexible micro-supercapacitor with remarkable electrochemical stability/capacity

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## ABSTRACT

High performance, all solid-state planar micro-supercapacitor (MSC) with interdigitated Boron carbon Nitride (BCN) electrodes are fabricated via fast, scalable laser patterning technique. Heteroatom doping desirably enhances the electrochemical activity of carbon electrodes. This BCN based micro-supercapacitor showed comparatively very high specific capacitance of  $72 \text{ mFcm}^{-2}$  at a current density of  $0.15 \text{ mAcm}^{-2}$ . Even at a high current density of  $1 \text{ mAcm}^{-2}$  device showed specific capacitance as high as  $17 \text{ mFcm}^{-2}$ . It has demonstrated excellent electrochemical stability when tested up to 80000 cycles without any sign of further decay in capacity/efficiency. This device showed stable capacity even after bending at  $150^\circ$  angle, for 1500 times during cycling showing remarkable flexibility.

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## 1. Introduction

Several technologies demand miniaturized and wearable electronic devices and consistent progress is observed in the development of flexible microelectronics. Consequently smaller, portable energy storage units are required to power microelectronic systems like self-powered medical implants, sensors etc [1]. In that context; lightweight, flexible, portable energy storage or conversion devices such as batteries, fuel cells and supercapacitors are seem to be essential for continuous technological advancement [2]. Commercialization of microbatteries/thin-film batteries is already realized and expanding its market rapidly [3]. However, batteries cannot deliver power quickly as required for some devices and their lifetime is comparatively shorter. Alternatively, supercapacitors (SCs) can be charged and discharged within seconds. SCs are quite stable for several years, undergo millions of charging-discharging cycles without losing specific capacity substantially [4]. Therefore,

development of flexible, wearable, stretchable, transparent MSC devices has seen rapid progress [5–8]. They can be either carbon based EDLC (Electrochemical double-layer capacitance) type; reversible redox reaction based pseudocapacitance type or a hybrid of both mechanisms.

Typically, an EDLC electrode is made up of large surface area carbons like activated carbon, graphene, carbon nanotubes and porous carbon etc. and charge is stored by adsorption/desorption of electrolyte ions on the surface of electrode material without faradaic charge transfer. Though they can be charged and discharged very fast displaying high power density and extraordinary stability; they have comparatively lower energy density. Metal oxides ( $\text{RuO}_2$ ,  $\text{MnO}_2$ ,  $\text{Co}_3\text{O}_4$ ,  $\text{NiO}$  etc.) and conducting polymers (polyaniline, polypyrrole, polythiophene etc.) are typical pseudocapacitive electrode materials that store charges by fast and reversible redox reactions on its surface [9]. Compared to EDLC carbons, pseudocapacitive materials have higher energy densities but are limited by intrinsic structural instability and subsequent poor cycle life [10–12]. Additionally, low electrical conductivity and structural rigidity make them less desirable for flexible devices. Therefore, hybrid electrodes are being explored in flexible MSCs to achieve both; mechanical stability and higher energy density. Another effective way to increase energy density of carbons itself is to dope

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## Security Threats in Perception and Network Layer of Internet of Things (IoT): A Review (AbstractView.aspx?PID=2020-10-2-5) (https://scholar.google.co.in/scholar?q=Security Threats in Perception and Network Layer of Internet of Things (IoT): A Review)

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# Hybrid Firefly Optimization with Double Q-learning for Energy Enhancement in Cognitive Radio Networks

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## Abstract

The key feature of IoT is connecting various objects together through the internet. IoT is a wide network which interconnects various devices and sensors and helps to carry out wireless communication in cost effective way. Connecting several objects of heterogeneous nature is a major challenge in IoT paradigm which are addressed by cognitive radio networks by meeting the connectivity demands with improved spectrum efficiency. Energy efficiency is prime factor which needs to be considered in CR networks. Battery powered IoT devices which are deployed in remote areas suffer with limited network lifetime. One way of enhancing the energy is by employing data aggregation and clustering which is implemented using Double Q-learning algorithm and a bioinspired heuristic Firefly Optimization (FO) is used for optimal spectrum allocation with less energy consumption and increased network capacity. Major IoT models adopts usage of data clustering and energy deprived model to address the problem of maximum energy consumption. Thus, by combining Firefly optimization with Double Q-learning efficient energy utilization is ensured. The simulation is performed to show the throughput, lifetime and network traffic which is compared with ant colony optimization and proves to be better energy efficient.

**Keywords:** Energy Efficiency Optimization, Firefly Optimization Algorithm, Wireless Communication, Cognitive Radio Networks.

## 1. INTRODUCTION

In wireless communications cognitive radio networks provides an effective solution to reduce spectrum insufficiency in wireless communication with its efficient channel selection. In current scenario demand for accessing radio spectrum is increasing with various new wireless networks. To improve the quality of service cognitive radio network identifies communication nodes and modifies the parameters of communication schemes. Cognitive networks have emerged as a solution for the for identifying and usage of licensed spectrum that falls underutilization category. A cognitive radio network consists of Primary Users (PU) and Secondary Users (SU). At present energy efficiency is considered as the major issue in

various wireless networks. Traditionally sensor nodes are powered by batteries which are not cost-effective also network lifetime is less. Secondary users can utilize the free channels or vacant spectrum with incorporation of different technologies without interfering the licensed primary users. CR networks can adapt to statistically varied input and utilize vacant channel efficiently by consuming less energy. Green communication is becoming a trend; in wireless systems energy efficiency is becoming an important factor. In this work Hybrid Firefly Optimization (HFO) is combined with Q-learning is employed for achieving optimal energy consumption, throughput and increased network lifetime, minimized network jamming. Firefly algorithm offers utilization of network capacity to the maximum by allocating contention free channels to the secondary users. In cognitive radio networks data aggregation is a best way for enhancing energy modeling. By increasing the network lifetime and adopting green communication network performance can also be increased [1]. Spectrum allocation problem is solved using firefly algorithm by optimizing the fitness function thereby improving the network capacity. The aim objective of cognitive radio is to maximize the spectrum utilization by adopting dynamic spectrum allocation algorithm [2]. To eliminate the interference between the spectrum users, current policies allocate fixed spectrum slice to each wireless application. Due to the fixed licensing policy only 6% of spectrum is utilized temporally and spatially [3] Firefly algorithm is utilized to reduce energy consumption by maximizing the utilization of communication channels and data aggregation is performed by employing double Q-learning. Clustering is used to deal with huge number of nodes in the network. Based on the operational parameters and geographical assumptions nodes are grouped. Firefly algorithm is adopted in this paper for maximizing the channel utilization with less energy and is compared with ant colony optimization.

The further sections of the paper is structured as follows. Section 2 describes the previous research about energy conservation in CR networks. Section 3 describes the problem statement. Section 4 describes the proposed firefly with Q-Learning for IoT for achieving maximum residual energy. Section 5 Performance evaluation of the proposed method and section 6 is the conclusion with cited references.

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## ANALYSIS ON AGRICULTURAL CREDIT FOR THE STATE OF CHHATTISGARH

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**ABSTRACT:** Chhattisgarh state is basically known as “Dhan Ka Katora” (Rice Bowl). The State has witnessed tremendous growth in the cooperative sector. Cooperative Agriculture and Rural Development Banks have plays a vital role in the socio-economic development of the State, particularly in the rural areas and in agriculture and allied sectors and always recognized as an integral part of state economy with its network. The Primary Cooperative Agriculture and Rural Development Banks (PCARDBs) have more reached to the rural area of Chhattisgarh state, through their huge network. They operate under a two-tier system known as (a) Chhattisgarh State Cooperative Agriculture and Rural Development Bank (CSCARDB) at the state level, and (b) Primary Cooperative Agriculture and Rural Development Bank (PCARDB) at the block level numbering 77 cater to the long term credit needs. This paper attempts to analyze the overall performance of CSCARD Bank in agricultural credit. The methodology adopted for this study is mainly through compilation of theoretical inputs, tallying them with practical, observed data and logically building a case for overall systemic reforms. An exploratory research design is followed in the present study.

**Keywords:** agricultural credit, chattisgarh, Rural Development Bank

### 1.INTRODUCTION

Credit is one of the critical inputs in agriculture and an effective means of rural development in India. The institutional credit delivery system for agriculture was started in the country with the setting up of co-operative credit societies in 1904, but the coverage of these societies towards meeting the credit requirement of farmers was limited. Therefore, the farming community had to depend on informal money-lending sources for its entire credit requirement.

The recommendations of All India Rural Credit Survey Committee in fact laid the foundations of institutional mechanism for establishing a sound credit delivery system in the country for financing agriculture and allied activities.

One of the objectives of the credit policy is to minimize the role of money lenders in the flow of agricultural credit.

### 1.1 Financing Agricultural Investments in the Eastern Region:

In order to support the banking system finance such key investments, NABARD has introduced a concessional refinance scheme in the year 2011-12, with an objective to accelerate investments in agriculture to enhance production and productivity of crops in the Eastern region (Assam, Bihar, Jharkhand, Chhattisgarh, Odisha, West Bengal and Eastern Uttar Pradesh) by incentivizing the banks.

Under the scheme, NABARD provides 100% refinance to banks at a concessional rate of 7.5% p.a. Provided certain minimum targets are achieved by the bank in financing these key investments. The operative period of scheme is for financial years, 2011-12 and 2012-13. Four activities viz, Water Resources development, Land development, Farm Equipment's (including tractor financing on group mode basis) and Seed Production are covered. Concessional refinance is provided subject to condition of minimum 70% lending against credit potential for the identified activities assessed



## ANALYSIS ON AGRICULTURAL CREDIT FOR THE STATE OF CHHATTISGARH

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Under the scheme, NABARD provides 100% refinance to banks at a concessional rate of 7.5% p.a. Provided certain minimum targets are achieved by the bank in financing these key investments. The operative period of scheme is for financial years, 2011-12 and 2012-13. Four activities viz, Water Resources development, Land development, Farm Equipment's (including tractor financing on group mode basis) and Seed Production are covered. Concessional refinance is provided subject to condition of minimum 70% lending against credit potential for the identified activities assessed



## छत्तीसगढ़ राज्य के रायपुरशहर की मलिन बस्तियों में ऊर्जा खपत

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### सारांश:

सतत विकास लक्ष्य को प्राप्त करने के लिए संयुक्त राष्ट्रसंघ द्वारा 25 सितम्बर 2015 को 193 सदस्य देशों द्वारा 2030 तक 17 लक्ष्य निर्धारित किए गए हैं उसमें से 7वें कम पर सुलभ एवं स्वच्छ ऊर्जा है। सभी के लिए सस्ती विश्वसनीय टिकाऊ और आधुनिक ऊर्जा तक पहुंच सुनिश्चित करना तथा विश्व की बढ़ती हुई जनसंख्या की ऊर्जा की आवश्यकताओं को पूरा करना एक बहुत बड़ा चुनौतीपूर्ण कार्य है। स्वच्छ ऊर्जा की पहुंच सुनिश्चित करने के लिए सौर ऊर्जा पवन ऊर्जा जैसे नवीनीकरण स्रोतों पर निर्भरता को बढ़ावा देना होगा। प्रस्तुत अध्ययन रायपुर शहर के 09 मलिन बस्तियों के 90 परिवारों के सर्वेक्षण से प्राप्त प्राथमिक समकों पर आधारित है। प्रस्तुत अध्ययन में 20 परिवारों का पायलेट सर्वे किया गया तत्पश्चात अनुसूची में आवश्यक सुधार कर 70 परिवारों से जानकारी एकत्र की गई। इस तरह कुल 90 परिवारों से जानकारी एकत्र की गई। अध्ययन से ज्ञात हुआ है कि 100 प्रतिशत परिवार प्रकाश के लिए बिजली का उपयोग करते हैं। इसके अलावा मिटटी तेल का उपयोग किया जाता है। बिजली का उपयोग परिवारों के द्वारा मुख्य रूप से प्रकाश के अतिरिक्त टेलीविजन, पंखा तथा कूलर के लिए किया जाता है। साथ ही रसोई ईंधन के लिए ऊर्जा के विभिन्न स्रोतों का उपयोग परिवारों द्वारा किया जाता है। प्रस्तुत अध्ययन से यह स्पष्ट है कि सर्वाधिक 100 प्रतिशत लोग रसोई ईंधन के लिए एल पी जी गैस का उपभोग करते हैं। इसके अतिरिक्त बिजली, कोयला एवं लकड़ी का भी उपभोग करते हैं।

**शब्द कुंजी** —सतत विकास लक्ष्य, छत्तीसगढ़, रायपुर, मलिन बस्ति, ऊर्जा खपत।



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**शब्द कुंजी** —सतत् विकास लक्ष्य, छत्तीसगढ़, रायपुर, मलिन बस्ति, ऊर्जा खपत।

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Authors Krishnan Pragati and Brahme Ravindra Sethi Archana

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## Classification of working memory loads using hybrid EEG and fNIRS in machine learning paradigm

S. Mandal , B.K. Singh, K. Thakur

First published: 09 November 2020

<https://doi.org/10.1049/el.2020.2710>

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### Abstract

Single modality brain–computer interface (BCI) systems often mislabel the electroencephalography (EEG) signs as a command, even though the participant is not executing some task. In this Letter, the classification of different working memory load levels is presented using a hybrid BCI system. N-back cognitive tasks such as 0-back, 2-back, and 3-back are used to create working memory load on participants while recording EEG and functional near-infrared spectroscopy (fNIRS) signals simultaneously. A combination of statistically significant features obtained from EEG and fNIRS corresponding to frontal region channels are used to classify different N-back commands. Kernel-based support vector machine (SVM) classifiers are employed with and without cross-validation schemes. Classification accuracy of 100% is achieved for binary classification of 0-back against 2-back and 0-back against 3-back using linear SVM, quadratic SVM, and cubic SVM under holdout data division protocol.

### Introduction

The cognitive workload is a measurable quantity of mental exertion needed to execute a task. Most of the existing techniques to measure the working memory load include those based on electroencephalography (EEG), functional MRI, functional near-infrared spectroscopy (fNIRS),

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# Perovskite Solar Cells an Efficient, Low Cost, Emerging Photovoltaic Technology (AbstractView.aspx?PID=2020-33-1-10)

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Keywords: Sol-gel ZnO () XRD () SEM () AFM () Organic Solar Cells () OSCs. ()



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Journal of Ravishankar University–B, 33 (1), 24-30 (2020)

## Preparation, Fabrication and Characterization of Sol-Gel ZnO Thin Films for Organic Solar Cells

Anil Kumar Verma<sup>a\*</sup>, Swati Sahu<sup>a</sup>, Mohan Patel<sup>b</sup> and Sanjay Tiwari<sup>a</sup>

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**Abstract:** In this work, ZnO has been prepared by the sol-gel method and thin films have been deposited onto the ITO (Indium-Tin-Oxide) coated glass substrates by spin coating method at different ZnO concentration and spin parameters. For this, Sol-gel ZnO was synthesized by Zinc acetate dehydrate, 2-methoxyethanol and ethanolamine as a starting material, solvent and stabilizer respectively. The study of deposition parameters on the structural, optical and electrical properties of the ZnO thin films was carried out. The Roughness and thickness were calculated by Profilometer. X-ray diffraction (XRD) analysis of the films showed the polycrystalline nature of the prepared films. Scanning Electron Microscopy (SEM) and Atomic Force Microscopy (AFM) was used to describe the surface morphology and optical properties were studied using UV-VIS-IR Spectroscopy. The fabricated results showed that ZnO thin films is crystalline and low-cost techniques with good features that will be useful for Organic Solar Cells (OSCs) device as an electron transport layer.

**Keywords:** Sol-gel ZnO, XRD, SEM, AFM, Organic Solar Cells, OSCs.

### Introduction

For deposition of materials, the sol-gel process is a technology for producing solid materials from small molecules. The technique is very useful for the fabrication of various metal oxides layers. The process involves conversion of monomers into a colloidal solution (sol) that acts as the precursor for an integrated network (or gel) of either discrete particles. Zinc oxide (ZnO) is an inexpensive, inorganic semiconductor with a wide band gap having optical transparency in the visible range. It crystallizes in a hexagonal

Article [Full-text available](#)Effect of ZnO ETL and MoO<sub>3</sub> HTL with PCDTBT:PC70BM-based BHJ organic solar cells

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DOI: [10.1680/jnaen.18.00021](https://doi.org/10.1680/jnaen.18.00021) Anil Kumar Verma ·  Naman Shukla ·  **Sanjay Tiwari**Citations 3Reads 263[Download full-text](#)[Export citation](#)[Overview](#) [Citations \(3\)](#) [References \(47\)](#)

## Abstract

In this work, the authors fabricated and characterized efficient inverted organic solar cells by modifying them with a highly transparent sol-gel-derived zinc oxide (ZnO) film as an electron transport layer and optimized molybdenum trioxide (MoO<sub>3</sub>) as a hole transport layer with a very low-bandgap polymer, poly[N-900-hepta-decanyl-2,7-carbazole-alt-5,5-(40,70-di-2-thienyl-20,10,30-benzothiadiazole)] (PCDTBT), in bulk heterojunction (BHJ) composites with the fullerene derivative [6,6]-phenyl-C70-butyric acid methyl ester (PC70BM) BHJ in various solvents. Variations in the sol concentration, thickness, surface and optical characteristics of inverted organic solar cell glass/indium tin oxide/zinc oxide/PCDTBT:PC70BM/molybdenum trioxide/silver (Ag) structures were investigated and analyzed. The thickness of zinc oxide increased as the sol concentration increased from 10 to 100 nm. With the modification of the PCDTBT:PC70BM solvent, the device efficiency improved from 4.22 to 7.43%, which was accompanied by an improvement in the open-circuit voltage ( $V_{oc}$ ) from 0.87 to 1.03 V and enhancement of the short-circuit current density ( $J_{sc}$ ) from 9.1 to 13.5 mA/cm<sup>2</sup>.

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**Keywords:** characterisation/fabrication/  
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## Nanomaterials and Energy

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# Effect of ZnO ETL and MoO<sub>3</sub> HTL with PCDTBT:PC<sub>70</sub>BM-based BHJ organic solar cells

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In this work, the authors fabricated and characterized efficient inverted organic solar cells by modifying them with a highly transparent sol-gel-derived zinc oxide (ZnO) film as an electron transport layer and optimized molybdenum trioxide (MoO<sub>3</sub>) as a hole transport layer with a very low-bandgap polymer, poly[*N*-900-hepta-decanyl-2,7-carbazole-*alt*-5,5-(40,70-di-2-thienyl-20,10,30-benzothiadiazole)] (PCDTBT), in bulk heterojunction (BHJ) composites with the fullerene derivative [6,6]-phenyl-C<sub>70</sub>-butyric acid methyl ester (PC<sub>70</sub>BM) BHJ in various solvents. Variations in the sol concentration, thickness, surface and optical characteristics of inverted organic solar cell glass/indium tin oxide/zinc oxide/PCDTBT:PC<sub>70</sub>BM/molybdenum trioxide/silver (Ag) structures were investigated and analyzed. The thickness of zinc oxide increased as the sol concentration increased from 10 to 100 nm. With the modification of the PCDTBT:PC<sub>70</sub>BM solvent, the device efficiency improved from 4.22 to 7.43%, which was accompanied by an improvement in the open-circuit voltage ( $V_{oc}$ ) from 0.87 to 1.03 V and enhancement of the short-circuit current density ( $J_{sc}$ ) from 9.1 to 13.5 mA/cm<sup>2</sup>.

## Notation

$J_{sc}$	short-circuit current density
$R_s$	series resistance
$R_{sh}$	shunt resistance
$V_{oc}$	open-circuit voltage
$\eta$	efficiency

## 1. Introduction

Organic solar cells (OSCs) or polymer solar cells have potential as a competitive photovoltaic (PV) technology for large-area, flexible, durable and very low-cost power generation applications.<sup>1,2</sup> A very attractive feature of organic PVs is the possibility of realizing semitransparent cells. Owing to the pronounced absorption features of various absorber molecules used in OSCs, devices can be designed to transmit light within a specific spectral range. Meanwhile, colored see-through PV elements (e.g. windows) can be made possible. In combination with semitransparent organic light-emitting diodes (LEDs),<sup>3</sup> the emerging applications come within reach of industry and the market. As opposed to standard OSCs used for the preparation of semitransparent organic devices, one of the key issues is related to the transparent top electrode. There are various methods to deposit thin films for transparent electrodes on thermally evaporated thin metal films or a multilayer of thin metal films and sputtered indium tin oxide (ITO) layers.<sup>4–6</sup>

Research studies on inverted device structures with a reversed charge-collecting nature at the electrodes have also been a new engineering idea for the development of highly efficient and stable OSCs resulting from the placement of poly(3,4-ethylenedioxythiophene) (PEDOT):polystyrene sulfonate (PSS) and low-work-function metal electrodes.<sup>7–13</sup> The general inverted

configuration includes an electron transport layer (ETL) inducing effective electron collection at the ITO anode and a hole transport layer (HTL) leading to efficient hole collection at the top cathode.

The advance of bulk heterojunction (BHJ) OSCs promises to show better improvement.<sup>14–20</sup> Power conversion efficiencies (PCEs) of up to 8% have been already reported.<sup>21–26</sup> However, for global commercialization, further improvements in PCE and stability are needed. A BHJ OSC generally consists of a transparent anode contact (typically ITO), a BHJ active layer (a blended mixture of donor polymer and fullerene molecule acceptor) and a cathode (e.g. aluminum (Al) or silver (Ag)). ETLs/HTLs are used as charge-selective contacts between the BHJ active layer and the electrodes.<sup>27,28</sup> Many experiments have shown that the lifetime of BHJ solar cells can be increased by introducing an HTL such as titanium dioxide (TiO<sub>2</sub>) or lithium fluoride (LiF) between the BHJ layer and the cathode.<sup>29–31</sup>

In the past decades, various methods, device materials and structures have been reported for improvements of inverted BHJ OSCs. Cheng *et al.*<sup>32</sup> used efficient BHJ poly(3-hexylthiophene): (6,6)-phenyl-C<sub>61</sub>-butyric acid methyl ester (PCBM) solar cells with molybdenum trioxide (MoO<sub>3</sub>) and copper phthalocyanine (CuPc) as buffer layers. The use of a molybdenum trioxide layer was found to be critical in device performance, as the layer effectively pulls holes to prevent exciton quenching and reduction of the interfacial resistance due to the alignment of energy levels. Cheng *et al.*<sup>32</sup> studied the effect of the molybdenum trioxide and CuPc layer thickness on device performance. When the thickness of the molybdenum trioxide layer was 12 nm and that of the CuPc layer was 6 nm, the resulting optimized PCE was 3.76%.<sup>32</sup> There have been significant efforts and enormous progress in the field of



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# Majority voting-based hybrid feature selection in machine learning paradigm for epilepsy detection using EEG

Sunandan Mandal, Bikesh Kumar Singh and **Kavita Thakur**Published Online: April 29, 2021 · pp 385-400 · <https://doi.org/10.1504/IJCVR.2021.116558>[ABOUT](#)

## Abstract

This article presents a combination of statistical and discrete wavelet transform (DWT)-based features for the identification of epileptic seizures in electroencephalogram (EEG) signals. A total of 150 quantitative features are extracted from EEG signals. A multi-criteria hybrid feature selection is proposed by combining six feature ranking methods using the majority voting technique to identify the most relevant EEG markers. Kernel-based support vector machine is used to evaluate the proposed approach along with a hybrid classifier namely support vector neural network (SVNN) which is a combination of support vector machine (SVM) and artificial neural network (ANN). For performance evaluation of the proposed method, a benchmarked database is used. A comparative study of various types of SVM and SVNN with ten-fold and hold-out cross-validation techniques is conducted. The highest classification accuracy (CA) of 98.18% and 100% sensitivity is achieved with a fine Gaussian SVM classifier with hold-out data division protocol.

## Keywords

EEG quantitative features, epilepsy, wavelet transform, multi-criteria feature selection, classification



IET Image Processing / Volume 15, Issue 4 / p. 1008-1022

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## An improved symbol reduction technique based Huffman coder for efficient entropy coding in the transform coders

Vikrant Singh Thakur  Kavita Thakur, Shubhrata Gupta

First published: 26 December 2020

<https://doi.org/10.1049/ipr2.12081>

Citations: 1

### Abstract

Entropy coding is the essential block of transform coders that losslessly converts the quantized transform coefficients into the bit-stream suitable for transmission or storage. Usually, the entropy coders exhibit less compression capability than the lossy coding techniques. Hence, in the past decade, several efforts have been made to improve the compression capability of the entropy coding technique. Recently, a symbol reduction technique (SRT) based Huffman coder is developed to achieve higher compression than the existing entropy coders at similar complexity of the regular Huffman coder. However, the SRT-based Huffman coding is not popular for the real-time applications due to the improper negative symbol handling and the additional indexing issues, which restrict its compression gain at most 10–20% over the regular Huffman coder. Hence, in this paper, an improved SRT (ISRT) based Huffman coder is proposed to properly alleviate the deficiencies of the recent SRT-based Huffman coder and to achieve higher compression gains. The proposed entropy coder is extensively evaluated on the ground of compression gain and the time complexity. The results show that the proposed ISRT-based Huffman coder provides significant compression gain against the existing entropy coders with lower time consumptions.

## 1 INTRODUCTION

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# Higher Order Statistics Based Blind Steg analysis using Deep Learning (AbstractView.aspx?PID=2021-34-1-3)

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# Modeling of Abnormal Hysteresis in CsPbBr<sub>3</sub> based Perovskite Solar Cells (AbstractView.aspx?PID=2021-34-1-1)

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**ABSTRACT:**

Perovskite solar cells are emerging photovoltaic devices with PCE of above 25%. Perovskites are suitable light absorber materials in solar cells with excellent properties like appropriate band gap energy, long carrier lifetime and diffusion length, and high extinction coefficient. Simulation study is an important technique to understand working mechanisms of perovskites solar cells. The study would help develop efficient, stable PSCs experimentally. In this study, modeling of perovskite solar cell was carried out through Setfos software. The optimization of different parameters of layer structure of solar cell would help to achieve maximum light absorption in the perovskite layer of solar cell. Simulation study is based drift-diffusion model to study the different parameters of perovskite solar cell. Hysteresis is one of the factors in the perovskite solar cell which may influence the device performance. The measurement of abnormal hysteresis can be done by current-voltage curve during backward scan during simulation study. In backward scan, the measurement starts from biasing voltage higher than open circuit voltage and sweep to voltage below zero. The numerical simulation used to study the various parameters like open circuit voltage, short circuit current, fill factor, power conversion efficiency and hysteresis. The simulation results would help to understand the photophysics of solar cell physics which would help to fabricate highly efficient and stable perovskite solar cells experimentally.

**Keywords:** Perovskite solar cells () Transient photo-current () Hysteresis () Efficiency () Setfos software. ()

**Cite this article:**

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Altazin, S., Stepanova, L., Werner, J., Niesen, B., Ballif, C., and Ruhstaller, B. (2018). Design of Perovskite/Crystalline-Silicon Monolithic Tandem Solar Cells. *Opt. Express*, 26: A579-A590.

Courtier, N.E., Richardson, G., and Foster, J.M., (2018). A Fast and Robust Numerical Scheme for Solving Models of Charge Carrier Transport and Ion Vacancy Motion in Perovskite Solar Cells. *Appl. Math. Model.*, 63: 329-348.

Eames, C., Frost, J.M., Barnes, P., O'Regan, B.C., Walsh, A., and Islam, M.S., (2015). Ionic Transport in Hybrid Lead Iodide Perovskite Solar Cells. *Nat. Commun.*, 6: 7497.

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# Various Techniques of MPPT Based Charge Controller & Comparison of A/C with D/C Home Appliances - A Review (AbstractView.aspx?PID=2021-34-1-13)

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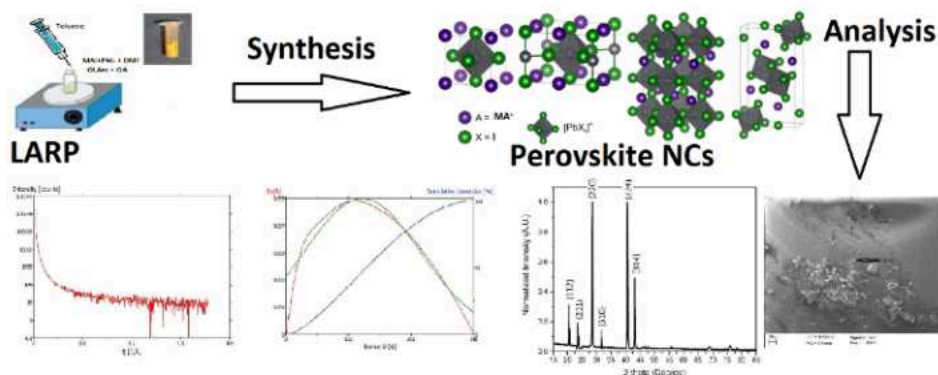
## X-ray and Raman study of $\text{CH}_3\text{NH}_3\text{PbI}_3$ perovskite nanocrystals

B. Gopal Krishna,<sup>1\*</sup> Dhriti Sundar Ghosh,<sup>2</sup> Sanjay Tiwari,<sup>1</sup>

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Submitted on: 04-July-2021 Accepted and Published on: 30-July-2021

### ABSTRACT



Organic-inorganic hybrid perovskite nanocrystals have gained considerable attention for optoelectronics applications due to their unique properties like high light absorption coefficient, band gap tunability, and larger diffusion length. In this work, the ligand-assisted re-precipitation method (LARP) was employed to synthesize  $\text{CH}_3\text{NH}_3\text{PbI}_3$  nanocrystals (NCs). The optical and structural properties of nanocrystals depend on their size. X-ray diffraction (XRD) and small-angle X-ray scattering (SAXS) techniques are used to determine the crystal structure, particle size distribution, and surface to volume ratio of  $\text{CH}_3\text{NH}_3\text{PbI}_3$  nanocrystals. The organic-inorganic interactions of  $\text{CH}_3\text{NH}_3\text{PbI}_3$  nanocrystals are studied by Raman spectra at room temperature. This study will provide the basis to interpret the morphological properties of perovskite nanocrystals for their full exploitation in different optoelectronics applications.

**Keywords:**  $\text{CH}_3\text{NH}_3\text{PbI}_3$  nanocrystals, Ligand-assisted re-precipitation method, XRD, SAXS, Raman spectra.

### INTRODUCTION

Metal halide perovskites have achieved incredible advances as optoelectronic materials due to extraordinary properties like excellent luminescence properties, high light absorption coefficient, and band gap tunability. The materials are used to fabricate photovoltaic cells, LEDs, and display applications. Perovskite materials have an exceptional combination of optical

and electronic properties. The fundamental understanding of perovskite material can lead to developing many technological applications. Halide perovskites have the formula  $\text{ABX}_3$  in which 'A', 'B' and 'X' are monovalent cation (MA or FA or Cs), divalent cation (Pb or Sn), and halides (I or Cl or Br) anions respectively.<sup>1-3</sup> In the perovskite crystal structure, 'B' is coordinated with six 'X' ions to form an octahedral structure. 'A' cation is positioned in between the octahedral structure. Perovskite can be all-inorganic or organic-inorganic material that depends upon the 'A' cation. The optical and structural properties of this material depend upon its composition.<sup>4</sup> The dimensions of perovskite material can be 0D or 2D or quasi-2D or 3D structure.<sup>5,6</sup> The crystal structure of a perovskite material can be known by tolerance factor 't' and an octahedral factor 'u'. The tolerance factor is given by equation as

$$t = \frac{r_A + r_B}{\sqrt{2}(r_B + r_X)} \quad (1)$$

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## Optical Materials

Volume 119, September 2021, 111357

Research Article

# Optical properties of CsPbBr<sub>3</sub> perovskite nanocrystals with silver nanoparticles using a room-temperature synthesis process

B. Gopal Krishna , , **Sanjay Tiwari**[Show more](#) 

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## Highlights

- Synthesis of CsPbBr<sub>3</sub> NCs and Silver nanoparticles by LARP method and biosynthesis.
- The doping strategy was deployed in which silver nanoparticles of different concentrations were mixed in to CsPbBr<sub>3</sub> NCs.
- The optical properties of CsPbBr<sub>3</sub> NCs were studied containing different concentrations of silver nanoparticles.
- The change in PL spectra (enhancement, quenching, blue and red shift) of CsPbBr<sub>3</sub> NCs– Ag NPs was observed.



# An investigation on the influence of temperature variation on the performance of tin (Sn) based perovskite solar cells using various transport layers and absorber layers

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## ARTICLE INFO

### Keywords:

Tin based perovskite solar cells  
SCAPS-1D  
Temperature variation  
HTL  
ETL

## ABSTRACT

The perovskite solar cells (PSCs) have become the fastest-growing photovoltaic (PV) cells to date. Despite its numerous merits, these cells face issues, such as poor stability, toxicity, etc. The issue of toxicity is dealt by using less-toxic substitutes of lead (Pb), such as Tin (Sn). However, the performance attained by Sn-based PSCs still lags behind Pb based PSCs to a great extent. In this work, we discuss some of the desirable electron transport layers (ETLs) and hole transport layers (HTLs) that can be used to fabricate an efficient Sn-based PSC, and report their performance. HTLs, such as “Spiro-OMeTAD”, Graphene, PEDOT:PSS, Cu<sub>2</sub>O, CuI, CuSCN and ETLs, such as ZnO, TiO<sub>2</sub>, PCBM are used in this study. We also simulate three different Sn perovskite materials based PSCs, (i) MASnI<sub>3</sub> (ii) FASnI<sub>3</sub> and (iii) CsSn<sub>0.5</sub>Ge<sub>0.5</sub>I<sub>3</sub>. We study theoretically the performance of the PSCs with various transport layers and absorber layers by varying the temperature from 300 K to 400 K.

## 1. Introduction

The PSCs have become the fastest-growing PV technology to date by showing a rapid increment in efficiency from 3.2% to 25.5% within past 10 years (Alta and Asu, 2020; NREL Efficiency Chart, 2019). Moller et al. in 1958 introduced lead halide perovskite for the first time with outstanding photoconductivity using all-inorganic (CsPbX<sub>3</sub>) perovskite material (Sandor et al., 1958). Later, in 1978 Weber et al. introduced hybrid organic inorganic perovskites (Dieter, 1978). The usage of halide perovskite materials in solar cell was done by Kojima et al. in dye sensitized architecture attaining PCE of 3.8% for the first time (Kojima et al., 2009). Since then, tremendous research has been carried out in this field. The noteworthy advancement in the performance of PSCs has been obtained in short span of time owing to the following reasons: (i) the chemical engineering process enabled mixed cations and mixed anions perovskite materials to be used as absorber layers allowing enhanced stability and band-gap tunability (Jeon et al., 2015; Saliba et al., 2016; Deng et al., 2016; Prasanna et al., 2017), (ii) modifications in film deposition techniques, leading to the deposition of a uniform film with compact and large grains (Bi et al., 2013; Nie et al., 2015; Pérez-del-Rey et al., 2018), (iii) adopting different perovskite materials for better transport and absorber layer applications.

Currently, the main focus is on the efficient charge transport layers (Chen et al., 2017; Grill et al., 2017; Wang et al., 2017; Wu et al., 2017; Fang et al., 2018; Sidhik et al., 2018). The PSCs use hybrid organic–inorganic halide based perovskites as an absorber layer. MAPbX<sub>3</sub> (X = Cl, Br, and I) is widely used as an absorber layer in PSCs. The basic structure of PSCs is n-i-p or p-i-n type, where the perovskite absorber layer is stacked between the charge transport layers (Cheng et al., 2020). The incorporation of toxic Lead (Pb) has been a matter of concern for researchers worldwide. There are limited choices of ions available that can be used instead of Pb maintaining the perovskite structure. In PSCs, even upon replacing Pb with other elements, such as Sn, Ge, Bi, Sb, etc., performance like Pb-based PSCs could not be achieved (Shao et al., 2018). Among the various ions available as an alternate to Pb, Ge and Sn have exhibited good performance as they possess the required ionic size, coordinates, and charge prerequisites (Stoumpos et al., 2015; Li et al., 2017; Mitzi, 1996). However, Ge based PSCs have attained the lowest PCE of 0.57%. Also, not much work has been done using Ge perovskite as it suffers from drawbacks, such as its unstable behavior and low solubility in polar solvents. Currently, to address the issue of toxicity, Sn is being used by researchers widely owing to its promising performance (Abate, 2017; Stoumpos et al., 2013). The lead and tin halide perovskites pos-

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## Solar Energy

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# Progress in ambient air-processed perovskite solar cells: Insights into processing techniques and stability assessment

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## Abstract

Perovskite solar cells are among the highly efficient devices with a power conversion efficiency of over 25% due to their outstanding optoelectronic properties like bandgap tunability, high light absorption coefficient, and long diffusion length. A highly efficient perovskite solar cell is fabricated under a controlled inert atmosphere. Perovskite solar cell's stability is influenced by ambient atmosphere parameters like air, water, light and temperature which prevent industrial deployment. The translation of lab-scale to industrial-scale production requires fabricating perovskite solar cells in an ambient environment. The morphology and crystallization of perovskite thin film is also influenced by ambient environment. Large-scale manufacturing of these solar cells requires a scientific understanding of the crystallization process, fabrication process, and industrial compatibility. The proper study of the influence of ambient environment on morphology and crystallization process is necessary to fabricate highly efficient and stable perovskite solar cell in ambient conditions. The packaging of perovskite solar cell is also an important part to prevent the degradation of device. There is a need to adopt standard protocols like



## Original Article

## Studies on Composition of Stool Samples in Korba Area

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**Abstract:** The ecosystem of Korba basin is contaminated with fluoride and other toxic elements due to coal burning. There contaminated water and food are taken by domestic animals. The clinical sample such as urine and stool are bio indicator for contamination of water and food. In this work stool of domestic animals such as cattle and buffalo were analyzed to investigate the content of pH, EC, F<sup>-</sup>, Na<sup>+</sup>, K<sup>+</sup>, and Cl<sup>-</sup> the range of 6.02 – 6.77, 411 – 622  $\mu$ S/cm, 160 – 225 mg/kg, 375 – 675 mg/kg, 2125 – 3500 mg/kg, and 2625 – 4025 mg/kg.

**Keywords:** Stools samples, fluorosis, fluoride pollution.

## 1. Introduction

Industrialization, urbanization, and modern civilization have lead to fast degradation of our natural resources like water, soil, and air mainly. Plants and animals are dependents on the soil for the supply of nitrogen and mineral elements. The composition of plants and animals is also influenced by presence of a wide range of essential and non-essential element present in the soil [1-9]. Soil type and the plants and crops grown on them are highly variable. Many nutrients tend to be over applied and highly generated wastes and pollution resulting in imbalance in the animal's body and harmful effects on the environment. An excess of nitrogen, fluorine and other elements can cause leaching, March 2019. The population of this area was 583,338 according to Census 2012 [19]. Korba District falls under the hot temperature dry climate zone. The industry. Apart from the power plants, Korba is surrounded by two sites hills and forest. Other sides are flats and soil profile mainly sandy.

groundwater, air, and soil contamination. Low values of cation and anion which suggest minimal pollution due to geogenic and anthropogenic sources in this study [10-18].

## 1.1. Materials and Method

## 1.2. Study Area

The Korba (22° 21' N, 82° 42' E) area was selected for study of stool chemical and physical parameters by stool analysis during

## 1.3. Sample Collection

Total 10 stool samples were collected from Korba area in March 2019. The fresh samples of cattle and buffalo stool were collected. The samples should be placed in clean, labeled container or leak-proof plastic bags [20-21]. Figure 2 and Table 1



Figure 1: Representation of the sampling location of Korba region



Figure 2: Representation of the various animal



## Original Article / Research Article

## Fluoride Contamination in Soil Samples of Korba Region

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**Abstract:** The coal is used for generation of energy in India and there are huge exploitations which cause contamination of the environment and the inorganic contamination of surface soil in the coal burning area of the Korba basin, Chhattisgarh, India. In this study, the electrical conductivity and pH values ranged from 241-722  $\mu$ S and 6.11-6.74 with mean value of 178.86 $\pm$ 93.78  $\mu$ S and 6.57 $\pm$ 0.20 respectively. Other important parameters of soil samples, i.e. TH, alkalinity, Na<sup>+</sup>, K<sup>+</sup>, NH<sub>4</sub><sup>+</sup>, Ca<sup>2+</sup>, Cl<sup>-</sup>, F<sup>-</sup>, SO<sub>4</sub><sup>2-</sup> ranged from 150-170, 79-176, 150-875, 550-850, 304-331, 56-100, 17.5-32.5, 190-339 and 76-185 mg/kg with the mean value of 162 $\pm$ 6.55, 131.2 $\pm$ 31.11, 615 $\pm$ 197, 740 $\pm$ 90.2, 312 $\pm$ 8.50, 69.6 $\pm$ 13.76, 26 $\pm$ 4.6, 264 $\pm$ 43.82, and 120 $\pm$ 34.09 mg/kg. The correlation studies of fluoride ion concentration with physico-chemical parameters were discussed by such statistical analysis.

**Keyword:** Alkalinity, turbiditymeter, Flam photometer, statistical analysis, physico-chemical parameters.

## Introduction

The soil contamination of the Korba basin has been not carried out so far in this work. The surface soil contamination of the Korba basin with elements F<sup>-</sup>. The pollution of soil is a great public health interest due to receiving of large number of pollutants from multiple sources including industrial wastes, vehicle, pesticides, paints, domestic waste, biomass burnings coal and batteries etc [1-5]. High concentration of metals in soil can negatively affect crop growth, as these metals interfere with respiration, photosynthesis degeneration of main cell organelles even leading to death of plants [5-12]. Several environmental issues i.e., acid mine drainage, deposition of toxic compounds environmental pollution, halting of acid rain, health hazards, storage of solid waste etc [13-15]. At least  $\approx$ 6 MT year<sup>-1</sup> of coal ashes results from the burning of 20 MT coal. It has also been linked to various environmental and health problems (EPA 2007). Further contamination was generated by the largest aluminum plant in Asia [3.2  $\times$  10<sup>5</sup> ton per year (TPY) Al smelter], which is also operated in this area. Preliminary investigations of soil pollution with HMs at nine locations were reported by Patel et al. (2016). Sharma et al.

(2017) studied HMs in pond water and sediments from 20 locations in the Korba Basin. In this work, concentration variations, arsenic speciation, enrichment factors, and sources of HMs in the soil at 20 locations of the Korba Basin over a 5-year period are described.

## Experimental

## Study area

The Korba area has been selected for the study of F<sup>-</sup> other parameter of soil samples. Korba contaminated of soil area 22.3595° N, 82.7501° E is located in the C.G. State. The population in Korba 583,338. A major producer of aluminum is also based in the

## Original Article

Distribution and Size Segregation of PM<sub>10</sub> in Mosquito CoilsShobhana Ramteke<sup>1</sup>, Bijnaneswar Mondal<sup>2</sup>, Bhaskar Sharma<sup>2</sup>, Bharat Lal Sahu<sup>2\*</sup><sup>1</sup>School of Studies in Environmental Science, Pt. Ravishankar Shukla University, Raipur (C.G.), India-492010<sup>2</sup>Department of Chemistry, Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur (C.G.), India -495509\*Corresponding Author: [bharatred007@gmail.com](mailto:bharatred007@gmail.com)

**Abstract:** Mosquito coils are extensively used to repel mosquitos. During the preparation, the integrant (pesticide, sodium fluoride, nitrate, etc.) is added. They are fumed in the micro indoor environment, and particles are in the ultrafine mode. In the current study, eight mosquito coils of various trades were fumed in the chamber by collecting the PM. The concentration of PM<sub>10</sub> was ranged from 11284 – 120103  $\mu\text{g m}^{-3}$  with mean value of  $43758 \pm 28409 \mu\text{g m}^{-3}$ . The relative concentration of PM<sub>10.0-9.0</sub>, PM<sub>9.0-5.8</sub>, PM<sub>5.8-4.7</sub>, PM<sub>4.7-3.3</sub>, PM<sub>3.3-2.1</sub>, PM<sub>2.1-1.1</sub>, PM<sub>1.1-0.7</sub> and PM<sub>0.7-0.0</sub> in the air was 1, 1, 1, 1, 4, 4, 13, 29 and 51%, respectively. The emission fluxes of various mosquito coil PM are discussed.

**Keywords:** Distribution, Size segregation, aerosols, Flux, Toxicity

## 1. Introduction

The mosquito problem persists for the majority of the year, and coils are fumed to repel mosquitos in the house, workplace, kitchen, restaurant, and so on. The main active elements of mosquito coils are poisonous compounds: pyrethrins, which account for around 0.3 - 0.4% of coil mass and, when burned, dissipate with smoke, repelling mosquitos from entering the room. [1]. The smoke is a complex mixture of particulate matter (PM), carbonate carbon (CC), organic carbon (OC), black carbon (BC), silica, metals, and other substances. The OC represent a wide range of organic compounds that may be categorised into generic compound classifications such as aliphatic, aromatic compounds, acids, and several unexplained compounds. [2]. They are of

significant sources for particulates, polycyclic aromatic hydrocarbons (PAHs), persistent organic pollutants (POPs), carbon monoxide (CO), benzene, isoprene, etc. [3]. These particles constituted a health danger since their size allowed them to penetrate the deepest into the human body. They are known to produce oxidative stress and inflammation in the lungs, leading to an aggravation of asthma symptoms in sensitive people [4]. The particles produced by burning processes leave the lungs vulnerable to acute lower respiratory infections and chronic obstructive pulmonary disorders such as asthma, cancer, TB, cataracts, low birth weight, infant mortality, and so on. Figure 1 [5–8]. The indoor air pollution severely affects especially poor women and small children [9]. The carbonaceous aerosol in atmosphere



Original Article / Research Article

## ASSESSMENT OF FLUORIDE LEVEL IN THE GROUNDWATER OF DONGARGARH CITY

Yogesh Bhaskar Tanwer<sup>1</sup>, Shobhana Ramteke<sup>2</sup>, Bijananeswar Mondal<sup>1</sup> and Bharat Lal Sahu<sup>1\*</sup><sup>1</sup>Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur-495009, CG, India.<sup>2</sup>School of Studies in Environmental Science, Pt. Ravishankar Shukla University, Raipur-492010, CG, India\*Corresponding author: [bharatred007@gmail.com](mailto:bharatred007@gmail.com)

**Abstract:** The basic bed rocks of central India are contaminated with fluorite minerals. The overuse of groundwater for irrigation causes increased mineralization of F<sup>-</sup> in the groundwater. This contaminated groundwater is widely used for drinking and other household purposes. The basic bed rocks of central India are contaminated with fluorite minerals. This contaminated groundwater is widely used for drinking and other household purposes. The prevalence of fluorosis is mainly due to the intake of large quantities of fluoride through water. Fluoride is found in shallow depth, presumably as a consequence of evaporation of water and precipitation of carbonate minerals. In this work, the fluoride pollution in groundwater of Dongargarh area (21.18842°N and 80.75875°E) during pre summer period (i.e. March 2020) is described. The concentration of F<sup>-</sup> in the groundwater (n = 12) was ranged from 2.5–5.6 mg l<sup>-1</sup> with mean value of 4.4±0.5 mg l<sup>-1</sup>. The quality of groundwater of Dongargarh city, Rajnandgaon, Chhattisgarh, India is examined. The physiochemical property of groundwater is discussed.

## 1. Introduction

Fluorine is a highly reactive element, and it has an important role in precipitation of various elements as minerals. Fluorine contents in the soil vary between 10 - 150 mg/kg, and the majority of fluorine occurs naturally in combined forms in various rocks, soils, waters, plants, other living organisms, slag, fluxes, etc. The fluoride in the ground water is severely extracting from the bed rock causing a disease known as "fluorosis", which continues to be an endemic problem in most parts of the world. India is among the 23 nations around the globe; where fluorosis health problems (i.e. dental, skeletal and/or non-skeletal) are continue to exist mainly due to the consumption of contaminated water. Fluoride toxicity is characterized by a variety of signs and symptoms. Upon ingestion, fluoride binds calcium ions and may lead to hypocalcaemia. Fluoride has cytotoxic effects and interferes with a number of enzyme systems. Fluoride inhibits acetylcholinesterase, which may be partly responsible for hyper salivation, vomiting, and diarrhea [1].

Serious pollution of ground water has occurred in several regions of the country either due to leaching of contaminants from the land surface or/and abstraction from the bed rocks. The F<sup>-</sup> contamination in groundwater of several states of the country viz. Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh, Uttarakhand, West Bengal, etc. were reported [2-16].

The weathering of the minerals (viz. topaz, fluorite, fluorapatite, villuamite, cryolite, ferro magnesium silicate, etc.), hydrological conditions and anthropogenic activities (viz. mining, coal burning, etc.) were reported for mineralization of excessive concentration of F<sup>-</sup> in the groundwater [17-20].

Abnormal levels of fluoride in the groundwater is common in India due to weathering of the fractured hard rock pegmatite veins composing of minerals i.e. topaz, fluorite fluorapatite, villuamite, cryolite, ferro magnesium silicate, etc. Millions of people are exposed to excessive amount of F<sup>-</sup> through drinking water contaminated from natural (geogenic) and anthropogenic sources by suffering with various types of fluorosis disease. Severe gastroenteritis, salivation, restlessness, sweating, anorexia, muscle weakness, stiffness, dyspnoea, ventricular tachycardia, and colonic convulsions followed by depression and death are typically seen. Chronic fluorosis is characterized by unthrifty animals with skeletal and dental abnormalities. Reduced feed and water intake accompanied by poor weight gain and milk production reflect dental lesions and impaired mastication. Mottled, chalky, pitted and stained enamel and uneven and excessive wear on the teeth are frequently seen. Skeletal abnormalities associated with increased bone resorption and remodelling produces severe lameness, stiffness, abnormal hoof growth, and exostoses, Figure 1.

## Original Article / Research Article

## Assessment of Fluoride Level in the Ground water of Rajnandgaon City

Lata Sahu<sup>1</sup>, Shobhana Ramteke<sup>2</sup>, Bilaneswar Mondal<sup>1</sup> and Bharat Lal Sahu<sup>1\*</sup><sup>1</sup>Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur-495009, CG, India.<sup>2</sup>School of Studies in Environmental Science, Pt. Ravishankar Shukla University, Raipur-492010, CG, India\*Corresponding author: [bharatred007@gmail.com](mailto:bharatred007@gmail.com)

**Abstract :** Several water-borne diseases are observed in people of Rajnandgaon city, Chhattisgarh, India. The basic bed rocks of central India are contaminated with fluorite minerals. The overuse of groundwater for irrigation causes increased mineralization of F<sup>-</sup> in the groundwater. This contaminated groundwater is widely used for drinking and other household purposes. The basic bed rocks of central India are contaminated with fluorite minerals. This contaminated groundwater is widely used for drinking and other household purposes. The prevalence of fluorosis is mainly due to the intake of large quantities of fluoride through water. Fluoride is found in shallow depth, presumably as a consequence of evaporation of water and precipitation of carbonate minerals. In this work, the fluoride pollution in groundwater of Rajnandgaon area (21.0972° N and 81.0338° E) during pre summer period (i.e. March 2020) is described. The groundwater of the Rajnandgaon city has very high conductivity. DO values of the groundwater were found to be in the range of permissible limits, i.e. 5–9.5 mg l<sup>-1</sup>. The level of F<sup>-</sup> is being several folds higher than WHO recommended values. The quality of groundwater of Rajnandgaon city, Chhattisgarh, India is examined. The physico-chemical property of groundwater is discussed.

**Keyword :** evaporation, bed rocks, fluorite minerals, groundwater, irrigation, contaminated ground water, evaporation, carbonate minerals, conductivity, DO values.

## Introduction

Most of the minerals and coal of the country are reserved in the Chhattisgarh state, India. The vast exploitation of the natural resources and overuse of ground water leads to depletion of the ground water quality in several parts of the state. Millions of people and animals were exposed to excessive amount of F<sup>-</sup> through drinking water, suffering with various types of fluoride diseases [1-17]. Fluorine is a highly reactive element, and it has an important role in precipitation of various elements as minerals. Fluorine contents in the soil vary between 10 - 150 mg/kg, and the majority of fluorine occurs naturally in combined forms in various rocks, soils, waters, plants, other living organisms, slag, fluxes, etc. The fluoride in the ground water is severely extracting from the bed rock causing a disease known as "fluorosis", which continues to be an endemic problem in most parts of the world. India is among the 23 nations around the globe where fluorosis health problems (i.e. dental, skeletal and/or non-skeletal) are continue to exist mainly due to the consumption of contaminated water. Fluoride toxicity is characterized by a variety of signs and symptoms. Upon ingestion, fluoride binds calcium ions and may lead to hypocalcaemia. Fluoride has cytotoxic effects and interferes with a number of enzyme systems. Fluoride inhibits acetylcholinesterase, which may be partly responsible for hyper salivation, vomiting, and diarrhea [18].

Serious pollution of ground water has occurred in several regions of the country either due to leaching of contaminants from the land

surface or/and abstraction from the bed rocks. The F<sup>-</sup> contamination in groundwater of several states of the country viz. Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh, Uttarakhand, West Bengal, etc. were reported [19-33].

Reduced feed and water intake accompanied by poor weight gain and milk production reflect dental lesions and impaired mastication. Mottled, chalky, pitted and stained enamel and uneven and excessive wear on the teeth are frequently seen. Skeletal abnormalities associated with increased bone resorption and remodelling produces severe lameness, stiffness, abnormal hoof growth, and exostoses,





# Sustainable valorization of seeds from eight aquatic plant species as a source of oil and lipophilic bioactive compounds

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## Abstract

Potential biomass valorization of aquatic plant seeds of eight species was studied. *Merremia emarginata* (Convolvulaceae), *Nelumbo nucifera* (Nelumbonaceae), *Schoenoplectus articulatus* (Cyperaceae), *Cleome viscosa* (Cleomaceae), *Ipomoea purpurea* (Convolvulaceae), *Rorippa palustris* (Brassicaceae), *Ludwigia parviflora* (Onagraceae), and *Hygrophila auriculata* (Acanthaceae) were investigated for their oil yield and their lipophilic bioactive compound composition. The ultrasound-assisted extraction of oil followed by GC and HPLC analyses was applied for the determination of bioactive compounds. The oil yield ranged from 1.7 to 29.1%, in *N. nucifera* and *H. auriculata*, respectively. The studied species differed significantly with respect to the composition of fatty acids and bioactive compounds (statistically assessed). Unsaturated fatty acids (UFA) were the predominant group of fatty acids (74–88%) in the investigated samples. Four species were mainly comprised of  $\gamma$ -tocopherol (88–99%) (*M. emarginata*, *C. viscosa*, *I. purpurea*, *L. parviflora*), while the other four studied samples were dominated by  $\gamma$ -tocotrienol (72%) in *N. nucifera*,  $\beta$ -tocotrienol (72%) in *S. articulatus*,  $\alpha$ - and  $\gamma$ -tocopherol (49% and 41%, respectively) in *R. palustris*, and  $\alpha$ -tocopherol (91%) in *H. auriculata*.  $\beta$ -Sitosterol was the main sterol (46–69%) in the majority of studied species, with the exception of *H. auriculata*, in which  $\Delta^5$ -stigmasterol (50%) dominated. Considerable levels of campesterol in each species (13–25%) were also recorded. Squalene was detected only in *I. purpurea*, *R. palustris*, and *L. parviflora*. The studied species were characterized by considerable quantities of carotenoids, tocopherols, phytoosterols, and squalene (0.6–6.9, 51–634, 292–2480, and 0–22 mg/100 g oil, respectively). Seeds of several studied aquatic species can be considered as an alternative source of oil and/or valuable lipophilic ingredients for industrial applications.

**Keywords** Aquatic plant seeds · Fatty acid · Tocotrienol · Tocopherol · Phytosterol · Carotenoid

## 1 Introduction

A large part of aquatic plants is classified as weeds due to their unwanted presence, for instance, in agriculture and water sports. Over the past decades, global weed utilization has been intermittent. Currently, productive utilization of weeds has been considered a promising alternative to aid weed management, with potential benefits for various areas of human life. Weeds have been mainly used in the past as sources of dye, fiber, and medicine; unlike cultivated plants, they are less susceptible to insects and diseases. The use of weeds have been highlighted as potential sources of phytomedicines that require increased attention due to their therapeutic properties [5]. Furthermore, economic benefits associated with their cultivation as profitable local crop have been demonstrated, for instance, *Cleome viscosa* [22].

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## Original Article / Research Article

## Assessment of Fluoride Level in the Groundwater of Ambagarh Chowki Block

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**Abstract :** The groundwater of Ambagarh Chowki, Rajnandgaon, India is contaminated with F<sup>-</sup> at elevated levels. The basic bed rocks of central India are contaminated with fluorite minerals. The overuse of groundwater for irrigation causes increased mineralization of F<sup>-</sup> in the groundwater. This contaminated groundwater is widely used for drinking and other household purposes. The prevalence of fluorosis is mainly due to the intake of large quantities of fluoride through water. Fluoride is found in shallow depth, presumably as a consequence of evaporation of water and precipitation of carbonate minerals. In this work, the fluoride pollution in groundwater of Ambagarh area (20°43'N and 80°44'E) during pre summer period (i.e. March 2020) is described. The RP value of the groundwater was found at least 5-folds lower than the recommended value of 650mV. The level of F<sup>-</sup> is being several folds higher than WHO recommended values. DO values of the groundwater were found to be in the range of permissible limits, i.e. 5-9.5 mg l<sup>-1</sup>. The quality of groundwater of Ambagarh block, Rajnandgaon, Chhattisgarh, India is examined. The physico-chemical property of groundwater is discussed.

**Keyword :** Irrigation, mineralization, evaporation, precipitation, fluoride pollution.

## Introduction

Serious pollution of ground water has occurred in several regions of the country either due to leaching of contaminants from the land surface or/and abstraction from the bed rocks. The F<sup>-</sup> contamination in groundwater of several states of the country viz. Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh, Uttarakhand, West Bengal, etc. were reported [1-15].

The weathering of the minerals (viz. topaz, fluorite, fluorapatite, villumamite, cryolite, ferro magnesium silicate, etc.), hydrological conditions and anthropogenic activities (viz. mining, coal burning, etc.) were reported for mineralization of excessive concentration of F<sup>-</sup> in the groundwater [16].

Fluorine is a highly reactive element, and it has an important role in precipitation of various elements as minerals. Fluorine contents in the soil vary between 10 - 150 mg/kg, and the majority of fluorine occurs naturally in combined forms in various rocks, soils, waters, plants, other living organisms, slag, fluxes, etc. The fluoride in the ground water is



severely extracting from the bed rock causing a disease known as "fluorosis", which continues to be an endemic problem in most parts of the world. India is among the 23 nations around the globe where fluorosis health problems (i.e. dental, skeletal and/or non-skeletal) are continue to exist mainly due to the consumption of contaminated water. Fluoride toxicity is characterized by a variety of signs and symptoms. Upon ingestion, fluoride binds calcium ions and may lead to hypocalcaemia. Fluoride has cytotoxic effects and interferes with a number of enzyme systems. Fluoride inhibits acetylcholinesterase, which may be partly responsible for hyper salivation, vomiting, and diarrhea [15]. Abnormal levels of fluoride in the groundwater is common in India due to weathering of the fractured hard rock pegmatite veins composing of minerals i.e. topaz, fluorite fluorapatite, villumamite, cryolite, ferro magnesium silicate, etc. Millions of people are exposed to excessive amount of F<sup>-</sup> through drinking water contaminated from natural (geogenic) and anthropogenic sources by suffering with various types of fluorosis disease. Severe gastroenteritis, salivation, restlessness, sweating, anorexia, muscle weakness, stiffness, dyspnoea, ventricular tachycardia, and colonic



## Chemical Engineering Journal

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# pH-responsive eco-friendly chitosan modified cenosphere/alginate composite hydrogel beads as carrier for controlled release of Imidacloprid towards sustainable pest control

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## Highlights

- IMI@Cht-Alg-Cn composite hydrogel beads as a CRS for imidacloprid was synthesized.
- Hydrogel beads showed 2600% water retention, pH responsiveness, and UV safeguarding.
- Long term insecticidal activity was achieved without affecting the host plant.
- Trophic level studies found the formulation to be safe towards non-targeted organisms.

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**Title**

AGRICULTURAL REGIONS OF CHHATTISGARH.

**Authors**

BAGHEL, ANUSUIYA; PANDA, BRISAKETU

**Abstract**

The present research paper aims to describe the cropping pattern and its physical, social and economic influencing factors in Chhattisgarh. Ranking of different crops and preparation of agricultural regions is another important objective of this study. The present study is based on the agricultural census data of Chhattisgarh 2015-2016. The entire Chhattisgarh region has been considered with 27 districts to analyze the agricultural specialties. Paddy is the dominant crop in all 27 districts. But in the southern part of the region, mainly in Bastar plateau, millets like kodo has been found as a secondary crop due to ragged surface. Similarly, ramtil and maize are dominant secondary crops in north Surguja upland. Teora has become the main pulse of Chhattisgarh. The central plain of Chhattisgarh is also dominated by Teora as a secondary crop. Soybean ranked second as oilseed has been found mainly in western Maikal region associated with black soil, where gram/wheat became the fourth ranked crop in this region. The crop combination regions have been prepared based on the Weaver's method (1954) of least deviation. Crop combination map were superimposed over geology, relief, soil, rainfall and population maps and the Chhattisgarh region has been divided into four major agricultural regions as-Rice cropped Chhattisgarh basin region, Rice cropped Bastar plateau region, Rabi cropped Maikal region and Deogarh-Raigarh Millets region. Three-fourth crops of Chhattisgarh belong to the Kharif crop, which reveals the impact of monsoon in the agriculture of this region. Due to the improvement of irrigation facilities, the cropping pattern of the plain area shows slight positive changes.

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# आजाद हिन्द फौज : नेताजी, अंतर्राष्ट्रीय संबंध और सहयोग

पूजा शर्मा

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भारत की आजादी की एक धारा गांधीवादी है, एक धारा क्रांतिकारी है और एक धारा नेताजी सुभाषचंद्र बोस की विचारधारा है, जो मिलिटरी है, दुस्साहसी है और अंतर्राष्ट्रीय संदर्भों के साथ अंतर्राष्ट्रीय सहयोग पर आधारित है, किन्तु इस धारा में आत्मसम्मान से, राष्ट्रीयता से और भारत की आजादी से कोई समझौता नहीं है, क्योंकि इसका मूल लक्ष्य भारत की आजादी है।

ऐतिहासिक घटनाओं के आलोक में नेताजी ने यह पाया कि साम्राज्यवाद से प्रताड़ित हर राष्ट्र ने अपनी स्वतंत्रता कतिपय विदेशी सहायकों के समर्थन से प्राप्त की है। प्रबल देशभक्त होने के कारण स्वतंत्रता प्राप्ति हेतु मार्ग से अधिक लक्ष्य उन्हें प्रिय था। वे विदेश नीति को एक यथार्थ वादी विषय मानते थे, जिसका निर्धारण राष्ट्रहित के दृष्टि से होना चाहिये, न कि भावनाओं के आधार पर।<sup>1</sup> तत्कालीन विश्व में ब्रिटेन की भूमिका, भारत के पक्ष में अंतर्राष्ट्रीय समर्थन और विश्व में एशिया के बढ़ते महत्व की दृष्टि से उनका यह कदम समय की मांग थी। सिक्के का दूसरा पहलू भी विचारणीय है कि नेताजी के इस प्रयास पर विदेशों की प्रतिक्रिया क्या थी? नेताजी ने देखा भी कि प्रतिक्रियाएं संबंधित स्वार्थों से संचालित, मिलीजुली दोहरी प्रकृति की थी, परन्तु वह भी पूरी तरह से इन पर निर्भर नहीं थे। 7 दिसंबर 1942 को रेडियो प्रसारण में तत्कालीन यूरोपीय स्थितियों का वर्णन करते हुए नेताजी ने कहा था कि "ब्रिटिश साम्राज्यवाद के शत्रुओं ने हमारी सहायता की तो इसे उखाड़ फेंकना हमारे लिये आसान होगा, परन्तु यदि यह नहीं हो सका तो हमें अपनी शक्ति समंजित कर, अपने प्रयासों और बलिदान से उसे प्राप्त करना होगा।"<sup>2</sup> इन सबके बीच महत्वपूर्ण तथ्य यह है कि हमने अपने नैतिक बल, कूटबुद्धि और रणनीतिक कौशल से न सिर्फ नैतिक, अपितु आर्थिक और सैन्य सहयोग भी प्राप्त किया।

भारत को स्वतंत्र कराने की नेताजी की योजना का पहला पड़ाव 'सोवियत संघ' था जो कि जर्मनी के साथ अनाक्रमण की संधि के कारण तब युद्ध से अलग था। अफगानिस्तान की सीमा रूस के साथ लगी हुई थी, जिससे उससे सहायता कम समय में और आसानी से प्राप्त की जा सकती थी। वैचारिक रूप से भी एक समाजवादी देश होने के कारण भारत की सहायता करने में रूस की आपत्ति का कोई कारण नहीं बनता था, परन्तु जब नेताजी अफगानिस्तान पहुँचे, उन्हें अपेक्षा के अनुरूप रूसी दूतावास और अधिकारियों से कोई सकारात्मक प्रतिक्रिया नहीं मिली। "दूसरी ओर उन्होंने यह महसूस किया कि रूस से अधिक रुचि जर्मनी दिखा रहा था।"<sup>3</sup> परन्तु जर्मनी पहुँचने की व्यवस्था हेतु भी रूस की ओर से कोई आश्वासन नहीं मिला। "इटैलियनों ने नेताजी को यह तर्क दिया कि कोई सोवियत यूनियन में उन्हें आने वाली दिक्कतों का कारण उनके द्वारा स्वयं को कलकत्ता में एण्टी कम्युनिस्ट बताया जाना था।"<sup>4</sup> धुरी राष्ट्रों के निवेदन पर रूस ने नेताजी के अपनी सीमा से होते हुए बर्लिन जाने पर कोई आपत्ति नहीं की। यद्यपि जर्मनी के आक्रमण के पश्चात सोवियत संघ मित्र राष्ट्रों के साथ हो लिया परन्तु जापान द्वारा हथियार डाले जाने पर नए विकल्प के रूप में सोवियत संघ के प्रति नेताजी अंतिम समय तक आशावादी रहे।

जर्मनी पहुँचने के प्रयास में इटली के दूतावास ने नेताजी की सहायता की। नेताजी ने इटैलियन मंत्री एल्बर्टो कुअरोनी को बताया कि "भारत क्रांति के लिए पूरी तरह तैयार है परन्तु ब्रिटिश शक्ति के महान होने की झिझक के कारण वह पहला कदम उठाने का साहस नहीं कर पा रहा। यदि जापान, जर्मनी और इटली के 50,000 लोग भारतीय सीमा पर खड़े हों तब भारतीय जनता और सेना दोनों ही बहुत कम समय में ब्रिटिश आधिपत्य को समाप्त कर सकती है।"<sup>5</sup> ज्यादा संतुष्ट ना होते हुए भी उन्होंने हमारी सहायता की। सोवियत यूनियन को विश्वास में लेते हुए धुरी राष्ट्रों की ओर से योजना बनाकर नेताजी को एक इटैलियन डिप्लोमेट 'ओर्लान्डो मोजेट्टा' के पासपोर्ट द्वारा रूस के मार्ग से मास्को भेजा गया। मास्को से वायुयान द्वारा वे बर्लिन पहुँचे।

इटली की भूमिका यहाँ पर समाप्त नहीं होती है। समय-समय पर धुरी राष्ट्रों की ओर से नेताजी को हर संभव सहायता पहुँचाने में उसने सहयोग किया। इटली में एक 'इंडियन पॉलिटिक्स डिपार्टमेंट' खोला गया था। यद्यपि इटली की नीतियाँ जर्मनी से इस बात में भिन्न थी कि वे उपमहाद्वीप में मुस्लिम शरणार्थियों पर ध्यान केन्द्रित करना चाह रहे थे, जो नेताजी के राजनीतिक विचारों के विरुद्ध था, क्योंकि नेताजी एकता के पक्षधर थे।<sup>6</sup> फिर भी भारत की स्वतंत्रता के मुद्दे पर धुरी राष्ट्रों को साधने में इटली की मुख्य भूमिका रही। परन्तु नेताजी की राह इतनी आसान नहीं थी। "प्रारंभ में इटली उनसे किसी भी प्रकार के समझौते के लिए तैयार नहीं था। इकबाल शेदाई इटली के अधिक करीब था जो नेताजी से वैचारिक भिन्नता रखता था और उसने जर्मन अधिकारियों को यह भी कहा था कि नेताजी ने बर्लिन में कम्युनिस्टों का अड़्डा बना रखा है परन्तु नेताजी उन्हें यह विश्वास दिलाने में सफल रहे कि भारतीय सेना के युद्धबंदी अंदर से अंग्रेजों से शत्रुता रखते हैं और जर्मनी की ओर से 'ट्राट और रेथ' ने अंग्रेजों के विरुद्ध लड़ाई में इनके उपयोग हेतु इटली को तैयार किया।"<sup>7</sup> इस प्रकार सभी विपरीत परिस्थितियों को अपने पक्ष में लाने का संघर्ष करते हुए अंततः नेताजी ने मुसोलिनी को भी इतना प्रभावित किया कि उसने भारत की स्वतंत्रता की घोषणा की।



# "संकल्प शक्ति और अभाव : उपलब्धि आजाद हिन्द फौज की"

## Resolve Power and Lack: Achievement of Azad Hind Fauj

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### सारांश

किसी महान उद्देश्य की प्राप्ति के लिए साधनों का सीमित होना उतनी बड़ी समस्या नहीं होती, जितनी अपने सिद्धांतों, नैतिकता और आत्मसम्मान को जीवित रखते हुए उस उद्देश्य की पूर्ति के लिए सहायता प्राप्त करना है। ब्रिटिश साम्राज्य जैसी महान शक्ति, जिसका सूर्य कभी अस्त नहीं होता था, को झुकाने के लिए पर्याप्त विदेशी समर्थन और सशस्त्र संघर्ष की आवश्यकता थी, तत्कालीन परिस्थितियों में यह दुष्कर कार्य था। नेताजी ने अपनी कूटनीतिक कौशल से न केवल राजनयिक समर्थन और आर्थिक सहायता प्राप्त की, अपितु अपने उच्च कोटि के प्रबंधन के माध्यम से विदेशी भूमि पर स्वयं के लिये सहयोग अर्जित किया।

Limiting the means to achieve a great objective is not as big a problem as keeping your principles, morals and self-respect alive and getting help for accomplishing that purpose. Substantial foreign support and armed struggle were needed to bow down to a great power like the British Empire, whose sun never set, this was a difficult task under the circumstances. Netaji gained diplomatic support and financial support not only through his diplomatic skills, but through his superior management, earning himself support on foreign lands.

**मुख्य शब्द :** संघर्ष, संप्रभुता, आत्मसम्मान, आर्थिक प्रबंधन, विध्वंसात्मक युद्ध।

Conflict, Sovereignty, Self-Respect, Economic Management, Subversive Warfare

### प्रस्तावना

विदेशी सहायता के संबंध में आजाद हिन्द रेडियो पर अपने सैनिकों को सम्बोधित करते हुए उन्होंने कहा था कि "जब तक हमें आवश्यकता नहीं होगी, हमारे ये मित्र जो हमारी स्वतंत्रता हेतु चिंतित हैं, स्वयं से हमें सहायता का प्रस्ताव नहीं देंगे और अपने राष्ट्र के सम्मान और आत्महित के लिए हमें तब तक सहायता की मांग नहीं करनी चाहिए, जब तक हम इसके अभाव में कोई कार्य करने में समर्थ न हो।" अस्तु तत्कालीन परिस्थितियों की विवशता में उन्होंने विदेशी सहायता स्वीकार की परन्तु उनकी महत्वपूर्ण उपलब्धि थी कि इन सभी कार्यों में उन्होंने अपने लक्ष्य, देश के आत्मसम्मान और संप्रभुता से किंचित भी समझौता नहीं किया।

अपने लक्ष्य और आत्मगौरव पर अटल रहते हुए कभी उन्होंने साधनों की परवाह नहीं की। श्री अरविन्द की भाँति ही सुभाष ने भी भारतीय स्वराज्य संघर्ष के लिए अपनायी जाने वाली तकनीकों के संबंध में लचीला दृष्टिकोण अपनाया था।<sup>1</sup> एक बहुआयामी विचारों वाले नेता के लिए अपने कार्यों की व्यवहारिक परिणति की दृष्टि से यह दृष्टिकोण समय की आवश्यकता थी। आजाद हिन्द फौज का लक्ष्य भारत की स्वतंत्रता होते हुए भी, इसके कार्य बहुआयामी थे। इसने एक विशाल सेना जो ब्रिटिश सेना का सामना करने में समर्थ हो, को प्रशिक्षित किया। इसके साथ-साथ कल्याणकारी कार्य, विद्यालय, अस्पताल, रोजगार की व्यवस्था, बैंकों का संचालन, पुनर्वास तथा आश्रयदाता कार्य एवं विस्थापित भारतीयों की भूमि की व्यवस्था आदि कार्य किये।

इन सबके साथ-साथ एक भविष्य दृष्टा होने का प्रमाण देते हुए नेताजी ने अस्थायी सरकार की नींव रखी, जिसे विध्वंसात्मक युद्ध के पश्चात पुनर्निर्माण की दृष्टि से प्रशिक्षित किया गया था। इसमें सरकार के सभी मुख्य



## पर्यावरण संरक्षण और बस्तर का धन : सलफी

डॉ. डी. एन. खुटे<sup>1,\*</sup>

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### सारांश:—

बस्तर के वनों में मुख्यतः साल, सागौन, बीजा, साजा, धावड़ा, मछुआ, तेंदू, हर्रा, आंवला, इमली, खैर, बांस तथा सलफी आदि के वृक्ष पाये जाते हैं। यहां पर हम बस्तर में प्रमुखता से पाये जाने वाले वृक्ष सलफी के बारे में चर्चा करना चाहते हैं। सलफी का वृक्ष नारियल प्रजाति का वृक्ष होता है। हलबी भाग में इसे सलफी रूख, गोंडी में गोगा मर्रा, अंग्रेजी में फिश टेल पाम ट्री कहा जाता है। वनस्पति शास्त्र की भाषा में करयोटा यूरेस के नाम से इसे जाना जाता है। बस्तर अंचल में यह प्रायः सर्वत्र पाया जाता है। माड़िया जनजाति का सीमित संसार है इसलिए वे कहते हैं— वालिया वाटो गोगा उले मामा ले अर्थात् ओ मामा ! तुम जहां भी जाओगे सलफी का पेड़ अवश्य पाओगे। सलफी के वृक्ष से सलफी नामक प्राकृतिक पेय पदार्थ की प्राप्ति होती है। छिंद वृक्षों से छिंद रस, ताड़ वृक्षों से ताड़ी मादक पेय पदार्थ प्राप्त होता है। सलफी रस को बस्तर की बीयर भी कहा जाता है। रस निकालने के लिए सलफी वृक्ष के साथ बांस की सीढ़ीनुमा संरचना तैयार की जाती है। सलफी का संरक्षण बस्तर में धन की तरह होता है। इस तरह स्वतः ही पर्यावरण सुरक्षा होती जा रही है— सदियों से।

शब्द कुंजी:—सलफी, गोगा मर्रा, फिश टेल पाम ट्री, करयोटा यूरेस, ताड़ी, बीयर।



# JUNI KHYAT जूनी ख्यात

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संस्कृति भवन

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## बस्तर में 1824 ई. का परलकोट विद्रोह एवं गेंदसिंह

• डॉ. डिश्वरनाथ खुटे

बस्तर रियासत छत्तीसगढ़ प्रभाग (मध्यप्रांत) की एक प्रमुख रियासत थी। यह रियासत छत्तीसगढ़ की सभी 14 रियासतों में सबसे बड़ी थी जिसकी राजधानी जगदलपुर थी।<sup>1</sup> यह रियासत  $17^{\circ}46'$  से  $20^{\circ}14'$  उत्तरी अक्षांश और  $80^{\circ}45'$  से  $82^{\circ}1'$  पूर्वी देशांश के मध्य 13062 वर्गमील क्षेत्र में विद्यमान थी।<sup>2</sup> रियासत की उत्तर से दक्षिण की लंबाई 180 मील एवं पूर्व से पश्चिम तक 125 मील चौड़ाई थी।<sup>3</sup> छत्तीसगढ़ के सुदूर दक्षिण में स्थित बस्तर भारत की स्वतंत्रता के बाद 1 जनवरी 1948 को जिला तथा 20 मार्च 1981 में संभाग बना। यह संभाग भौगोलिक क्षेत्रफल की दृष्टि से केरल राज्य से भी बड़ा है।

बस्तर, छत्तीसगढ़ राज्य का एक महत्वपूर्ण संभाग है। इसके इतिहास का अध्ययन इसलिए आवश्यक है क्योंकि वह सम्पूर्ण इतिहास को जोड़ने वाली कड़ी है। क्षेत्रीय इतिहास की जानकारी राष्ट्रीय चेतना की आधारशिला होती है। ज्ञान के अभाव में विद्वानों ने बस्तर को भारत का सोया हुआ दैत्य कहा है। अपनी सांस्कृतिक, पुरातात्विक तथा भौगोलिक विशिष्टताओं के कारण यह संभाग सभी के लिये आकर्षण का केन्द्र है। अपनी अपार वनसंपदा, खनिज संपदा, जलप्रपातों, गुफाओं और जनजातियों के कारण बस्तर संभाग न केवल देश में वरन् विदेशों में भी प्रसिद्ध है।

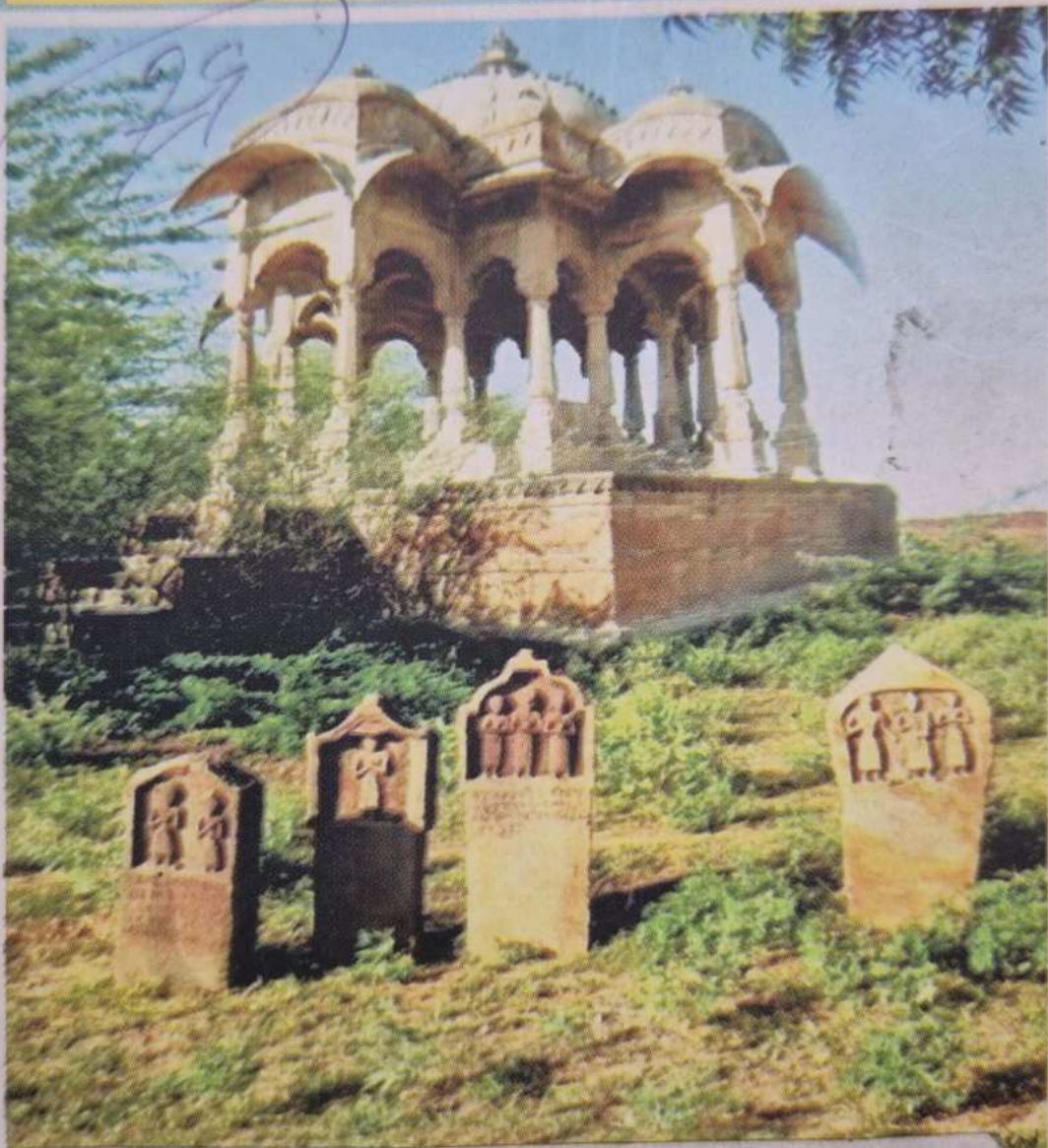
बस्तर की राजनैतिक धरा में नल, गंग, नाग व काकतीय राजवंश का वर्चस्व रहा जिसमें काकतीय राजवंश का शासनकाल 1324 ई. से 1947 ई. तक बना रहा। यद्यपि हैहय, मराठे और अंग्रेजी सत्ता समयानुसार इन पर नियंत्रण रखती रही। बस्तर रियासत में 13 प्रमुख जमींदारियां भी थी। 'बस्तर रियासत में जमींदारी प्रथा का आरंभ काकतीय वंश की स्थापना के साथ हुआ



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श्याम महर्षि



मरुभूमि शोध संस्थान

संस्कृति भवन

एन.एच. 11, श्रीडूंगरगढ़ (बीकानेर) राजस्थान



## महात्मा गाँधी और नेताजी सुभाष चंद्र बोस के वैचारिक संघर्ष के विविध आयाम

पूजा शर्मा • डॉ. डी.एन. खुटे

नायक की संज्ञा सामान्यतः उसे दी जाती है जो यथास्थितिवाद और असफलता के भय से परे अपना मार्ग स्वयं प्रशस्त करता है। हमारा स्वतंत्रता संघर्ष भी इससे अछूता नहीं रहा है, पूर्व में प्रयोग की गयी विचारधाराओं के वांछित परिणाम न मिलने, तत्कालिक राष्ट्रीय और अंतर्राष्ट्रीय परिस्थितियों तथा यथार्थपरकता के प्रति रुचि ने हमारे स्वतंत्रता नायकों को भिन्न-भिन्न मार्गों के अनुसरण हेतु प्रेरित किया, परन्तु एक समान ध्येय के होते हुए भी इनमें वैचारिक मतभेदों का उत्पन्न होना स्वाभाविक था।

इन वैचारिक असहमतियों का मूल तत्कालीन परिस्थितियों से प्रेरित था। सन् 1920-21 का वर्ष (जब नेताजी लंदन से वापस आए) जनता में असंतोष के अस्फुट स्वरों से प्रतिध्वनित था। प्रथम विश्व युद्ध के बाद अंग्रेजों का अपेक्षा के विपरीत व्यवहार, अंतर्राष्ट्रीय घटनाक्रम, आर्थिक समस्याओं, संवैधानिक कार्यों की असफलता ने जनता को उद्वेलित किया। तिलक और गोखले के निधन ने जो रिक्तता उत्पन्न की, उसे दोनों विचारधाराओं के उत्तराधिकारी के रूप में महात्मा गाँधी ने पूर्ण किया। कदाचित एक वर्ग ऐसा भी था जो तत्कालीन क्रांतिकारी विचारधारा, समाजवाद, अधिक व्यावहारिक मार्ग का समर्थक हुआ। इनमें से कुछ को नेताजी का भी समर्थन मिला। अपनी पुस्तक 'द इंडियन स्ट्रगल' में उन्होंने इस बात का उल्लेख किया है कि महात्मा गाँधी से प्रथम साक्षात्कार के बाद ही वे उनसे असहमत थे। स्वाभाविक है एक ओर अहिंसा सत्याग्रह के कई सफल प्रयोग किये हुए, गाँधी जी अपने सिद्धांतों के प्रति दृढ़ थे। वही स्वतंत्रता के लिये अपना सर्वस्व न्यौछावर कर आए युवा सुभाष के लिये स्वतंत्रता प्राप्ति के अतिरिक्त कुछ भी महत्वपूर्ण नहीं था।

समय के साथ महात्मा गाँधी ने अपने विचारों में कुछ परिवर्तन किये परंतु



# Innovation

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# बस्तर रियासत की पुलिस, जेल एवं सैन्य व्यवस्था (1854 ई.-1947 ई.)

**Police, Jail and Military System of Bastar State (1854 AD to 1947 AD)**

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**डि.श्वर नाथ खुटे**

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## सारांश

बस्तर रियासत में शांति व्यवस्था बनाये रखने के लिए पुलिस की व्यवस्था थी। पुलिस विभाग के प्रधानाध्यक्ष दीवान होते थे। सन् 1858 ई. में पंजाब पुलिस मैनुअल छत्तीसगढ़ में लागू किया गया तथा इसके अनुसार पुलिस कर्मचारियों को मिलने वाले पोशाक, हथियार, ड्रिल और उनके अनुशासन संबंधी नियम बनाये गये। मध्यप्रांत के निर्माण के पश्चात् 1862 ई. में पुलिस व्यवस्था के क्षेत्र में नवीन सुधार किये गए। प्रत्येक जिले में पुलिस अधीक्षक, सहायक अधीक्षक और प्रत्येक थाने में निरीक्षक, मुख्य आरक्षक व आरक्षक के पद सृजित किए गए। पुलिस द्वारा गिरफ्तार किये गये अपराधियों की व्यवस्था सजा उपरांत जेल में होती थी। बस्तर रियासत हेतु स्टेट जेल जगदलपुर में था जबकि सेंट्रल जेल रायपुर में स्थित थी। कैदियों के स्वास्थ्य परीक्षण की व्यवस्था थी। कैदियों को बागवानी व अन्य प्रकार की शिक्षा दी जाती थी। डिप्टी कमिश्नर जेल की व्यवस्था का निरीक्षण करते थे। जेल की साफ-सफाई को विशेष महत्व दिया जाता था। पहले बस्तर रियासत में राजा सैन्य दल का प्रधान होता था फिर दीवान का स्थान था। ब्रिटिश सर्वोच्चता के समय बस्तर रियासत को अंग्रेजी शासन पर आश्रित होना पड़ता था। 1876 ई. एवं 1910 ई. में हुए विद्रोह को ब्रिटिश सेना के बल पर ही दबाया जा सका था। इस समय बस्तर राजा ब्रिटिश शासन की अनुमति के बिना न तो दूसरे राज्य पर आक्रमण कर सकते थे और नहीं परस्पर सैनिक सहायता कर सकते थे।

There was a police system to maintain peace in the Bastar State. The Diwan was the head of the police department. In 1858 AD, the Punjab Police Manual was introduced in Chhattisgarh and according to rules was made regarding the costumes, weapons, drills and discipline given to the police employees. After the creation of Madhya Pradesh, new improvements were made in the field of policing in 1862 AD. The posts of Superintendent of Police, Assistant Superintendent and Inspector, Chief Constable and Constable in each police station were created in each District. The criminals arrested by the police were arranged in jail after the punishment. The State Jail for Bastar princely state was in Jagdalpur while the Central Jail was located in Raipur. There was a system of health testing of prisoners. The prisoners were given horticulture and other types of education.

**मुख्य शब्द :** रियासत, दीवान, अबूझमाड़, बैलाडीला, फ्यूडेटरी स्टेट, चीफ कमिश्नर, कोटवार, कारागार, बिसाहा, बेगारी, सेंट्रल जेल, बन्दूक।  
Riyasat, Diwan, Abujhmad, Bailadila, Fudatory State, Chief Commissioner, Kotwar, Jail, Bisaha, Begari, Central Jail, Gun.

## प्रस्तावना

### बस्तर का सामान्य परिचय -स्थिति, विस्तार एवं सीमाएँ

अंग्रेजी साम्राज्य के अंतर्गत एक सामंतीय राज्य के रूप में बस्तर 17°48' से 20°14' उत्तरी अक्षांश और 80°15' से 82°14' पूर्वी देशांश के मध्य स्थित था। बस्तर का क्षेत्रफल 13062 वर्गमील था, जो कि देश की चौथी बड़ी क्षेत्रफल वाली रियासत थी। उत्तर से दक्षिण तक लंबाई 183 कि.मी. तथा पूर्व से पश्चिम तक अधिकतम चौड़ाई 205 कि.मी. थी।<sup>1</sup> बस्तर रियासत के उत्तर में कांकेर रियासत एवं रायपुर जिला, पूर्व में जैपुर (उड़ीसा), दक्षिण में भद्राचलम तालुका और पश्चिम में चांदा जिला तथा हैदराबाद का निजाम राज्य विद्यमान था।<sup>2</sup>

भारत की स्वतंत्रता प्राप्ति के बाद 1 जनवरी 1948 ई. को बस्तर व कांकेर रियासत को मिलाकर बस्तर जिला का निर्माण किया गया तथा मध्यप्रांत में मिलाया गया। 20 मार्च 1981 को बस्तर को संभाग का दर्जा मध्यप्रांत में मिलाया गया। 20 मार्च 1981 को बस्तर को संभाग का दर्जा प्रदान किया गया। वर्तमान में प्रदान किया गया। वर्तमान में छत्तीसगढ़ राज्य के अंतर्गत बस्तर संभाग प्रशासनिक दृष्टि से 7 जिले 32 तहसीलों और 32 विकासखंडों में विभाजित है।<sup>3</sup>

### धरातलीय स्वरूप

बस्तर का धरातलीय स्वरूप सभी जगह एक समान नहीं है, कहीं पर अधिक ऊँचा तो कहीं पर नीचा है। बस्तर की भूमि समुद्र सतह से 160 से 180 मीटर तक ऊँची है।<sup>4</sup> प्राकृतिक दृष्टि से बस्तर को 6 भागों में बांटा जा सकता है—(1) उत्तर का निम्न या मैदानी भाग (2) केशकाल की घाटी (3) अबूझमाड़ की पहाड़ी क्षेत्र



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# बस्तर का नलवंश एक ऐतिहासिक पुनरावलोकन

\*डिश्वर नाथ खुटे

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सभ्यता का विकास पाषाण काल से प्रारंभ होता है। इस काल में बस्तर में रहने वाले मानव भी पत्थर के नुकीले औजार बनाकर नदी नाले और गुफाओं में रहते थे। इसका प्रमाण इन्द्रावती और नारंगी नदी के किनारे उपलब्ध उपकरणों से होता है। वैदिक युग में बस्तर दक्षिणापथ में शामिल था। रामायण काल में दण्डकारण्य को उल्लेख मिलता है। मौर्य वंश के महान शासक अशोक ने कलिंग (उड़ीसा) पर आक्रमण किया था, इस युद्ध में दण्डकारण्य के सैनिकों ने कलिंग का साथ दिया था। कलिंग विजय के बाद भी दण्डकारण्य का राज्य अशोक प्राप्त नहीं कर सका। वाकाटक शासक रुद्रसेन प्रथम के समय दण्डकारण्य में समुद्रगुप्त ने आक्रमण किया। उसने दक्षिणापथ के 12 राजाओं को परास्त किया था। समुद्रगुप्त ने 350 ई. में दक्षिण कोसल के राजा महेन्द्र (जो वाकाटक का करद सामंत था) तथा महाकांतार के राजा व्याघ्रराज को पराजित किया था। बस्तर में नलवंश का साम्राज्य 290 ई० से 950 ई० तक माना जाता है।

शब्द कुंजी:— तालुका, अबूझमाड़, बैलाडीला, दण्डकारण्य, महावन, कोश, चक्रकोट, भ्रमरकोट, एरकोट,।

बस्तर का सामान्य परिचय :

अंग्रेजी साम्राज्य के अंतर्गत एक सामंतीय राज्य के रूप में बस्तर 17048' से 20014' उत्तरी अक्षांश और 80015' से 8201' पूर्वी देशांश के मध्य स्थित था। बस्तर का क्षेत्रफल 13062 वर्गमील था, जो कि देश की चौथी बड़ी क्षेत्रफल वाली रियासत थी। उत्तर से दक्षिण तक लंबाई 183 कि.मी. तथा पूर्व से पश्चिम तक अधिकतम चौड़ाई 205 कि.मी. थी।<sup>1</sup> बस्तर रियासत के उत्तर में कांकेर रियासत एवं रायपुर जिला, पूर्व में जैपुर (उड़ीसा), दक्षिण में भद्राचलम तालुका और पश्चिम में चांदा जिला तथा हैदराबाद का निजाम राज्य विद्यमान था।<sup>2</sup>

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गया। वर्तमान में छत्तीसगढ़ राज्य के अंतर्गत बस्तर संभाग प्रशासनिक दृष्टि से 7 जिले 32 तहसीलों और 32 विकासखंडों में विभाजित है।<sup>3</sup>

भौगोलिक परिचय :

बस्तर रियासत की भू-पृष्ठ अनेक प्रकार की शैलों से निर्मित है। ये शैल अत्यंत प्राचीन है। भारतीय भू-वैज्ञानिक सर्वेक्षण विभाग के अनुसार बस्तर के शैलों को निम्नांकित 5 समूहों में बांटा गया है 1. विन्ध्यन शैल समूह 2. कड़प्पा शैल समूह 3. प्राचीन ट्रेप 4. आर्कियन ग्रेनाइट और नाइस 5. धारवाड़ क्रम।<sup>4</sup>

भूगर्भिक बनावट के फलस्वरूप बस्तर में पृथ्वी के प्राचीन शैल से लेकर आधुनिकतम नवीन चट्टाने पायी जाती है। बस्तर में मुख्यतः ग्रेनाइट, नाइस, शिस्ट एवं अन्य बलुआ पत्थर, चूना पत्थर, चट्टाने पायी जाती है। ये सभी चट्टाने ठोस तथा कठोर होती है। इनमें भूमिगत



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कला, मानविकी एवं वाणिज्य की मानक शोध पत्रिका

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# मराठा कालीन छत्तीसगढ़ की सामाजिक स्थिति का ऐतिहासिक पुनरावलोकन (सन 1741 से 1818)

डॉ० डिश्वर नाथ खुटे

शोध निर्देशक, इतिहास अध्ययन शाला, पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर (छत्तीसगढ़)

ममता श्रुव

शोधार्थी, इतिहास अध्ययन शाला, पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर (छत्तीसगढ़)

## सारांश-

छत्तीसगढ़ में अरण्यक तथा अर्ध-नागरिक सभ्यताएं एक साथ पाई जाती थी। अरण्यक सभ्यता के रूप में हमें आदिवासियों की अनोखी रीति-नीति दिखलाई पड़ती है। अर्ध-नागरिक सभ्यता के उन लोगों में दिखाई पड़ती है, जो यहां मैदानी क्षेत्र में दूसरे प्रदेश से आकर रहने लगे हैं। परिणामतः यहां की सभ्यता को मिश्रित सभ्यता कहा जा सकता है। अपनी इन्हीं भौगोलिक विशेषताओं के कारण छत्तीसगढ़ अपने में अनेक संस्कृतियों का पोषण कर उन्हें बनाये रखने में सफल रहा है।

सामान्यतः आधुनिकतम सभ्यता इस क्षेत्र से प्रायः दूर ही रही है। कारण यह है कि इस भौगोलिक रचना ने इसके सामाजिक जीवन को बहुत अधिक प्रभावित किया है। यहां के लोग प्रकृति पर ही निर्भर रहते हैं और प्रकृति की अनुकम्पा प्राप्त करने के लिये अनेक देवी-देवताओं की आराधना-अर्चना करते रहे हैं। समय-समय पर जो अन्य लोग (इस क्षेत्र के बाहर के लोग) यहां आये उनका प्रभाव भी यहां के निवासियों के जीवन पर पड़ा है।

लोग स्वभाव से सरल, उदार, कृतज्ञ और सहिष्णु होते थे। शिक्षा की कमी एवं शासकों की उपेक्षा के कारण यहां के जीवन में विशेष विकास या सुधार सैकड़ों वर्षों तक नहीं हो सका था और बहुत कुछ सीमा में यह पिछड़ापन आज भी अपने पूर्ण रूप से विद्यमान है। छत्तीसगढ़ में यद्यपि वर्ण-व्यवस्था प्रचलित थी तथापि उनमें कट्टरता कम थी। ब्राह्मण लोग पूजनीय माने जाते थे। क्षत्रिय और वैश्य भी समान आदर के अधिकारी थे।

छुआछूत का भी अधिक प्रचार नहीं था। इसके विपरीत समय-समय पर जादू-टोने आदि के व्यभिचार-कृत्यों में शूद्र-वर्ग को जो इसमें निष्णात माने जाते थे बहुत आदर प्राप्त होता था। बैगा, गुनिया आदि लोगों का समाज में सम्मान होता था। आदिवासी क्षेत्रों 565 में तो इनका महत्वपूर्ण स्थान था। आदिवासी सभ्यता का प्रभाव मैदानी सभ्यता पर भी पड़ा। इसलिए तन्त्र-मन्त्र सम्बन्धी कृत्यों के लिये सम्पूर्ण छत्तीसगढ़ एक ही प्रकार की मान्यता वाला क्षेत्र बन गया।

अन्ध-विश्वास का यहां महत्वपूर्ण स्थान रहा है। कभी-कभी तो यह भावना पराकाष्ठा को पहुँच जाती थी और वशीकरण, उच्चाटन आदि विद्याओं में निपुण व्यक्तियों को ग्राम-बहिष्कार शारीरिक यातना और कभी-कभी प्राण-दण्ड की सजा का भी भाजन होना पड़ता था। वर्तमानकाल की ही तरह आलोच्य काल में भी छत्तीसगढ़ के गाँवों के लोग प्रायः कृषि कार्य करते थे। इस कार्य में सभी वर्गों के लोगों में सहयोग एवं सहकारिता की भावना होती थी।

विशिष्ट धंधा करने वाले लोगों को समाज में विशेष सम्मान प्राप्त होता था। लुहार, नाई, धोबी, कुम्हार और कहार आदि को अवसर के अनुकूल अभीष्ट सम्मान मिलता था। यहां के समाज में यथा सम्भव समानता का व्यवहार किया जाता था। अंग्रेजों के आगमन के पूर्व छत्तीसगढ़ की सामाजिक दशा का उल्लेख अंग्रेजी अभिलेखों में भी मिलता है।

शब्द कुंजी-वेशभूषा, रीति, रिवाज, भाषा, प्रकृतिवाद, धर्म, संस्कार, जनजाति, सहकारिता, सभ्यता।

## उद्देश्य-

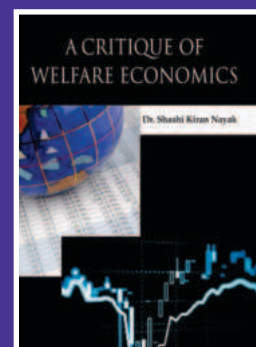
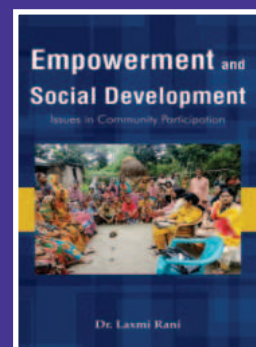
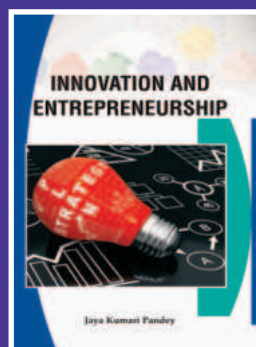
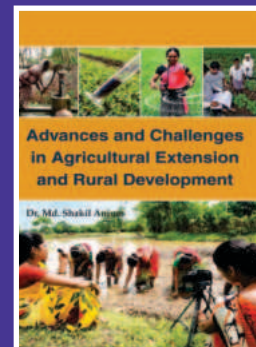
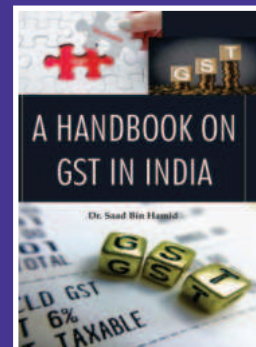
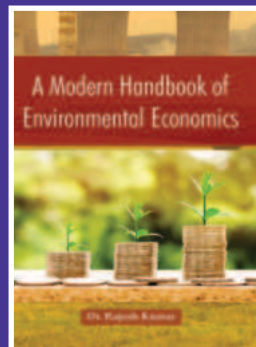
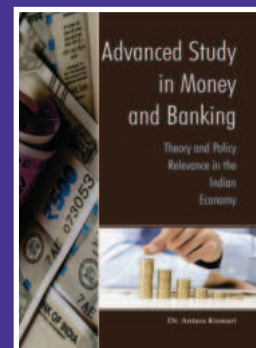
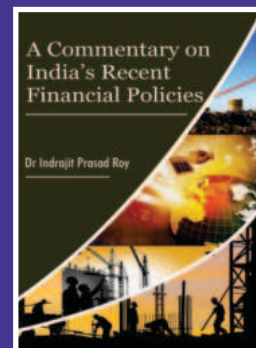
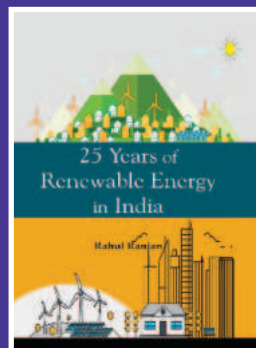
इस अध्ययन का लगातार बदलती राजनीति के दौर में मराठा कालीन शासन व्यवस्था का छत्तीसगढ़ की सामाजिक स्थिति पर पड़ने वाले प्रभाव का अध्ययन करना। पाश्चात्य सभ्यता व संस्कृति के आगमन से छत्तीसगढ़ के सामाजिक एवं आर्थिक ढांचे में आमूल-चूल परिवर्तन होने लगे। शोधार्थी की इस विषय पर अध्ययन करने के पीछे निहित उद्देश्य उस काल के लोगों के आचार, विचार, पहनावा, भाषा, व्यवहार व शिष्टाचार में पड़ने वाले प्रभाव का अध्ययन करना है।



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IMPACT FACTOR : 5.051

# छत्तीसगढ़ में बुनियादी शिक्षा का ऐतिहासिक अनुशीलन ( जेनसन मेमोरियल उच्चतर माध्यमिक विद्यालय जगदीशपुर के विशेष संदर्भ में )

डॉ० बन्सो नुरूटी

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रणजीत कुमार

शोधार्थी, इतिहास अध्ययनशाला, पं. रविशंकर शुक्ल विश्वविद्यालय ( छ.ग. )

## सारांश:-

भारतीय शिक्षा का इतिहास भारतीय सभ्यता का भी इतिहास है। संसार का इतिहास इस बात का साक्षी है कि ज्ञान की सर्वप्रथम किरण भारत की भूमि पर प्रस्फुटित हुई थी और शिक्षा का शुभारम्भ भी सबसे पहले इसी भूमि पर हुआ था। हमारे देश में वैदिक काल में शिशु की शिक्षा गर्भावस्था से प्रारम्भ होने का उल्लेख मिलता है। भारतीय समाज के विकास और उसमें होने वाले परिवर्तनों की रूपरेखा में शिक्षा की जगह और उसकी भूमिका को भी निरंतर विकासशील पाते हैं। सूत्रकाल तथा लोकायत के मध्य शिक्षा की सार्वजनिक प्रणाली के पश्चात् हम बौद्धकालीन शिक्षा को निरंतर भौतिक तथा सामाजिक प्रतिबद्धता से परिपूर्ण होते देखते हैं। बौद्धकाल में महिलाओं और शूद्रों को भी शिक्षा की मुख्यधारा में सम्मिलित किया गया।

प्राचीन भारत में जिस शिक्षा व्यवस्था का निर्माण किया गया था वह समकालीन विश्व की शिक्षा व्यवस्था से उत्कृष्ट थी लेकिन कालान्तर में भारतीय शिक्षा व्यवस्था का ह्रास हुआ। ब्रिटिश सरकार ने यहां की शिक्षा व्यवस्था को उस अनुपात में विकसित नहीं किया, जिस अनुपात में होना चाहिए था।

**शब्द-कुंजी:-** गर्भावस्था, प्रतिबद्धता, बुनियादी, सर्वांगीण, सोसायटी, हस्तांतरित।

**अध्ययन पद्धति:-** प्रस्तुत अध्ययन जेनसन मेमोरियल उच्चतर माध्यमिक विद्यालय जगदीशपुर के बुनियादी शिक्षा पर केन्द्रित है। प्रस्तुत अध्ययन प्राथमिक एवं द्वितीयक स्त्रोतों पर आधारित है। इसके अतिरिक्त पं. सुन्दरलाल शर्मा ग्रंथागार, रायपुर के विभिन्न पुस्तकों का अध्ययन किया।

## भूमिका

शिक्षा बालक के सर्वांगीण विकास का आधार मानी जाती है। बालक को व्यवहारिक एवं सामाजिक बनाये जाने की कल्पना को साकार केवल शिक्षा के माध्यम से ही किया जाता है। शिक्षा व्यक्ति के विकास का वह नाम है जो कि उसे सक्षम बनाये, उसकी अर्न्तनिहित शक्तियों को प्रस्फुटित करे, ज्ञान का प्रकाश फैलाकर अन्धकार दूर करने में समर्थ हो। शिक्षा एक सतत् चलने वाली एक गतिशील प्रक्रिया है जो व्यक्ति के जन्म से लेकर मृत्युपर्यन्त तक निरन्तर चलती रहती है। शिक्षा ही व्यक्ति को सुसंस्कारित करके समाज का एक अच्छा नागरिक बनाता है। शिक्षा वह आधारशिला है जिस पर न केवल व्यक्ति अपितु समाज का भविष्य भी निर्भर है। प्रत्येक व्यक्ति को अपने विकास एवं अपने ज्ञान व अनुभव में वृद्धि के लिए शिक्षा की आवश्यकता होती है। व्यक्ति को अपने निर्वहन की प्रत्येक परिस्थितियों और विभिन्न रूपों में एक व्यक्ति का सीखना अपने ज्ञान में वृद्धि करना ही शिक्षा कहलाती है।<sup>1</sup> शिक्षा को जीवन के विभिन्न क्षेत्रों में पथप्रदर्शित करने वाला प्रकाश माना गया है। शिक्षा वह प्रकाश है जो व्यक्ति को अपना बहुरंगी विकास करने उत्तम जीवन व्यतीत करने और मोक्ष प्राप्त करने में सहायता करती है। इस कथन की पुष्टि के लिए डॉ. ए. एस. अल्लेकर का वाक्य उल्लेखनीय है वैदिक युग से लेकर आज तक भारत में शिक्षा का मूल तात्पर्य यह रहा है कि शिक्षा प्रकाश का वह स्रोत है जो जीवन के विभिन्न क्षेत्रों में हमारा सच्चा पथ प्रदर्शक करती है।<sup>3</sup> बालक की शिक्षा का प्रारम्भ शैषवावस्था से ही हो जाता है। भारतीय प्राचीन ग्रंथों में यह भी उल्लेख मिलता है कि बालक माता के गर्भ में ही रहकर सीख लेता है जैसे महाभारत में अभिमन्यु अपनी माता के गर्भ में रहकर ही चक्रव्यूह की रचना का ज्ञान सीखता है। व्यक्ति की शिक्षा उसके शैषवावस्था से ही प्रारम्भ हो जाती है और जीवन पर्यान्त निरन्तर व गतिशील प्रक्रिया के रूप में चलती रहती है।

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# मुरिया जनजाति का परम्परागत शिक्षा केन्द्र: घोदुल

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## सारांश

जनजातीय संस्कृतियों की प्रचीनतम और मौलिक संस्थाएँ उनकी विशेषताएँ हैं, घोदुल उनमें से एक है। यह मुरिया जनजाति की एक ऐसी संस्था है, जो सामूहिक दृष्टिकोण से बहुत महत्वपूर्ण है। युवक-युवतियों की प्रगति के लिए जनजातीयों कितने राजग हैं तथा उनकी चतुर्मुखी अभिवृद्धि के लिए वे क्या-क्या करते रहते हैं, इसकी जानकारी हमें इस संस्था के ऐतिहासिक अध्ययन एवं वर्तमान स्वरूप से भलीभाँति प्राप्त होता है। घोदुल अविवाहित लड़के एवं लड़कियों का एक ऐसा संगठन है, जिसका कार्य उन्हें अपने समाज की संस्कृति से परिचय कराना तथा अपनी संस्कृति के अनुरूप उनके मानसिक विकास को सुनिश्चित करना है। जनजाति परम्परा को एक पीढ़ी से दूसरी पीढ़ी तक पहुँचाने वाली यह संस्था अपने युवक-युवतियों को सामाजिक भूमिका निभाना सिखाती है। इसके माध्यम से वे अपनी संस्कृति को पारगत बनाते हुए उसके आधारभूत कार्य-सिद्धान्त द्वारा संगठन को सुदृढ़ता प्रदान करते हैं। यही कारण है कि घोदुल में प्रदत्त प्रशिक्षण से जनजाति जीवन में जो प्रभावकारी सहकारिता का विकास हुआ है, वह किसी दूसरे संगठन में सम्भव नहीं है। मुरिया जनजाति में प्रचलित परम्परागत शिक्षा का केन्द्र घोदुल आज भी कहीं-कहीं देखने को मिलता है। घोदुल एक पाठशाला है, जहाँ युवक-युवतियों को समाज के प्रति दायित्व, कर्तव्य-निष्ठा, व्यवहार, अनुशासन, सेवा, सामुदायिक जीवन और चरित्र निर्माण का प्रशिक्षण दिया जाता है। इसमें दस वर्ष के ऊपर आयु के सभी अविवाहित लड़के-लड़कियाँ एकत्रित होकर नृत्य संगीत के द्वारा मनोरंजन करते हैं। यहाँ के युवक को चेलिक और युवती को मोटियारी कहा जाता है।

**शब्द कुंजी:** सहभागिता, चेलिक, मोटियारी, कुमारगृह, वनोपधियों, सौंदर्य, अद्वितीय, सांस्कृतिक, धार्मिक, और बौद्धिक।

**अध्ययन का उद्देश्य:** मुरिया समाज का परम्परागत शिक्षा केन्द्र-घोदुल का ऐतिहासिक अध्ययन कर उसे प्रकाश में लाना शोधार्थी का मुख्य उद्देश्य है।

**अध्ययन पद्धति:** प्रस्तुत अध्ययन वस्तु की मुरिया जनजाति का युवागृह-घोदुल पर केन्द्रित है। जहाँ मुरिया जनजाति के युवक-युवतियों को परम्परागत सामाजिक एवं सांस्कृतिक शिक्षा प्रदान की जाती है। प्रस्तुत अध्ययन प्राथमिक एवं द्वितीयक स्त्रोतों पर आधारित है। इसके अतिरिक्त पं. सुन्दरलाल शर्मा ग्रंथागार, रायपुर में विभिन्न पुस्तकों का अध्ययन किया।

## भूमिका

आदिमकाल से जब मानव सभ्यता का विकास हुआ, तब से शिक्षा मानव जीवन का एक महत्वपूर्ण अंग रहा है। बिना शिक्षा के मानव को असम्भव समझा जाता है। आदिमकाल में युवकों को गाँव तथा शहर से दूर विगन वन में जाकर ऋषि-मुनियों के सानिध्य में रहकर शिक्षा प्राप्त करना होता था। इसे गुरुकुल शिक्षा भी कहा जाता है। इस शिक्षा केन्द्र में जहाँ युवाओं को सामाजिक, राजनीतिक, आर्थिक एवं धार्मिक शिक्षा प्रदान की जाती थी वहीं इसके साथ-साथ उन्हें व्यवस्था रखा व चरित्रात्मक निर्माण की शिक्षा भी दी जाती थी। इस प्रकार की सम्पूर्ण शिक्षा से मानव का नैतिक विकास होता था। इसी प्रकार की शिक्षा भारत की जनजातीय समुदायों में आदिमकाल से प्रदान की जा रही है। जिसे विभिन्न जनजातियों में भिन्न-भिन्न नामों से जाना जाता है, जैसे- अगामी नागा जनजाति में 'किन्बुकी', गारो जनजाति में 'नोकपाते', मुण्डा तथा हो जनजाति में 'गिटिओरा', उराँव जनजाति में 'धुमकुरिया', भोटिया जनजाति में 'रंग-बग', गोंड एवं मुरिया जनजाति में 'घोदुल' या 'गोदुल' आदि। घोदुल वास्तव में नैप्य विहार के 'कुमारगृह' हैं, जिसे अंग्रेजी में 'डार्मिटरी' तथा जर्मन भाषा में 'कुटिलियस हाउस' कहते हैं।

यहाँ यह स्पष्ट कर देना समीचीन होगा कि मुरिया जनजाति की संस्था घोदुल का वास्तविक नाम गोदुल है। यह गोडी भाषा का संयुक्त शब्द 'गो-दुल' का नाम से बना हुआ है। जहाँ गो यानि गीगा अर्थात् दुःख और दुल क्लेश निवारण शक्ति, जिसे विद्या कहा जाता है और दुल यानि ठिया या ताना अर्थात् स्थल। इस तरह गोदुल का अर्थ गीगा स्थल अर्थात् विद्या स्थल है।

मुरिया जनजाति की संस्था घोदुल सामाजिक, सांस्कृतिक, धार्मिक, और बौद्धिक शिक्षा का केन्द्र है और इसीलिए विश्व की सर्वाधिक विकसित एवं



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डॉ० बन्सो नुरुटी

सहायक प्राध्यापक, इतिहास अध्ययनशाला पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर (छ.ग.)

## सारांश

संसार में कुल आबादी की लगभग आधी आबादी महिलाओं की हैं। विश्व के सभी देशों में महिलाओं ने कल्याणप्रद समाज के निर्माण में महत्वपूर्ण भूमिका निभाई हैं। अपने देश के उच्चतम मूल्यों का संरक्षण महिलाओं ने ही किया है। समाज की रीति-रिवाज एवं परम्पराओं को भी अपने श्रम और ज्ञान से जीवित भी महिलाओं ने ही रखा है। संभवतः इसलिए चिन्तकों ने स्पष्ट कहा कि किसी समाज की वास्तविक दशा और उसका स्तर उसमें रहने वाली महिलाओं की स्थिति से प्रमाणित होता है। सिंधु घाटी के विभिन्न स्थलों पर की गयी खुदाई में महिलाओं की कई मृणमूर्तियाँ प्राप्त हुई हैं। मोहन जोदड़ो से एक कांस्य नर्तकी की मूर्ति प्राप्त हुई है, जो कि आज की आदिवासी कन्याओं से समानता रखती है। महिलाओं की प्रतिमाएँ अत्यधिक मिलने से ऐसा प्रतीत होती है कि सैन्धव समाज मातृसत्तात्मक था। पुरापाषाण काल में भी मातृसत्तात्मक समाज की जानकारी मिलती है। अतः प्रागैतिहासिक एवं आद्य ऐतिहासिक काल में हमें भारत में मातृसत्तात्मक समाजों की जानकारी मिलती है जो कि निश्चित रूप से महिलाओं की प्रतिष्ठा को प्रदर्शित करती है। आज भी गोंड समाज व प्रत्येक गांव में ठाकुरदाई एवं जिमीदारिन माता विराजित है, गांव का कोई भी शुभ कार्य करने के पहले इसकी पूजा की जाती है। गोंडों में विवाह अवसर पर कन्या के लिए वर पक्ष को वधु-मूल्य चुकाना पड़ता है। यह उनकी मजबूत स्थिति का सूचक है।

**शब्द कुंजी:**-प्रागैतिहासिक, मातृसत्तात्मक, सृजनात्मक, पुरातत्वविद, उत्तराधिकारी, परिस्थिति, हथियार, स्वामिनी, जमाई, टोटम।

**अध्ययन का उद्देश्य:**- महिला परिवार, समाज व राष्ट्र की रीढ़ की हड्डी होती है। जब महिला शिक्षित, स्वस्थ और जागृत होगी, तब परिवार, समाज व राष्ट्र का विकास होगा। सशक्त महिला से ही सशक्त समाज की कल्पना की जा सकती है। गोंड समाज में महिलाओं की स्थिति का ऐतिहासिक अध्ययन कर उसे प्रकाश में लाना, शोधार्थी का मुख्य उद्देश्य है।

**अध्ययन पद्धति:**- प्रस्तुत अध्ययन कांकेर जिले की गोंड जनजातीय महिलाओं की स्थिति पर केन्द्रित है। प्रस्तुत अध्ययन प्राथमिक एवं द्वितीयक स्रोत पर आधारित है। इसमें कांकेर जिले के 100 उत्तरदाताओं का चयन कर समाजशास्त्रीय साक्षात्कार विधि से तथ्यों का संकलन किया गया है एवं इसके अतिरिक्त पं. सुन्दरलाल शर्मा ग्रंथागार के विभिन्न पुस्तकों का भी उपयोग किया गया है। इस अध्ययन में गोंड महिलाओं की स्थिति का ऐतिहासिक विश्लेषण किया गया है।

## भूमिका

प्रागैतिहासिक युग में महिला वर्ग एवं पुरुष वर्ग की समान साझेदारी थी। पुरुष एवं महिला दोनों ही शिकार करते थे और गृह कार्यों में भी बँटवारा नही हुआ था। प्रजनन क्षमता के कारण महिला को सृजनात्मक शक्ति का द्योतक माना जाता था। उत्तर प्रदेश के मिर्जापुर जिले की बेलन घाटी के उत्खनन से प्राप्त नारी प्रतिमा के विषय में श्री सांकलिया लिखते हैं कि निश्चय ही यह नारी प्रतिमा पश्चिमी एशिया तथा पूर्वी यूरोप में प्रचलित आदि-युगीन सृजनात्मक मातृ देवी के समान प्रतीत होती है। जब सिंधु घाटी की खुदाई सर जॉन मार्शल, मौके, व्हीलर, प्रो. आर. डी. बनर्जी, दया राम साहनी आदि पुरातत्वविदों के निदर्शन में हुआ तब इस घाटी से अनेक मृण मूर्तियाँ प्राप्त हुई हैं जिनमें वक्ष और उदर काफी उभरे हुए हैं जो सृजनात्मक शक्ति के द्योतक माने जा सकते हैं। नृत्यांगना की कांस्य प्रतिमा की प्राप्ति भी उत्खनन में हुई है जिससे यह प्रमाणित किया जा सकता है कि महिलाएँ ललित कला में निपुण थीं। मुहरों पर भी अनेक नारी चित्र उत्कीर्ण हैं, जो उत्खनन द्वारा प्राप्त हुई हैं। एक मुहर पर स्त्री के गर्भ से वनस्पति का जन्म होता दिखाया गया है। मातृ देवी को मनुष्य, पशु एवं वनस्पति की जन्मदात्री माना जाता था। उसे उर्वरता की देवी भी माना जाता था।

मातृसत्तात्मक परिवार व्यवस्था जनजातियों की प्रमुख विशेषता थी। ऐसी व्यवस्था के विकास का संबंध मातृदेवी की उपासना से था इस कारण निश्चय ही इसका जन्म पश्चिम एशिया में हुआ जो बाद में सुमेरियन लोगों के आगमन के साथ-साथ भारत पहुँच गई, मगर दूसरी ओर पितृसत्तात्मक परिवार-व्यवस्था आर्यों में प्रचलित थी। मातृ सत्तात्मक परिवार में परिवार की सबसे बड़ी बेटी परिवार की धन-दौलत, भूमि तथा राज्य की वास्तविक उत्तराधिकारी होती है। जबकि आर्यों में सबसे बड़ा बेटा उत्तराधिकारी होता है। मातृसत्तात्मक व्यवस्था आज भी पूर्वी तथा दक्षिण भारत की जनजातियों में प्रचलित है।



# छत्तीसगढ़ के कुष्ठ आश्रम और इसकी पुनर्वास योजना का ऐतिहासिक विश्लेषण ( धमतरी जिले की शांतिपुर कुष्ठ आश्रम के विशेष संदर्भ में )

रणजीत कुमार

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## सारांश

छत्तीसगढ़ आदिवासी बाहुल्य प्रदेश है। इस अंचल के मूल निवासी दूरस्थ वनों से आच्छादित क्षेत्रों में निवास करते हैं। यहाँ के लोग एक गम्भीर चर्म रोग (कुष्ठ) से ग्रसित हैं। यह बीमारी लेप्रोबेसिलाइ जीवाणु के द्वारा एक व्यक्ति से दूसरे व्यक्ति में फैलती है। समाज कुष्ठ रोगियों को अभिषिप्त और हीन दृष्टि से देखता है। धमतरी क्षेत्र में कार्यरत अमेरिका के मेनोनाइट मिशन के मिशनरियों ने कुष्ठ रोगियों की व्यथा को देखकर उनके इलाज एवं उन्हें आश्रय प्रदान करने की योजना बनाई। इस योजना की क्रियान्वयन हेतु मेनोनाइट मिशन बोर्ड और मिशन टूलैपर्स संयुक्त रूप से कार्य करना प्रारंभ किया। इस मिशन के द्वारा शुरूआत में धमतरी के रानी बगोचा में कुष्ठ रोगियों का इलाज किया गया। कालान्तर में शांतिपुर में कुष्ठ रोगियों की उपचार हेतु व्यवस्थित रूप से अस्पताल व आश्रम आदि का निर्माण किया गया। रोगियों के इलाज के साथ-साथ उनके शिक्षा और उन्हें आर्थिक रूप से स्वावलंबी बनाने के लिए कौशल प्रशिक्षण भी दिया जाता था, जिससे वे एक सम्मानजनक जीवन व्यतीत कर सकें। इसके अलावा मिशनरियों ने एस.ई.टी. कार्यक्रम के अन्तर्गत गाँव-गाँव जाकर रोगियों का पता लगाकर उनका इलाज और उन्हें स्वास्थ्य संबंधित शिक्षा से जागरूक करने का काम किया। कुष्ठ रोगियों के आश्रित बच्चों एवं रिश्तेदारों के लिए अलग से भूमि खरीदकर तीन गाँव बसाये गये, जिसे संयुक्त रूप से मंगलतराई कहा जाता है। लंबे समय तक अमेरिका से मेनोनाइट मेडिकल बोर्ड के द्वारा मिशनरी डॉक्टर कुष्ठ रोगियों के उपचार हेतु भेजे जाते थे, परन्तु बाद में द लेप्रोसी मिशन सभी प्रशासनिक कार्य एवं इलाज का कार्य भार संभाला।

**शब्द कुंजी:-** बाहुल्य, आच्छादित, अभिषिप्त, क्रियान्वयन, स्वावलंबी, कौशल, हस्तान्तरित, जागरूकता।

**उद्देश्य:-** ईसाई मिशनरियों के शांतिपुर की कुष्ठ आश्रम में रोगियों की उपचार एवं उनके पुनर्वास योजना का ऐतिहासिक विश्लेषण किया गया है।

**अध्ययन पद्धति:-** प्रस्तुत शोध-पत्र छत्तीसगढ़ के धमतरी जिले की शांतिपुर कुष्ठ आश्रम एवं पुनर्वास योजना पर केंद्रित है। प्रस्तुत अध्ययन प्राथमिक एवं द्वितीयक स्रोतों पर आधारित है। इसमें व्यक्तिगत भेंटवार्ता के माध्यम से तथ्यों का संकलन किया गया है एवं इसके अतिरिक्त आधुनिक तकनीक इंटरनेट सुविधा व पं. सुन्दरलाल शर्मा ग्रंथागार के विभिन्न पुस्तकों का भी उपयोग किया गया है। इस अध्ययन में छत्तीसगढ़ के कुष्ठ आश्रम और इसकी पुनर्वास योजना का ऐतिहासिक विश्लेषण करने का प्रयास किया गया है।

**भूमिका:-** कुष्ठ जीवाणु जन्य रोग है परन्तु समाज में व्याप्त अवैज्ञानिक मान्यताओं व अंधविश्वासों के फलस्वरूप कुष्ठ रोग को छुपाया जाता है, जिससे इस रोग की सही स्थिति का आंकलन कठिन होता है। छत्तीसगढ़ राज्य में कुष्ठ रोग की समस्या अभी भी बनी हुई है। यह एक ऐसी बीमारी है जो वायु में मौजूद जीवाणु के द्वारा फैलती है। वायु में ये जीवाणु किसी बीमार व्यक्ति से ही आते हैं। इसलिए इसे संक्रामक रोग भी कहते हैं। यह संक्रमण सांस के द्वारा फैलती है। लेकिन यह छुआछूत की बीमारी बिल्कुल नहीं है। यदि स्वस्थ व्यक्ति किसी कुष्ठ रोगी से हाथ मिलायेगा या उसे छूयेगा तो यह बीमारी नहीं होगी। लेकिन कुष्ठ रोगी के खांसने, छींकने से लेप्रोबेसिलाइ जीवाणु वायु में मौजूद नमी के साथ ट्यूनिंग करके स्वयं को विकसित कर लेता है और स्वस्थ व्यक्ति उस वायु में मौजूद नमी के उन कणों को सांस के द्वारा अपने अन्दर लेता है, तब वह संक्रमित होता है।

**लक्षण:-** कुष्ठ रोगी के चेहरे के रंग में शुरूआती दौर में बदलाव होने लगता है। कुछ मरीज का चेहरा सुनहरा हो जाता है तो कुछ का रंग काला पड़ जाता है। उसके बाद चमड़े में सुनापन आने लगता है। हाथ-पैरों में सूजन आ जाती है। पैरों में झीनझीनी होने लगती है। धीरे-धीरे प्रभावित अंगों में दर्द होने लगता है। अगर मरीज ने इस पर ध्यान नहीं दिया तो यह बीमारी बढ़ने लगती है और विकलांगता की स्थिति बनने लगती है। मरीज को पलक झपकाने में दिक्कत होने लगती है, क्योंकि जीवाणु मरीज के आंखों की नसों को प्रभावित करता है। इसके हर वक्त खुला रहने के कारण आंखें ड्राई होने लगती हैं।



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## **The Concept of Right to Health: A Study of its Evolution, Constitutional Provisions and Judicial Perspective in India**

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### **Abstract**

In India, the concept of 'health' has been accorded prime importance at all stages of its historical development. In ancient period, utmost priority was given to hygiene and a clean environment which is key to health. Moreover, during that period, Ayurveda system of medicine flourished and great physicians like Charaka and Susruta rendered their great service to serve the ailing mankind. During the Mughal Rule, the Unani and Siddha medicine flourished and thereafter, during the British Rule the modern system of medical science was born. After independence, 'health' was included in the category of non-justiciable rights under the Directive Principles of State Policy which depended upon the will of the States for its implementation. But the Supreme Court of India realizing the importance of 'health' granted it the status of Fundamental Rights by bringing it within the ambit of 'Right to Life' under Article 21 through its landmark decisions. Since this right is not explicitly mentioned in the Constitution, there is lack of awareness resulting in the violation of this important right. Hence, in order to make the people more vigilant, there is a need to expressly incorporate the 'Right to Health' under Article 21 by constitutional amendment just like the Right to Education under Article 21A.

**Keywords:** Right, Health, Constitution, Life, Fundamental rights, Directive principles

### **Introduction**

The concept of 'right to health' is a basic human right and has become the most burning and debated issue all over the world particularly after the outbreak of the COVID-19 pandemic. India is a democratic country which has flourished upon the idea of setting up a welfare state in the country by assuring various fundamental rights and freedoms to the people. The various fundamental rights are assured in Part III under Articles 12-35 of the Constitution of India. Although the right to health is not expressly mentioned in the Constitution of India, it has now



## भारत में विलम्बित न्यायिक व्यवस्था एवं पारदर्शिता पर समीक्षात्मक अध्ययन

डॉ.ए.के. साहू

सारांश

हमारे देश की न्यायिक व्यवस्था "विरोधात्मक प्रणाली" पर आधारित है अर्थात् न्याय के पहले विरोधीपक्ष का पर्याप्त अवसर दिया जाता है जिसमें कहानी के दो पहलू एवं दो पक्षों के कथन के साथ साक्ष्य पर निष्कर्ष उपसंहार तय किये जाते हैं, हमारे न्यायधीशगण अपने निर्णयों आदेशों से कानून का विकास एवं पुर्ननिर्माण की रूपरेखा तैयार करते हैं। भारतीय न्यायिक प्रणाली दुनिया की सबसे पुरानी न्यायिक प्रणालियों से एक होते हुए भी यहाँ न्यायिक ढांचा का पर्याप्त अभाव है। खर्चीली न्याय के कारण न्याय बहुसंख्यक लोगों के पहुंच के बाहर है।

### बैकलॉग एवं विलम्बित न्यायिक व्यवस्था:-

हमारे देश में लम्बित मामलों का "बैकलॉग" है। "बैकलॉग" के लिये न्यायिक संस्था अपनी जवाबदेही को स्वीकार नहीं कर रही है जबकि विश्व के सबसे ज्यादा लम्बित मामलों की संख्या भारत में है। उच्चतम न्यायालयों में 60,000 उच्च न्यायालयों में लगभग 44 लाख तथा जिला न्यायालयों में लगभग तीन करोड़ मामले लम्बित हैं। दोषी शासन है जिसमें देश में प्रति 10 लाख पर 18 न्यायाधीश हैं, आवश्यकता 50 की है। "न्यायिक बैकलॉग" ने भारतीय जेलों में विचाराधीन कैदियों की संख्या बढ़ा दिया है। सजा से अधिक "विचाराधीन कैदी" दण्ड भोग रहे हैं, खुद के बचाव का खर्च व उनका दर्द वास्तविक सजा से अधिक हो गयी है। हमें ब्रिटिश न्यायिक सेटअप विरासत से मिली है, उसके हम कोई सुधार नहीं कर पाये। संविधान की प्रस्तावना, मूल अधिकार के अनुच्छेद 14, 19, 21, 32, 226 के अलावा राज्य के नीति निदेशक तत्व के बाद भी समय रहते न्याय देने में भारतीय न्यायपालिका 'कमजोर' रही है एवं अपने दायित्वों का निर्वहन में सक्षम साबित नहीं हुई न उसे प्रक्रिया ने सक्षम साबित होने दिया। न्याय में विलम्ब ने मानव जीवन की नकारात्मकता को बढ़ावा दिया है। 90% लोग अदालतों एवं वकीलों के चक्कर में जाना नहीं चाहते। आरोपी की मृत्यु हो जाने के बाद उसका फैसला आता है। विचाराधीन कैदी 10 वर्ष कैद में रहने के बाद निर्दोष घोषित किये जा रहे हैं। विवाद को सुलझाने की कोई निश्चित अवधि निर्धारित नहीं की गई। अधिवक्ताओं एवं सुनवाई का युक्तियुक्त अवसर पर सीमायें निर्धारित नहीं की गई जिसका अधिवक्ता फायदा उठा रहे हैं।

जब हम स्वतंत्र हुए थे तो हम एक सुई तक नहीं बना पाते थे परन्तु आज अंतरिक्ष में कदम रख लिये हैं। भारतीय लोकतंत्र विश्व का बड़ा संसदीय लोकतंत्र के साथ शक्तिशाली लोकतंत्र के रूप में विश्व जगत में स्थान बना लिया है। विश्व के आर्थिक व्यवस्था में हमारा स्थान पांचवी सबसे बड़ी आर्थिक लोकतंत्र के रूप में है। वही न्यायिक तंत्र में हमें निराशा हाथ लगी है। राम रहिम के पीड़ित साहनी को अपनी पीड़ा प्रधानमंत्री को पत्र लिखकर बताना पड़ा एवं उसे न्याय मिलने में 15 वर्ष के साथ एक भाई को खोना पड़ा। बलात्कार की पिड़ित एक बालिका एवं अबोध बच्ची को कानूनी दाव पेंचों में ऐसे उलझाया गया कि उसे 12 वर्ष के उम्र के आस-पास एक बालिका को जन्म देना पड़ा। भारतीय लोकतंत्र में एक अक्षरशः सत्य वाली यह प्रचलित कहावत भयावह एवं सत्य है एवं भविष्य के लिये खतरे का संकेत भी है कि "दुश्मनों को भी अस्पताल एवं कचहरी का मुह न देखना पड़े।" वर्तमान में इन दोनों स्थानों में गवाही एवं खर्च के मंजर के अलावा कुछ नहीं है।

विचारण न्यायालय में विचाराधीन न्यायधीश बहुत अधिक दिनों तक लंबित मामलों में रुचि कम लेते हैं विशेषकर सिविल मामलों में क्योंकि उन्हें मालूम है कि तीन चार पेशी की तारीखे देदे तो आगे उनका स्थानांतरण होना स्वभाविक है।



## DOMESTIC VIOLENCE IN INDIA

Dr. A.K. Sahu\*

## ABSTRACT

*The term domestic violence is most commonly used to touch on the violence done within a married relationship, in which one partner, usually male or his famil, uses a pattern of assault and intimidating acts to impose power and control over the other partner, typically female. As mentioned, generally, such kind of violence targets the victimization of women. Out of this, most women face this as a general household problem and choose to keep quiet for family reputation. you have felt serious alarm or distress and it has had a substantial effect on your usual day to day activities. The behaviour has had a substantial effect on you if it has caused you to change the way you live. For example, you may have changed the way you socialise, your physical or mental health may have deteriorated, you may have changed the way you do household chores or how you care for your children. If you have changed the way you live in order to keep you or your children safe from harm, it is possible that the behaviour you are experiencing is coercive control.*

## INTRODUCTION

This paper focuses on domestic violence as a human rights violation. The study of domestic violence as a human right violation means that the application of international human rights law can have the effect of reinforcing the state's obligations to respect the individual rights of each and every person and thus be held accountable for abuse of those rights by private individuals. Although the state does not actually commit the abuse, its failure to prosecute the abuse and to guarantee legal protection to women victims amounts to complicity in it. As a result, domestic violence can be a matter subject to scrutiny and review by the international community.

## Domestic violence in India

According to the Crime in India Report 2018, published by the National Crime Research Bureau, a crime is recorded against women in India every 1.7 minutes and a woman is subjected to domestic violence every 4.4 minutes. It also topped the categories of violence against women according to the report. As per the data, 89,097 cases related to crimes against women were registered across India in 2018, higher than the 86,001 cases registered in 2017.

The National Family Health Survey, 2015-16 highlighted that 30 percent of women in India between the ages of 15-49 have experienced physical violence. The report suggests that among married women experiencing physical, sexual, or emotional abuse, an alarming 83 percent list their husbands as the main perpetrators, followed by abuse from their husbands' mothers (56 percent), fathers (33 percent), and siblings (27 percent).<sup>1</sup>

These statistics don't capture the data on violence against women in its entirety. This is primarily due to the prevalence of orthodox social norms and the stigma that is placed on survivors of sexual or domestic violence, resulting in cases being grossly underreported. Women also feel unsafe while approaching the police, because they worry that if their partners are arrested, they may face worse abuse once they are released, and in the interim, might face harassment from their in-laws or others.



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## विधिक में "लोक चेतना" का भारतीय समाज पर प्रभाव

डॉ. ए. के. साहू

### सारांश

भारत में विधियों के संहिताकरण के समय तत्कालिन प्रचलित व्यक्तिगत विधियों में इतनी असमानता व्याप्त थी कि उनमें समन्वय किया जाना सम्भव नहीं था इसलिये अंग्रेजों ने इसे अतिसंवेदनशील विषय मानकर नहीं छुआ, उस समय भारतीयों के लिये इन व्यक्तिगत विधियों के अलावा धार्मिक स्थिति रीति-रिवाज भी अतिसंवेदनशील थे एवं विधियों के संहिताकरण के लिये ये मुख्य श्रोत भी थे, इसलिये हिन्दु विधियों में वहीं परिवर्तन दिये गये जो समाज-सुधारकों द्वारा इंगित थे उदाहरण के लिये ईश्वरचन्द्र विद्यासागर के कारण हिन्दू विधवा पुनर्विवाह अधिनियम 1856 व राजराममोहन राय के कारण सती प्रथा समाप्ति अधिनियम में सुधार किये गये। इन दोनों विधियों में लोक चेतना का अभाव था, इसी तरह बंगाल में कुलीन ब्राम्हणों द्वारा दुरुपयोगिता बहुविवाह प्रथा को ईश्वरचन्द्र विद्यासागर के लाख प्रयास बाद भी तत्कालिन गवर्नर जनरल के परिषद् ने इसे पारित नहीं किया क्योंकि अधिकांशतः हिन्दू लोक चेतना बहुविवाह के विरुद्ध नहीं थे।

### परिचय :-

"लोक चेतना" को जर्मनी की तत्कालिन परिस्थितियों को लेकर सेविग्नी की विचारधारा को समर्थन मिला था क्योंकि नेपोलियन युद्ध के पश्चात् जर्मनी में विधियों का संहिताकरण किये जाने की मांग जोर पकड़ रही थी। उस समय जर्मनी में भिन्न-भिन्न स्थानों में अनगिनत स्थानीय विधियाँ, रूढ़िया एवं समाजिक नीति नियम प्रचलित थे। वैश्विक स्तर पर उस समय फ्रांसीसी सिविल कोड संहिताबद्ध थी, इसी से प्रभावित होकर हेडेल बर्ग के प्रोफेसर थीबॉट जर्मनी विधियों के संहिताकरण पर बल दे रहे थे परन्तु जर्मनी में स्थानीय विधियाँ बिना विवाद के अनगिनत काल से चली आ रही थी ऐसे में उनका नवीनीकरण किया जाना सामाजिक संघर्ष का एक नया न्योता था इसलिये सेविग्नी ने जर्मनी के तत्कालिन विधियों के शीघ्रता एवं जल्दबाजी में संहिताकरण करने की अपेक्षा शैने-शैने किये जायें पर बल दिया ताकि राज्य, संभाग, धर्म एवं परम्परा के बीच संघर्ष उत्पन्न न हो।<sup>1</sup>

सेविग्नी का तर्क था कि समय लोक चेतना एवं सेविग्नी का विचार विकास के साथ-साथ विधि में उसी रूप में विकसीत होती रहती है सेविग्नी ने यहाँ "राष्ट्र" शब्द का अर्थ मानव के उस समुदाय से लगाया जो सामाजिक एवं भौगोलिक श्रृंखला में एक-दूसरे से सूत्रबद्ध रहते हैं एवं विधि इन्हीं के पारस्परिक सहयोग से उत्पन्न हुई है। इसलिये सेविग्नी हयागों के इस विचार से सहमत थे कि मानव जन्म के समय से ही विधि ने मानव समुदायों की भाषा, रीति-रिवाजों एवं गठन के अनुसार अपना रूप ग्रहण कर लिया था एवं जैसे-जैसे मानव समुदायों में चेतना विकसीत होती गयी वैसी-वैसी विधि भी विकसीत होती गयी। इसलिये उनका दृढ़ विश्वास था कि मानव सभ्यता की चेतना पर ही विधि आधारित है : एवं विधि की उत्पत्ति का आधार "लोक चेतना" है। एवं इन्होंने "विधि को जन जीवन की सामान्य लोक चेतना" (Volkegeist) का प्रतीक माना।

<sup>1</sup> (सहायक प्राध्यापक-विधि)



## Availability of elementary Legal Education in Higher Secondary School level to Promote general legal awareness

डॉ. आलेख कुमार साहू \*

भारत में कानून की पढ़ाई के लिए छात्रों के पास हाई स्कूल के बाद पांच साल की अवधि के लिए एलएलबी करने का विकल्प है या फिर स्नातक के बाद तीन साल की अवधि के लिए। इंटर्नल और एक्सटर्नल परीक्षा का तरीका इस समय सिंबायोसिस और जिंदल ग्लोबल लॉ स्कूल जैसे कुछ प्राइवेट लॉ स्कूलों के साथ ही नेशनल लॉ यूनिवर्सिटी और दिल्ली विश्वविद्यालय आदि में भी उपयोग में लाया जा रहा है। जहां दिल्ली विश्वविद्यालय में एक्सटर्नल और इंटर्नल एसेसमेंट का 75:25 का पैटर्न अपनाया जाता है, सिंबायोसिस में कोर लॉ पाठ्यक्रम के छात्रों के लिए 60:40 का पैटर्न अपनाया जाता है। आंतरिक मूल्यांकन में प्रोजेक्ट, केस एनायलसिस, लेख, प्रजेंटेशन, क्विज, ड्राफ्टिंग, मूट कोर्ट्स, लर्निंग लॉग्स या डायरी और छोटे क्लास टेस्ट आदि शामिल हैं। आंतरिक मूल्यांकन के तरीके हर संस्थान में अलगअलग होते हैं। इन संस्थानों में हालांकि इंटर्नशिप को बढ़ावा तो दिया जाता है, लेकिन यह अनिवार्य नहीं है और छात्र समर इंटर्नशिप स्वैच्छिक रूप से करते हैं, जिस पर किसी प्राधिकरण की निगरानी नहीं होती। इसके मुकाबले, अखिल भारतीय आयुर्विज्ञान संस्थान (एम्स), जिसे देश के सर्वश्रेष्ठ मेडिकल कॉलेज में गिना जाता है, अपने छात्रों को पूरे एक साल के लिए मेडिसीन की विभिन्न शाखाओं में बारी-बारी से इंटर्नशिप करने के लिए भेजता है। इससे जाहिर होता है कि यहां अकादमिक सत्र के दौरान प्रैक्टिकल प्रशिक्षण पर कितनी तवज्जो दी जाती है। इसी तरह चार्टर्ड एकाउंटेंसी (सीए) पास करने वाले छात्रों को इसके विभिन्न स्तर की परीक्षाओं के बीच तीन साल के लिए आर्टिकलशिप पूरी करनी होती है और के इस पर इंस्टीट्यूट ऑफ चार्टर्ड एकाउंटेंट्स ऑफ इंडिया (आइसीएआइ) नजर रखती है। ऐसे में कानूनी डिग्री जो सीए या मेडिसीन की ही तरह पेशेवर डिग्री है, इसमें भी सैद्धांतिक ज्ञान के साथ ही व्यावहारिक प्रशिक्षण की आवश्यकता होती है।

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## भारतीय शिक्षा व्यवस्था पर समसायिक एवं विधिक अध्ययन (उच्च शिक्षा के विशेष संदर्भ में)

डॉ. ए. के. साहू

सारांश

"शिक्षा का अधिकार अनुच्छेद 21 के अधीन विहित है और यह अधिकार प्राण एवं दैहिक स्वतंत्रता के अधिकार से प्रभावित होता है। बिना शिक्षा के कोई भी नागरिक अपने अन्य मूल अधिकारों का पूरा उपयोग नहीं कर सकता है। अनुच्छेद 21 की परिधि में अप्रमाणित अधिकार (Unenumerated Right) सम्मिलित है और न्यायपालिका को इस क्षेत्र के निदेशक तत्वों से प्रेरणा ग्रहण करके न्यायिक कर्मण्यता (Judicial Actinism) की भूमिका का निर्वहन करना चाहिए। अनु. 21 के नकारात्मक व सकारात्मक दो आयाम हैं अतः नकारात्मक शब्दों का प्रयोग संविधान द्वारा प्रदत्त सकारात्मक अधिकार को हटाया नहीं जा सकता क्योंकि सामाजिक व आर्थिक प्रजातंत्र को यथार्थ बनाने में व सहायक के रूप में मौलिक अधिकार और निदेशक तत्व रथ के दो पहिये हैं और किसी अधिकार को मूल अधिकार के रूप में प्रमाणित अथवा उल्लेखित न किया गया हो फिर भी उसे मूल अधिकार के रूप में मान्य किया जा सकता है।

21वीं सदी की उच्च शिक्षा को तब तक स्तरीय नहीं बनाया जा सकता, जब तक भारत की स्कूली शिक्षा 19वीं सदी में विचरण करती रहेगी। स्कूली शिक्षा की मूलभूत सुविधाओं में पिछले एक दशक में जबरदस्त वृद्धि हुई है, लेकिन असली समस्या गुणवत्ता की है। ये एक कड़वा सच है कि भारत के आधे से अधिक प्राथमिक विद्यालयों में कोई भी शैक्षणिक गतिविधि नहीं होती। अतः अब समय आ गया है कि चाक और ब्लैक बोर्ड के जमाने को भुलाकर शिक्षा के लिये तकनीक का इस्तेमाल किया जाए।

### शिक्षा के अधिकार एवं भारतीय स्थिति

सर्वोच्च न्यायालय के दिशा निर्देशों के अनुरूप केन्द्र सरकार ने शिक्षा का अधिकार अधिनियम बनाकर पहली कक्षा से आठवीं तक के छात्रों को अप्रैल 2010 से अनिवार्य शिक्षा प्रदान कर राहत तो प्रदान कर दी है, पर इस अधिनियम को लागू करने के पीछे छिपी हुई उद्देश्यों की शायद ही पूरा किया जा सके। सर्वोच्च न्यायालय ने ही अपने 1996 के ऐतिहासिक निर्णय 'में अंतराष्ट्रीय निर्णय का हवाला देते हुए केन्द्रीय व राज्य सरकारों को यह स्पष्ट निर्देश दिया था कि संविधान के अनुच्छेद 45 के आदेशों के अनुसार 14 वर्ष तक की आयु के उन बालकों को शिक्षा पाने का पूर्ण अवसर प्रदान किया जावे जो किसी भी कारखाने या खान और अन्य संकटपूर्ण कार्य में नियुक्त हैं और गरीबी, भूखमरी के कारण शिक्षा से वंचित हैं। न्यायालय ने यह निर्देश दिया था कि उनके स्थान पर उनके परिवार के किसी वयस्क सदस्य को काम दिया जावे। ऐसे बालकों के नियंत्रण प्रत्येक बालक को 20,000/- दे जो बालक के श्रम पूर्णवास एवं कल्याण खाते में जमा हो। यदि सरकार ऐसे बालकों के वयस्क सदस्य को काम नहीं दे सके तो सरकार 5000/- उसके बालक के कल्याण के लिए 5000/- पूर्णवास एवं कल्याण खाते में जमा करें ताकि इस जमा रकम की ब्याज से 14 वर्ष तक के आयु के बालकों को शिक्षा दिलाई जा सके। खतरे रहित कार्यों में यदि बालकों को काम में लगाया जाता है तो उसकी कार्य अवधि 4 या 6 घंटे से अधिक नहीं होगी तथा उसे 2 घंटे पढ़ने के लिए दिये जायेंगे जिसका व्यय ऐसे बालकों से काम में लगाने वाले नियोक्ता द्वारा वहन किया जायेगा।

संविधान का अनुच्छेद 45 यद्यपि न्यायालय द्वारा प्रवर्तित नहीं किये जा सके थे और न्यायालय सरकार को ऐसा करने के लिए बाध्य नहीं कर सकती थी क्योंकि अनुच्छेद 45 संविधान के भाग IV के नीति निदेशक तत्व है जो राज्य सरकारों पर देश के शासन में मूलभूत होने के कारण विधि बनाते समय को ध्यान में रखने को दायित्वाधीन करता है।

संविधान निर्माताओं ने संविधान के प्रारंभ के दस वर्षों के भीतर 14 वर्षों तक के सभी बालकों के लिए निःशुल्क एवं अनिवार्य शिक्षा की व्यवस्था कर दी थी परन्तु इन प्रावधानों के लागू होने के 60 वर्षों के बाद भी इस लक्ष्य को प्राप्त नहीं किया जा सका। यद्यपि 1986 की राष्ट्रीय शिक्षा नीति लागू होने के बाद भारत सरकार ने राज्य सरकारों की सहभागिता में इस प्रावधानों की पूर्ति हेतु अथक प्रयास किया है फिर भी सार्वभौमिक और गुण सम्पन्न शिक्षा देने की व्यवस्था पूरी नहीं हो सकी। इस कमी को पूरा करने के लिए विधि आयोग की 165 वीं रिपोर्ट तथा संसद की स्थायी समिति की सिफारिशों के मददेनगर इस उद्देश्य की पूर्ति हेतु निम्नलिखित संविधान संशोधन भी किये गये<sup>1</sup> :-

1. संविधान का (86वां) संशोधन अधिनियम 2002 के द्वारा अनुच्छेद 21 (क) अंतः स्थापित करके एक नया मूल अधिकार बना दिया गया है, इसके द्वारा राज्य को यह कर्तव्य सौंपा गया है कि वह 6 से 14 वर्ष की आयु के सभी बालकों को निःशुल्क और अनिवार्य शिक्षा प्रदान करेगा। इस अधिकार की अनुपूर्ति के लिए राज्य समुचित विधि बनायेगा। शिक्षा समवर्ती सूची का विकास है इसलिए केन्द्र व राज्य दोनों राज्य पर विधि बना सकते हैं।



## “छत्तीसगढ़ में नक्सलवाद एवं समाधान”

डॉ. आलेख कुमार साहू \*

सारांश:-

नक्सलवाद की समस्या बहुआयामी है। इसका समाधान किसी भी पक्ष द्वारा हिंसक तरीके अपनाकर नहीं किया जा सकता। यदि नक्सलवादी/ माओवादी यह सोचते हैं कि आतंकवादी गतिविधियों के सहारे गुरिल्ला युद्ध अपनाकर वे 110 करोड़ भारतीयों के जीवन और सम्पत्ति की रक्षा के लिए समर्पित राज्य व्यवस्था को परास्त कर लेंगे, तो यह उनका दिवा स्वप्न है। एक न एक दिन नक्सलवाद का भी वही अजाम होगा जो पंजाब में खालिस्तान समर्थक सिख आतंकवादियों का हुआ या फिर श्रीलंका में तमिल चीतों का हुआ। इसी प्रकार भारत सरकार तथा छत्तीसगढ़ सरकार को भी अपनी रणनीति पर फिर से विचार करना होगा कि हिंसा के मार्ग पर चल रहे आदिवासी युवाओं को विकास की मुख्यधारा में किस प्रकार से वापस लाया जाए। 30,000 से अधिक माओवादियों को गिरफ्तार करके न तो जेल में डाला जा सकता है और न गोली मारकर उनका समूल विनाश ही किया जा सकता है नक्सली हिंसा पर नियन्त्रण स्थापित करने के लिए सेना का प्रयोग भी कोई बेहतर विकल्प नहीं है नक्सलवादी भारत के शत्रु नहीं हैं जिनके विरुद्ध सेना कोई निर्णायक युद्ध लड़े। ये आम भारतीय हैं, जो अपने अधिकार के लड़ाई लड़ रहे हैं। उनकी बात सुने जाने चाहिए विकास के लिए एकीकृत रणनीति अपनाई जानी चाहिए शांति और सद्भाव का रास्ता दुर्गम हो सकता है, असाध्य नहीं।

परिचय:-

छत्तीसगढ़ में निरन्तर हिंसक होते जा रहे नक्सलवादी आन्दोलन ने राज्य सरकार को पंगु तथा केन्द्र सरकार को चिन्तित कर दिया है। नक्सलवाद का समाधान क्या हो, इस पर नेताओं, सेना और बुद्धिजीवियों में मतभेद हैं। एक विचारधारा इसके शान्तिपूर्ण एवं विकासात्मक समाधान की है तथा दूसरी इसे हिंसक तरीके से बिना किसी सहानुभूति के समूल नष्ट करने की है।

अब भारत सरकार सहित नक्सलवाद प्रभावित राज्यों-आन्ध्र प्रदेश, छत्तीसगढ़, उड़ीसा, झारखण्ड, बिहार, महाराष्ट्र, प. बंगाल, मध्य प्रदेश, उत्तर प्रदेश की सरकारें समग्र रूप से ऐसी रणनीति बनाने तथा उसे कार्यान्वित करने पर लगी हैं जिससे नक्सलवाद प्रेरित हिंसा तथा आतंकवाद पर नियन्त्रण स्थापित किया जा सके।

भारत में साम्यवाद की जड़ें तो स्वाधीनता संग्राम में ही अपना आधार खोज चुकी थीं। कार्ल मार्क्स, स्टालिन, लेनिन तथा माओ के विचारों से प्रभावित बुद्धिजीवियों ने सर्वहारा वर्ग के उत्थान हेतु कृषकों, आदिवासियों, श्रमिकों को संगठित किया। भारत की लोकतांत्रिक शासन प्रणाली में सम्मिलित होकर साम्यवादियों ने सन् 1957 में केरल में अपनी सरकार बनाई जो सीमित अवधि के बाद ही सत्ताच्युत कर दी गई। 1962 के भारत-चीन युद्ध के बाद भारत की साम्यवादी पार्टी दो धड़ों में विघटित हो गई। 'गैर-पूँजीवादी विकास की ओर शान्तिपूर्ण मार्ग' की ओर चलने वाली कम्युनिस्ट पार्टी आफ इण्डिया तथा

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## REVIEW ARTICLE

# Laws Relating to Contempt of Court

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## ABSTRACT:

This paper deals with the various provisions relating to contempt in shrine under constitution and the statute. Also in this paper author elaborated development of Contempt Law in India, explaining the present situation. The paper includes various judgments of Hon'ble Supreme Court and high court and their observation on the contempt law.

**KEYWORDS:** Constitution, Contempt, Civil, Criminal, Judge, Freedom of Speech.

## 1. HISTORICAL BACKGROUND

The evolution of Contempt law can be traced back to pre-independence period. When the presidency town has been established and in the charter of 1726 first time English law introduced in India. With this Charter Mayor Court were constituted in the presidency towns and were given the power to decide all the Civil cases and made their court of record. Thereafter in year 1774 Supreme Court of judicature at Fort William at Calcutta was established by replacing the mayor court and Supreme Courts at Madras and Bombay were came into existence in year 1801 and 1824 respectively. These Supreme Courts were again replaced by High Court under the Indian High Court Act 1861. Thereafter, High Court at Madras, Bombay, Calcutta and Allahabad came into existence and they all were have the power to punish for contempt and was constituted as a court of record. In<sup>1</sup>Re; AbdoolandMahtab case Chief Justice Peacock laid down rule regarding the power to punish for contempt in following words:

There can be no doubt that every court of record has the power of summarily punishing for contempt." There was a conflict of opinion regarding power to punish for contempt of subordinate court, among the different High Courts prior to coming into force of the Contempt of Court Act, 1926. In 1927, Lahore High Court examines the contempt jurisdiction in matter of Muslim Outlook Lahore<sup>2</sup> and observed that every high court was having inherent power of contempt jurisdiction and not only in three Chartered High Courts. The Act of 1926 was applicable to whole of India but some of the princely states like Hyderabad, Madhya Pradesh, Mysore, Rajasthan, Trankore-Cochin, Swarashtra and Pepsu had there own state enactment on contempt. Thereafter, Act of 1926 along with aforementioned state enactment was replaced by Contempt of Court Act, 1952. Again in 1960, a bill was introduced to amend law relating to contempt of court and after proper legislative procedure and deliberations Contempt of Court Act, 1971 came into force and replaced the Act of 1952.

## 2. CONTEMPT OF COURT:

In 1742 Lord Hardwick L.C., suggested the meaning or kind of contempt in three different ways; "One kind of contempt is scandalising the court itself. There may be likewise contempt of this court in abusing parties who are concerned in causes here. There may also be

## An Evaluation of Using Library Resources and Services by the Agriculture Scientists in Postgraduate Agriculture College Libraries: special reference to Chhattisgarh, India

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### Abstract

Library resources and services are pivotal role players in teaching, learning, and innovation. Owing to the adoption of information communication technology (ICT) in library and day-to-day changing information needs of the users, it is need of present era to redesign the library resources and services. The study which forms the subject matter of the present article highlights the usage of resources and services by agriculture postgraduate colleges of Chhattisgarh and examines the library resources and services which are really useful to agriculture scientist. Further the study is focused on significance satisfaction level differences amongst agriculture scientists. For carrying out this study, the research approach was used as a survey method. Questionnaire was used as a tool for getting information from respondents. The findings of the study have confirmed that most of the agriculture scientists were occasional visitors to the library due to less information resources in the library. It was found that majority of the agriculture scientists were partially satisfied with the library resources and services.

**Keywords:** Resources, Services, Agriculture scientist, Library

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## Abstract View

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# Study of Lotka's Law and Authorship Pattern in the Conference Proceedings of COLLNET: an International Conference Covering Exclusively Bibliometric Study (AbstractView.aspx?PID=2020-26-1-1)

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## Lotka's Law and Productivity Patterns in the field of Genetics and Plant Breeding

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**Abstract-** In this paper we have selected Indian journal of Genetics and Plant breeding for Bibliometric study. In this study data was taken from only 10 volumes vol. 68 (2008) to vol. 77 (2017). The purpose of this study is to examine the applicability of Lotka's Law on the above sample. To confirm the applicability of Lotka's Law a KS test was performed to examine the deviation between Observed cumulative frequency and Expected Cumulative Frequency. After application of KS test it is found that Lotka's Law does not fit on the given sample.

**Key Words:-** Lotka's Law, KS-Test, Bibliometrics, Bibliometric Study, Indian Journal of Genetics and Plant Breeding.

### Introduction:-

Indian Journal of genetics and plant breeding is published by Indian Society of Genetics and plant Breeding, New Delhi. Its SJR is 0.24 and H Index is 10.0. NAAS rating of this journal in 2017 is 6.28. It is a peer reviewed journal. This journal is interdisciplinary in nature. (Jgateplus.com). Its impact factor is 0.409. ([isgpb.com/current-issue.php](http://isgpb.com/current-issue.php)) Its publication frequency is quarterly. It publishes in the month of Feb, May, Aug and Nov.

"The Indian Journal of Genetics and Plant Breeding is a periodical for the publication of records of original research in all the branches of genetics, plant breeding and cytology, including human genetics, molecular biology and biotechnology, and other cognate sciences of sufficient importance and of such a character as to be of primary interest to the geneticist and plant breeders". (<http://www.isgpb.org/index.php>)

In this paper we will study the authorship productivity pattern of the journal of Genetics and Plant Breeding for 10 years 2008-2017 as well as we will study that this journal follows Lotka's law or not.

### Review of Literature:-

Literature Review is the basic homework for any research process or it can be resulted the best strategy of any research. So to find out the objective of any Research comprehensive review of literature available on the topic is very much important. So many studies have been done in the field of bibliometrics. Many Researchers applied Lotka's Law in different disciplines and found different results.

Miranda Lee Pao in his paper Lotka's Law: A testing procedure has given step by step guideline to find the author productivity through Lotka's Law. This paper becomes a land mark in study of Lotka's law and helps many of the researchers in their research work. This paper speak about how to calculate each and every value related to Lotka's law and where lotka's law can be applied. (Pao, 1985)

Marija Petek has done a study for testing Lotka's law through Personal name headings in COBIB which is cooperative Bibliographic Database and contains 30,85,000 plus records. In this study author chose a random



## Electronic Information-seeking behavior amongst Social Science faculty

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### ABSTRACT

The internet has become an important source to acquire information in this Covid-19 pandemic situation. Today, the internet is providing 24 hours service to us even though libraries have been closed in this critical pandemic situation. This study is to investigate the electronic information-seeking behavior of social science faculty, who work in colleges affiliated to Atal Bihari Vajpayee University, Bilaspur, Chhattisgarh. A survey method has been adopted for this study and used the questionnaire as a tool for data collection. The analysis showed the test of Chi-square, cleared that influence of gender counterpart on the use of the internet is not found statically significant but the relationship between age and form of document (Print and Electronic) for reading and writing and the relationship between the use of e-books and e-journals with other electronic resources are found highly significant. They largely depend on e-books and e-journals among other e-resources. Regarding skills for using e-resources on the internet majority of faculty found it by themselves and search through the search engine. To use of internet majority of the social faculty answered that the Internet has been affected their information-seeking behavior positively with the help of it they get new and updated information frequently.

**Keywords:** Internet, Electronic resources, effects, Linking Facilities.

### 1. INTRODUCTION

Social sciences are the study of society and social relationships that deal with human behavior in its social and cultural aspects. The cluster of disciplines like political science, sociology, economics, social and cultural anthropology, as well as economic geography are coming under this group but the Indian Council of Social Science Research (ICSSR) recognizes some others subject as social sciences, they are psychology, management, international relation, social work, criminology, education, commerce<sup>1</sup>. In the present scenario, information is the basic need of humankind after air, water, food, and shelter. It is the key element in all research activities. Information reduces uncertainty, helps policy formation, and decision making. It is most important for teaching, research, and development in academics. Information seeking behavior is one of the most famous areas in library and information science. It is the way, where people search, evaluate, obtain, and use the information to satisfy their information required. In



## A STUDY ON INFORMATION-SEEKING BEHAVIOR OF SOCIAL SCIENCE FACULTIES OF COLLEGES AFFILIATED TO ATAL BIHARI VAJPAYEE VISHWAVIDYALAYA, BILASPUR CHHATTISGARH

■ Mrs. Kirti Jachak\*

Dr. Santu Ram Kashyap\*\*

### ABSTRACT

*The study investigates the Information-seeking behavior of Faculty members of Social science who work at colleges affiliated to Atal Bihari Vajpayee Vishwavidyalaya, Bilaspur Chhattisgarh. The study based on a survey method and random sampling was used for the selected sample from the population. For the gathering of the data, a structured questionnaire used as a tool. The data was analyzed through MS excel and Garrett's ranking technique. The research finding shows that the majority of the faculties ranked 1<sup>st</sup> to the internet as an informational source for their educational work, after the internet, they have ranked to 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> to the library, discussion with a subject expert, discussion with colleague and participation in seminar/conference/workshop respectively. Regarding services provided by the Information and Library Network (Inflibnet), Shodhganga109(74.15%) is highly using by them. The majority of the faculty 76(51.7%) visit Library 2,3 times in a week and they mostly seeking information for teaching purposes 132(89.78%). There are various problems faced by them while they are seeking information, in Which Inadequate Library resources ranked first among another challenge.*

**Keywords:** - Information, Information seeking behavior, Social sciences, keyword, Library, Inflibnet, Problems.

### Introduction

Information is an important key resource for the overall development of society and also it is a power that performs an important role in the development and progress of a country, therefore, today is necessary to acquire all kinds of information and manage and convey them to the right users so that they can be utilized to the maximum. Presently information has taken an important place. No work is possible without information.

All people required Information; Students required information according to the prescribed syllabus to complete their academic work. Teachers required information to teach their students and research work. There is a constant need for information for the researcher and scientists for their

research work and the latest discovery of new knowledge. There is a need for information in every field, even the economy of a nation depends on the availability and use of information. It is regarded as a valuable source for the commodity. Its help the person to take and suggest rights decision at the right time.

Information seeking behavior is the study of the users, in this context, we try to find out what kind of information required by the Users, what users do for the required information, What user use for information obtained. Information needs and information-seeking behavior is closely related to each other. When the person recognizing an information needs, articulate into a query and do some activity to convey through formal and information channel of information and take a

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## A STUDY ON UTILIZATION OF LIBRARY RESOURCES AND SERVICES BY POST GRADUATE STUDENTS OF NIT RAIPUR, CHHATTISGARH

Dr. Santu Ram Kashyap\*

Mr. Lokendra Kumar Sudhakar\*\*

### ABSTRACT

*Functions, services or relevant material constitutes library resources which is hallmark of present library arrangement. Like any other educational stream, the role of library resources is immense in technical education. In engineering institutions its library provide additional database on instructions given in the classroom. It also encourages them towards self study. Hence overall learning outcomes can be enhanced through efficient library resources and services. In this context the present study choose NIT Raipur as engineering institute for studying the utilization of library resources and services by their post graduates students. In this paper utilization of library resources and services by post graduate students from NIT Raipur Chhattisgarh is assessed. Conclusions are drawn from various facets of use of library resources and services by the post graduate students of NIT Raipur.*

**Keywords:** Library resources, library services, NIT Raipur.

### INTRODUCTION:

Functions, services or relevant material constitutes library resources which is hallmark of present library arrangement. Library resources comprise of expertise and experience of staff, books, journals, audio/visual aids in the form of books as material along with functions such as acquisition, processing, storage, retrieval and maintenance respectively. Library services such as lending, indexing, abstracting, documentation and translation are also part of library resources. So it can be said that library resources are the combination of so many factors such as people, ideas and money etc. The library service includes circulation and reference service, audio visual service etc. Since ages libraries are serving as a knowledge bank and it is essential for development of our society as well as learning outcomes. So modern libraries are essential for student's academic outcomes. Like any other educational stream, the role of library resources is immense in technical education. In engineering institutions its library provide additional database on instructions

given in the classroom. It also encourages them towards self study. Hence overall learning outcomes can be enhanced through efficient library resources and services. In this context the present study choose NIT Raipur as engineering institute for studying the utilization of library resources and services by their post graduates students.

Keeping in mind the glorious past since 1956, the Govt. Engineering College Raipur has been declared as the National Institute of Technology in the year 2005 by a central government act. The central library of this institute has in excess of 1 lacs books, 1.7 lacs e-book. The library has reference as well as text books apart from Ph.D. theses, online journal and achieves. The central library of NIT Raipur is run by LibSys7- Library management software. It also have plagiarism checker, remote access facilities and discovery service. More than 5000 users have access to various library services in NIT Raipur.

Although the central library of NIT Raipur is among the best, it is essential to know the utilization of library resources and services by the

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## **Factors Affecting on Job Satisfaction level and Social Status among Library Professionals in Chhattisgarh**

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### **ABSTRACT :**

This paper examined job satisfaction levels among library professionals in Chhattisgarh region based on different affecting factors. This survey study is made up of 69 library Professionals in different 7 districts. The majority of the respondents are female library professionals (53.62%) while the rest are male professionals (46.38%). Among the sample of library professionals, 81.16 % are married and 18.84% are unmarried. A questionnaire was distributed by hand and through the mail for data collection and analyzed using excel. Job satisfaction is a very essential aspect that is often evaluated by organizations. The way of measurement is the use of an evaluation scale where librarians report their opinion to their jobs. Questions are connected with Nature of work Professional status, social status, motivation, Management support, and professional development. As a result of a study by calculation of mean; most of the library professionals are dissatisfied with their nature of work but moderately satisfy with Professional status, motivation and human resources. High social status affects their satisfaction level.

**Keywords:** Job satisfaction, Library professionals, Social Status, Professional Status, Motivation and Human resources.



## RESEARCH PRODUCTIVITY OF PEARL – A JOURNAL OF LIBRARY AND INFORMATION SCIENCE DURING 2007- 2019

Dr. Harish Kumar Sahu\*  
Aditi Joshi\*\*

## ABSTRACT

A Bibliometric Analysis of the journal "PEARL – A Journal of Library and Information Science" for the period 2007-2019 has been carried out. The trend publication such as the year and volume-wise distribution of articles, page length of the contributions, year wise references, country-wise distribution of articles, authorship patterns of research contributions, single author and multi authors of contributions and degree of collaboration have been studied. For the analysis of the study 13 volumes containing 52 issues have been taken up. It is found that 541 papers were published during the period of study. The maximum number of articles (55) was published in 2017.

**Keywords:** Bibliometrics, PEARL: A journal of library and information science, authorship pattern, Research productivity, Ranking.

## 1. INTRODUCTION

The journal PEARL: A journal of Library and Information Science published by University Library Teachers Association of Andhra Pradesh, Hyderabad. It is a quarterly journal published since 2007. The journal publishing research papers in the fields of library and information science. The study highlights the various article of scholarly content published by this journal during 2007-2019.

## 2. REVIEW OF RELATED LITERATURE

Previously several studies by "K. Thavamani (2013) Study is also intended to identify the growth and authorship pattern of productivity of articles of source journal 'DESIDOC' Journal of Library & Information Technology'. It was observed from the study that the year 2008 was most participating year during the study period 2007 - 2011. The

Relative Growth Rate (RGR) was high in terms of literature productivity and Degree Collaboration (DC) was also high in terms authorship pattern i.e., 108 out of 194 (0.556). and many more features were identified." [1].

"S. Paramasivam, A. Rajinikanth and M. Pandiyan (2013) Discusses the Bibliometric analysis of the journal titled 'Indian Journal of Radio and Space Physics 2007-2011'. This article cover mainly the number of articles in each volumes, authorship pattern, Institution wise contributions, Length of articles, Geographical distribution of contributions, Forms of documents cited, Ranked list of cited journals etc., This paper show that the total 246 contributions and maximum number of papers has been contributed by 40.24% of four and above authors. This study reveals that maximum contributions from foreign countries 149 (19.51%)." [2].

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## JOB SATISFACTION OF LIS PROFESSIONALS OF SELECTED DISCIPLINE AND ITS IMPACT ON INFORMATION TECHNOLOGY

□ Aditi Joshi\*

Dr. Harish Kumar Sahu\*\*

### ABSTRACT

*In the present day, modern libraries are emerged in digitalization and be responsible for a variety of tools for access e-reading material from the library. The paper presents job satisfaction among library professionals and it's the impact on Information Technology (IT) of art, commerce science, engineering, medical, agriculture, law, education, management and other institutes. A total of 105 library professionals were selected as samples for the satisfaction of the Impact of Information technology. As a result of the study, the majority of the respondents were working with information technology. Most engineering, medical and, agriculture LIS Professionals are satisfied with the impact of IT. The study examines that there is no significant relationship between job satisfactions of LIS professionals from various disciplines.*

**Keywords:** Job satisfaction, digitization, information technology, library, LIS professionals, library automation.

### 1. INTRODUCTION

At the present time Modern ICT have extremely changed the traditional library system and its processes. Library professionals are changing them to fulfill the users' needs. LIS Professionals need to fill the gap between education and professional training. In this turn, increases the essential need for continuous bring up-to-date in the profession, with training and development. The library Professionals can be satisfied when the library can fulfill its responsibilities towards its library work as well as a satisfaction to the users. The Challenges that they face by the changes of emerging technology are to grow up

planning and arrangement to easier access to library resources and find the routes of various vendor and publishers' platforms. Second challenges are to fulfill the user's need with a low budget and high demand for library resources. The fast digitization of library operations inside a very short period, so it makes a gap it needs to improve the skills to operate a new modern library.

### 2. REVIEW OF LITERATURE

Bellary Ravi N, Sadlapur Shivanand Sadlapur and Ramesh R. Naik (2015) highlights on understanding the impact of ICT on job satisfaction and improvement of the

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# ग्रंथालय एवं सूचना केंद्रों में क्यूआर कोड का अनुप्रयोग

## (Application of QR Code in Library and Information Centres)

**डॉ. हरीश कुमार साहू**

**प्रवीण कुमार देवांगन**

[क्यूआर कोड (QR Code) की अवधारणा की व्याख्या करने के साथ क्यूआर कोड (QR Code) के अर्थ, संरचना, प्रकारों, कार्यविधि व ग्रंथालय सेवाओं में इसके उपयोग का वर्णन प्रस्तुत करता है।]

### 1. प्रस्तावना (Introduction)

तकनीकी के विकास के फलस्वरूप ग्रंथालय सेवाओं की गति में परिवर्तन आया है एक ओर जहां परम्परागत विधियों से ग्रंथालय सेवाओं जैसे- संदर्भ सेवा, बिब्लियोग्राफी सेवा, प्रलेख वितरण सेवा आदि को प्रदान करने में कई घण्टों से लेकर कुछ दिनों तक का समय लग जाता था, वहीं आज नवीन तकनीकों से इन सेवाओं को कुछ ही सेकण्ड में पाठकों तक पहुंचाया जा सकता है। डॉ. एस. आर. रंगनाथन द्वारा प्रतिपादित के ग्रंथालय विज्ञान के चतुर्थ सूत्र 'पाठक का समय बचाएं' भी ग्रंथालयों को उन सभी नवीन तकनीकों को अपनाने की सलाह देता है, जिनसे पाठकों के समय की बचत होती हो। वर्तमान समय में पाठकों के साथ-साथ ग्रंथालय कर्मचारियों के पास समय का अभाव है यदि पाठकों के मानसिक भूख को तत्काल शांत न किया जाय तो वह नष्ट हो सकती है। इस सूत्र के अनुसार पाठकों के बाह्य तथा अधिकरण विषयक दोनों प्रकार के समय की बचत होनी चाहिए। वास्तव में जहाँ यह सूत्र ग्रंथालय प्रशासन तथा संचालन में सुधारों के साथ ग्रंथालयों में नवीन तकनीकों को अपनाने की अनुसंशा करता है, वहीं क्यूआर कोड (QR Code) प्रौद्योगिकी द्वारा प्राप्त एक ऐसी तकनीक है जिसके ग्रंथालयों में उपयोग से न केवल ग्रंथालय सेवाओं को सरल बनाया जा सकता है अपितु त्वरित व त्रुटि रहित ग्रंथालय सेवा पाठकों को उपलब्ध कराया जा सकता है।

### 2. क्यूआर कोड क्या है ? (What is a QR Code)

आज कल हम आधार कार्ड, हवाई जहाज, रेल व बस यात्रा के टिकटों, ऑनलाइन परीक्षाओं के प्रवेश पत्रों, मोबाइल आधारित ऑनलाइन पेमेंट माध्यमों जैसे- पेटीएम (Paytm),

\* वरिष्ठ सहायक प्राध्यापक, ग्रंथालय एवं सूचना विज्ञान अध्ययनशाला, पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर (छ.ग.) ई-मेल: hari197479@yahoo.in

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## Abstract

The search for information is similar to an activity in which the most knowledge from any subject can be tested. Attempts have been made by the participants to obtain the necessary information from various information channels to fulfill their objectives. To find out what kind of information is used by the participants of the refresher course at the Human Resource Development Center of Pandit Ravi Shankar Shukla University, Raipur. The participants use which means to get information. In this, 100% of the participants prefer to attend conferences, workshops and seminars to get new information. The participants also use the highest 84.61% e-journals, 79.48% Shodh Ganga, 74.35% Books, 71.79% N-List, 66.66% e-ShodhSindhu, 58.97% Journals, 46.15% Shodh Gangotri, 41.02% E-Books and Magazine / Newspapers, and 35.89% Vidwan Database and the least 28.20% Vidya-Mitra sources to get information.

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## Use Pattern and Information Seeking Behaviour of participants of HRDC, Pt. Ravishankar Shukla University, Raipur (C.G.)

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**Abstract-** *The search for information is similar to an activity in which the most knowledge from any subject can be tested. Attempts have been made by the participants to obtain the necessary information from various information channels to fulfill their objectives. To find out what kind of information is used by the participants of the refresher course at the Human Resource Development Center of Pandit Ravi Shankar Shukla University, Raipur. The participants use*



## Role of libraries in Pharmacy Education

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### ABSTRACT

*This paper is to discuss the findings on Research Productivity of role of libraries in Pharmacy education among Pharmacy students in Chhattisgarh. For the purpose of data collection, 46 questionnaires were distributed. The findings reveal that majority of users 28 (60.86%) are of female respondents, 32 (69.56%) greater part of respondents use digital resources daily. It is also clear that highest numbers of 39 (84.78%) respondents are using digital resources to prepare course materials for study in the field.*

**KEYWORDS:** Pharmacy Education, digital literacy, digital resources.

### 1. INTRODUCTION

Pharmacy education is essential for the development of basic medical and pharmaceutical sciences to serve the society. Libraries are provided in supporting and achieving the mission of higher education in today's information world. Faculty, students and research scholars always depend on libraries and librarians. Librarians generously share their knowledge with them. It is important to work with your librarians to embed information literacy training into delivery of support for the course. Computer is very important because they are applied in almost all the fields in the Modern Era.

### 2. OBJECTIVES OF THE STUDY

The following objectives of the study are:

1. To find research productivity of role of libraries in Pharmacy education and digital literacy among Pharmacy students in Chhattisgarh.
2. To find out the frequency of use of digital resources pharmacy students.
3. To identify the purpose of using digital resources pharmacy students.

### 3. METHODOLOGY OF THE STUDY

The present study was conducted pharmacy students. For collecting of data from the respondents' questionnaire was administered. 46 questionnaires were distributed among the students.

### 4. PHARMACY EDUCATION IN CHHATTISGARH

There has been a substantial quantitative growth of pharmacy institution in the state towards the promotion and development pharmaceutical field.

## Role of libraries in Pharmacy Education

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Bovine Review

# Behavior and foraging ecology of cattle: A review

Bhupendra Kumar Sahu <sup>a</sup>, **Arti Parganiha** <sup>a b</sup>  , Atanu Kumar Pati <sup>a b c</sup>[Show more](#)  Share  Cite<https://doi.org/10.1016/j.jveb.2020.08.004> [Get rights and content](#) 

## Abstract

Cattle are diurnal and distributed all over the world. They are true ruminants and exhibit several behaviors, namely, foraging, reproductive, social, maternal care, dominance, cognitive behavior, and so on. Foraging behavior is essential for their survival, growth, and reproductive fitness. A review of the literature reveals that in most of the research papers and projects, the study of cattle behavior has not been one of the primary objectives of the research—most of the documents focused on foraging and reproductive behavior from the angle of economic prospective only. The Scopus and other searches revealed only 2 publications on street/stray cattle. Street/stray cattle are the perfect model to study their changing behavior during urbanization. Therefore, information on the behavioral ecology of street/stray cattle will be relevant and valuable for the ethologists studying urban ecology and landscape.

## Introduction







## Journal of Veterinary Behavior

Volume 40, November–December 2020, Pages 50–74

Bovine Review

# Behavior and foraging ecology of cattle: A review

Bhupendra Kumar Sahu <sup>a</sup>, Arti Parganiha <sup>a b</sup>  , Atanu Kumar Pati <sup>a b c</sup>[Show more](#)  Share  Cite<https://doi.org/10.1016/j.jveb.2020.08.004> [Get rights and content](#) 

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## Introduction



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## BIOACCUMULATORY, HEPATOTOXIC AND GENOTOXIC POTENTIAL OF CHRONIC FLUORIDE EXPOSURE ON CAT FISH, CLARIAS BATRACHUS

May 2023

Authors:

**Purva Mishra**

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**Aditi Niyogi Poddar**

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## Abstract

Fluorine is the most reactive and highly electronegative element in the periodic table and is not available in its free form due to its high reactive property. Being a soluble and easily transportable inorganic pollutant, it gets accumulated in various organs of aquatic organisms and adversely affects many physiological functions. *Clarias batrachus* were exposed to different sub lethal concentrations of NaF (Sodium fluoride) for 60 days (chronic exposure). Bioaccumulation status of fluoride was estimated in blood and tissues (Liver, Kidney & Muscle). Highest concentration was found in liver tissues ranging from 0.018 to 0.069 mg Kg<sup>-1</sup>. Liver enzymes GOT (Glutamic oxaloacetic Transaminases) & GPT (Glutamic pyruvic Transaminases) were analyzed for their activities, which ascertained hepatotoxic effects of fluoride accumulation. DNA damage was also estimated using COMET assay technique, in which percent DNA was calculated using visual scoring method. Percent DNA damage was found to be high in fluoride exposed fishes. All the results were found to be highly significant, performed by statistical analysis, two way ANOVA (P<0.05).

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# BIOACCUMULATORY, HEPATOTOXIC AND GENOTOXIC POTENTIAL OF CHRONIC FLUORIDE EXPOSURE ON CAT FISH, *CLARIAS BATRACHUS*

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**ABSTRACT :** Fluorine is the most reactive and highly electronegative element in the periodic table and is not available in its free form due to its high reactive property. Being a soluble and easily transportable inorganic pollutant, it gets accumulated in various organs of aquatic organisms and adversely affects many physiological functions. *Clarias batrachus* were exposed to different sub lethal concentrations of NaF (Sodium fluoride) for 60 days (chronic exposure). Bioaccumulation status of fluoride was estimated in blood and tissues (Liver, Kidney & Muscle). Highest concentration was found in liver tissues ranging from 0.018 to 0.069 mg Kg<sup>-1</sup>. Liver enzymes GOT (Glutamic oxaloacetic Transaminases) & GPT (Glutamic pyruvic Transaminases) were analyzed for their activities, which ascertained hepatotoxic effects of fluoride accumulation. DNA damage was also estimated using COMET assay technique, in which percent DNA was calculated using visual scoring method. Percent DNA damage was found to be high in fluoride exposed fishes. All the results were found to be highly significant, performed by statistical analysis, two way ANOVA (P<0.05).



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# Circadian rhythm in the pattern of online usage of Facebook messenger during the COVID-19-triggered lockdown: a sequel to the pre-pandemic study

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# Optimization of kraft lignin decolorization and degradation by bacterial strain *Bacillus velezensis* using response surface methodology

Monika Verma<sup>a</sup>, Amia Ekka<sup>a</sup>, Titikshya Mohapatra<sup>b</sup>, Prabir Ghosh<sup>a</sup>

<sup>a</sup> School of Studies in Life Science, Ravishankar Shukla University, Raipur, Chhattisgarh, India

<sup>b</sup> Department of Chemical Engineering, NIT Raipur, Raipur, Chhattisgarh, India

## ARTICLE INFO

Editor: G. Palmisano

### Keywords:

*Bacillus velezensis*  
Decolorization  
Degradation  
RSM  
*Phaseolus aureus*

## ABSTRACT

In the present study, optimization of Kraft lignin (KL) decolorization and degradation were carried out using an isolated ligninolytic bacterial strain *Bacillus velezensis*. The process was optimized using Central Composite Design (CCD) through Response Surface Methodology (RSM) for four variables i.e. carbon, nitrogen as nutritional parameters and temperature, pH as physical parameters while monitoring two response (% color removal and degradation). Under optimal conditions, the maximum KL decolorization and degradation capacity of strain was 56.16 % and 40.39 %, respectively. The pulp paper mill effluent toxicity was assessed in terms of phytotoxicity measurement on *Phaseolus aureus*. The germination percentage of *Phaseolus aureus* in wastewater treated with bacterial strain was 70 %, while untreated sample showed 50 % only.

## 1. Introduction

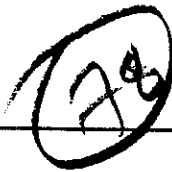
In our country, the pulp and paper mill are the major industrial sectors. There were 17 paper mills in India with the total paper production of 0.13 million tons per year in 1951. The number was increased up to 406 in 2002 with the production of 1.9 million tons [1]. These industries utilize huge amount of chemicals, lignocellulosic components of plants and water during manufacturing. The amount of water required for per tons of paper production is about 60,000–1,00,000 gallon and discharges more than 47,000–80,000 gallon of water which contains lignin and chlorophenols [2]. The wastewater released from pulp and paper is dark brown in color which is due to the presence of lignin and its derivatives [3–5]. The dark brown color adversely affects the aquatic ecosystem due to the absorbance of light as it inhibits the natural process of photosynthesis in the streams. Untreated and partially treated effluents result in the persistence of color in the receiving water body over a long time discharge. Depending on the used raw material and stage of production process, these industries generate different kinds of wastewater with different characteristics. Most significant source of pollutant in such mill is wood preparation, pulping, bleaching and coating process [6]. During pulping process, a polymer by product, kraft Lignin is formed. In order to produce the rayon grade pulp, only premium-quality fiber containing wood chips were chosen with a superfluous chemical process that involves extensive pre-hydrolysis of wood chips at elevated

pressure and temperature followed by alkaline digestion. The semisolid pulp is collected, washed and a colloidal aqueous solution of lignin, black liquor is generated. The dark brown color is due to lignin solubility. The waste water released from this stage principally contains hemicelluloses, lignin fragments, phenolics, resins, sodium sulfate, sodium carbonate, fatty acids and extra inorganic salts. When these constituents get mixed together becomes soluble in the strongly basic medium [7]. Unnecessary load of inorganic nutrients and organic matter causes eutrophication contained by the receiving water bodies. The lignosulfonate constituent of pulp paper wastewater may hinder the growth of algae, phototrophic planktons and plants by dropping the transmission of sunlight in water. Farmers in many developing countries like India, due to non-availability of alternative sources, irrigate their crop plants with industrial effluents containing high level of toxic compounds including heavy metals, leading to adverse effect on human health through food chain [8].

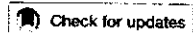
Although several physical and chemical methods are available for the treatment of effluent, however they are considered to be less desirable. Therefore, the researchers are now focusing on environmental friendly technologies for the treatment of wastewater, which include biological methods for the removal of contaminants from the effluent [9]. Among the biological methods, majority of the literatures have been paying attention only on some genera of white rot fungi because of their wide range and non-specific extracellular ligninolytic enzymatic system (Manganese peroxidase, Lignin peroxidase and Laccase). For the

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## ARTICLE



# Predictive role of socio-demographic and chronotype on health-related quality of life of cancer patients from southeastern India

Armiya Sultan<sup>a</sup>, Saba Taj<sup>a</sup>, Vivek Choudhary<sup>b</sup> and **Arti Parganiha<sup>a,c</sup>**

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## ABSTRACT

It is well known that cancer and its treatment produce marked impact on the health-related quality of life (HRQoL) of cancer patients. Research concerning impact of chronotype on HRQoL in cancer patients is almost not studied yet, but the interests are growing in several diseases. Present study was carried out to explore the impact of socio-demographics, chronotype and consumption of tobacco, alcohol and sleeping medicine on HRQoL of Indian oncology patients. Self-reported Quality-of-Life questionnaire (EORTC QLQ-C30), Hospital Anxiety and Depression Scale (HADS), and Morningness-Eveningness Questionnaire (MEQ) were administered to the cancer patients (N = 1000) in the native Hindi language. Results revealed that among the socio-demographic factors, only age exhibited significant negative association with physical, role and cognitive functioning and positive association with symptoms, namely fatigue and pain. Interestingly, chronotype was found to be positively associated with emotional functioning and negatively with nausea-vomiting, dyspnoea, diarrhoea and depression. Patients who consumed tobacco, alcohol or sleeping medicine exhibited lower functioning and higher symptoms. Further, treatment of cancer also produced effect on a few measures of HRQoL of patients. In conclusion, age, chronotype and consumption of tobacco, alcohol or sleeping medicine were found to be important determinants of HRQoL of the patients.

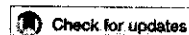
## KEYWORDS

Cancer patients; health-related quality of life; socio-demographic; chronotype; addictive habits

## 1. Introduction

In oncological trials and practices, health-related quality of life (HRQoL) is considered as an important end point along with the tumour response rate, and disease-free and overall survival of the cancer patients. HRQoL includes patient's physical, psychological, and social wellbeing (Parganiha et al. 2014; Sultan et al. 2017a, 2018a). It is well known that cancer and its treatment produce marked impact on the anxiety, depression and HRQoL of cancer patients (Mystakidou et al. 2005; Sultan et al. 2017b). However, the impact may depend on the gender, age, type, stage and grade of cancer; type of treatment and its





# Time-of-day and seasonal variations in foraging behavior of street cattle of urban Raipur, India

Bhupendra Kumar Sahu<sup>a</sup>, Arti Parganiha<sup>a,b</sup> and Atanu Kumar Pati<sup>a,b,c</sup>

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## ABSTRACT

We studied time-of-day and seasonal variations in the foraging behavior of street cattle in Raipur city, India. We recorded the foraging behavior of street cattle at 48-time points each day for over three consecutive days at 10 different locations of Raipur city across three distinct seasons of the year. We log-transformed the time series data and employed Single Cosinor to compute the characteristics of time-of-day variation in foraging activity. We also determined the effects of the factors "time-of-day" and "season" on foraging behavior and the number of cattle. We found statistically significant time-of-day variation in foraging pattern with the peaks located mostly at midday hours, irrespective of seasons. The amplitude of foraging was the least in the summer as compared with the rainy and the winter seasons. The factors "time-of-day" and "season" modulated both foraging activity and frequency of cattle on the streets statistically significantly. The observed spatiotemporal patterns in the foraging behavior of cattle on the streets might provide useful information to the stakeholders engaged in mitigating the urban cattle menace in Raipur city and elsewhere in the world.

## ARTICLE HISTORY

Received 25 April 2020

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## KEYWORDS

Time-of-day variation; seasonal variation; foraging behavior; street cattle; cattle menace

## 1. Introduction

Bovine species are familiar to humans. They were domesticated from time immemorial for the purpose of meat and milk. Cattle population has worldwide distribution. A sizable number of cattle, nearly 305 million head (30.44% of the global population), are present in India. This makes India a leading country in the world for cattle population (Cook 2019). Recently released 20<sup>th</sup> Livestock Census report of India (2019) indicated that out of 302.79 million bovine population (Cattle, Buffalo, Mithun, and Yak), 192.49 million consists of cattle (cow and ox) only. The report also revealed a 0.8% increase in the cattle population in India over the data recorded in the last livestock census (19<sup>th</sup> Livestock Census 2012). A large number of stray street cattle wander freely on the street in urban cities of India. Continuous overexploitation and shrinkage of grassland might be the cause of the above phenomenon (19<sup>th</sup> Livestock Census 2012; Gowen 2018; Arya et al. 2019; Sahu et al. 2019).

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# A population estimation study reveals a staggeringly high number of cattle on the streets of urban Raipur in India

Bhupendra Kumar Sahu, [Arti Parganiha](#) , Atanu Kumar Pati

Published: January 20, 2021 • <https://doi.org/10.1371/journal.pone.0234594>

## Abstract

Cattle are cosmopolitan in distribution. They are economically and ecologically significant. The cattle menace on the urban streets of developing and underdeveloped countries is challenging. The number of road accidents is increasing rapidly over time, in the urban areas of most of the developing countries, like India. In the present study, we estimated the population of cattle wandering on the streets/roads/highways of Raipur city of India using the direct headcount method and advanced Photographic Capture-Recapture Method (PCRCM). We compared these two methods of population estimation to check their suitability and adequacy. We superimposed 163 grids (1.0 x 1.0 km each) on the map of Raipur city using Quantum Geographic Information System (QGIS) software. We randomly selected 20 grids for the estimation of the street cattle population. We used both line transect and block count sampling techniques under the direct headcount method. The estimates of visibly roaming cattle on the Raipur city streets were 11808.45 and 11198.30 using the former and the latter sampling techniques, respectively. Further, advanced PCRCM indicated an estimated 35149.61 and 34623.20 cattle using the line transect and block counting sampling techniques, respectively. We observed a female-biased sex ratio in both mature and immature cattle. The frequency of mature cattle was significantly higher than that of naive cattle, followed by the calf. Further, we noticed the frequency of cattle in a grid in the following order: cow > bull > heifer > immature male > female calf > male calf. We concluded that the estimated population of street cattle in Raipur city is about 35 thousand. The results of both the techniques, i.e., direct headcount method and PCRCM, are consistent for population estimation. The direct headcount method yields the number of cattle visibly roaming on the street at a particular time. In contrast, advanced PCRCM gives the total population of street cattle in the city. Active surveillance of the urban cattle population might be of critical importance for municipal and city planners. A better understanding of the urban cattle population might help mitigate the cattle menace on the street, eventually preventing cattle-human conflict and minimizing road accidents. The techniques adopted in this study will also help estimate the population of free-ranging dogs and other wildlife animals in any target location.

**Citation:** Sahu BK, Parganiha A, Pati AK (2021) A population estimation study reveals a staggeringly high number of cattle on the streets of urban Raipur in India. PLoS ONE 16(1): e0234594. <https://doi.org/10.1371/journal.pone.0234594>

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**Data Availability:** All relevant data are within the manuscript and its [Supporting Information](#) files.

**Funding:** The author(s) did not receive any specific funding for this work. However, this work is a part of the Doctor of Philosophy thesis of one of the authors, BKS, who is getting a Junior Research Fellowship under the scheme CSIR-UGC NET for JRF [Sr. No. 2121530765. Ref. No: 20/12/2015(ii)EU –V; dated 18/05/2016].

**Competing interests:** The authors have declared that no competing interests exist.

## Introduction

Man began to domesticate cattle about 10000- to 8000-year ago [1, 2]. They used them as sources of milk and meat. Cattle are distributed worldwide and constitute the most significant number among the ungulates [3, 4]. In the animal world, cattle represent the largest zoomass (about 600 million metric tons) [5].

At the end of 2018, the worldwide cattle population was about 996.36 million [3]. As per the global cattle inventory 2018, India possesses the most significant number of cattle (i.e., 305.00 million) in the world [4]. This figure was about 196.19 million during 2012 (19<sup>th</sup> livestock census, 2012) that included 5.29 million strays (free-roaming ownerless cattle) [6]. Recently, India's 20<sup>th</sup> livestock census (2019) was released. It showed that the cattle population is about 198.48 million, including 5.02 million stray cattle in India [7]. In the India's State of Chhattisgarh, the cattle population is about 9.98 million, including 0.374 million in urban areas; and the stray cattle population is about 0.185 million [7].

As a consequence of the increasing cattle population, many cattle are wandering here and there on streets in most developing and underdeveloped countries [8–11]. Rapid urbanization, facilitated by both the government and private sectors, is attributed to increased street cattle. Due to the shortage of foraging spots, cattle wander freely on the streets of urban areas. One of the crucial



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## Article

# Animal Welfare Attitudes: Effects of Gender and Diet in University Samples from 22 Countries

Christoph Randler <sup>1,2,3,\*</sup>, Ana Adan <sup>4,5</sup>, Maria-Mihaela Antofie <sup>6</sup>, Arturo Arrona-Palacios <sup>7</sup>, Manecas Candido <sup>8</sup>, Jelle Boeve-de Pauw <sup>9</sup>, Priti Chandrakar <sup>10</sup>, Eda Demirhan <sup>11</sup>, Vassilis Detsis <sup>12</sup>, Lee Di Milia <sup>13</sup>, Jana Fančovičová <sup>14</sup>, Niklas Gericke <sup>15</sup>, Prasun Halder <sup>16</sup>, Zeinab Heidari <sup>17</sup>, Konrad S. Jankowski <sup>18</sup>, Juhani E. Lehto <sup>19</sup>, Ryan Lundell-Creagh <sup>20</sup>, William Medina-Jerez <sup>21</sup>, Adrian Meule <sup>22,23</sup>, Taciano L. Milfont <sup>24</sup>, Mireia Orgilés <sup>25</sup>, Alexandra Morales <sup>25</sup>, Vincenzo Natale <sup>26</sup>, Xóchitl Ortiz-Jiménez <sup>27</sup>, Babita Pande <sup>10</sup>, Timo Partonen <sup>28</sup>, **Atanu Kumar Pati** <sup>10,29,30</sup>, Pavol Prokop <sup>31,32</sup>, Arash Rahafar <sup>17</sup>, Martin Scheuch <sup>33,34</sup>, Subhashis Sahu <sup>35</sup>, Iztok Tomažič <sup>36</sup>, Lorenzo Tonetti <sup>26</sup>, Pablo Vallejo Medina <sup>37</sup>, Peter van Petegem <sup>9</sup>, Alejandro Vargas <sup>37</sup> and Christian Vollmer <sup>38</sup>

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# Circadian clock modulating small molecules repurposing as inhibitors of SARS-CoV-2 M<sup>pro</sup> for pharmacological interventions in COVID-19 pandemic

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## ABSTRACT

The COVID-19 pandemic caused by SARS-CoV-2 is a global health emergency warranting the development of targeted treatment. The main protease M<sup>pro</sup> is considered as a key drug target in coronavirus infections because of its vital role in the proteolytic processing of two essential polyproteins required for the replication and transcription of viral RNA. Targeting and inhibiting the M<sup>pro</sup> activity represents a valid approach to prevent the SARS-CoV-2 replication and spread. Based on the structure-assisted drug designing, here we report a circadian clock-modulating small molecule "SRT2183" as a potent inhibitor of M<sup>pro</sup> to block the replication of SARS-CoV-2. The findings are expected to pave the way for the development of therapeutics for COVID-19.

## ARTICLE HISTORY

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## KEYWORDS

Circadian clock-modulating molecules; COVID-19; inhibitors; main protease; pandemic; SARS-CoV-2 M<sup>pro</sup>; SRT2183; targeted therapy

## Introduction

Outbreaks of deadly contagious diseases, particularly caused by viruses, have always been a big threat to the human race. During the last five decades, herpes, legionnaires, HIV/AIDS, Western African Ebola epidemic, Middle East Respiratory Syndrome (MERS), Severe Acute Respiratory Syndrome (SARS), and now new coronavirus disease 2019 (COVID-19) viruses have attacked human population worldwide. The members of the coronavirus family, alone, have caused two deadly outbreaks, namely MERS caused by MERS coronavirus (MERS-CoV) and SARS caused by SARS coronavirus (SARS-CoV) during the last two decades (Zhong et al. 2020). In December 2019, a new unprecedented viral infection emerged in Wuhan, China. Genomic studies have shown that about 82% genome of this novel virus match the RNA genome of SARS-CoV (Wu et al. 2020a, 2020b; Zhou et al. 2020). The novel virus was named as Severe Acute Respiratory Syndrome coronavirus-2 (SARS-CoV-2) and the contagious infectious disease caused by this new virus was named as coronavirus disease 2019 (COVID-19) (Gorbalenya et al. 2020).

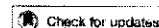
Pathophysiological findings made it evident that SARS-CoV-2 infection is more contagious than both MERS and SARS (Zhang and Holmes 2020). Infection can spread even if an individual is asymptomatic or in presymptomatic conditions. Individuals infected with

SARS-CoV-2 develop mild-to-moderate illness; however, older people and those with chronic medical complications are more likely to develop serious illness (Chen et al. 2020; Li et al. 2020; World Health Organization, clinical management of COVID-19: Interim Guidance 2020).

In December 2019, the COVID-19 pandemic outbreak originated in Wuhan city, Hubei province of China. The first cluster of cases of "pneumonia of unknown cause" was reported in late December 2019 (Wu et al. 2020c). Thereafter, the contagious SARS-CoV-2 infection quickly spread globally. The first laboratory-confirmed novel coronavirus case recorded outside of China was reported on 13th January 2020 by the Ministry of Public Health in Thailand (Yan et al. 2020). The World Health Organization (WHO) declared the infection a pandemic on 11th March 2020 (Zhang et al. 2020). According to WHO reports, confirmed cases of COVID-19 are increasing exponentially worldwide. Globally, as of 04:02h CET, 4 March 2021, there have been 114,853,685 confirmed cases of COVID-19, including 2,554,694 deaths, reported to WHO (<https://covid19.who.int/>). However, these numbers are likely to be higher than reported because of the frequent exclusion of mild or asymptomatic cases.

Currently, no therapeutic options are available for COVID-19. However, an insight gained on the SARS-CoV-2 RNA genome and crystal structures of

## ORIGINAL ARTICLE



# Circadian rhythmicity of heart rate variability and its impact on cardiac autonomic modulation in asthma

Meenakshi Sinha<sup>a</sup>, Ajoy K. Behera<sup>b</sup>, Ramanjan Sinha<sup>a</sup>, Arti Parganiha<sup>c</sup>, Babita Pande<sup>a</sup>, Richa Sharma<sup>a</sup>, and Atanu K Pati<sup>d</sup>

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## ABSTRACT

The commonly observed nocturnal attack of asthma is accompanied by circadian variations in airway inflammation and other physiological variables. It is also documented to present with a significantly higher risk of adverse cardiovascular events that are associated with lower heart rate variability (HRV) and depressed sympathetic and enhanced parasympathetic modulations. However, available literature is scarce with regard to the impact of alteration in circadian rhythmicity of long-term HRV and its day-night variation in asthmatic patients. Thus, 72-h continuous recording of RR interval and oxygen saturation was done to study the circadian variability of HRV (in terms of time and frequency domain indices) and also to assess the pattern of alterations in sympathetic and parasympathetic tones at different times of the day in asthmatic patients ( $n = 32$ ) and healthy control subjects ( $n = 31$ ). Repeated-measure analysis of variance and independent-samples *t*-test revealed significantly increased parasympathetic tone [in terms of increased square root of the mean squared differences of successive NN intervals (RMSSD), percentage of number of pairs of adjacent RR interval differing by more than 50 ms (pNN50), standard deviation of NN intervals (SDNN), and high frequency (HF)] with reduced sympathetic activity [decreased low frequency (LF) and LF/HF ratio] at early morning hours (between 04:00 and 10:00 h) in the asthma patients in contrast to the healthy subjects who had opposite response. Also, significant phase delay ( $p < 0.05$ ) of all the HRV indices and  $SpO_2$  was evident by cosinor analysis. Therefore, disturbed circadian rhythm of HRV indices and early morning increased parasympathetic tone points toward the possible pathophysiological basis of exacerbated asthmatic symptoms at late night/early morning hours and susceptibility of future cardiovascular pathologies. This also necessitates the assessment of HRV rhythm while dealing with the therapeutic management of asthma patients.

## ARTICLE HISTORY

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## KEYWORDS

HRV; HRV circadian rhythm; circadian rhythm in asthma; oxygen saturation rhythm

## Introduction

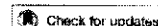
Asthma, a chronic lung disease due to inflammation and narrowing of the airways, frequently presents with worsening of symptoms overnight, particularly in the early hours of the morning. In fact, nocturnal symptoms in asthma are the most frequent reason and essential indicator of the escalation of treatment. Circadian variations in airflow limitation and airways hyper-responsiveness accompanied by the nocturnal symptoms of cough and dyspnea have been documented as the pathophysiological basis for the same (Sutherland 2005).

On the other hand, a significantly higher risk of cardiovascular events, including myocardial infarction, cardiac arrest, angina, and stroke, has been seen in persistent asthma (Tattersall et al. 2015). In this context, heart rate variability (HRV) has emerged as a noninvasive validated tool for the evaluation of cardiac autonomic function.

Poor asthma control has been found to be associated with lower HRV, depressed sympathetic, and enhanced parasympathetic modulations with longer asthma duration, whereas an opposite HRV response is found in controlled asthmatics (Lutfi 2015). Children with stable chronic asthma have been documented recently to present with enhanced parasympathetic modulation and cardiac autonomic imbalance (Franco et al. 2020). But the impact of altered circadian rhythm of HRV in the disease process is still largely unclear. The well-known circadian rhythmicity of various HRV indices in healthy individuals shows increased HRV during the night with predominance of vagal activity and a nighttime peak during the second half of the night (Sammito et al. 2016). A maximal shift toward sympathetic autonomic activation during sleep-to-wake transitions takes place, which has been linked to the observed increase in cardiovascular



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Meenakshi Sinha<sup>a</sup>, Ajoy K. Behera<sup>b</sup>, Ramanjan Sinha<sup>a</sup>, Arti Parganiha<sup>c</sup>, Babita Pande<sup>a</sup>, Richa Sharma<sup>a</sup>, and Atanu K Pati<sup>d</sup>

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## ABSTRACT

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## Introduction

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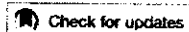
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Poor asthma control has been found to be associated with lower HRV, depressed sympathetic, and enhanced parasympathetic modulations with longer asthma duration, whereas an opposite HRV response is found in controlled asthmatics (Lutfi 2015). Children with stable chronic asthma have been documented recently to present with enhanced parasympathetic modulation and cardiac autonomic imbalance (Franco et al. 2020). But the impact of altered circadian rhythm of HRV in the disease process is still largely unclear. The well-known circadian rhythmicity of various HRV indices in healthy individuals shows increased HRV during the night with predominance of vagal activity and a nighttime peak during the second half of the night (Sammuto et al. 2016). A maximal shift toward sympathetic autonomic activation during sleep-to-wake transitions takes place, which has been linked to the observed increase in cardiovascular





## ORIGINAL REPORT



# Does exposure to radiofrequency radiation (RFR) affect the circadian rhythm of rest-activity patterns and behavioral sleep variables in humans?

Margaret Messiah Singh<sup>a</sup>, Priyanka Chandel<sup>a</sup>, Atanu Pati<sup>a,b,c</sup> and Arti Parganiha<sup>a,b</sup>

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## ABSTRACT

We evaluated the effects of the exposure to radio-frequency radiation emanating from the base transceiver station (BTS) on the characteristics of circadian rest-activity rhythm and behavioral sleep variables in humans. We performed this exploratory field study in a sample of 89 healthy subjects randomly chosen out of 1434 individuals surveyed for the purpose. We divided 89 subjects into five groups, including the control, as a function of distance from the BTS. The E-field strength was higher in the groups of the inter-tower region and between 0 and 150 m away from the BTS. The E-field (distance) did not significantly affect the circadian rhythm parameters and behavioral sleep variables, except a marginal delay in the peak timings of the rest-activity rhythm of subjects in the inter-tower and 300–500 m groups. Notable secondary effects of the factor gender were noticed on circadian amplitude, sleep efficiency, dichotomy index, and wake after sleep onset. We concluded that exposure to radiation from the BTS did not modulate actigraphy-based behavioral sleep variables of people residing around BTS installations. We recommend more extensive field-based studies with rigorous longitudinal designs to validate the effects of radiation from the BTS in humans.

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## KEYWORDS

BTS; RF-EMR; actigraphy;  
rest-activity rhythm;  
behavioral sleep variables;  
human

## 1. Introduction

In modern society, we have an intimate association with the telecommunication system comprising mobile phones (MPs) and their base transceiver stations (BTSs). Each BTS operates in the radiofrequency range. According to the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), the non-ionizing radio-frequency electromagnetic field (RF-EMF) ranges from 3 kilohertz (kHz) to 300 gigahertz (GHz). The number of BTS installations is rapidly rising over the last decade to meet the increasing use of smart-phones for social media, online services, and internet access (Barrile et al. 2009; Kaushal et al. 2012; Haryono and Gunawan 2020). Deployment of BTS in residential areas makes humans exposed to radiofrequency radiation (RFR) persistently. People living in BTS

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 Supplemental data for this article can be accessed here.

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Research Articles

# Does exposure to radiofrequency radiation (RFR) affect the circadian rhythm of rest-activity patterns and behavioral sleep variables in humans?

Margaret Messiah Singh, Priyanka Chandel, Atanu Pati & Arti Parganiha

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## Review article

# Drug resistant tuberculosis: Current scenario and impending challenges

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## ABSTRACT

Tuberculosis is still one of the ten leading causes for death worldwide. In spite of the latest medical and health advance gained over a period of time, tuberculosis effectively evades the successful targeting by drugs. The persistence abilities demonstrated by the mycobacteria had surprised the global community, since its discovery and pathogenesis in humans. Emergence and detection of drug resistant mycobacteria (MDR-TB, XDR-TB) had further complicated the treatment regime. Under the aegis of WHO, there is a concerted understanding and effort by the global community to eradicate TB. Towards this goal, novel drug molecules, new vaccine and treatment regime are being developed. Here, our current understanding pertaining to mode of action, molecular mechanisms of novel as well as traditional drug molecules and possible drug resistance mechanism in *M. Tuberculosis* is reviewed. Recent advances on new vaccination regime are also reviewed as it demonstrated huge potential in containing TB. This knowledge is essential for the development of more effective drug molecules, vaccines and may help in devising new strategy for containing and eradicating TB.

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## 1. Introduction

Tuberculosis has become an epidemic in the world amounting to approximately one fourth of the world's population being infected with the latent form of tuberculosis.<sup>1</sup> According to World Health Organization (WHO), a total of 1.4 million people died from TB in 2019 (including 2, 08,000 people with HIV). Epidemiologically, TB is still one of the top 10 causes of death from a single infectious agent (above HIV/AIDS). *Mycobacterium tuberculosis* (MTB), the causative agent, primarily affects human lungs (pulmonary tuberculosis, PTB), but can affect other tissues and organs such as brain, bone and liver.<sup>2,3</sup> TB is

predominant in developing countries due to poor health regime and lack of awareness. Majority of the people who developed tuberculosis in 2019 were localized in South East Asian countries (44%), followed by Africa (25%), Western Pacific (18%), Eastern Mediterranean (8.2%), the Americas (2.9%) and Europe (2.5%). Eight countries, namely India (26%), Indonesia (8.5%), China (8.4%), the Philippines (6.0%), Pakistan (5.7%), Nigeria (4.4%), Bangladesh (3.6%) and South Africa (3.6%), accounted for almost two thirds of the total patients.<sup>4</sup> Emergence of drug-resistant TB had further complicated the treatment regime and poses a grave threat to public health. Globally in 2019, close to half a million people developed rifampicin-resistant TB (RR-

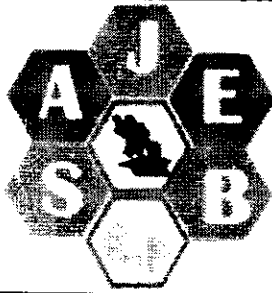
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## REGULAR ARTICLE

### Exposure to radio-frequency electromagnetic radiation shortens sleep duration and lengthens sleep latency and sleep inertia in humans living in proximity to the base transceiver stations

Priyanka Chandel<sup>1</sup>, Margaret Messiah Singh<sup>1</sup>, Atanu Kumar Pati<sup>1,2</sup>, **Arti Parganiha<sup>1,2\*</sup>**

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**Keywords:** Radiofrequency electromagnetic radiation; base transceiver station; electric-field strength; Narda Broadband Meter-550; behavioral sleep pattern

#### ABSTRACT

Radio-frequency electromagnetic radiations (RF-EMRs) are ubiquitous at present. Therefore, it is essential to assess the impact of RF-EMRs on human health. In this study, we examined the non-thermal effects of RF-EMR exposure on behavioral sleep patterns in humans. A total of 1072 randomly selected individuals living in the proximity of base transceiver stations (BTS) participated in the study. The sample consisted of 122 subjects from zone A (Inter-tower region), 310 from zone B (0-150 m), 316 from zone C (150-300 m), 197 from zone D (300-500 m), and 127 from the control zone (without BTS installations). We classified the zones as a function of distance from the BTS. We measured electric-field strength at each participant's house using Narda Broadband Field Meter-550 equipped with EF0-391 probe. We used Munich-Chronotype Questionnaire to determine each subject's behavioral sleep patterns. ANOVA results revealed the highest E-field strength in zone-A than the other zones and control. Results from ANCOVA, Kruskal-Wallis, and Mann-Whitney U tests showed that the participants from zone A had shorter sleep duration, and longer sleep latency and inertia than those living in other zones. Further, a significant effect of co-factors 'gender' and 'year of residence' was validated on mid-sleep (work and free days). Compared to women and > 5-year residents, men and 1-5-year residents had delayed mid-sleep. We concluded that RF-EMR might alter the behavioral sleep patterns of subjects living in the vicinity of BTS. However, further confirmatory and extensive studies are necessary, involving a large sample living near many more BTS installations.

#### 1. Introduction

Exposure to electromagnetic fields (EMFs) is a common phenomenon these days. All organisms, including humans, receive electromagnetic radiations of varying frequencies. Base transceiver stations (BTS) and cell phones are the primary sources of human-made EMF (Buckus et al., 2017). However,

the radio-frequency electromagnetic radiations (RF-EMRs) fall in the non-ionizing category (The International Commission on Non-Ionizing Radiation Protection, 1998). RF-EMR lies in the frequency range between 3 kilohertz (kHz) to 300 gigahertz (GHz) as per the report of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). In the past few decades, the extensive usage of

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# Exposure to radio-frequency electromagnetic radiation shortens sleep duration and lengthens sleep latency and sleep inertia in humans living in proximity to the base transceiver stations

Priyanka Chandel

Margaret Messiah Singh

Atanu Kumar Pati

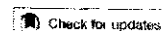
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## ABSTRACT

Radio-frequency electromagnetic radiations (RF-EMRs) are ubiquitous at present. Therefore, it is essential to assess the impact of RF-EMRs on human health. In this study, we examined the non-thermal effects of RF-EMR exposure on behavioral sleep patterns in humans. A total of 1072 randomly selected individuals living in the proximity of base transceiver stations (BTS) participated in the study. The sample consisted of 122 subjects from zone A (Inter-tower region), 310 from zone B (0-150 m), 316 from zone C (150-300 m), 197 from zone D (300-500 m), and 127 from the control zone (without BTS installations). We classified the zones as a function of distance from the BTS. We measured electric-field strength at each participant's house using Narda Broadband Field Meter-550 equipped with EF0-391 probe. We used Munich-Chronotype Questionnaire to determine each subject's behavioral sleep patterns. ANOVA results revealed the highest E-field strength in zone-A than the other zones and control. Results from ANCOVA, Kruskal-Wallis, and Mann-Whitney U tests showed that the participants from zone A had shorter sleep duration, and longer sleep latency and inertia than those living in other zones. Further, a significant effect of co-factors 'gender' and 'year of residence' was validated on mid-sleep (work and free days). Compared to women and > 5-year residents, men and 1-5-year residents had delayed mid-sleep. We concluded that RF-EMR might alter the behavioral sleep patterns of subjects living in

## ORIGINAL ARTICLE



# Locomotor activity rhythm in catfish *Heteropneustes fossilis* as a function of shoal size under different light regimens

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## ABSTRACT

The information on the circadian characteristics of catfish in shoals is scanty. We examined the circadian locomotor activity rhythm of catfish *Heteropneustes fossilis* either singly housed (SS1) or in shoals of four (SS4) and six (SS6) under different light regimens. We carried out the study sequentially under LD<sub>1</sub> (12:12), constant darkness (DD), LD<sub>2</sub>, continuous light (LL), LD<sub>3</sub>, and DL (12:12). Each condition was for at least 10–12 consecutive days. We analyzed the time-series data by employing Cosinor rhythmometry to detect circadian rhythm characteristics in locomotor activity at a fixed time window with a  $\tau = 24$  h. Results indicated that singly housed or shoals exhibited statistically significant ( $p < .001$ ) circadian rhythm in locomotor activity under LD conditions with a higher activity level during the dark phase. Further, we observed free-running rhythms in locomotor activity under DD and LL, irrespective of the shoal sizes. In phase inverse DL, both singly housed and shoals demonstrated higher activity in the dark phase. The two-way ANOVA results revealed a significant effect of the factor 'light regimen' on amplitude and acrophase; the factor 'shoal size' produced a statistically significant impact on the mesor only. Both shoals showed significantly higher mesor than singly housed fish. The circadian amplitude declined under constant conditions of DD and LL. The locomotor activity rhythm exhibited a free-running pattern with a  $\tau_{FR}$  greater than 24 h under both DD and LL conditions. We conclude that light is a more prominent factor for the entrainment of circadian activity in catfish *H. fossilis*. However, the extent of social aggregation (shoal size) has little or no effects on the characteristics of circadian locomotor activity rhythm in *H. fossilis*.

## ARTICLE HISTORY

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## KEYWORDS

Locomotor activity rhythm;  
light regimen; shoal size;  
free-running period;  
*Heteropneustes fossilis*

## Introduction

The social organization of fishes is unique and exciting. Fishes live either in solitude or in a group. The fishes often swim together for foraging, avoiding predators, and finding a suitable mate. The phenomenon is called shoaling behavior. During shoaling, fishes' social aggregation could be either loose or stable (Ryer and Olla 1998). Shoaling behavior is typical among many teleost fishes (Snekser et al. 2010). Fish in shoals demonstrates varied behavioral patterns, unlike those in solitude. It is a complex behavioral strategy that has broad adaptive functions (Pavlov and Kasumyan 2000). Shoaling confers several benefits to the individuals.

The foremost is the anti-predator benefits (Magurran 1990). In addition, shoaling provides benefits in selecting and having easy access to mates (Krause and Ruxton 2002). A shoal in many fish species may vary in size and composition (Pitcher 1998). The more massive shoal incurs confusion effects for predators; hence confers significant advantages to shoal members. However, big

shoals also have some negative consequences by increasing the competition among the shoal mates (Krause et al. 2000). The shoal modulates the behaviors, namely foraging and swimming in minnows (*Phoxinus phoxinus*) and goldfish (*Carassius auratus*) (Magurran and Pitcher 1983; Pitcher et al. 1982). These two species exhibit variability in foraging behaviors when shoaling size increases. It implies that shoaling behavior and shoal size are species-specific. The foraging advantages associated with more massive shoals decrease in some species when the shoal size increases beyond a critical number (Pitcher et al. 1982). The behavior difference can also be due to the difference in a species' shoaling tendency (Magurran and Pitcher 1983). It indicates that optimum shoal size plays a role in influencing the behavior of the fish.

The shoaling behavior of fish may vary dramatically as a function of the time of the day. Environmental cues that vary along a 24-h day might play a significant role (Paciorek and McRobert 2012). Different shoal sizes might also modulate circadian rhythm in locomotor





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Original Article

# Locomotor activity rhythm in catfish *Heteropneustes fossilis* as a function of shoal size under different light regimens

Pratibha Kujur, Atanu Kumar Pati & Arti Parganiha

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## PROTECTIVE ROLE OF L-DOPA AGAINST CYPERMETHRIN INDUCED REPRODUCTIVE TOXICITY IN JAPANESE QUAIL

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**ABSTRACT :** To test whether administration of L-Dopa can protect against cypermethrin (Cyp) induced reproductive toxicity in Japanese quail, *Coturnix coturnix japonica*. Twenty four adult male quails were divided into four groups. Group-1 received normal saline and served as control. Group-2 received Cyp 1mg/kg bw. Group-3 received L-Dopa 5mg/100mg bw and Group- 4 received both Cyp and L-Dopa. Treatments were given for 30 days. Body and testes weight, testicular and cloacal gland volume and GSI of each bird of each group were recorded. Blood samples were collected from the jugular vein for the estimation of serum testosterone. Testes were collected for the estimation of acid phosphatase and histological observations. Body and testis weight, testes and cloacal gland volume, serum testosterone, testicular acid phosphatase and GSI of Cyp fed groups showed significantly decreased value. L-Dopa treated group showed significantly increased value. Cyp + L-Dopa fed group showed significantly increased value of serum testosterone and testicular acid phosphatase level where as other parameters showed no significant difference, but the mean value was higher than those of Cyp group. Histologically, testis of Cyp treated group showed irregularity and variability in seminiferous tubules shape having fewer spermatozoa. L-Dopa group showed enlarged form of seminiferous tubules with abundant spermatozoa and showed full breeding condition. Cyp + L-Dopa treated group exhibited nearly normal appearance of the seminiferous tubules and spermatozoa. It may be concluded that L-Dopa might be a potent protective agent against Cyp induced toxic effect on reproduction in Japanese quail. In view of the nutritional value of poultry products and the importance of poultry industry worldwide finding of this study may aid in the rational development of new strategies of poultry industry management aimed at improving the human health (resources of food and nutrition) and benefiting the economy.

**Key words :** Cypermethrin, L-Dopa, toxicity, reproduction, Japanese quail.

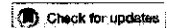
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### INTRODUCTION

White meat and egg products of poultry industries are a rich source of essential component of food and nutrition (Ghafoor *et al*, 2010). Parasitic infection in poultry farm causes concurrent infections which results in loss of productivity. Lice, ticks, mites and flies are most common external parasites of poultry. An infestation with *Argas persicus* (poultry soft tick) represent a major ectoparasitic problem worldwide in poultry industries and is affecting egg and meat production (Hagos and Eshetu, 2005). Cypermethrin is one of the widely used pesticides as anti parasitic medicine to resolve the ectoparasitic infestation in poultry farm along with other practices (Alves *et al*, 2016; Sivajothi *et al*, 2017). Their excessive use is the major source of environmental hazards for

animals and even for human beings, because it gets incorporated in the food chains (Abd-Alla *et al*, 2002). Many pesticides are known to cause degeneration of reproductive organs, inhibition of spermatogenesis, sterility and decrease in hormone and steroid levels. Pyrethroids are derived from natural occurring pyrethrum flowers (*Chrysanthemum cinerariaefolium*) and it has insecticidal properties (Perger and Szadkowski, 1994). *In vitro* study reveals that pyrethroid insecticides including permethrin, fenvalerate and cypermethrin act as anti-androgen chemicals (Xu *et al*, 2008). Among these, Cypermethrin is one of the widely used pesticides and it is considered as an endocrine disruptive chemical (Mnif *et al*, 2011). It affects secondary sexual characters, the processes of oogenesis, spermatogenesis, early onset of

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## Sexual dimorphism in ultradian and 24h rhythms in plasma levels of growth hormone in Indian walking catfish, *Clarias batrachus*

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### ABSTRACT

Growth hormone (GH), a key regulator of somatic and reproductive growth in vertebrates, has been extensively studied, although primarily in female fish. Despite numerous reports about sex- and species-specific growth patterns in fish, to our knowledge, there is no report about the 24 h rhythm of plasma GH in male fish. Thus, we aimed to investigate temporal variations in plasma GH levels and the existence of any rhythms therein during the reproductively active months of March to August in the male walking catfish, *Clarias batrachus*. We also aimed to compare the secretory temporal patterns of GH in male–female specimens of *C. batrachus* to decipher sexual dimorphism in GH secretions in fish. After 14 days of acclimation to the natural environment, male catfish (N = 240 in total) were sorted and randomly divided into eight groups for study at ZT0 (sunrise ~06:00 h); 3, 6, 9, 12, 15, 18, and 21. During each month, physical parameters like duration of photoperiod and water temperature were measured. Male catfish (n = 40/month) in all eight groups were sampled (n = 5/group) at each time point under the natural time-of-year 24 h light–dark (LD) cycle. Male catfish were anesthetized and blood was collected through a caudal puncture, centrifuged, and plasma isolated. Plasma GH was measured using a competitive homologous enzyme-linked immunosorbent assay. Further, testes were removed, weighed, and the gonadosomatic index (GSI) was calculated. A significant effect of time and season ( $p < 0.05$ , two-way ANOVA) on plasma GH level was detected. Cosinor analyses verified the existence of statistically significant ( $p < 0.05$ ) ultradian (12 h) and 24 h rhythms of plasma GH in male *C. batrachus*, with the higher values of Mesor (time series mean) and amplitude (one-half peak-to-trough difference) of the periodicities from March to July. Mapping of the acrophases (peak times) showed two ultradian and one 24 h acrophase of GH during the early photophase and early scotophase from March to August. Distinct sexual-dimorphism in plasma GH Mesors and acrophases was noticed between male and female catfish. GSI values of male catfish indicate males mature a little earlier than females in terms of size and reproductive activity. The findings that plasma GH show 24 h and seasonal fluctuations in a sex-specific manner collectively demonstrate the importance of considering the effect of biological 24 h and seasonal time and sex on the GH level in regulating the physiology of somatic growth and reproduction in catfish.

### ARTICLE HISTORY

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### KEYWORDS

Sexual dimorphism; growth hormone; diurnal rhythm; ultradian rhythm; season; *Clarias batrachus*

### Introduction

Fish, being poikilotherm, are influenced by daily and seasonal variations in photoperiod, temperature, rainfall, physico-chemical, and biological characteristics of the aquatic ecosystem, such as dissolved O<sub>2</sub>, CO<sub>2</sub>, pH, and salinity. Biological rhythms are recurrent processes, from molecular to behavioral levels, controlled by endogenous oscillators or biological clocks. These rhythmic processes are the output of interactions between the biological clock and external environment (Lamont and Amir 2010) that provide adaptive fitness to organisms by appropriately timing their behavior (feeding, locomotion, and social aggregation) and physiology (growth, reproduction, immune response, and hormone

secretion). In fish, rhythmic secretion of various metabolic and reproductive hormones, such as gonadotropin (De Vlaming and Vodcink 1977; Harikrishnan et al. 2002; Hontela and Peter 1978; Khan and Thomas 1994), sex steroids (Lamba et al. 1983; Singh and Singh 1987), and thyroid hormones (Eales et al. 1981; Sinha et al. 1992; Stacey et al. 1984) has been reported. In vertebrates, rhythmic secretion of these hormones controls and coordinates growth and reproduction, two crucial physiological processes.

Daily variations in GH secretion have been described in many fish species, such as rainbow trout (Gomez et al. 1996; Le Bail et al. 1991; Niu et al. 1993), Atlantic salmon

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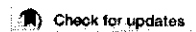
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# To which world regions does the valence-dominance model of social perception apply?

Over the past 10 years, Oosterhof and Todorov's valence-dominance model has emerged as the most prominent account of how people evaluate faces on social dimensions. In this model, two dimensions (valence and dominance) underpin social judgements of faces. Because this model has primarily been developed and tested in Western regions, it is unclear whether these findings apply to other regions. We addressed this question by replicating Oosterhof and Todorov's methodology across 11 world regions, 41 countries and 11,570 participants. When we used Oosterhof and Todorov's original analysis strategy, the valence-dominance model generalized across regions. When we used an alternative methodology to allow for correlated dimensions, we observed much less generalization. Collectively, these results suggest that, while the valence-dominance model generalizes very well across regions when dimensions are forced to be orthogonal, regional differences are revealed when we use different extraction methods and correlate and rotate the dimension reduction solution.

## Protocol registration

The stage 1 protocol for this Registered Report was accepted in principle on 5 November 2018. The protocol, as accepted by the journal, can be found at <https://doi.org/10.6084/m9.figshare.7611443.v1>.

People quickly and involuntarily form impressions of others based on their facial appearance<sup>1,2</sup>. These impressions then influence important social outcomes<sup>3,4</sup>. For example, people are more likely to cooperate in socioeconomic interactions with individuals whose faces are evaluated as more trustworthy<sup>5</sup>, vote for individuals whose faces are evaluated as more competent<sup>6</sup>, and seek romantic relationships with individuals whose faces are evaluated as more attractive<sup>7</sup>. Facial appearance can even influence life-or-death outcomes. For example, untrustworthy-looking defendants are more likely to receive death sentences<sup>8</sup>. Given that such evaluations influence profound outcomes, understanding how people evaluate others' faces can provide insight into a potentially important route through which social stereotypes impact behaviour<sup>9,10</sup>.

Over the past decade, Oosterhof and Todorov's valence-dominance model<sup>11</sup> has emerged as the most prominent account of how we evaluate faces on social dimensions<sup>12</sup>. Oosterhof and Todorov identified 13 different traits (aggressiveness, attractiveness, caringness, confidence, dominance, emotional stability, unhappiness, intelligence, meanness, responsibility, sociability, trustworthiness and weirdness) that perceivers spontaneously use to evaluate faces when forming trait impressions<sup>13</sup>. From these traits, they derived a two-dimensional model of perception: valence and dominance. Valence, best characterized by rated trustworthiness, was defined as the extent to which the target was perceived as having the intention to harm the viewer<sup>14</sup>. Dominance, best characterized by rated dominance, was defined as the extent to which the target was perceived as having the ability to inflict harm on the viewer<sup>15</sup>. Crucially, the model proposes that these two dimensions are sufficient to drive social evaluations of faces. As a consequence, the majority of research on the effects of social evaluations of faces has focused on one or both of these dimensions<sup>16</sup>.

Successful replications of the valence-dominance model have only been conducted in Western samples<sup>17,18</sup>. This focus on the West is consistent with research on human behaviour more broadly, which typically draws general assumptions from analyses of Western participants' responses<sup>19</sup>. Kline et al.<sup>20</sup> recently termed this problematic practice the Western centrality assumption and argued that regional

variation, rather than universality, is probably the default for human behaviour.

Consistent with Kline et al.'s notion that human behaviour is best characterized by regional variation, two recent studies of social evaluation of faces by Chinese participants indicate that different factors underlie their impressions<sup>21,22</sup>. Both studies reported that Chinese participants' social evaluations of faces were underpinned by a valence dimension similar to that reported by Oosterhof and Todorov for Western participants, but not by a corresponding dominance dimension. Instead, both studies reported a second dimension, referred to as capability, which was best characterized by rated intelligence. Furthermore, the ethnicity of the faces rated only subtly affected perceptions<sup>23</sup>. Research into potential cultural differences in the effects of experimentally manipulated facial characteristics on social perceptions has also found little evidence that cultural differences in social perceptions of faces depend on the ethnicity of the faces presented<sup>24,25</sup>. Collectively, these results suggest that the Western centrality assumption may be an important barrier to understanding how people evaluate faces on social dimensions. Crucially, these studies also suggest that the valence-dominance model is not necessarily a universal account of social evaluations of faces and warrants further investigation in the broadest set of samples possible.

Although the studies described above demonstrate that the valence-dominance model is not perfectly universal, to which specific world regions it does and does not apply are open and important questions. Demonstrating differences between British and Chinese raters is evidence against the universality of the valence-dominance model, but it does not adequately address these questions. Social perception in China may be unique in not fitting the valence-dominance model because of the atypically high general importance placed on status-related traits, such as capability, during social interactions in China<sup>22,26</sup>. Indeed, Tan et al.<sup>21</sup> demonstrated face-processing differences between Chinese participants living in mainland China and Chinese participants living in nearby countries, such as Malaysia. Insights regarding the unique formation of social perceptions in other cultures and world regions are lacking.

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# To which world regions does the valence–dominance model of social perception apply?

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## Formulation of anti-larval nanoemulsion: Impact of droplet size on larvicidal activity against malaria vectors in Chhattisgarh, India

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*Mentha piperita* (peppermint) essential oil nanoemulsion was prepared by low energy spontaneous emulsification method. GC-MS analysis revealed the composition of peppermint essential oil and menthol (45.2%) was the major bioactive compound along with menthone (15.39%), neomenthol (8.1%), menthyl acetate (7.7%) and isomenthone (7.4%). Optimization of the nanoemulsion preparation process was done by Response Surface Methodology (RSM) with Central Composite Design (CCD). The droplet diameter and polydispersity index at optimized conditions (15% oil concentration, 25% surfactant concentration and Tween80 as surfactant) were 39.2 nm and 0.22 respectively. Optimized peppermint oil nanoemulsion (OPNE) was optically transparent, spherical in morphology and was stable for 6 months. OPNE formulation demonstrated dose, time and size-dependent larvicidal activity against malaria vectors with LC<sub>50</sub> value of 48 ppm and 123 ppm against *Anopheles culicifacies* and *Anopheles stephensi* respectively. The LC<sub>50</sub> values were 90 ppm and 163 ppm against *Anopheles culicifacies* and *Anopheles stephensi* correspondingly for the bigger droplet size formulation (PNE, droplet diameter: 129.6 nm) confirming the droplet size-dependent larvicidal activity of the nanoemulsion. The results of this study propose that peppermint oil-based nanoemulsion possibly be used as an eco-friendly larvicide for mosquito vector control strategies.

**Keywords:** Anopheles mosquitoes, Larvicidal activity, Nanoemulsion, Plant essential oil, Response Surface Methodology

Synthetic insecticides are the most important parts of the mosquito vector control program *i.e.*, growth regulators for insects (*e.g.*, diflubenzuron, methoprene, etc.) and organophosphates (*e.g.*, temephos, fenthion, etc.). Repeated indiscriminate use of the synthetic pesticides has been reported to have a harmful effect on fish and other non-target organisms, and also they cause the increase in insecticide resistance of arthropods<sup>1</sup>. There are reports on malaria vector resistance to DDT (Organochlorine), Malathion (Organophosphate) and Deltamethrin (Pyrethroids) in Chhattisgarh state<sup>2</sup>. Synthetic insecticides also have caused environmental problems such as air, soil and groundwater pollution including toxicity to the aquatic ecosystem. Hence, scientists are looking for the development of more efficient and eco-friendly alternatives to conventional pesticides, which are safe to health of human and further to the environment and the non-target organisms.

Mosquitoes transmit diseases *Le* Barmah Forest fever, chikungunya, dengue, dirofilariasis, Eastern

equine encephalitis, filariasis, Japanese encephalitis, La Crosse encephalitis, malaria, Ross River fever, Saint Louis encephalitis, tularemia, Venezuelan equine encephalitis, West Nile virus, Western equine encephalitis, yellow fever and Zika fever<sup>3,4</sup>. They also cause a nuisance by biting which can lead to allergic reactions to humans. Hence, mosquito vector control is an essential requirement in control annoyance created by and the epidemic diseases spread by mosquitoes. Malaria is foremost public health concern of the Country and also globally. It is one of the life-threatening diseases and the causative organism is plasmodium parasites. Biting of the infected female anophelines transmits these parasites to human hosts. An estimated 219 million cases of malaria was spread over 90 various countries and resulted in death of 435,000 people in 2017. Although African countries share an unaccountably high score of the global burden of malaria, India shared 4% of the disease burden<sup>5</sup>. There are around one million malaria cases reported in India annually caused by *P. vivax* and *P. falciparum* with around 50% proportion of each<sup>6</sup>. Out of 58 anophelines found in India, Malaria is transmitted by 6 primary vectors and 3 secondary

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## ANTIMICROBIAL EFFICACY OF BIOACTIVE COMPOUNDS OF RARE ENDOPHYTIC ACTINOBACTERIA, *Actinoalloteichus cyanogriseus* SIR5 (MK793584)

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### ABSTRACT

To address the problem of antibiotic resistance in pathogens, our research aimed for endophytic actinobacteria, producers of a diverse array of significant bioactive metabolites. Endophytic actinobacteria SIR5 was isolated from roots of *Sphaeranthus indicus* Linn. and was identified to be *Actinoalloteichus cyanogriseus* via 16S rRNA sequencing. With the accession number MK793584, the gene sequence was deposited to NCBI. In the current study, a rare actinobacteria *Actinoalloteichus cyanogriseus*, has been reported as an endophyte for the first time. Both Microbial Type Culture Collection (MTCC) and Clinical Cultures (CC) were used to investigate the antimicrobial property of the bioactive chemicals synthesized by *A. cyanogriseus* SIR5. A significant zone of inhibitions was recorded against clinical cultures: *B. cereus* (12.16±0.16 mm), *Candida albicans* (12.83±0.44 mm), *E. coli* (15.33±0.33 mm), *S. epidermidis* (11.50±0.28 mm) and MTCC pathogens: *B. cereus* (11.16±0.16 mm), *B. subtilis* (13.33±0.16 mm), *P. aeruginosa* (13.33±0.33 mm), *S. epidermidis* (12.33±0.33 mm). The production of bioactive compound was enhanced by optimization using one factor at a time (OFAT), which was achieved with modified ISP-4 medium (starch - 1% w/v,  $\text{NH}_4\text{NO}_3$  - 1% w/v,  $\text{CaCO}_3$  - 2 g/l,  $\text{K}_2\text{HPO}_4$  - 1 g/l,  $\text{MgSO}_4$  - 1 g/l, NaCl - 1g/l, trace solution - 1 ml/l) with inoculum size - 13%, incubation period - 16 days, pH - 8.0 and temperature - 28°C. **Keywords:** *Actinoalloteichus cyanogriseus*, Bioactive Compounds, Antimicrobial Activity, Endophytic Actinobacteria

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### INTRODUCTION

The increased multidrug resistance (MDR) in pathogens as a result of anthropogenic activities in addition to natural processes (through hereditary changes, efflux pump,  $\beta$  lactamases, etc.) is alarming for public health and modern medicine.<sup>1,2</sup> The situation has resulted in reduced effectiveness of approved antibiotics and thus efforts are being made to find efficient and broad-spectrum antibiotics from actinobacteria which are potential producers of diverse metabolites. Since currently available antibiotics are mainly derived from soil actinobacteria, research on endophytic actinobacteria is underway to replace repetitive discovery of known antibiotics. Endophytic actinobacteria are more likely to be involved in the metabolic pathway of the host plant and thus chances of production of some potential novel bioactive metabolites in addition to chemically similar ones are more.<sup>3</sup> Taxane (taxol), an anticancer compound produced by the plants *Taxus brevifolia* and *Taxus baccata*, has also been obtained from its endophyte *Micromonospora* sp. and *Kitasatospora* sp. respectively.<sup>4</sup> possibly evidencing the involvement of both in their metabolism. Thus to ascertain more efficient compounds, recent research has focused on rare endophytic actinobacteria, an underexplored group of microorganisms. In this study, a rare actinobacteria, *Actinoalloteichus cyanogriseus* strain SIR5 was procured from the root tissue of medicinal weed *Sphaeranthus indicus* from Raipur, Chhattisgarh and its antimicrobial activity was observed against MTCC and Clinical pathogens. Previously, *A. cyanogriseus* has been isolated from the soils of China and the strain was authenticated to be of family *Pseudonocardiaceae*, based on phylogenetic analysis.<sup>5</sup> Bioactive alkaloids, caeruleomycin and cyanogranamide, obtained from marine *A. cyanogriseus*, exhibited significant antibacterial, antifungal, anticancer and antiamebic activity.<sup>6-8</sup>

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## PROLONGED EFFECTS OF RADIOFREQUENCY ELECTROMAGNETIC RADIATION EMANATED FROM MOBILE PHONE ON GLOBAL DNA METHYLATION AND SPAWNING IN ZEBRAFISH, *DANIO RERIO*

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**ABSTRACT :** In this age of global communication, mobile phones have been tremendously used by all human beings especially by young adults. Ionizing radiations are known to damage genetic components and can be lethal, studies on the effect of non-ionizing radiations are contradictory and few. DNA methylation pattern is an important aspect for gene regulation during the developmental phase and seen to occur profoundly during the adult phase on exposure to certain environmental conditions. The present study is an effort to estimate the effects of Radiofrequency Electromagnetic Field emitted from a mobile phone on global DNA methylation changes, egg spawning and body weight in zebrafish. The experiment was conducted in eight groups of zebrafish, with 10 fish per group, where four groups were utilized as control while the other four groups were exposed with mobile phone mediated non-ionizing radiations for 5, 10, 15 and 20 days. Each experiment was performed in triplicate. A Narda Broad Band Meter (NBM)-550 and EF0-391 probe were used for recording the electric field (E-Field) strength of MP radiation. The experiment was conducted in separate rooms for both groups, and after the tentative time period, DNA was isolated from randomly selected zebrafish from each group. Later, DNA methylation was quantified in zebrafish muscle tissues using a MethylFlash Methylated DNA quantification Kit. Statistical analysis reveals that various parameters such as DNA methylation, spawning and body weight showed significant difference between control and exposed groups. While DNA methylation was found to be higher in exposed group than control group, body weight and spawning measured less in exposed group as compared to the control group. The study concludes that prolonged exposure to mobile phone radiations could affect DNA methylation pattern as well as the reproductive machinery in zebrafish.

**Key words :** Zebrafish, mobile phone radiation, DNA methylation, spawning.

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### INTRODUCTION

Mobile Phone (MP) use has become widespread in the current decade (Parasuraman *et al.*, 2017). Recently, 4G-long term evolution (4G-LTE) mobile phones (MPs) are becoming prevalent and provide very fast internet speeds. MPs, with not only their communication facilities but also their ability to access the internet, make it an unavoidable gadget in our current lifestyle. Radiation, which is an integral part of any living organism, lies in the ionizing as well as the non-ionizing zone of the EM Spectrum. The antenna of MPs is located at the rear bottom or the top for transmitting or receiving signals.

All living organisms, including humans are continuously exposed to Radio Frequency Electromagnetic Fields (RF-EMFs). RF-EMFs are emitted from MPs, home appliances and medical devices. Radiofrequency lies between the range from 3 kilohertz (KHz) to 300 gigahertz (GHz) and are conventionally called Radio frequencies (RF). MPs use radio frequency to transmit and receive signals and its radiation varies from device to device. MPR is measured by a quantity known as the Specific Absorption Rate (SAR) value for the particular device. (FCC, Consumer and Governmental Affairs Bureau. Reviewed:10/28/16). SAR is the rate of radiofrequency energy that is absorbed by the human body

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# Stress and development phenotyping of Hsp101 and diverse other Hsp mutants of *Arabidopsis thaliana*

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## Abstract

Heat shock proteins or Hsps are critical in mounting plant resistance against heat stress. The complex Hsp spectrum of *Arabidopsis thaliana* plant contains over two hundred proteins belonging to six different families namely Hsp20, Hsp40, Hsp60, Hsp70, Hsp90 and Hsp100. Importantly, the cellular function(s) of most Hsps remains to be established. We aimed at phenotyping of stress and development response of the selected, homozygous *hsp* mutant lines produced by T-DNA insertional mutagenesis method. The heat stress phenotype was assessed for basal and acquired heat stress response at seed and seedling stages. Distinct phenotype was noted for the *hsp1-3* mutant (knockout mutant of *Hsp101* gene) showing higher heat sensitivity and for the *salk\_087844* mutant (knockout mutant of *Hsc70-2* gene) showing higher heat tolerance than the wild type seedlings. The homozygous *cs808162* mutant (mutant of *ClpB-p* gene encoding for the chloroplast-localized form of Hsp101) did not survive even under unstressed, control condition. *salk\_064887C* mutant (mutant of *cpn60β4* gene) showed accelerated development cycling. The *hsp1-3* mutant apart from showing different heat response, exhibited development lesions like bigger size of seeds, buds, siliques, and pollen compared to the wild type plants. In response to controlled deterioration treatment of seeds, *hsp1-3* seeds showed higher accumulation of reactive oxygen species molecules, higher rates of protein and lipid oxidation and a faster decline in germination rate as compared to wild type seeds. Our findings show that Hsps perform diverse metabolic functions in plant response to stress, growth, and development.

**Keywords** *Arabidopsis thaliana* · Development · *Hsp101* gene · Heat stress · *Hsp* mutant · T-DNA

## Abbreviations

APX	Ascorbate peroxidase	KO	Knockout
AT	Acquired tolerance	MDG	Multiplying mean daily germination
BT	Basal tolerance	PCR	Polymerase chain reaction
CD	Controlled deterioration	PQC	Protein quality control
Clp	Caseinolytic proteases	PV	Peak value
DPS	Days post stress	ROS	Reactive oxygen species
GI	Germination index	SOD	Superoxide dismutase
HS	Heat stress	TAIR	The Arabidopsis information resource
Hsf	Heat shock factor	UTR	Untranslated region
Hsp	Heat shock protein	WT	Wild type
HSR	Heat stress response		
KD	Knockdown		

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## Introduction

For performing the uphill task to survive, grow, and reproduce under heat stress (HS) conditions, plants adopt diverse strategies to minimize the damage and ensure protection of cellular homeostasis during the stress and



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April 2025

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## Abstract

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# ‘चीफ की दावत’ : मध्यमवर्गीय जीवन की गाथा

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डॉ. मधुलता बारा

सहायक प्राध्यापक, साहित्य एवं भाषा अध्ययनशाला, पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर, छत्तीसगढ़

सारांश:- रचनाकार भीष्म साहनी ने ‘चीफ की दावत’ कहानी में मध्यमवर्गीय समाज की दशा को चित्रित किया है। वे सामाजिक यथार्थ के पक्षधर हैं। उन्होंने शामनाथ के माध्यम से आज के शिक्षितवर्ग, युवा पीढ़ी के अमानवीय आचरण को मार्मिकता के साथ प्रस्तुत किया है। यह कहानी आज भी उतनी ही प्रासंगिक है जितनी लेखन के समय थी।

मुख्य शब्द:- पाखंड, खोखलापन, दिखावटीपन, स्वार्थता, काबिल, संवरने, मुकाम, सर्वस्व समर्पित, बोझ, भटकने, पदोन्नति, त्याग, बलिदान, समर्पण, तरक्की, तरवीर, चापलूस, निछावर, धूर्त, सादगी, संवेदना, सर्वस्व एवं दावत।

प्रस्तावना:- ‘चीफ की दावत’ कहानी के माध्यम से रचनाकार ने समकालीन समाज की तरवीर को उजागर करने का सफल प्रयास किया है। रचनाकार ने मध्यमवर्गीय परिवार के शामनाथ जैसे पात्र के माध्यम से समाज के स्वार्थी, धूर्त, असंस्कारी, चापलूस, पाखंडी बेटे के साथ-साथ सादगी एवं रीबदार व्यक्तित्व के धनी चीफ जैसे विशाल हृदय वाले व्यक्तित्व का चित्रण किया है। एक विधवा माँ जो अपने पुत्र के जीवन को संवरने के लिए अपना सब कुछ निछावर करने को तत्पर है। वह बेटे पर आश्रित है। माँ जो अपने बेटे की पदोन्नति के लिए अपना जीवन, अपनी आँखें सब कुछ समर्पित कर देती है। वहीं पुत्र शामनाथ सर्वस्व समर्पण का लाभ उठाता अपने स्वार्थ पूर्ति में लगा रहता है। इस कहानी के माध्यम से आज के समाज की तरवीर उभर कर सामने आती है।

‘चीफ की दावत’ में मध्यमवर्ग:- कहानी का प्रारंभ दावत की जोर शोर तैयारी के साथ होती है। आज शामनाथ ने अपनी तरक्की के लिए अपने बॉस को घर पर दावत के लिए आमंत्रित किया है। घर के कोने-कोने के कूड़े करकट पुराने समान को छिपाकर, श्रेष्ठ से श्रेष्ठ समान से घर को सजाया संवारा जाता है। “आखिर पाँच बजते-बजते तैयारी मुकम्मल होने लगी। कुर्सियाँ, मेज, तिपाड़ियाँ, नैपकिन, फूल, सब बरामदे में पहुँच गये। डिंकर का इन्तजाम बैठक में कर दिया गया। अब घर का फालतू सामान आलमारियों के पीछे और पलंगों के नीचे छिपाया जाने लगा। तभी शामनाथ के सामने सहसा एक अड़चन खड़ी हो गयी, माँ का क्या होगा?” विदेशी बॉस व आधुनिक वातावरण के बीच घर में माँ की उपस्थिति उन पति-पत्नी के लिए बड़ी समस्या बन जाती है।

यह कहानी मध्यमवर्गीय समाज के खोखलेपन और दिखावटीपन के यथार्थ रूप को उजागर करती है। कहानी आज भी उतनी ही प्रासंगिक है जितनी उस समय थी। शामनाथ जैसे शिक्षित युवा पीढ़ी की स्वार्थता पर करारा व्यंग्य किया गया है। माता-पिता अपने बच्चों को काबिल बनाने, जीवन संवरने के लिए और उच्च मुकाम तक पहुँचाने के लिए अपना सर्वस्व समर्पित

कर देते हैं। लेकिन आज की युवा पीढ़ी अपने माता-पिता को एक बोझ समझती है। अपनी सुख-सुविधा के लिए आज की पीढ़ी अपने वृद्ध माता-पिता को दर-दर भटकने के लिए छोड़ देते हैं। मानवीय संवेदनाओं को झकूत करने वाली एक उम्दा कहानी है। पाश्चात्य संस्कृति, संस्कार और सभ्यता की अंधी दौड़ में मानव असंस्कारी और अमानवीय हो गया है।

पाटी चलते तक माँ को कोठरी में चुपचाप सलीकेदार तरीके से बैठे रहने की हिदायत देकर शामनाथ ने माँ को छिपाने का प्रयास किया। “मगर कोठरी में बैठने की देर थी कि आँखों से छल-छल आँसू बहने लगे। वह दुष्ट से बार-बार उन्हें पोछती, पर वह बार-बार उमड़ आते, जैसे बरसों का बौध तोड़कर उमड़ आये हो। माँ ने बहुतेरे दिल को समझाया, हाथ जोड़े, भगवान का नाम लिया, बेटे के चिरायु होने की प्रार्थना की, बार-बार आँखें बंद की, मगर आँसू बरसात के पानी की तरह जैसे थमने में ही न आते थे।” वृद्ध माता-पिता की अवहेलना, अपमान, तिरस्कार, उपेक्षा उत्तर आधुनिकता की देन है, कहर है।

चीफ अमेरिकन होते हुए भी भारतीय संस्कृति, लोक-कला को जानने समझने की इच्छा व्यक्त करते हैं। अपने अधीनस्थ अधिकारी शामनाथ की विधवा माँ से आत्मीयता से मिलते हैं और लोक गीत सुनाने का प्रस्ताव भी रखते हैं। माँ से लोक गीत सुनकर अत्यधिक प्रसन्न भी होते हैं। एक तरफ पुरानी परंपराओं पर आस्था रखने वाली पीढ़ी अपनी पुरानी मान्यताओं को लेकर चलती है और वहीं दूसरी ओर नयी पीढ़ी अपने नयेपन के बोध को लेकर समाज में परिवर्तन चाहती है।

शामनाथ में भारतीय संस्कृति और आदर्शों को तोड़कर पाश्चात्य संस्कृति और मान्यताओं के प्रति ललक अधिक देखा जा सकता है। “चीफ माँ को देख लेता है। माँ को देखकर खुश होता है हाथ मिलाने के लिए आगे बढ़ता है। इसे देखकर देसी अफसर की पत्नियाँ हँसने लगती हैं, क्योंकि उनकी दृष्टि में वृद्ध माँ गंवार है। वह क्या जवाब देगी। कहानी का संदर्भ ध्यान देने योग्य है। चीफ की माँ के साथ साहब का व्यवहार सामान्य है, वह माँ की खराटे पर या उसकी कुरूपता पर वह माँ की ममता को श्रद्धा के साथ ग्रहण करता है। वृद्ध जनों का उपहास हमारे संस्कार के विरुद्ध है। मध्यवर्ग के संस्कारहीन लोग भारतीय संस्कृति की गरिमा को भूल गए हैं। माँ चीफ को अपनी कमजोर आवाज में बेटे के हुक्म पर गीत सुनाती है। कहानी में नाटकीय मोड़ तब आता है, जब फालतू, बेकार, समस्या बनी माँ शामनाथ के लिए तरक्की का माध्यम बनती है।” आधुनिकता के अंधकार में डूबी संकुचित सोच को धृता बताती यह कहानी स्पष्ट करती है कि कला एवं संस्कृति के कद्रदान अब भी हैं।

चीफ की दावत कहानी पाखंड, स्वकेन्द्रित अति महत्वाकांक्षी की

# जयनंदन की कहानियों में नारी-शोषण

डॉ० मधुलता बारा

निर्देशक, सहा. प्राध्यापक, साहित्य एवं भाषा-अध्ययनशाला, पं. रविशंकर शुक्ल वि.वि., रायपुर (छ.ग.)

बरातू राम ध्रुव

शोधार्थी

## सार

आधुनिक एवं स्वतंत्र भारत में स्त्रियों के साथ तरह-तरह के अत्याचार किए जा रहे हैं, जिससे स्त्री-शोषण एवं उत्पीड़न से घिरी हुई दिखाई देती है। इस आधुनिकीकरण, प्रगतिशील और भूमंडलीकरण के दौर में हम कितने संकीर्ण हो गए हैं कि स्त्रियों को आज भी अपनी दासी ही समझते हैं।

जयनंदन ने अपनी कहानियों में नारी-शोषण की समस्याओं को प्रमुखता से चित्रित किया है। उनकी कहानियों में ऐसे कई नारी-पात्र हैं जो विभिन्न प्रकार की शारीरिक, मानसिक, आर्थिक, सामाजिक व राजनैतिक शोषण का शिकार होते हुए चित्रित हैं। उनकी कुछ प्रमुख कहानियाँ हैं, जैसे- 'मरे घोड़का नाल', 'झुनझुना', 'गिद्ध-झपट्टा', 'छुट्टा साँड़', 'बॉडीगॉर्ड', 'गोजर सिंह अमर रहे', 'हिरोशिमा और नागासाकी', 'चितामन चा का नरक', 'स्वतंत्रता सेनानी की बेटी', 'कस्तूरी पहचानो, वत्स' और 'ठेंगा' इत्यादि कहानियों में नारी-पात्रों पर घटित अमानवीय व्यवहार का चित्रण किया गया है। इस शोध-पत्र में मैंने 'मरे घोड़े की नाल', 'गिद्ध झपट्टा', 'छुट्टा साँड़' तथा 'चितामन चा का नरक' कहानी की प्रमुख स्त्री-पात्रों पर हुए शोषण के कुछ प्रमुख अंशों को प्रस्तुत किया है।

## प्रस्तावना

जब हमें किसी कार्य या बातचीत के द्वारा प्रत्यक्ष-अप्रत्यक्ष, शारीरिक या मानसिक दुःख, कष्ट आघात पहुँचता है, उसे शोषण कहते हैं। शोषण मुख्यतः मानसिक, शारीरिक, सामाजिक एवं आर्थिक आदि श्रेणी के हो सकते हैं। पीड़ामय, मानसिक कष्ट एवं अनुचित कार्य होने के कारण यह अपराध की श्रेणी में आता है। अपराध की श्रेणी में होने के बावजूद अपने स्वार्थ, ईर्ष्या-द्वेष, लोलुपता, अभिलाशा, घृणा, अहं, अहंकार, क्रोध-आक्रोश एवं आवेश आदि मानसिक विकृतियों के कारण यह उपजते हैं। शोषण एक मनोविकृति एवं नकारात्मक मानसिकता द्वारा उपजी विकृतियाँ हैं। मानसिक शोषण, डराना-धमकाना, गाली देना, अपमान करना, बेइज्जत करना, व्यंग्य कसना, द्विअर्थी बात कहना, दबाव डालना, पीटना, उपेक्षा, आरोप मढ़ना, दोषारोपण करना, चरित्र हनन, आलोचना करना है। शारीरिक शोषण के अंतर्गत मारना-पीटना, दम घोटना, जहर देना, धक्का-मुक्की करना, जलाना, गिराना, चोट, आघात आदि कई तरह के कष्ट पहुँचाना तथा शारीरिक पीड़ा, यौन-शोषण इत्यादि आता है।

पुरुष प्रधान सामाजिक व्यवस्था के अंतर्गत महिलाओं को हमेशा नीचले स्तर पर रखा गया है और यह विरोधाभास दीर्घकाल से भारतीय सामाजिक व्यवस्था में विद्यमान रहा है। इस विषय पर हिंदी के प्रसिद्ध कवि मैथिलीशरण गुप्त की अपनी रचना 'यशोधरा' में कहा गया कथन नारी की स्थिति को सार्थक व चरितार्थ करती है- "अबला जीवन हाथ तुम्हारी यही कहानी आँचल में है दूध और आँखों में पानी।"

अर्थात् महिलाओं की करुण स्थिति का मार्मिक चित्रण किया गया है। इस प्रकार आज न जाने कितनी महिलाएँ अपने तन-मन और आत्मा की पीड़ा को अपने अंदर समेटे सारी जिह्दगी अपमानित सी घुट-घुट कर काट लेती हैं। इसका यथार्थ चित्रण हिंदी साहित्य में हुआ है।

सामाजिक शोषण के अंतर्गत केवल एक व्यक्ति ही नहीं बल्कि पूरे परिवार और समूह को शिकार होना पड़ता है। कई बार हम सामाजिक शोषण को पहचाने में चूक कर जाते हैं, इस कारण उसको सह लेते हैं और सहन करते ही जाते हैं। इस कारण यह शोषण अप्रत्यक्ष रूप से प्रत्यक्ष प्रहार करते जाता है, जिसका परिणाम कई बार जानलेवा भी साबित होता है। आर्थिक शोषण में दूसरे को श्रम का अनुचित लाभ लेना, झूठ, फरेब, जालसाजी, धोखाधड़ी करना अर्थात् दुर्बल या अधिनस्थ सहयोगी का आर्थिक रूप से किया जाने वाला शोषण होता है।

## नारी-शोषण

भारत पुरुष प्रधान देश रहा है, इस कारण महिलाओं को लेकर नारी सशक्तिकरण पर बहुत कुछ लिखा जा चुका है और बहुत कुछ लिखा जा रहा है। नारी की स्थिति को लेकर आज भी कई सवाल हैं, जिसका उच्चार समाज से अपेक्षित है। भारत एवं विश्व के अन्य देशों में महिलाओं पर होने वाले उत्पीड़न,



## छत्तीसगढ़ो लोक-गाथाओं में राम

डॉ. (श्रीमती) शोभा राम

ज्योतिबाबा साहू  
शोधार्थी

प्रोफेसर एवं अध्यक्ष

साहित्य एवं भाषा-अध्ययनशाला व रविशंकर  
मुन्डल विधि, रायपुर (छ.ग.)

छत्तीसगढ़ की पावन भूमि प्रागैतिहासिक काल से गौरवमयी एवं पजनीय रही है। छत्तीसगढ़ की भूमि गुरु से महिमा-मंडित रही। इसका सबसे महत्वपूर्ण कारण ब्रह्माण्ड नायक राम को जन्म देने वाली माँ कौशिल्या की यह जन्मभूमि है। पूर्णावतार ब्रह्म श्रीराम की लीला-भूमि होने के कारण छत्तीसगढ़ की पावन धरती राम के प्रति अधिक आस्थावान दिखाई देती है, जैसा कि 'रामचरितमानस' से पता चलता है।

"ब्रह्म भयऊ कोसल पुर भूपा।"

बाबा तुलसी के मर्यादा पुरुषोत्तम राम छत्तीसगढ़ में जनमानस के आदर्श हैं, उनके जीवन के पथ-प्रदर्शक हैं। इस कारण जीवन के प्रत्येक उपक्रम में प्रत्येक समस्याओं से उलझे वातावरण में छत्तीसगढ़ का जन-मानस तुलसीदास के काव्य द्वारा समाधान एवं सम्यक् विवेचन दे पाने में सक्षम एवं समर्थ प्रतीत होते हैं।

छत्तीसगढ़ एक ऐसी पावन भूमि है, जहाँ राम ने अपने चौदह वर्ष के वनवास काल में कुछ समय व्यतीत किए। छत्तीसगढ़ ऋषि-मुनियों की तपस्या का केंद्र सदा से रहा है। कहा जाता है। छत्तीसगढ़ में दो करोड़ सात लाख पचास हजार नौ सौ छप्पन राम मंदिर हैं, जो पुरे छत्तीसगढ़वासियों के हृदय में ज्ञान, भक्ति और वैराग्य के रूप में विद्यमान है।

"ज्ञान भक्ति वैराग्य जनु, सोवत धरे शरीर।"

इस कारण राम छत्तीसगढ़ के जन-मानस में सहज रूप में व्याप्त है। साथ ही यहाँ के आचार-विचार, सभ्यता-संस्कृति कविता-कहानियों के साथ-साथ छत्तीसगढ़ के लोक-गाथाओं में राम रमे हुए हैं। मौखिक परंपरा के रूप में होने के कारण लोक-गाथाओं

का कोई क्रमबद्ध इतिहास ही नहीं मिलता। साहित्यकारों के अनुसार लोक को ही समस्त गाथाओं का रचयिता माना जाता है।

## छत्तीसगढ़ो लोक-गाथाओं में राम

डॉ. (श्रीमती) शोभा शर्मा

प्रोफेसर एवं अध्यक्ष

साहित्य एवं भाषा-अध्ययनशाला व रशिशज्जर  
मुन्सिपलिटी, रायपुर (छ.ग.)

ज्योतिबाला साहू

शोधार्थी

छत्तीसगढ़ की पावन भूमि प्रागैतिहासिक काल से गौरवमयी एवं पजनीय रही है। छत्तीसगढ़ की भूमि गुरु से महिमा-मंडित रही। इसका सबसे महत्वपूर्ण कारण ब्रह्माण्ड नायक राम को जन्म देने वाली माँ कौशल्या की यह जन्मभूमि है। पूर्णावतार ब्रह्म श्रीराम की लीला-भूमि होने के कारण छत्तीसगढ़ की पावन धरती राम के प्रति अधिक आस्थावान दिखाई देती है, जैसा कि 'रामचरितमानस' से पता चलता है।

"ब्रह्म भयऊ कोसल पुर भूपा।"

बाबा तुलसी के मर्यादा पुरुषोत्तम राम छत्तीसगढ़ में जनमानस के आदर्श हैं, उनके जीवन के पथ-प्रदर्शक हैं। इस कारण जीवन के प्रत्येक उपक्रम में प्रत्येक समस्याओं से उलझे वातावरण में छत्तीसगढ़ का जन-मानस तुलसीदास के काव्य द्वारा समाधान एवं सम्यक् विवेचन दे पाने में सक्षम एवं समर्थ प्रतीत होते हैं।

छत्तीसगढ़ एक ऐसी पावन भूमि है, जहाँ राम ने अपने चौदह वर्ष के वनवास काल में कुछ समय व्यतीत किए। छत्तीसगढ़ ऋषि-मुनियों की तपस्या का केंद्र सदा से रहा है। कहा जाता है। छत्तीसगढ़ में दो करांड सात लाख पचीस हजार नौ सौ छप्पन राम मंदिर हैं, जो पुरे छत्तीसगढ़वासियों के हृदय में ज्ञान, भक्ति और वैराग्य के रूप में विद्यमान है।

"ज्ञान भक्ति वैराग्य जनु, सोवत धरे शरीर।"

इस कारण राम छत्तीसगढ़ के जन-मानस में सहज रूप में व्याप्त है। साथ ही यहाँ के आचार-विचार, सभ्यता-संस्कृति कविता-कहानियों के साथ-साथ छत्तीसगढ़ के लोक-गाथाओं में राम रमे हुए हैं। मौखिक परंपरा के रूप में होने के कारण लोक-गाथाओं

का कोई क्रमबद्ध इतिहास ही नहीं मिलता। साहित्यकारों के अनुसार लोक को ही समस्त गाथाओं का रचयिता माना जाता है।



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## छत्तीसगढ़ी रामकथापरक लोकनाट्य 'रामलीला'

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ज्योतिबाला साहू\*\*

## शोध सारांश

'रामलीला' भगवान राम के जीवन-चरित्र का नाट्य-रूपांतरण है। छत्तीसगढ़ में मुख्यतः दीपावली के पूर्व नवरात्री पर्व में दस दिन तक रामलीला का मंचन किया जाता है। रामलीला में मुख्य रूप से 'श्रीरामचरितमानस' को माध्यम बनाकर राम-जन्म, सीता-स्वयंवर, राम-वनवास, सीता-हरण, लंका-दहन, रावण-वध दिखाया जाता है। रावण-दहन के बाद गाँव की माताएँ घर-घर में राम-दल की आरती उतारती हैं। पूरा गाँव राम के जयकार से गूँज उठता है। रामलीला मंचन का मुख्य उद्देश्य राम के आदर्श चरित्र को नाटक के माध्यम से लोगों तक पहुँचाकर जन-जन में राम के चरित्र को प्रसारित करना है।

**Keywords :** लीला-भूमि, ननिहाल, भांजे, दिग्दर्शन, नवरात्री, विजयादशमी, दर्शक-दीर्घा, मुकुट-पूजा, शेरवानी, अस्त्र-शस्त्र, विदूषक, आतिशबाजी, पौराणिक धरोहर, श्रीरामचरितमानस, संवा-योजना।

छत्तीसगढ़ी लोकनाट्य हमारे प्रदेश की एक समृद्धशाली वाचिक परंपरा रही है। छत्तीसगढ़ की वाचिक परंपरा का सीधा संबंध हमारे किसान, मजदूर और गाँवों में निवासरत जनता से रहा है। किसी भी लोकनाट्य में उस समय की तत्कालीन आर्थिक, सामाजिक, राजनीतिक, सांस्कृतिक वातावरण का स्पष्ट बिम्ब परिलक्षित होता है।

लोकनाट्य दो शब्दों से मिलकर बना है— 'लोक' और 'नाट्य'। 'लोक' अर्थात् सामान्य जन-समूह जब नाट्य रूप में कथोपकथन के माध्यम से किसी भी कथा के मर्म को उपस्थित करे, तो उसे लोकनाट्य कहकर पुकारा जाता है। लोकनाट्य के स्वरूप को निखारने व रोचक बनाने के लिए नृत्य, संगीत, वेशभूषा, अभिनय आदि का एक अनूठा सामंजस्य रहता है। या यँ कह सकते हैं कि असल की नकल होते हुए भी नकल में असल की प्रतिच्छाया दिखाई दे, वही लोकनाट्य है। लोकनाट्य का अपना कोई शास्त्र नहीं है, फिर भी ये शास्त्र-संगत होता है।

## लोकनाट्य का अर्थ

लोकनाट्य पाश्चात्य शब्दकोश 'फोकलड्रामा' का पर्याय रूप है। इसे लोगों के अनुभूत भावनाओं का अनुकरणात्मक स्वरूप भी कह सकते हैं। लोकनाट्य की नृत्य नवीनता, सहजता के साथ प्रस्तुतीकरण जन-सामान्य की अनुभूतियों, उनकी भावनाओं एवं सहज स्वभाव की अभिव्यंजना करता है। लोकनाट्य एक सामाजिक कल्पना है न कि व्यक्तिगत कल्पना।

## लोकनाट्य की परिभाषा

नगेन्द्र के अनुसार— "जीवन की सामूहिक आवश्यकताओं एवं प्रेरणाओं के बीच इनका जन्म हुआ। संस्कृत के अनेक उपरूपक तथा रूपकों में डिम, प्रहसन, हल्लीसक, रासक, रास, लास्य, लास्यनाटक, बीथी आदि लोक-नाटकों के ही परिष्कृत रूप हैं।"

हिंदी साहित्य कोश के अनुसार— "लोकनाट्य की उत्पत्ति लोक- विश्वास, लोक-प्रचलन, धार्मिक रूढ़ियाँ, जन-परंपराएँ, वीर-पूजा, मनोरंजन, उत्सव, मांगलिक पर्व तथा शोक के अवसरों आदि धारणाओं के बीच हुई है।"

महावीर अग्रवाल के अनुसार— "नाटक चाहे वेद या आध्यात्म से उत्पन्न हो, वह कितने ही सुंदर शब्दों और छन्दों में रचा गया हो वह तभी सफल माना जाता है जब 'लोक' उसे स्वीकार कर ले, क्योंकि नाटक लोकपरक होता है।"

लोकनाट्य का सरल सा अर्थ है— वह जन-साधारण के साथ रहा और हमेशा रहेगा। सरल भाषा में इसे ग्रामीण नाट्य या परंपराशील नाट्य भी कह सकते हैं।

## रामलीला

'राम ते अधिक रामकर दासा' को चरितार्थ करने वाली स्थली छत्तीसगढ़, राम की लीला-भूमि रही है। यहाँ के लोक-जीवन, लोक-साहित्य, लोक-संस्कृति के रंग-रंग में राम रमे हुए हैं। भगवान श्री राम को जन्म देने वाली माता कौशिल्या

\*निर्देशक — प्रोफेसर एवं अध्यक्ष, साहित्य एवं भाषा-अध्ययनशाला, पं. रविशंकर शुक्ल वि.वि., रायपुर (छ.ग.)

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**Iron Man of Silver World – An Enquiry into Alchemy of  
Shri Vishwakarma Silver House**H. M. Jha Bidyarthi\*, A. K. Srivastava\*\*, Mayur A. Dande\*\*\*,  
P. M. Kuchar\*\*\*\* & S. M. Mishra\*\*\*\*\***Abstract**

One hundred and thirty-five years ago, Keshavramji Jangid, one of the three sons of Shoramji Jangid and a native of Ramgad village under Churu district of Rajasthan relocated to a small town Khamgaon in the neighboring State of Maharashtra and resumed with his family business of making silver articles. He was a great artisan and trailblazer who had crafted a pure silver made small moving train attached with bogies carrying edibles kept on the round dining table of the then king of Ramgad. This lasting invaluable legacy was entrusted to his adopted son Jawaharmalji Jangid with unbending stiff directions. "Work with integrity evaporates scarcity. Generations may perish as an aftermath of ill and filthy ways of earning. Customers come willingly and gladly where righteousness resides." The lighthouse suggestions were practiced in letter and spirit by Jawaharmalji and he succeeded in expanding the silver business manifold. In 1937, his son Chiranjilalji Jangid augmented the business and shifted it from the sarafa (jewelry) market to own land and showroom named "Shri Vishwakarma Silver House" (in short SVSH). The fifth generation of the Jangid family under the capable leadership of Jagdish Prasad Jangid who entered the business in his early teens saw enormous diversification of silver articles consisting of thousands of varieties ranging from a few grams to 250 kilograms. Dr. Kamal Jangid who is currently one of the partners of this House represents the sixth generation of the family who despite being himself an M.B.B.S., dedicated to leapfrog the family legacy and associated his son Rahul – the seventh generation of this family – too with this business. SVSH is a national brand today with automated processes of sheet making, molding and wire making to cater customized solutions to fulfill the demands of a huge customer base including Indian celebrities, top-notch industrialists, shrines, and temples. SVSH chose not to register for Hallmark as the purity of silver under Hallmark is 92.50% whereas the purity of silver articles designed by SVSH stands at 99.50%. Based on primary research this case highlights archetypal and vintage business's credibility which is in a position to edify and cultivate the entrepreneurial and innovative mindsets, specifically in the pioneering stage.

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### **REVIEW ARTICLE**

## **A Study on Cyber Crime and Data Breach Management**

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### **ABSTRACT:**

Cyber-crime have made lot of damage to individual as well as organizations even the government and private sector are facing the problem in the field of cyber security, several laws and method has been introduced to prevent cyber crime and number of awareness program has been run by the government as well as the private organizations. The paper describe about the common Areas where the number of attacks has been made and the increased rate in data breach as well as the classes of hackers and types of attack they are using for various cyber-crime such as financial fraud, cyber bullying, phishing and remote access is another major attacks we also discuss about prevention mechanism.

**KEYWORDS:** Cyber Crime, Hacking Attacks, Financial Fraud, Cyber Criminal, Phishing Attack, Web Security, Email Bombing, Remote Access Trojan (RAT), Remote Computing, Data Breach, Data Breach Management.

### **I. INTRODUCTION:**

The cyber-crime is Today cyber-crime has a lot of damage due to individual as well as organizations even the governments and private sector both are facing the problem in the field of cyber security several laws and method has been introduced to prevent cyber-crime and number of awareness program has been done by the government as well as the private organizations. The paper describe about the common Areas where the number of attacks has been made as well as the classes of hackers and types of attack they are using for various cyber-crime such as financial fraud cyber bullying phishing remote access another major attacks and prevention mechanism. Now a day's number of internet users are increased day by day similarly number of attacks are also increasing due to the lack of awareness about the cyber security among the people. In this study well discuss the current cyberspace challenges. A hacker is an individual who uses computer, networking or other skills to overcome a technical problem. The term hacker may refer to anyone with technical skills, but it often refers to a person who uses his or her abilities to gain unauthorized access to systems or networks in order to commit crimes. A hacker may, for example, steal information to hurt people via identity theft, damage or bring down systems and, often, hold those systems hostage to collect ransom.

### **II. CLASSES OF HACKERS:**

#### **A. Black Hat Hackers:**

Individual with the extraordinary computer skills restoring to malicious or destructive activities and also known as cracker.

The main objective of black hat hacker is to perform illegal activities such as performing criminal activities cyber bullying, financial attack, hacking devices, breaking down the security of networks for monetary benefits.

#### **B. Gray Hat Hacker:**

Individual who work both offensively and defensively at various time. This are the type of hackers who worked in the both domains security as well as the attack depending upon the requirement.





## **A review on Effect of e trust and e risk on Consumers of retail e markets in India: A Comparative Study Based on Sociodemographic Variables**

Anuraag Agarwal<sup>1</sup>, **Dr. Sanskrity Joseph<sup>2</sup>**

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**Abstract:** Most companies run their online portals to sell their products / services online. The potential growth of online shopping has given rise to the idea of conducting online shopping research in India. Trust is one of the biggest barriers to success in Internet media. Lack of confidence and the risks involved can prevent online customers from participating in e-commerce. This investigation goals to investigate how electronic consumers develop their initial confidence or obtaining purposes with e retailers. The present study attempts to draw value information that impacts the e trust and e risk on shopping behaviour of Indian e shopper and their possible implications one retailer's product offerings. The study intends to identify key variables and construct which has a significant influence one trust and e risk in India. The researcher through literature review has identified few dimensions of trust and risk which will be explored on the basis of sociodemographic variables to get broad picture and to arrive at conclusions. The data was collected through Questionnaires.

**Keywords:** e risk, e trust, e retail markets, online shopping, e-commerce

### **1. Introduction**

E-commerce refers to "buying information, products and services through computer networks" (Kalakota & Whinston, 1996). Bloch, Pigneur, and Segev (1996) expanded it to include "support for any kind of business transaction through digital infrastructure". Online shopping is a process of e-commerce through which patrons can directly contact electronic suppliers or obtaining goods or facilities from online stores (Chaffey, 2009, p. 88).

The retail ecosystem is made up of consumers, retailers and partners who are rapidly transforming the retail landscape. They deliver very difficult consumer demands by combining ecommerce, chat, streaming, gaming or payment services into a single platform or application adopted by customers



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## Abstract View

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# Mobile Shopping Adoption: Research Insights (AbstractView.aspx?PID=2020-26-1-3)

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## MOBILE BANKING ADOPTION: A REVIEW

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### Abstract

The world has undergone a major shift with the technological development impacting life of a common man. It has also changed the way of doing business. Business has already evolved from traditional business to online business and now shifting towards mobile operated business. Present study is an attempt to review the articles published on mobile banking adoption during 2010 to 2018 by using keywords like m banking, mobile banking, m banking adoption etc. from different reputed publishers and journals and present comprehensive knowledge on mobile banking adoption studies. Findings of reviewed literature reveals that variables like perceived usefulness, perceived ease of use, performance expectancy, effort expectancy, facilitating conditions, social influence, awareness, positively affects the adoption of mobile banking services whereas variables like security, perceived risk, complex process, technical problems, improper security, and inadequate knowledge hinders the adoption of mobile banking. This study theoretically adds existing body of knowledge in the area of mobile banking adoption in specific and mobile commerce in general and helps future researchers, banks, marketers and other practitioners while providing useful insights for directed decisions. This paper presents crux of crux of mobile banking adoption literature within a decade. This paper provides overview of reviewed literature, key variables, objectives, findings, limitations, and future research suggestions in tabular form. The insights of the paper will be fruitful in promoting designing, customising and successfully implementing mobile banking technologies in the new markets.

**Keywords:** Mobile banking, M banking, Mobile banking adoption, Systematic Review of Literature, Review of Literature

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### INTRODUCTION

Technology has impacted all walks of human life (Kurzweil, 2005) and gradually improved the quality of life (Changchit & Chuchuen 2018). Not only it has impacted our personal life but also it has transformed the way business is conducted. Advantages that technology offers mainly to business organizations include "increase in efficiency" and "operating cost" (Laukkanen & Lauronen, 2005; Leung & Matanda, 2013). Due to these reasons banks also adopted technology and that has transformed the banking scenario. Banking has been advanced from branch banking to internet banking to mobile banking just because of emergence of self-service technologies (SSTs). In recent years, smart phones have become an integral part of consumers' lives (Singh, Srivastava & Srivastava, 2010) due to which mobile banking is gaining momentum. From bankers perspective mobile banking is a way of offering financial services through smartphones (Pousttchi and Schurig, 2004). Whereas from customers perspective mobile banking simply refers to accessing bank account and performing banking transactions and availing various banking services in smart phone (mobile) either through banking application or through wireless internet. Mobile banking is getting popularized due to several reasons such as: (i) smart phone penetration, (ii) availability of mobile network (The World Bank, 2009), (iii) convenience, (iv) user friendliness (Alalwan et al., 2015), (v) any time - anywhere access (Lee & Chung, 2009). Mobile banking allows customers to perform, throughout day and night, fund transfer, recharge, bill payments, balance enquiry, mini statement, cheque book request, SMS alerts etc. (Zhou et al., 2010; RBI, 2014). It also helps in knowing transaction details, location of banks and ATMs, exchange rates; handling card related issues like activation and blocking of cards; availing insurance and mobile brokerage services etc. (Tiwari & Buse, 2007).

This review paper is an endeavour to explore the literature on mobile banking adoption and to classify these studies based on their perspectives on mobile banking adoption. This paper highlights major factors due to which mobile banking was adopted by customers. Research gap of the research papers were identified and presented in the form of suggestion to future researchers. Systematic and precise review of earlier research presented in this paper will not only enhance conceptual understanding but also it will save time and effort of future researchers and academicians while providing crux of mobile banking adoption literature within a decade in tabular form. After introduction, review methodology is discussed in the next section, followed by literature analysis, results & discussions, implications, limitations & future research agenda and conclusions.

### REVIEW METHODOLOGY

#### Research Objectives

The present paper aims: (i) to present comprehensive view of research conducted in the area of mobile banking adoption by consumers, (ii) to enhance conceptual foundation through systematic and systematized review, (iii) to provide suggestions for future research.

#### Data Sources

The data was collected from secondary sources. Search for journal articles related with consumers' mobile banking adoption was made using key words like m-banking adoption, mobile banking adoption, and mobile commerce services adoption through: (i) search engines - Google and Google Scholar and (ii) Inflixbnet consortium. Collected articles belong to J-Gate, Science Direct, Research Gate, Emerald, SAGE, Springer, Taylor & Francis.



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## Abstract

Technology has touched and impacted all walks of life. We cannot imagine our life without technology because of ease, comfort, convenience it offers to us in all sphere of life especially while performing various personal and professional tasks, availing different kinds of services, buying products etc. Despite literacy and education many people are not properly aware of the various facilities offered by Government of India under Digital India Initiatives. In the present paper authors attempt to explore how social media influences people towards various facilities offered by Government of India under Digital India Initiatives. Influence of social media was studied with respect to formation of perceived ease of use, perceived usefulness, social influence and perceived risk, which further causes intention to adopt facilities offered under digital initiatives by Government of India. Data for the purpose of study was collected through Google forms from respondents residing in state of Chhattisgarh only. Total 98 responses were received and analysed through SPSS using statistical techniques like multiple response analysis, correlation It was found that respondent's attitude, perceived ease of use, perceived usefulness, perceived risk and social influence created by social media causes intention to adopt facilities offered under digital initiatives by Government of India. Except perceived risk all other factors exercised significant positive influence. Keywords: Digital initiatives, Digital India Program, Social Media Influence, Attitude, Perceived ease of use, Perceived usefulness, Perceived risk, Social influence, Intention to adopt.

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## Factors triggering impulse buying: A study among millennials at Raipur City

Bhavna Prajapati, **Dr. G.K. Deshmukh**, Arijit Goswami


### Abstract

*The aim of this study is to understand the elements influencing the millennial of Raipur city who opt to buy in shopping malls. For this the survey was done with 180 respondent of Y generation who were born after 1980. These generations of consumers are technologically sound and are open to new experiences. They likely have a different shopping style. The researcher collected the data through the convenient sampling method. After regression analysis he found the factors which impacts millennial in their impulse buying. It is seen that in this world of so much fashion and flamboyance the millennials get tempted towards many things and land up purchasing those things. The purchase of many things by a millennial is not always planned. At times factors like financial independence encourages them to buy a product which is not pre decided. It is also seen that the product promotion and visual merchandising also influence the impulse buying. Apart from all other factor the role of demographic factors can't be isolated. The impulsive buying is being affected by the factors; which can be justify by framed hypothesis.*

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## Abstract

Present study identifies Indian seniors' intention to use the internet and actual usage along with influence of age, gender, education and experience as moderators. This study proposes modifications in unified theory of acceptance and use of technology (UTAUT) model while adding education as moderators and also studied relationship between facilitating conditions (FC) and behavioural intention. The proposed research model was empirically tested by data collected from 371 Indian seniors above the age of 50 years through offline survey. The collected data were analysed using structural equation modelling (SEM) and multiple moderation analysis. The result revealed that performance expectancy (PE), effort expectancy (EE), subjective norm (SN), technology anxiety (TA) significantly influence elders' behavioural intention (BI) to use and adopt internet except FC. Further BI resulted in actual system use which is also determined by FC. Actual system use is predicted by three variables: learning, place of access and health conditions. In this study only age and gender were emerged as moderators. Findings of the study have important implications particularly to understand determinants of Indian seniors' intention to use the internet and actual usage along with influence of moderators.



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## Abstract

Global information technology projects are risky with failure rates for customer relationship management information technology (CRM IT) projects estimated to 70 percent. These failures are often due to multiplicity of factors including poor risk management. The project management literature points out four broad types of risks: technical, external, organizational, and other risk factors. Project manager's basic job, therefore, becomes to manage the risks and ensure that an IT project is steered to completion while meeting the objectives. Unmanaged risks run into chances of failure and ultimately impacting the CRM project and the reputation of the consultant. [Payne and Frow's \(2005\)](#) advocates the need for a structured study on the information technology implementations of these projects. The objectives of the study are to investigate: how project risks in CRM- IT implementations impact the final outcome and how the risk management process adopted by the IT project manager impacts the final outcome of the project. The research was conducted administering questionnaire to 135 project managers. It was found that project risk impact cost, time, and technical performance and risk management process impacts planning, support of customers as well as top management.



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# An Efficient and Secure, ID-based Authenticated, Asymmetric Group Key Agreement Protocol for Ubiquitous Pay-TV Networks

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## Abstract

Internet-of-Things (IoT) based applications are rapidly gaining popularity. Smart home is one of them; home security and safety, home automation, energy management and health surveillance are some applications of smart homes. Smart homes have enormous potential as well as enormous threat to security and privacy of the end users. Pay TV is considered as the likely entry points for IoT services into smart homes. Pay TV has evolved security techniques very similar to of IoT based smart homes services. Pay TV is an application of broadcast encryption schemes in which premium content is broadcasted only to subscribed users. The broadcaster needs assurance that only subscribed user can access premium content, so the program is encrypted with a group key shared among all subscribers. Thus, to share the key, Pay-TV systems require efficient and secure group key agreement (GKA). This research proposes an efficient and secure, dynamic, ID-based authenticated, asymmetric group key agreement (AAGKA) protocol for Pay-TV networks. Security is proved under the assumptions of the discrete logarithm problem (DLP) and decisional Diffie-Hellman problem (DDHP). Finally, comparison of the protocol with state-of-art protocols shows that the proposed protocol is highly efficient.

**Keywords:** Internet-of-Things (IoT), Authentication, Asymmetric group key agreement, Bilinear pairing, Pay-TV network

## 1 Introduction

Smart homes, an IoT based application is next big thing in the rapidly growing technology-based lifestyle. Pay-TV has much to offer to the fast-developing smart home era. Over the years, Pay-TV had gained trust among the customers with secure data management and determination without compromising the privacy of the subscribers. In order to avail the benefits of smart homes and IoT, consumers have to allow the

new technology to go deeper into their homes.

With established subscriber relationship, Pay-TV can enable IoT to manage smart homes with robustness and reliability and without any attack on their privacy.

Group key agreement (GKA) protocols provide a secure and robust approach to establishing group session keys for public networks and hence aim to provide secure communication over an insecure network. Wu et al. [20], introduced the concept of the asymmetric group key agreement (AGKA) protocol, in which all group members compute a common secret group key and only group members can broadcast secret messages to the group. In asymmetric protocols, unlike in symmetric protocols, all group members compute a common group encryption key (GEK) and hold different group decryption keys (GDKs).

The authenticated asymmetric protocol proposed here has the following advantages: (1) messages can also be broadcasted by any non-registered member in the group (using the GEK); (2) asymmetric protocols use short signatures to achieve mutual authentication; and (3) the protocol complements dynamic networks by maintaining backward and forward secrecy. Thus, an authenticated, asymmetric group key agreement (AAGKA) protocol preserves benefits of both the GKA protocol and broadcast encryption.

In a Pay-TV system, broadcasters generate revenue by charging subscribers for viewing programs. Thus, broadcasters need a mechanism so that only the paid subscribers can view the program. We present only a brief discussion here of the specific requirements of Pay-TV systems, but greater detail may be found in [7-8, 11, 13]. A Pay-TV system is asymmetric with respect to computational and communication capabilities between the broadcaster and the subscribers. Since the broadcaster has greater computational capabilities than the subscribers, a GKA protocol for Pay-TV should place greater computational and communication load on the broadcaster than on the subscribers.

Further, a key agreement protocol for Pay-TV must

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Research Article

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# Edge Theoretic Extended Contractions and Their Applications

R. Rajagopalan , Ekta Tamrakar, Fahad. S. Alshammari, H. K. Pathak, Reny George 

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## Abstract

Edge theoretic extended contractions are introduced and coincidence point theorems and common fixed-point theorems are proved for such contraction mappings in a metric space endowed with a graph. As further applications, we have proved the existence of a solution of a nonlinear integral equation of Volterra type and given a suitable example in support of our result.

## 1. Introduction and Preliminaries

The celebrated Banach contraction principle is a motivation for many fixed-point theorems. It guarantees the existence and uniqueness of solution of various equations arising in mathematics. The initial generalizations of Banach's result came up in the form of Kannan's contraction, Chatterjea's contraction, Reich's contraction, Ciric's contraction, Hardy-Roger's contraction, and Ciric's quasicontraction. Among these, Ciric's quasicontraction is the most general form in the sense that any mapping which does not satisfy Ciric's quasicontraction does not satisfy any of the previously mentioned contractions. Further, these results have been widely investigated and many interesting applications have been found by many authors (see [1–7]).  $F$ -contraction and fixed-point theorem for  $F$ -contraction mappings were introduced by Wardowski [8] as a generalisation of the Banach contraction principle.



**Definition 1 (see [8].)** Consider the collection of functions  $F : (0, \infty) \rightarrow \mathbb{R}$  satisfying the following:



## Biocatalysis and Agricultural Biotechnology

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# Mosquito repellent and larvicidal perspectives of weeds *Lantana camara* L. and *Ocimum gratissimum* L. found in central India

Mukesh Sharma <sup>a</sup>, Amit Alexander <sup>b</sup>, **Shailendra Saraf** <sup>c</sup>, Swarnlata Saraf <sup>c</sup>,  
Umesh Kumar Vishwakarma <sup>d</sup>, Kartik T. Nakhate <sup>e</sup>, Ajazuddin <sup>a</sup>  

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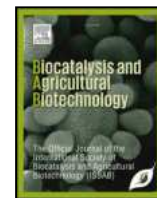


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## Highlights





## Mosquito repellent and larvicidal perspectives of weeds *Lantana camara* L. and *Ocimum gratissimum* L. found in central India

Mukesh Sharma<sup>a</sup>, Amit Alexander<sup>b</sup>, Shailendra Saraf<sup>c</sup>, **Swarnlata Saraf<sup>c</sup>**,  
Umesh Kumar Vishwakarma<sup>d</sup>, Kartik T. Nakhate<sup>e</sup>, Ajazuddin<sup>a, \*</sup>

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### ARTICLE INFO

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*Ocimum gratissimum*  
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### ABSTRACT

Development of natural mosquito repellants is essential considering their safety profile unlike synthetic insecticides. Herein, novel liquid vaporizable preparations of the essential oils obtained from the leaves of weeds *Lantana camara* Linn (*L. Camara*) family Verbenaceae, and *Ocimum gratissimum* Linn (*O. gratissimum*) family Lamiaceae were developed for the evaluation of mosquitocidal and larvicidal activities against malaria vectors, *Anopheles subpictus*, *Aedes aegypti* and *Culex quinquefasciatus*. While mosquitocidal effect was evaluated as knock-down of mosquitoes in modified glass chamber for an exposure period of 1 h, larvicidal activity was assessed as inhibition of larval motility in petri dish at intervals of 6-, 12- and 24-hr. Combination of essential oils of *L. Camara* and *O. gratissimum* leaves prepared in ethyl alcohol at 1:5 ratio exhibited maximum synergistic mosquitocidal effect against all three test species (94–97%). This effect was comparable with that of standard 1:1 combination ratio of essential oils of *Cymbopogon nardus* (L.) Rendle and *Eucalyptus globulus* Labill. Furthermore, statistical analysis using probit regression model for determination of LC50 and LC90 revealed excellent larvicidal effect of essential oil of *O. gratissimum* leaves at 24-hr time-point (LC50 = 40.08 ± 1.60 ppm and LC90 = 78.035 ± 1.90 ppm). Our data suggest the lethal effects of essential oils of *L. camara* and *O. gratissimum* leaves on *Anopheles subpictus*, *Aedes aegypti* and *Culex quinquefasciatus*. Therefore, essential oil preparations of these weeds can be used as natural, harmless and inexpensive mosquito repellents.

### 1. Introduction

Malaria is a serious mosquito borne disease, which cause millions of deaths globally every year particularly of children under the age of five (Ali et al., 2014). Moreover, filariasis, West Nile, Japanese encephalitis, and arbovirus infections like dengue, yellow fever, chikungunya and Zika are a few of the common, serious and emerging diseases spread by mosquitoes (Tolle, 2009; Lwande et al., 2020). Since vaccines are unavailable for the majority of these diseases, mosquito control is considered as an important approach to address this issue. Therefore, some strategies including repellents to avoid mosquito bites are being developed (Islam et al., 2017). Moreover, application of larvicides at breeding sites is the commonly suggested alternative (Govindarajan and Benelli, 2016). In fact, the synthetic insecticides have been developed successfully for controlling mosquito-borne diseases (Gokulakrishnan

et al., 2013). However, synthetic agents produced deteriorating effects on environment as well as on the human health. For example, organic compounds pyrethroids (similar to pyrethrins produced by the pyrethrum flowers) are 2250 times lethal to the insects than humans. Unfortunately, their repeated contact over prolonged periods in the form of mosquito repellents can lead to potential health consequences including kidney and spleen toxicity (Burfield and Reekie, 2005; Arnason et al., 2010). To address these issues, the development of safe herbal-based mosquito repellents and larvicides cannot be overemphasized. The use of essential oils (EOs) obtained from plants are seems to be an attractive approach. EOs are effective against broad spectrum of insect pests, and described as easy to remove, eco-friendly and biodegradable, with negligible toxicity to mammals (Younoussa et al., 2016).

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## Review article

# Stimuli-responsive *In situ* gelling system for nose-to-brain drug delivery

Mukta Agrawal <sup>a</sup>, **Shailendra Saraf** <sup>b</sup>, Swarnlata Saraf <sup>b</sup>, Sunil K. Dubey <sup>c</sup>, Anu Puri <sup>d</sup>, Umesh Gupta <sup>e</sup>, Prashant Kesharwani <sup>f</sup>, V. Ravichandiran <sup>g</sup>, Pramod Kumar <sup>h</sup>, V.G.M. Naidu <sup>i</sup>, Upadhyayula Suryanarayana Murty <sup>j</sup>, Ajazuddin <sup>a</sup>, Amit Alexander <sup>k</sup>  

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## Highlights



- Sol-gel transformation of biomaterials upon exposure to physiological stimulus.
- Stimuli responsive *in situ* nasal gel increases drug retention and lessen mucociliary clearance.
- Increases bioavailability of drug in brain through olfactory and trigeminal nerve passage.
- Removes the barriers of direct nose-to-brain drug delivery.
- Suitable for large lipophilic moieties like proteins, peptides and also small hydrophilic substances.

## Abstract

The diagnosis and treatment of neurological ailments always remain an utmost challenge for research fraternity due to the presence of BBB. The intranasal route appeared as an attractive and alternative route for brain targeting of therapeutics without the intrusion of BBB and GI exposure. This route directly and effectively delivers the therapeutics to different regions of the brain via olfactory and trigeminal nerve pathways. However, shorter drug retention time and mucociliary clearance curtail the efficiency of the intranasal route. The *in situ* mucoadhesive gel overthrow the limitations of direct nose-to-brain delivery by not only enhancing nasal residence time but also minimizing the mucociliary clearance and enzymatic degradation. This delivery system further improves the nasal absorption as well as bioavailability of drugs in the brain. The *in situ* mucoadhesive gel is a controlled and sustained release system that facilitates the absorption of various proteins, peptides and other larger lipophilic and

Review article

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Review article

# Recent strategies and advances in the fabrication of nano lipid carriers and their application towards brain targeting

Mukta Agrawal <sup>a</sup>, Swarnlata Saraf <sup>b</sup>, **Shailendra Saraf** <sup>b</sup>, Sunil Kumar Dubey <sup>c</sup>, Anu Puri <sup>d</sup>, Ravish J. Patel <sup>e</sup>, Ajazuddin <sup>a</sup>, V. Ravichandiran <sup>f</sup>, Upadhyayula Suryanarayana Murty <sup>g</sup>, Amit Alexander <sup>g</sup>  

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## Highlights

- Current global status of different neurological disorders and available therapies.
- Different approaches of brain targeting including delivery across BBB and through intranasal route
- Advantages and limitations of NLC along with various fabrication techniques
- Complete research data of past decade explaining application of NLC for brain targeting of bioactives.
- Pharmacokinetic data and preclinical progress of NLC based therapies towards treatment of CNS disorders

## Abstract

In last two decades, the lipid nanocarriers have been extensively investigated for their drug targeting efficiency towards the critical areas of the human body like CNS, cardiac region, tumor cells, *etc.* Owing to the flexibility and biocompatibility, the lipid-based nanocarriers, including nanoemulsion, liposomes, SLN, NLC *etc.* have gained much attention among various other nanocarrier systems for brain targeting of bioactives. Across different lipid nanocarriers, NLC remains to be the safest, stable, biocompatible and cost-effective drug carrier system with high encapsulation efficiency. Drug delivery to the brain always remains a challenging issue for scientists due to the complex structure and various barrier mechanisms surrounding the brain. The application of a suitable nanocarrier system and the use of any alternative route of drug administration like nose-to-brain drug

Review article

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# Formulation Strategies of Nano Lipid Carrier for Effective Brain Targeting of Anti-AD Drugs

[Amit Alexander](#) <sup>1</sup>, [Mukta Agrawal](#) <sup>2</sup>, [Swarnlata Saraf](#) <sup>3</sup>, [Shailendra Saraf](#) <sup>3</sup>, [Ajazuddin](#) <sup>2</sup>,  
[Mahavir B Chougule](#) <sup>4</sup>

Affiliations

PMID: 32048957 DOI: [10.2174/1381612826666200212120947](#)

## Abstract

NLC is a next-generation lipid nanocarrier, which holds many advantages over other colloidal lipid carrier systems like higher drug loading, better and controlled release and enhanced stability. Owing to the unique structural composition, i.e. crystallized solid and liquid lipid blend, it offers excellent biocompatibility and higher permeation across physiological membranes like BBB. Moreover, the surface of NLC can easily be modified with target-specific ligands, proteins, peptides, etc. which makes it a potential candidate for brain targeting of CNS acting drugs. NLC has found various applications for the treatment of various CNS disorders including Alzheimer's disease, Parkinson's disease, schizophrenia, epilepsy, migraine, cerebral ischemia, etc. Among these, the application of NLC towards the treatment of AD has been well-explored in the past two decades. In this piece of work, we have discussed the types of NLC, its composition, fabrication techniques, characterization, stability profile and application in the treatment of AD.

**Keywords:** Alzheimer's disease; BBB; Nanostructured lipid carrier; brain; fabrication techniques; lipid.

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# Biomedical applications of microemulsion through dermal and transdermal route

Tripti Shukla <sup>a</sup>, Neeraj Upmanyu <sup>a</sup>, Mukta Agrawal <sup>b</sup>, Swarnlata Saraf <sup>c</sup>, Shailendra Saraf <sup>c d</sup>, Amit Alexander <sup>b</sup>  

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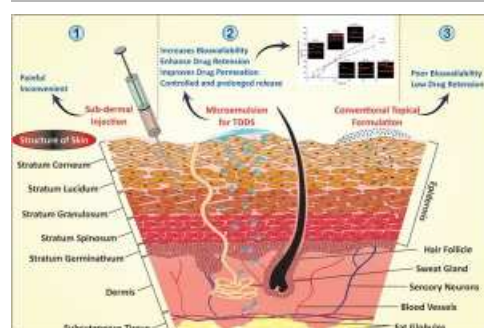
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## Abstract

Microemulsions are thermodynamically stable, transparent, colloidal drug carrier system extensively used by the scientists for effective drug delivery across the skin. It is a spontaneous isotropic mixture of lipophilic and hydrophilic substances stabilized by suitable surfactant and co-surfactant. The easy fabrication, long-term stability, enhanced solubilization, biocompatibility, skin-friendly appearance and affinity for both the hydrophilic and lipophilic drug substances make it superior for skin drug delivery over the other carrier systems. The topical administration of most of the active compounds is impaired by limited skin permeability due to the presence of skin barriers. In this sequence, the microemulsion represents a cost-effective and convenient drug carrier system which successfully delivers the drug to and across the skin. In the present review work, we compiled various attempts made in last 20 years, utilizing the microemulsion for dermal and transdermal delivery of various drugs. The review emphasizes the potency of microemulsion for topical and transdermal drug delivery and its effect on drug permeability.

## Graphical abstract

The conventional topical formulations (like ointment, gel, cream, lotion, etc.) are not able to deliver the drug deep into the skin because of the presence of stratum corneum as skin barrier (3). Also, the subdermal injections are very painful and inconvenient approach of drug administration (1). In comparison to both of these, the microemulsion represents a novel drug carrier system to enhance the drug permeation across the skin and delivers the drug efficiently via transdermal route (2).





# Biomedical applications of microemulsion through dermal and transdermal route

Tripti Shukla <sup>a</sup>, Neeraj Upmanyu <sup>a</sup>, Mukta Agrawal <sup>b</sup>, Swarnlata Saraf <sup>c</sup>, **Shailendra Saraf** <sup>c,d</sup>, Amit Alexander <sup>b</sup>

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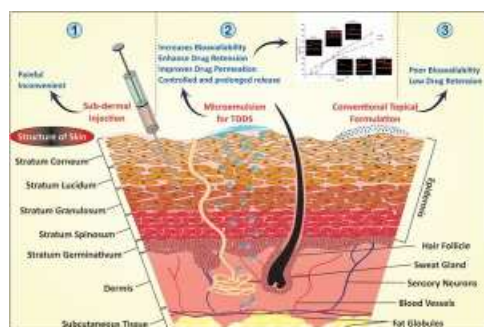
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## Abstract

Microemulsions are thermodynamically stable, transparent, colloidal drug carrier system extensively used by the scientists for effective drug delivery across the skin. It is a spontaneous isotropic mixture of lipophilic and hydrophilic substances stabilized by suitable surfactant and co-surfactant. The easy fabrication, long-term stability, enhanced solubilization, biocompatibility, skin-friendly appearance and affinity for both the hydrophilic and lipophilic drug substances make it superior for skin drug delivery over the other carrier systems. The topical administration of most of the active compounds is impaired by limited skin permeability due to the presence of skin barriers. In this sequence, the microemulsion represents a cost-effective and convenient drug carrier system which successfully delivers the drug to and across the skin. In the present review work, we compiled various attempts made in last 20 years, utilizing the microemulsion for dermal and transdermal delivery of various drugs. The review emphasizes the potency of microemulsion for topical and transdermal drug delivery and its effect on drug permeability.

## Graphical abstract





The conventional topical formulations (like ointment, gel, cream, lotion, etc.) are not able to deliver the drug deep into the skin because of the presence of stratum corneum as skin barrier (3). Also, the subdermal injections are very painful and inconvenient approach of drug administration (1). In comparison to both of these, the microemulsion represents a novel drug carrier system to enhance the drug permeation across the skin and delivers the drug efficiently via transdermal route (2).





Review article

# In-line treatments and clinical initiatives to fight against COVID-19 outbreak

Mukta Agrawal <sup>a</sup>, **Shailendra Saraf** <sup>b</sup>, Swarnlata Saraf <sup>b</sup>, Upadhyayula Suryanarayana Murty <sup>c</sup>, Sucheta Banerjee Kurundkar <sup>d</sup>, Debjani Roy <sup>d</sup>, Pankaj Joshi <sup>e,f</sup>, Dhananjay Sable <sup>g</sup>, Yogendra Kumar Choudhary <sup>h</sup>, Prashant Kesharwani <sup>i</sup>  , Amit Alexander <sup>c</sup>  


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## Highlights

- Aggressive and effective measures are essential to combat COVID-19.
- A huge number of potential diagnostic tools are needed to examine one and all.
- Chloroquine and hydroxychloroquine are not found effective as expected.
- FDA announced EUA for remdesivir.
- Vaccines with novel technologies are under clinical trials.





## Abstract

In December 2019, when the whole world is waiting for Christmas and New Year, the physicians of Wuhan, China, are astounded by clusters of patients suffering from pneumonia from unknown causes. The pathogen isolated from the respiratory epithelium of the patients is similar to previously known coronaviruses with some distinct features. The disease was initially called nCoV-2019 or SARS-nCoV-2 and later termed as COVID-19 by WHO. The infection is rapidly propagating from the day of emergence, spread throughout the globe and now became a pandemic which challenged the competencies of developed nations in terms of health care management. As per WHO report, 216 countries are affected with SARS-CoV-19 by August 5, 2020 with 18, 142, 718 confirmed cases and 691,013 deaths reports. Such huge mortality and morbidity rates are truly threatening and calls for some aggressive and effective measures to slow down the disease transmission. The scientists are constantly engaged in finding a potential solution to diagnose and treat the pandemic. Various FDA approved drugs with the previous history of antiviral potency



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# Chromatographic Fingerprinting and Quantitative Analysis of Marker in the Extract of *Gloriosa superba* Tubers Collected from Some Region of Chhattisgarh

Rakesh Tirkey, Swarnlata Saraf\*

University Institute of Pharmacy, Pt. Ravishankar Shukla University, Raipur, Chhattisgarh, INDIA.

## ABSTRACT

**Background:** *Gloriosa superba* (Family: *Liliaceae*) is commonly known as Kalihari in India and has been used by several indigenous communities to treat a snake bite, skin diseases and joint pain. It has been also scientifically reported for many pharmacological activities such as hypoglycaemic, hepatoprotective, anticancer, anti-inflammatory. Present work is an effort to develop validated HPTLC method for the detection and quantification of chief constituent in the tuber extract of *Gloriosa superba*. **Methods:** HPTLC analysis of tuber extract has been performed on Silica gel 60 F<sub>254</sub> (10 cm×10 cm) plates with mobile phase consisting toluene, ethyl acetate and diethylamine (02:08:02, v/v/v). Densitometric scanning of the plate was performed at 371nm by using CAMAG TLC scanner III equipped with visionCATS version 2.4.17207.2 (CAMAG) and developed method was also validated for accuracy, precision and robustness as per ICH guidelines.

**Results:** present work has confirmed the rich content of colchicine in tuber extract of *Gloriosa superba*. The calibration curve was linear in the selected range of 0.4-1.2 µg/spot and regression equation found to be

$y = 0.0285x + 0.0074$ . the correlation coefficient (r) was 0.9978 for the regression equation. The LOQ and LOD was 0.170 µg /spot and 0.056 µg /spot respectively. The average recovery of colchicine at three levels was 99.5, 98.6 and 99.6 %, which indicated the remarkable reproducibility of the method. **Conclusion:** findings revealed that the developed method is simple, precise, and accurate for quantitative analysis of *Gloriosa superba*; and it might be useful for quality control of herbal medicine.

**Key words:** Chromatography, Kalihari, Quantitative, HPTLC, *Liliaceae*.

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## INTRODUCTION

*Gloriosa superba* is enormously valued in Indian folk medicine and its tremendous medicinal potential has been well mentioned in the Ayurveda for the treatment of various ailments.<sup>1</sup> It is usually known as “kalihari” in India, belonging to family *Liliaceae*, deciduous climbing shrub with *Appealing* wavy-edged yellow and red flowers.<sup>2-5</sup> Leaves are ovate, lanceolate and twist at the tip that empowers the plant to climb 10 feet or higher; the stem is 1-2 meter high; tuber are perennial and V or L shaped, roots are fibrous; flowers are large singular and axillary.<sup>6-8</sup> It is widely dispersed around most tropical and subtropical nations such as Africa, India, Sri Lanka, Bangladesh, Myanmar and Malaysia.<sup>9,10</sup> As a folkloric medicine, seed and tuber part of *Gloriosa superba* has been used in the tribal region of different countries to treat diseases like chronic ulcer, leprosy, intestinal worm, joint pain, snake bite, skin diseases etc.<sup>6,11-14</sup> It has been also claimed for several therapeutic potentials by many *in-vitro* and *in vivo* screening for hypoglycaemic, anticancer, hepatoprotective, anthelmintic, anti-inflammatory, analgesic, antimicrobial, antivenom, and antifungal activity.<sup>13,15-22</sup> In last few years, it has been mostly researched for its chemotherapeutic nature against various carcinomas such as Lung cancer (A549) cell line, breast cancer (MCF-7 and MDA-MB231) cell line, pancreatic carcinoma (PANC-1) cell line and bacteria.<sup>21,23</sup> Results of antimicrobial and anticancer studies were significant, which suggested that the medicinal properties of *Gloriosa superba* could be attributed to its precious alkaloidal content. This plant contains a number of alkaloidal compounds, which are mainly colchicine, colchicoside, and other colchicine derivatives.<sup>24</sup> Nowadays, the various advanced analytical techniques (HPLC, GCMS and NMR-spectroscopy)

has also contributed to identify some other colchicine derivatives such as N-formyl-N-deacetylcolchicine, 3-demethylcolchicine, β and γ-lumicolchicine.<sup>25-28</sup>

*Gloriosa superba* is part of the traditional medicinal system of India and its therapeutic potential has also proven in different pharmacological screening. Hence, for its therapeutic use as herbal medicine, there is great need of a precise validated method for qualitative and quantitative determination of its marker constituents.<sup>29</sup> Therefore, the present work is intended to develop a chromatographic profile for the quantification of marker compound in tuber extract of *Gloriosa superba* by using a validated HPTLC method.<sup>30</sup>

## MATERIALS AND METHODS

### Plant material and chemicals

The tuber part of plant *Gloriosa superba* was collected during the month of September from some region of Korba (Chhattisgarh, India). Tubers were cleaned with water and dried under the shade then coarsely powdered and stored in airtight containers for further study.<sup>31,32</sup> The plant was identified and authenticated by Dr. N.K. Dubey, Department of Botany, Banaras Hindu University, Varanasi (U.P.). Herbarium specimen of *Gloriosa superba*, bearing voucher specimen number *Lilia*. 2018/02 was deposited in the Department of Botany, Banaras Hindu University, Varanasi.

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# Nano-Lipidic Carriers as a Tool for Drug Targeting to the Pilosebaceous Units

Shweta Ramkar <sup>1</sup>, Abhishek K Sah <sup>2</sup>, Nagendra Bhuwane <sup>1</sup>, Ishwari Choudhary <sup>1</sup>,  
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## Abstract

The pilosebaceous unit is the triad comprising of hair follicle, arrector pilli muscle, and sebaceous gland. Drug delivery to and through the hair follicles has garnered much attention of the researchers and the hair follicles represent an attractive target site via topical applications. They are bordered by capillaries and antigenpresenting cells, connected to the sebaceous glands and the bulge region of the hair follicle anchors the stem cells. The nano lipid carriers have the propensity to penetrate through the skin via transcellular route, intracellular route and follicular route. It has been established that nano lipid carriers have the potential for follicular drug delivery and provide some advantages over conventional pathways, including improved bioavailability, enhanced penetration depth, fast transport into the skin, tissue targeting and form a drug reservoir for prolonged release. This review describes the pilosebaceous unit (PSU) and related diseases and the recent lipid-based nanotechnology approaches for drug delivery to the follicular unit as well as related issues. Different types of nano lipid carriers, including ethosomes, liposomes, nanoparticles, solid lipid nanoparticles (SLNs), and nano lipid carriers (NLCs) have been reported for follicular drug delivery. Targeted drug delivery with nano-lipid carriers has the potential to augment the efficacy of drugs/bioactives to treat diseases of PSU. This review systematically introduces the activities of different formulations and the use of nano lipid carriers in treating PSU related disorders like alopecia, acne, and hirsutism.

**Keywords:** Hair follicles; drug delivery; lipids; nanocarrier; skin; skin disease; targeting; topical.

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# Polymers in topical delivery of anti-psoriatic medications and other topical agents in overcoming the barriers of conventional treatment strategies

Krishna Yadav<sup>1</sup> · Akanksha Soni<sup>1</sup> · Deependra Singh<sup>1</sup> · Manju Rawat Singh<sup>1</sup>

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## Abstract

In recent decades, topical treatments to dermal disorders have shown ineffectiveness in delivering the medication at a particular location without a suitable drug carrier. Psoriasis treatment is hindered because of the ineffective delivery and efficacy of conventional pharmaceutical treatment. In conventional medication formulation approach, it is difficult to breach the transdermal layer of a skin membrane for topical drugs, i.e. cyclosporine, methotrexate. This problem is further complicated by extreme disease-associated conditions such as hyperkeratosis and irritation. Intending to assure better drug delivery carriers, this review emphasizes the therapeutic efficacy of polymers and their potential to deliver the drug into the deeper layer of the skin membrane. The polymers are essential in structural and physiochemical perspectives as it works as a carrier for the medication. A vast variety of delivery carriers is available nowadays but their applicability in such dermal cases like psoriasis is still lacking due to less knowledge on an appropriate polymer. The current investigation of suitable polymer would assist in brushing our expertise to optimize the advantages of a wide spectrum of polymers to fulfill the topical targeting of psoriasis.

**Keywords** Psoriasis · Hyperkeratosis · Inflammation · Polymeric carrier · Immune-mediated skin disorder

## Introduction

Psoriasis is an inflammatory, chronic autoimmune disorder of the skin that affects epidemiologically 1–3 percent of the world's population with a negative effect on patient life (Yadav et al. 2018b; Pradhan et al. 2018). Psoriasis is a multiple-factor disease regulated by abnormal keratinocyte proliferation and migration of T cells to the skin by stimulated immune systems. Later, the T cell release cytokines and chemokines, which ultimately regulate disease etiology including aggravating inflammation and premature hyperkeratosis (Elder et al. 2010; Rahman et al. 2015; Yadav et al. 2018a).

The initiation and progression of the disorder are regulated by the immune system in individuals with a genetic susceptibility to psoriasis. The pathomechanism is orchestrated to stimulate various mediators, such as cytokines,

chemokines, and growth factors, to facilitate hyperkeratosis, epidermal thickening, neovascularization, and keratinocyte proliferation (Sala et al. 2018). Physiologically, induction of T lymphocytes and inflammatory infiltrates into the skin is responsible for hyperkeratosis in which antigen-presenting cells conjugate with MHC, leading to large cytokines being recruited, i.e. TNF- $\alpha$ , Interleukin-23 (IL-23), and IL-17 playing key functions in the production of inflammatory psoriatic lesions (Roberts et al. 2017). The studies revealed that IL-17 and IL-23 are crucially involved in psoriasis pathogenesis (Tonel et al. 2010; Kuwabara et al. 2017). A sequential process that occurred during the pathogenesis of psoriasis has been demonstrated in Fig. 1.

The treatment of psoriasis involves topical application through the cream, lotion, gel as well as phototherapy, or/and systemic therapy depending on the rigorosity of disease as mild to severe. Topical therapy was frequently utilized for psoriasis treatment but the major challenge includes deliverance of active constituents into the transdermal layer (Chandrashekar 2012; Pradhan et al. 2018; Abed et al. 2019). Several specific drugs are now commonly used for topical treatment of psoriasis in variable dosage formulations. Despite all challenges of topical treatment including low

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## Article

Topical delivery of fluocinolone acetonide integrated NLCs and salicylic acid enriched gel: A potential and synergistic approach in the management of psoriasis

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DOI: [10.1016/j.jddst.2020.102282](https://doi.org/10.1016/j.jddst.2020.102282)

 Madhulika Pradhan ·  Krishna Yadav ·  Deependra Singh ·  Manju Singh

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## Abstract

Psoriasis is a chronic autoimmune inflammatory disease of the skin that tends to affect around 2-3% of the global population. As a cascade of events occurs concurrently during psoriasis pathogenesis, treatment with a therapeutic combination is primarily concerned. The conventional formulation containing a combination of anti-inflammatory corticosteroid and the keratolytic agent is frequently employed for topical therapy of psoriasis, but their efficacy remains low. Therefore, the present work aimed to explore the efficacy of Fluocinolone Ace-tonide (FA) loaded NLCs and plain Salicylic Acid (SA) containing novel gel (FSG) for effective management of psoriasis. For comparative study plain FA, and SA containing conventional gel (PFSG) formulation was also prepared. The FSG formulation exhibited prolonged release of FA for more than 24 h, whereas the PFSG formulation released more than 90% of FA within 7 h. Ex-vivo permeation study revealed negligible absorption of drugs into the systemic circulation from both the FSG and PFSG formulations; nevertheless, the dermal pharmacokinetic investigation revealed significantly higher ( $P < 0.05$ ) retention of FA from FSG formulation as compared to PFSG formulation. Confocal laser scanning microscopic study confirmed strict confinement of FA loaded NLCs to the epidermal and deep dermal layer of the skin whereas PFSG was largely restricted to the outer layer of skin. No skin irritation was reported in vivo, upon topical application of FSG formulation, whereas slight irritation was reported for PFSG formulation. Results of histopathological studies proposed th

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References (41)

## Abstract

Psoriasis is a chronic autoimmune inflammatory disease of the skin that tends to affect around 2-3% of the global population. As a cascade of events occurs concurrently during psoriasis pathogenesis, treatment with a therapeutic combination is primarily concerned. The conventional formulation containing a combination of anti-inflammatory corticosteroid and the keratolytic agent is frequently employed for topical therapy of psoriasis, but their efficacy remains low. Therefore, the present work aimed to explore the efficacy of Fluocinolone Ace-tonide (FA) loaded NLCs and plain Salicylic Acid (SA) containing novel gel (FSG) for effective management of psoriasis. For comparative study plain FA, and SA containing conventional gel (PFSG) formulation was also prepared. The FSG formulation exhibited prolonged release of FA for more than 24 h, whereas the PFSG formulation released more than 90% of FA within 7 h. Ex-vivo permeation study revealed negligible absorption of drugs into the systemic circulation from both the FSG and PFSG formulations; nevertheless, the dermal pharmacokinetic investigation revealed significantly higher ( $P < 0.05$ ) retention of FA from FSG formulation as compared to PFSG formulation. Confocal laser scanning microscopic study confirmed strict confinement of FA loaded NLCs to the epidermal and deep dermal layer of the skin whereas PFSG was largely restricted to the outer layer of skin. No skin irritation was reported in vivo, upon topical application of FSG formulation, whereas slight irritation was reported for PFSG formulation. Results of histopathological studies proposed th

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## ORIGINAL ARTICLE

Development and Characterization of *Costus Speciosus* Rhizome Extract Based Antimicrobial Liposomal Gel

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## ABSTRACT

**Objective:** Liposome based formulations are quite popular nowadays for effectively treating different dermal disorders. Different synthetic and plant based drugs are successfully used for liposome preparation for better potential effect. Use of herbal extract into liposome results reduction in side effects as in case of synthetic drugs. *Costus speciosus* rhizomes possess good antibacterial potential, assuring its greatness as potent plant active of this plant. Alcoholic extract of *Costus speciosus* rhizomes were found to be more active towards the bacterial species than the aqueous extract. Therefore, this rhizomes extract was incorporated into liposomes for enhanced activity, upon topical application. The main objective of the present research work is to develop this potent rhizome extract into a nano formulations i.e. liposomes and to fabricate its novel topical liposomal gel for anti-microbial activity. Methanolic Rhizome Extract (MeRE) was incorporated into liposomes by thin film hydration method. The batch having lipid ratio i.e. Soya lecithin: Cholesterol (3:1); MeRE concentration 70 mg with entrapment efficiency  $71.5 \pm 0.9\%$  was finalized. The vesicle size was found to be  $3.3\mu\text{m} \pm 0.4$ . In vitro drug diffusion and skin retention from liposomal gel was found to be  $63.3\% \pm 1.2$  and  $24.02\% \pm 0.28$  respectively. Stability studies indicated that formulation was stable over a period of 3 months when stored at  $2-8^\circ\text{C}$ .

**Conclusions:** The fabricated gel formulation showed a promising drug delivery vehicle for topical delivery of *Costus speciosus* rhizome extract and could be successfully used for the treatment of dermal microbial infections.

**Keywords:** *Costus speciosus*, Methanolic Rhizome Extract (MeRE), Antibacterial, In vitro drug diffusion.

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## INTRODUCTION

The fruitful management of pharmacokinetics as well as the tissue distribution of any drug is the main goal during the development of new drug delivery system. To achieve the above target, variety of delivery systems such as microspheres, nanoparticles, lipoproteins, micellular systems and liposomes are used in the past for several years. Among these, most useful delivery system has been liposomal drug delivery system. Liposome has the ability of to carry a wide variety of substances. Based on their structural properties and harmless nature of their components, liposomes have been very popular to treat variety of therapeutic conditions [1]. Liposomes are the promising carriers as they are having potential to incorporate with variety of small drug molecules, proteins, nucleotides and plasmids as well. Liposomes can be easily formulated and refined to different sizes, compositions, charges and lamellarity [2].

On topical application of liposomal formulation, the liposomes are easily absorbed and merged with the cellular membranes of the skin. During this process, the drug loaded liposomes release the active materials into the cells. Due to the interaction of liposomal formulation with the corneocytes and of the intercellular lipids, it results in the softening and smoothening of skin [3]. Liposomes are capable of reaching the deeper layers of skin with high dose of drugs as well as it reduces the percutaneous absorption and unwanted side effects [4].



A wide variety of synthetic and herbal drugs are successfully incorporated into liposome for enhanced efficacy [5]. Liposomes are most suitable for plant extract delivery vehicles. Examples like turmeric, carrot extract, papaya extract, aloe-vera, green tea extract are reported for successful delivery through





Research paper

# Statistically optimized calcipotriol fused nanostructured lipid carriers for effectual topical treatment of psoriasis

Madhulika Pradhan<sup>a</sup>, Amit Alexander<sup>b</sup>, Manju Rawat Singh<sup>c</sup>, Deependra Singh<sup>c</sup>, Swarnlata Saraf<sup>c</sup>, Shailendra Saraf<sup>c</sup>, Krishna Yadav<sup>c</sup>, Ajazuddin<sup>a</sup>  

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## Abstract

Present work focuses on the development and optimization (Box-Behnken design) of calcipotriol (CP) loaded nanostructured lipid carrier (NLC) enriched nanogel for topical treatment of psoriasis. In this regard, CP-NLCs were prepared, optimized, and investigated *in vitro* for various physical parameters. Further, the optimized batch of CP-NLCs was loaded into a carbopol 931 gel base to achieve CP enriched nanogel (CPNG) formulation. Mean particle size, zeta potential, and percent entrapment efficiency of an optimized batch of CP-NLCs were found to be  $123.60 \pm 1.21$  nm,  $-36.8 \pm 8.85$  mV, and  $85.31 \pm 1.18\%$  respectively. TEM confirmed the spherical shape of CP-NLCs. DSC curve demonstrated the absolute dispersal of CP in the matrix. Drug release data verified prolonged drug release obeying the Higuchi model ( $r^2=0.987$ ). The developed nanogel formulations presented pH, viscosity, and spreadability in an acceptable range for easy topical application. *Ex vivo* permeation experiment revealed negligible permeation of drugs into the systemic circulation. Besides, the retention experiment furnished that the retention of CP from nanogel formulation was enhanced by 1.57 in the SC and increased by 3.67 folds in viable layers, as compared to pure CP containing gel formulation. Furthermore, no irritation was reported for developed nanogel formulation. *In vivo* study on mice tail animal model revealed significantly higher anti-psoriatic efficacy of nanogel formulation in terms of enhancement in % orthokeratosis of skin and % drug activity. Conclusively, the newly developed formulation is an expectant modality for the cure of psoriasis.

## Graphical abstract

Research paper

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## Graphical abstract




# Multifaceted targeting of cationic liposomes via co-delivery of anti-IL-17 siRNA and corticosteroid for topical treatment of psoriasis

Krishna Yadav <sup>a</sup>, **Deependra Singh** <sup>a</sup>, Manju Rawat Singh <sup>a</sup>, Madhulika Pradhan <sup>b</sup>  

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## Abstract

Psoriasis is a chronic autoimmune disorder that affects the skin to alter its structure and physiology and express the phenotypic function of abnormal epidermal cell growth through a cascade of molecular, and cellular intervention. The histological changes in skin include inflammation, scaling, hyperproliferation of epidermis resulting in thickening of the skin, under the influence of altered immunopathogenesis. The zone of activity for the therapeutic targeting of psoriasis is viable epidermis involving various cellular events regulating the whole progression of the disease manifestation. Therefore, therapeutic targeting of psoriasis through the systemic route would be imprecise and associated with numerous side effects. Small interfering RNA (siRNA) molecules have emerged as a powerful class of therapeutics for treating psoriasis. However, successful targeted delivery of naked siRNA into the skin is hampered due to physicochemical features, proneness to enzymatic degradation, and unavailability of effective delivery carriers. The steroidal medications are the most preferred choice among existing conventional topical formulations; however, they also have their drawbacks like poor aqueous solubility, deprived drug penetration across the skin, reduced half-life, dose-dependent side effects, and reduced patient compliance. In the present study, we hypothesize the development of a liposomal gel formulation for co-delivery of siRNA (siRNA against IL-17A) and a steroidal drug (Clobetasol propionate) to target different pathogenic events of psoriasis leading to the accomplishment of synergistic therapeutic effect. Since a sequence of events simultaneously occurs during the pathogenesis of psoriasis, synergistic blends of siRNA and corticosteroid would ensure a multi-targeted treatment that would act through a diverse range of mechanisms, ultimately leading to the enhancement of therapeutic effect. Therefore, exploiting the full therapeutic potential of these therapeutics. Thus, the present work suggests a novel, innovative, and promising idea for accomplishing effective treatment of psoriasis.

## Introduction

Psoriasis is a hereditarily intervened long-lasting inflammatory skin disorder with an annual occurrence rate of 50 to 140 new cases per 100,000 people. It is characterized by extremely inflamed red erythematous plaques supported by the presence of silver scales. The chronic mutilating nature of psoriasis leads to substantial social and psychological distress resulting in impaired health-related quality of life, with an influence on the physical and mental functioning of the sufferer [1]. There are numerous therapeutic options available for psoriasis, such as corticosteroids, vitamin D derivatives, phototherapy, and immune-modulators.



## Medical Hypotheses

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# Multifaceted targeting of cationic liposomes via co-delivery of anti-IL-17 siRNA and corticosteroid for topical treatment of psoriasis

Krishna Yadav <sup>a</sup>, Deependra Singh <sup>a</sup>, **Manju Rawat Singh** <sup>a</sup>, Madhulika Pradhan <sup>b</sup>  [Show more](#)  Share  Cite<https://doi.org/10.1016/j.mehy.2020.110322> [Get rights and content](#) 

## Abstract

Psoriasis is a chronic autoimmune disorder that affects the skin to alter its structure and physiology and express the phenotypic function of abnormal epidermal cell growth through a cascade of molecular, and cellular intervention. The histological changes in skin include inflammation, scaling, hyperproliferation of epidermis resulting in thickening of the skin, under the influence of altered immunopathogenesis. The zone of activity for the therapeutic targeting of psoriasis is viable epidermis involving various cellular events regulating the whole progression of the disease manifestation. Therefore, therapeutic targeting of psoriasis through the systemic route would be imprecise and associated with numerous side effects. Small interfering RNA (siRNA) molecules have emerged as a powerful class of therapeutics for treating psoriasis. However, successful targeted delivery of naked siRNA into the skin is hampered due to physicochemical features, proneness to enzymatic degradation, and unavailability of effective delivery carriers. The steroidal medications are the most preferred choice among existing conventional topical formulations; however, they also have their

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# Novel Suberoylanilide Hydroxamic Acid Analogs Inhibit Angiogenesis and Induce Apoptosis in Breast Cancer Cells

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Affiliations

PMID: 34488592 DOI: [10.2174/1871520621666210901102425](#)

## Abstract

**Background:** Histone deacetylases (HDACs) are the enzymes that catalyze the removal of the acetyl group from lysine residues and regulate several biological processes. Suberoylanilide hydroxamic acid (SAHA) is a notable HDAC inhibitor that exhibited remarkable anti-proliferative efficiency by alleviating gene regulation against solid and hematologic cancers.

**Aim:** The aim of this study was to develop new chemotherapeutic agents for breast cancer treatment, therefore, a novel series of Suberoylanilide hydroxamic acid (SAHA) analogs were investigated as anticancer agents.

**Methods:** We designed and synthesized a novel series of analogs derived from SAHA by substituting alkyl, alkoxy, halo, and benzyl groups at different positions of the phenyl ring. The newly synthesized analogs were assessed for their cytotoxic potential against four human cancer cell lines in comparison with healthy cell lines, using several biological assays.

**Results:** SAHA analogs displayed significant cytotoxic potential with IC<sub>50</sub> values ranging from 1.6 to 19.2  $\mu$ M in various tumor cell lines. Among these analogs, 2d (containing 3-chloro, 4-floro substitutions on phenyl moiety), 2h (containing 3,4-di chloro substitutions on phenyl moiety), and 2j (containing 4-chloro, 3-methyl substitutions on phenyl moiety) showed significant cytotoxic potential with IC<sub>50</sub> values ranging from 1.6 to 1.8  $\mu$ M in MCF-7 (breast carcinoma) cell line. More importantly, these analogs were found to be non-toxic towards healthy primary human hepatocytes (PHH) and mouse fibroblast cells (NIH3T3), which represent their tumor selectivity. These analogs were further analyzed for their effect on cell migration, BrdU incorporation, Annexin V-FITC and cell cycle arrest (Sub-G1 phase). Remarkably, analogs 2d, 2h, and 2j displayed significant HDAC inhibition than the parent SAHA molecule. Further studies also confirmed that these SAHA analogs are efficient in inducing apoptosis, as they regulated the expression of several proteins involved in mitochondrial or intrinsic apoptosis pathways. Findings in the Chick Chorioallantoic Membrane (CAM) assay studies revealed anti-angiogenic properties of the currently described SAHA analogs.

**Conclusion:** From anti-proliferative study results, it is clearly evident that 3,4-substitution at the SAHA phenyl ring improves the anti-proliferative activity of SAHA. Based on these findings, we presume that the synthesized novel SAHA analogs could be potential therapeutic agents in treating breast cancer.

**Keywords:** Angiogenesis; HDAC inhibitors; SAHA analogs; anti-cancer activity; apoptosis; cell cycle arrest.



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## Review article

## Quantum dots: Prospectives, toxicity, advances and applications

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Vikas Kumar Jain<sup>d</sup>, Amber Vyas<sup>a,\*</sup><sup>a</sup> University Institute of Pharmacy, Pt. Ravishankar Shukla University, Raipur, CG, India<sup>b</sup> Columbia Institute of Pharmacy, Tekari, Raipur, CG, India<sup>c</sup> Center for Basic science, Pt. Ravishankar Shukla University, Raipur, CG, India<sup>d</sup> Department of Chemistry, Government Engineering College, Raipur, C.G, India

## ARTICLE INFO

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Quantum dots  
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## ABSTRACT

Quantum Dots are fluorescence type semiconductor nano sized particles. They are made up of either heavy metal or inorganic material with size range from 2 to 10 nm. The word quantum dots itself indicates its quantum confinement and optical properties. They contain same number of electrons and atoms, hence are called as artificial atom. Quantum dots consist of two free functional groups for binding with drug molecule. Surface modification of quantum dots through covalent and/or non-covalent binding affects and alters the properties of drug molecule. Their cellular delivery is mediated by passive transport, facilitated delivery and active transport. The outer shell of quantum dots is made of semiconductor material which provides the surface for bio-conjugation leading to improvement in aqueous solubility. This provides effective surface area for binding of drug with the targeting molecule. The unique feature being that the material of shell reduces the toxicity of core of quantum dots. Various functionalization and surface modification makes them suitable for application in pharmaceutical field such as biomedical imaging, drug delivery, drug release study and diagnosis. Toxicity of quantum dots depends upon the size, material used, dose, route of administration and capping material. The regulatory status of quantum dots is not yet clear; still they are regarded as safe to use. The first clinical trial of quantum-dot technology in humans was approved by USFDA in 2011. With the advances in technology; most of the chemotherapeutics and cytotoxic drugs are delivered as quantum dots for improved/enhanced pharmacological action.

## 1. Introduction

One of the invention in nanotechnology; comprises nano-sized particles called as Quantum dots (QDs), which have gained lot of popularity among researchers' over past two decades because of their interesting physical and chemical properties. Quantum dots are fluorescent type of semiconductor nanoparticles, which are composed of core material enclosed within a shell of another semiconductor material with a diameter of 2–10 nm. The size of QDs reflects the properties like optical property, absorbance and photoluminescence in dependent manner [1]. The name quantum dots itself indicates its quantum confinement and optical properties. This specific property makes them suitable candidate for biological function and imaging. They have great potential towards imaging, sensing, tracking and real time monitoring. QDs are also known as artificial atom because of the presence of same number of electrons and atoms, demonstrating their movement in three dimensions

with narrow electronic energy level [2,3]. The selection of quantum dots depends on their application in various fields. The semiconductor outer shell of QDs are made of heavy or inorganic material like cadmium (Cd), selenium (Se), Zinc oxide (ZnO), silica etc. which are coated with shell material and provides a specific site for the conjugation and reduces their toxicity.

In drug delivery system; biocompatible quantum dots like carbon quantum dots, graphene quantum dots and zinc oxide quantum dots are used which contribute towards the aqueous solubility. For example - carbon quantum dots are preferred for the delivery of mitomycin (anti-cancer agent) [3,4]. For imaging and sensing purpose semiconductor quantum dots are mostly used such as ZnCuInS/ZnS quantum dots and CdTe quantum dots. QDs coated with organic acid are used for *in-vivo* cellular imaging of tumor and *in-vitro* cell staining [5]. Quantum dots possess a rigid structure which provides a large surface area for the drug conjugation, where the drug is not encapsulated in quantum dots but is

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# Regulatory Framework Of Herbal Medicine In Mexico

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## Abstract

*Recently there has been a shift in universal trend from synthetic to herbal medicine, which we can say "Return to Nature". Medicinal plants have been known for millennia and are highly esteemed all over the world as a rich source of therapeutic agents. Botanical medicine represents an important share of the pharmaceutical market. Natural products compounds discovered from medicinal plants (and their analogues thereof) have provided numerous clinically useful drugs in the treatment of chronic and or acute disease and still remain as an essential component in the search for new medicines. So, these traditionally used plants can be explored effectively in order to find New Chemical Entity for the treatment of chronic and acute disease. The herbal industry shares about US \$100 billion with good growth potential. Hence this field is having greater future perspectives. Review was performed systematically by review of literature published in journals and websites of different regulatory agencies, then after study of all the literatures which will summaries details related to registration of herbal product in Mexico. It covers legal aspects, procedural details, GMP and labeling requirements. It is very common trend globally to register herbal medicines and Mexico is one the country in that list. So the present work might provide a path for pharmaceutical companies who wise to sell their product in Mexico. This paper gives details about registration of herbal medicines in Mexico.*

**Keywords:-** Herbal medicines, GMP, Scientific names, Regulatory Agency, Mexico

## 1.0 Introduction

Conventional medicines are those which contain traditional knowledge that developed over generations in various cultures. The oldest record of herbal medicine is found in Indian, Chinese, Greek, Roman, Syrian and Egyptian literature science about 5000 years.<sup>1</sup> As per WHO about 80% of world population is using products based on medicinal herbs and Plants and market share of conventional medicine is increasing exponentially.<sup>2</sup> As per the World Bank report there is about 15% growth in the trade of medicinal plants and raw materials. As number of patients seeking alternate and herbal therapy is growing globally However, recent findings indicate that all herbal medicines may not be safe as severe consequences are reported for some herbal drugs.<sup>3</sup> Most herbal products in the market today have not been subjected to drug approval process to demonstrate their safety and effectiveness. So regulatory agencies are also working continuously to set perfect regulatory framework for manufacturing and marketing of herbal products. But transformation of traditional knowledge in to modern regulatory frameworks is a big challenge. The Mexico guidelines on for cultivation and collection of medicinal plants advise local



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## Phytochemical screening and determination of phenolics and flavonoids in *Dillenia pentagyna* using UV-vis and FTIR spectroscopy

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### ABSTRACT

Here, we report an ultrasonic-assisted extraction (UAE) of phytochemicals from bark, leaves, sepals, fruits, and seeds of *Dillenia pentagyna* (Roxb) using different organic solvents such as chloroform, ethanol, and n-hexane. The preliminary phytochemical screening results showed that the ethanolic extract is enriched with phenolics, flavonoids, tannin, saponin, alkaloid, and terpenoids. The profiling of phytochemicals is carried out employing UV-Vis and Fourier-transform infrared (FTIR) spectroscopy analyses. The higher amount of phenolic compounds obtained in the ethanolic extract of bark and leaves as compared to other parts of the plant. Consequently, a higher amount of total flavonoid compounds unveiled in the bark of targeted species. The ethanolic extract of bark and leaves showed good free radical scavenging activity using DPPH with inhibition percentage of  $90.58 \pm 1.89\%$  and  $76.46 \pm 1.58\%$ , respectively, in comparison to standard ascorbic acid at  $10 \mu\text{g/mL}$ . Moreover, the half-maximal inhibitory concentration ( $\text{IC}_{50}$ ) value of bark and leaves are  $5.64$  and  $6.54 \mu\text{g/mL}$ , respectively, in comparison to standard ascorbic acid. With the best of our knowledge, it is the first report pertaining to characterization and quantification of phenols and flavonoids as well as the investigation of the medicinal property in *D. pentagyna*.

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### 1. Introduction

There are about 300,000 plant species whose phytochemicals with diverse structures and properties are elucidated [1]. These phytochemicals are divided into two major categories, firstly primary metabolites such as carbohydrates, lipids, proteins; and secondly, secondary metabolites like alkaloids, terpenoids, and phenolic compounds. The primary metabolites are responsible for the growth and development of plants; whereas secondary metabolites play an important role in defense mechanisms against the environmental pollutants, insects, and other foreign threats to the plant [2]. Among, these phenolic compounds and flavonoids are considered to be a very important class of biomolecules having a significant medicinal property for the human being. The basic structure of phenolic compounds (gallic acid, caffeic acid, ferulic acid, protocatechuic acid, and coumaric acid) consists of a phenolic ( $\text{C}_6\text{H}_5\text{OH}$ ) ring, the carboxylic acid ( $-\text{COOH}$ ) and hydroxyl groups ( $-\text{OH}$ ). Moreover, flavonoids are polyphenols that contain at least two phenolic rings and further categorized into different sub-class such as

flavonols, flavonones, flavones, flavanolols, flavan-3-ols, and isoflavones [3–5]. The antioxidant activity of phenolic compounds and flavonoids is directly proportional to the presence of the hydroxyl ( $-\text{OH}$ ) group in the sample. Further, the positions of hydroxyl groups also affect the ability of free radical scavenging activity [6,7]. The phenolic compounds have already been shown many pharmacological activities such as antimicrobial, antioxidants, anticancer, and antidiabetic [8–10].

Nowadays, the entry of toxic substances through food and drinking water generates free radicals which induce several diseases in the human body. It is due to the free radicals of reactive oxygen species attack on fatty acids, DNA, proteins, lipids, and initiate a rapid destructive chain reaction to damage the cell membranes [11]. The phenolic compounds and flavonoids play a significant role in preventing the damage caused by free radicals [12,13]. Thus, the characterization and determination of phytochemicals such as phenolic compounds and flavonoids in plant samples are essential to know the mechanism of these compounds against various biological activities. Here, different plant parts of *Dillenia pentagyna* (Roxb.) is chosen for the extraction and determination of bioactive components, and free radical scavenging activity of phenolic compounds and flavonoids is investigated.

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## REVIEW ARTICLE



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## Promising herbs for the management of inflammation associated with various pathological conditions - A Review

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## ABSTRACT



Ailments with ignescent etiopathology have expanded in rate lately. Medications utilized for restorative administration of such provocative ailments are alleviating the disease and yet additionally countering genuine perilous outcome. Allopathic medications really pejorate the disease condition in patients, particularly with rheumatoid joint pain and osteoarthritis. Add to this the huge number of individuals detriment by these medications, as well as their huge expenses and the need of using reciprocal means become obvious. On the other hand, natural medicines offer one engaging approach to decrease the use of allopathic non- narcotic anti- phlogistic agents. The reason for administering herbs incorporate long accounts of utilization, a broad examination on various natural constituents, the relative simplicity of administration profile, economical and magnificent security records. So far, Many Phyto-constituents are investigated for numerous therapeutic applications, albeit a large fraction of these reports are of scholarly interest, only some of them get a pass for clinical preliminaries. Future exploration should look into the molecular mechanisms of various therapeutic applications of the natural plants in different ailments associated with inflammation. This review is a compilation of anti-inflammatory natural agents along with reported action path. We have summarized all necessary information regarding the title with the aid of best possible sources.

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**INTRODUCTION**

Inflammation is considered as an in-vivo intrinsic reaction, which becomes evident to shield the body

from toxic and unwanted boosts, bringing about the edema of tissues, torment, or even damage at a cellular level. The primary purpose behind this system is to fix and return the harmed tissue to the normal condition. The expansion in the size of the vessels is seen around the inflamed loci (i.e., neutrophils, macrophages, and lymphocytes) during the starting phases of inflammation. However, in consecutive time, numerous sorts of cells arrive at neutrophils, trailed by macrophages within 48 hours and lymphocytes following a few days. It is notable that the bio-chemical disturbances of cells happen during inflammation, prompting the arrival of arachidonic acid, and further goes through two metabolic precursor pathways known as the lipoxygenase and cyclooxygenase pathways.

[Review](#) > [Curr Pharm Des.](#) 2020;26(27):3218-3233. doi: 10.2174/1381612826666200622133407.

# Recent Advances in Lipid-based Nanodrug Delivery Systems in Cancer Therapy

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## Abstract

Cancer is the second leading cause of death globally, with every sixth death being attributable to cancer. Nevertheless, the efficacy of conventional chemotherapeutic drugs is often limited due to their poor solubility, unfavorable pharmacokinetic profile, and lack of tumor selectivity. The use of nanotechnology provides an opportunity to enhance the efficacy of a chemotherapeutic drug by improving its bioavailability and pharmacokinetic profile while facilitating preferential accumulation at the tumor tissue. To date, a variety of platforms have been investigated as nanocarriers in oncology, which include lipid-based, polymer-based, inorganic materials, and even viruses. Among different nanocarriers, lipid-based delivery systems have been extensively used in oncology because of their biocompatibility, biodegradability, ability to encapsulate diverse drug molecules, high temporal and thermal stability, and offer prolonged and controlled drug release. This review discusses the current status of the lipid-based nanocarriers and their applications in cancer treatment as well as an overview of the different liposomal formulations commercially available for cancer therapy.

**Keywords:** Cancer; chemotherapeutics; drug delivery; liposomes; nanostructured lipid carriers; solid lipid nanoparticles; targeted drug delivery.

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# Investigation of Effect of Phytoconstituents Aloe Emodin and Quercetin on Bioavailability of Albendazole

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## ABSTRACT

**Background/Aim:** Albendazole is a drug with benzimidazole nucleus and is poorly absorbed from the gastrointestinal tract due to its low aqueous solubility. The objective of present work was to study the effect of two phytoconstituents aloe emodin and quercetin on the bioavailability of albendazole. **Materials and Methods:** Estimation was done through UV spectroscopy and HPLC analysis using different concentration of both the phytoconstituents. *In-vivo* study was conducted to investigate the pharmacokinetics and pharmacodynamic parameters. **Results:** Results revealed no change in  $T_{max}$  of albendazole and significant changes were observed in  $C_{max}$  values. The  $C_{max}$  was maximum i.e. 0.138  $\mu\text{g/ml}$  when 20mg/kg of quercetin was added as compared to aloe-emodin. The increase in bioavailability of Albendazole was due to the presence of flavonoids in quercetin. The retention time of albendazole as estimated through HPLC chromatogram was found to be 3.2 minutes with acetonitrile and phosphate buffer as the mobile phase. However; albendazole was not detectable in 24 hr plasma sample and values of AUC were found to be zero in all the concentration of aloe emodin and quercetin. **Conclusion:** Thus, the phytoconstituents rich in flavonoids could be used to increase the bioavailability of poor soluble drugs.

**Key words:** Albendazole, Aloe emodin, Quercetin, Bioavailability, Pharmacokinetics.

## INTRODUCTION

Albendazole (ABZ) is a benzimidazole category drug which is poorly absorbed from the gastrointestinal tract due to its poor aqueous solubility. ABZ is relatively insoluble in water and other organic solvents; this hinders its absorption behavior in the body. In the mouse and rat, oral absorption of ABZ is about 20-/30% and in cattle, it is about 50%, compared to about 1-5% in humans.<sup>1</sup> Use of herbal products as medicine has increased tremendously now a day's all over the world due to their therapeutic effect and fewer adverse effects as compared to modern medicines. Nature is a good source of medicine about 60% of anticancer drugs and 75% of anti-infective drugs approved from 1981-2002 could be traced to natural origin.

Natural products, as used by the general population, are usually complex mixtures of many compounds.<sup>2</sup> Both the putative active ingredient(s) and other constituents present in that mixture have the potential to cause interactions with various classes of drugs. Such interactions include induction or inhibition of metabolizing enzymes and drug efflux proteins. It is now claimed and proved that the naturally occurring dietary supplements can modulate hepatic and enterocytic CYP activity. Several flavonoids, which constitute one of the primary classes of active constituents in most herbs, appear to be capable of modulating P-gp<sup>3</sup> Co-administration of herbal bioactive constituents with the therapeutic drugs may lead to increased absorption due to

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## REVIEW ARTICLE

# Bora Rice: Natural polysaccharide polymer for drug delivery

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## ABSTRACT:

People believed that safe synthetics are okay, but natural is best. Natural polymers play an important role as excipients in any dosage form. The natural polymers are polysaccharides so, they have become broader considerations in pharmaceuticals because of its accessibility and biocompatibility. The utilization of natural polymers in the drug delivery keeps on being a territory of escalating research regardless introduction of new engineered polymers. Starch is a naturally occurring polysaccharide polymer and has vital intrinsic properties that have made its pharmaceutical applications possible. Rice is one of the major sources of starch worldwide. Assam Bora rice (*Oryza sativa L*, Japonica variety), a gathering of glutinous rice of Assam, has been accounted to contain up to 90% starch. The Bora rice is a festival food in Assam, is described by its dull smooth appearance and consists of basically amylopectin and traces of amylase; it is otherwise called waxy or clingy rice. This review emphasizes the pharmaceutical utility of Bora rice and its starch as a characteristic polymer for drug delivery. It is preferred as a mucoadhesive matrix in a controlled release drug delivery system since it is exceptionally clingy and has splendid gelling property. Additionally, the rice is a typical staple and is biocompatible and promptly accessible subsequently, marked as 'GRAS' (Generally Regarded as Safe), which is fundamental rules for any substance to be utilized in food and pharmaceuticals. This article reviews the literature on Assam bora rice and depicts their varied applications and future use in the drug delivery system.

**KEYWORDS:** Assam Bora rice, starch, natural polymer, mucoadhesive agent, drug delivery system.

## INTRODUCTION:

Any pharmaceutical formulation contains two ingredients- active pharmaceutical ingredient and excipients. Excipients help in the manufacturing of dosage form and it also improves physicochemical parameters of the dosage form. Polymers play an important role as excipients in any dosage form [1]. The advances in drug delivery have simultaneous urged the discovery of novel excipients which are safe and fulfill specific functions and directly or indirectly influence the rate and extent of release or absorption [2]. A large number of plant-based pharmaceutical excipients are available today. Many researchers have explored the usefulness of plant-based materials as pharmaceutical excipients. Synthetic polymers are toxic, expensive, have environment related issues, need long development time for synthesis and are freely available in comparison to

naturally available polymers. However the use of natural polymers for pharmaceutical applications is attractive because they are economical, readily available, non-toxic and capable of chemical modifications, potentially biodegradable and with few exceptions and also biocompatible. The fact for increase in importance of natural plant based material is that plant resources are renewable and if cultivated or harvested in a sustainable manner, they can provide a 6 constant supply of raw materials [3]. However, substances from plant origin also pose several potential challenges such as being synthesized in small quantities and in mixtures that are structurally complex, which may differ according to the location of the plants as well as other variables such as the season. This may result in a slow and expensive isolation and purification process. Another issue that has become increasingly important is that of intellectual property rights. The plant based polymers have been studied for their application in different pharmaceutical dosage forms like matrix controlled system, film coating agents, buccal films, microspheres, nanoparticles, viscous liquid formulations like ophthalmic solutions,

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## Potential of Neoteric Phytoactives and Herbs for Targeting Pathophysiological Modules of Arthritis

Rakesh Tirkey<sup>1</sup>, AdeepKujur<sup>1</sup>, Krishna Yadav<sup>1</sup>, Vaibhav Tripathi<sup>2</sup>, Dhansay Dewangan<sup>3</sup>, Swarnlata Saraf<sup>1\*</sup>

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### ABSTRACT

*Rheumatoid arthritis (RA) is debilitating, progressive autoimmune diseases of unknown cause. It affects joints by destructing bone and cartilage, leading to pain, inflammation, and restricted movement of joints. Many conventional antiarthritic agents are available, most of them are immunosuppressive and commonly associated with severe side effects. In recent years, numerous plant actives and herbs have been investigated for their anti-arthritis efficacy in order to overcome the therapeutic shortcomings of these conventional therapies. The finding of these researches revealed that herbs and their bioactives can modulate the major inflammatory cytokine expression in synovial cells and the regulation of the inflammatory immune process by targeting various cellular targets including PGE2 and COX-2. The present review is an endeavour to gather the therapeutic insight of some potential plant based actives and herbs for aiming pathophysiological targets in arthritis and their effective management. It also reports the medicinal value of herbs as novel clinical pharmaceutical agents for the management of arthritic conditions with the least side effects.*

**Keywords:** Arthritis, herb, plant actives, autoimmune disease, cytokines.

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### INTRODUCTION

Arthritis is an inflammatory disease that is distinguished and begins largely in proportion to its age. Its prominent symptoms include joint pain, rigidity, decreased joint movement and redness, and joint swelling. Rheumatoid arthritis (RA) is a catastrophic type of inflammatory joint diseases that threaten people globally amongst many forms of arthritis [1,2,3]. Rheumatoid arthritis is a debilitating autoimmune condition due to the hyperproliferation of synovial fibroblast and massive invasion of inflammatory cells in the joints comprising CD4+T cells and innate immune cells such as macrophages. Numerous different pro-inflammatory cytokines such as IL-1 $\beta$ , TNF- $\alpha$ , IL-6, IL-10, and IL-18 facilitate self-immunity, systemic inflammation, and degradation of the tissue [4,1].

A variety of prescribed medications have been used to regulate joint inflammation and pain in RA. These affordable drugs relieve joint inflammation, mitigate pain, minimize joint deterioration, and reduce disability. Non-Steroidal anti-inflammatory drugs (NSAIDs) and corticosteroids are most commonly utilized as the first line of therapy with fast responses to regulate inflammation and pain in RA [4]. Disease-modifying antirheumatic drugs (DMARDs) include methotrexate, sulfasalazine, antimalarial medications, and other medicinal products that can modulate the functioning of the immune system by inhibiting radiographic growth and fatality. These medications used for the management of RA can quell inflammatory targets and produce numerous therapeutic effects by suppressing the activation and creation of different enzymes (for example cyclooxygenase [COX]-1 and COX-2), cytokines (for example TNF- $\alpha$  and IL-1 $\beta$ ), or transcription factors (for example, nuclear factor- $\kappa$ B [NF- $\kappa$ B], c-Jun N-terminal kinases and p38 kinases). Though these therapies have ameliorating activity on the joint injury, physical mobility, and quality of life, their myriad side effects is still a curse to human health [5]. The side effects of these drugs include Cushing habitus, elevated blood pressure, hyperglycemia, stomach ulceration, and bleeding [4,5].



## Potential of Neoteric Phytoactives and Herbs for Targeting Pathophysiological Modules of Arthritis

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## DEVELOPMENT AND OPTIMIZATION OF MANNOSYLATED NARINGENIN LOADED TRANSFERSOMES USING RESPONSE SURFACE METHODOLOGY FOR SKIN CARCINOMA

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### ABSTRACT

**Objective:** The flavonoidal drug Naringenin offers a natural defense against free radical generation due to their antioxidant i.e. free radical scavenging property. The continuation of research work towards the invention of targeting the flavonoidal drug for skin carcinoma. Naringenin is a potent antioxidant, having remarkable reactive oxygen species scavenging potential and abundantly found in citrus fruits.

**Methods:** The optimization of the formulated mannosylated naringenin-loaded transfersomes (MA-NgTfs) was performed using Box–Behnken statistical design to obtain crucial variable parameters that influence vesicular size, size distribution and surface charge. Therefore keeping both the concepts in mind our objective is to design and optimize the mannosylated naringenin loaded transfersomes (MA-NgTfs) for macrophage targeting. The Box Behnken with 3D surface response design graph was employed to optimize the formulation.

**Results:** Phospholipids and surfactant ratio played a remarkable role to determine the mean vesicular size and the Zeta potential of the vesicles. The Zeta potential is found in the formulation having a range of  $-18.01 \pm 1.05$  to  $-28.7 \pm 1.008$  mV represents the good stability of the formulation. The vesicles size range was found in the range of  $102.4 \pm 1.01$  to  $263.74 \pm 0.63$  and range of Entrapment efficiency of nanovesicles was as  $72.04 \pm 1.53$  to  $82.04 \pm 0.81$ . *In vitro* drug release study shows that mannosylated naringenin loaded transfersomes (MA-NgTfs), and marketed formulation dispersion was found 69.31 %, 62.03 %, 58.71 %, and 65.02 % respectively. *Ex vivo* skin permeation and deposition study shows that the marketed product and pure drug suspension optimized transfersomes through the skin of mice was of flux  $6.5 \pm 3.07$  and the percentage of drug retention was  $0.76 \pm 1.26$ . The results gave us strong evidence of cellular uptake by mannose-directed transfersomes via mannose receptor-based endocytosis.

**Conclusion:** On the basis of findings, the study revealed that the prepared formulation has characteristic potential for targeting and the concept of ligand directed nanocarrier formulation was imparts synergistic effect against UV-induced skin carcinoma.

**Keywords:** Naringenin, BBM, Mannosylated Transfersomes, Macrophage targeting, Skin cancer

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### INTRODUCTION

Human skin is the largest organ and is highly exposed to environmental solar radiation and due to chronic long term exposure skin produces abnormal cell growth, which is responsible for the progression of skin cancer [1]. The solar radiation is composed of various electromagnetic radiation having UV-radiation and infrared radiation mainly. From all the three regions the UV-radiation having the range of (280-320) nm i.e. UVB is having remarkable potency to alter the biological function of the cell and causes maximum DNA damage due to free radical generation into the cells and promotes the abnormal cell growth [2]. Nowadays, various drug delivery systems are in the pharmaceutical market, to deliver the medicament at the specific site, but due to frequent wear and tear of the keratinized layer of skin, the presence of enzymes and the lipophilicity of skin membrane, and various contributing factors, site-specific drug delivery to the skin is not as easy task as it appears to be [3]. The pre-existing conventional therapy has also been failed to bring relief because they do not identify the cancerous and the normal proliferating cells. Thus the major objective of the skin cancer therapy is to develop such type of targeted drug delivery system that can able to deliver the medicaments specifically at the site of action. The macrophages are expressed into the skin keratinocyte and fibroblast due to chronic exposure of UV-radiation of the range (280-320 nm) are enhances the macrophage production, which may inhibit the p53-dependent apoptotic pathway, thereby inducing photocarcinogenesis into the skin. Hence the macrophage targeting-based therapeutics could be useful for targeting cancerous cell [4]. Mannose receptors are one of the receptors which are overexpressed on the surface of the macrophage (MMR), while the other MR+cells (i.e. dendritic and endothelial cells) and other different lectins with having mannose-binding activity have been subsequently identified. The glycotargeting exploits highly significant interactions of endogenous lectins with the moiety of carbohydrates (often with more than one

carbohydrate) [5]. Functionalization of nanovesicles through the conjugation of ligands that are specifically recognized by surface receptors on target cells may favor the stimulation of the immune system. Targeting of mannose receptors can be achieved by the technique of mannosylation, which is an effective strategy to design and develop nano-systems that could be able to target mannose receptors, which are highly expressed in cells of the immune system and can play crucial role in preventing UV radiation caused skin carcinoma in which the immunity is hampered directly [6]. The flavonoids drug naringenin offers a natural defense against free radical generation due to their antioxidant i.e. free radical scavenging property. The continuation of research work towards the invention of targeting drug delivery systems for skin cancer. Hence we proposed the macrophage targeting for skin cancer which may be useful for future perspective and effectively used as a site-specific drug delivery of Naringenin to the cancerous cells and also decrease the adverse effect related to the drug and treat skin carcinoma synergistically [7]. Mannose receptor is the most suited receptor to formulate the drug delivery system for herbal bioactive and other small and macromolecules. The Mannose ligands and their associated delivery system are cost-effective and easily affordable to use and for future perspective. On the basis of previous findings, a formulation based on targeted therapy of natural bioactive for skin cancer is yet present in the market; therefore, our objective of the study was to conceptualize and formulate the optimized mannosylated naringenin loaded transfersomes based formulation for targeting macrophages of cancerous cells via Mannose ligand.

### MATERIALS AND METHODS

#### Materials

Naringenin (Ng) was purchased from Sigma Aldrich, USA; D-Mannosamine HCl was purchased from Himedia Laboratories and Soya Phospholipids, Rhodamine, was purchased from Himedia Mumbai India. Phosphatidyl-Choline from soy lecithin containing

## Editorial

### New Generation of Biocompatible Nanocarriers with Targeting Potential

This special issue of *Current Pharmaceutical Design* is dedicated to Professor Suresh P. Vyas, as a tribute to his exceptionally illustrious and remarkable research career in the area of drug delivery applications of nano-colloidal systems. It is to celebrate and honour this extraordinary and iconic scientist who dedicated his teaching career to his passion and gave his energy, imagination, and intellect to the scientific community in general, and pharmaceutical scientists in particular. This dedicated issue comprises a total of fourteen articles, including Editorial, Biosketch, Minireview and eleven Reviews contributed by the former students and scientists associated with Prof. Vyas.

Nanocarriers present a novel platform for the effective delivery of drug molecules to the various diseased tissues. Advanced nanocarriers based on organic materials (*e.g.* polymeric micelles, liposomes, niosomes, dendrimers, hydrogels, *etc.*) and inorganic materials (*e.g.* quantum dots, metallic and mesoporous silica nanoparticles, *etc.*) have found various drug delivery applications. These carriers are reported to reduce sensitive toxicity and/or adverse reactions associated with actives. Nano drug delivery systems are reported to improve pharmacokinetics & biodistribution, solubility and stability as well as decrease toxicities due to controlled release and site-specific delivery of therapeutic agents.

The biodegradability of the components makes these delivery systems an attractive core and results in the production of minimal amounts of toxic metabolites. The advantages derived from the use of such systems are manifold. The physiochemical profile of the nano-constructs can be manipulated by changing their composition, size, shape, surface charge, functional groups, and tagging of targeting moieties. The use of biodegradable nanocarriers as molecule transporters is one of the most promising strategies for controlled-release systems. The fundamental requirement for a biomaterial to be used in this sense is its biocompatibility; that is, the ability to be metabolised without any harmful effects. Systems of this type must have properties such as the ability to cross the body's anatomical barriers, controlling the concentration of the drug over time and the release of the active molecule at the site of action. The nanotherapeutic agents may be modified with target specific molecules or ligands for delivering the active therapeutics *via* receptor-mediated transcytosis to the desired sites.

Lipid coated vesicles with a polymer core have been shown to act as stable drug carriers where polylactide (PLA), poly-lactide-co-glycolide (PLGA), poly-alkyl cyanoacrylate (PACA), and many other polymers can be used as core materials. These biodegradable polymers are more suited since they break down into molecules physiologically and so they do not pose any threat to the body. Polymeric nanocarriers have also emerged as a potential and efficient, targeted drug delivery system for clinical applications. Hyaluronic acid (HA) -based soft nano-systems have garnered considerable attention owing to the biodegradability, biocompatibility and nonimmunogenic profile of HA. Additionally, since surface receptors can recognise HA on the tumour cells, they may be an ideal candidate for targeted delivery of anticancer drugs. A number of soft nanocarriers based on HA conjugated or complexed polymer systems like micelles, nanogels, nanoparticles and polyerosomes have been reported. Magnetic liposomes (ML) that combine magnetic nanoparticles with liposomes are reported to offer cumulative benefits for cancer therapy. The MLs may be utilised for various types of cancer treatments for triggering drug/gene release, photothermal/photodynamic therapy, among others.

Glyconanoparticles (GNPs) have been reported for drug targeting potential of actives for diseases localised in macrophages owing to their inbuilt ability to interact with macrophage lectins. The carbohydrates are key components in several biological events like inflammation, cellular migration, immune reactions, cellular communication, infection, enzyme trafficking and cancer metastasis. These features, coupled with their hydrophilicity, biodegradability, biocompatibility and highly specific interaction of targeting cell-surface receptors have expanded the horizon of their utility in drug delivery applications. The GNPs also hold immense promise in antimicrobial drug carrier for the treatment of HIV/AIDS, candidiasis, leishmaniasis, salmonellosis and tuberculosis.

This thematic issue aims to provide an update on the various facets of biocompatible nano-carriers, including their design, fabrication, characterization, fate, toxicity, challenges, applications and translational potentials. It also intends to provide insight into the versatile role of the vesicular carriers in delivering various drugs and bioactives that may provide future directions for innovations in this field.

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## Novel Formulations of Green Synthesized Plant Based Metal Nanoparticles along with their Therapeutic Applications: an Insight to Nano-Green world

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### ABSTRACT

*Nanoparticles are the most important entity in the widely spread field of nanotechnology. A series of numerous physical and chemical methods are involved in nanoparticle synthesis. Metallic nanoparticle can overcome the issues of highly monodispersed nanoparticles of various sizes, geometries and chemical composition, as they are comparatively smaller in size. Hence chemicals and non-polar solvents are involved in the synthesis of metallic nanoparticles which makes them unsuitable for being used in clinical fields. Therefore, the scientists have developed new aspects of clean, non-toxic, biocompatible and eco-friendly synthesis method for nanoparticles. Metal nanoparticles have attained a special focus attributed to their unique features like size and shape dependant optical, electrical and magnetic properties. The green synthesis using biological molecules obtained from plant sources are quite beneficial over other physical and chemical methods that have been used for metal nanoparticle synthesis and stabilization. This exhaustive review is focused on the metallic nanoparticles, which are synthesized from plant sources and overview of their pharmacological properties.*

**Key words:** Size and shape dependant optical, electrical and magnetic properties, Metallic nanoparticles, Green synthesis.

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### INTRODUCTION

FDA approves number of chemically synthesized newer molecules nowadays, which are introduced in the market with wide therapeutic efficacy, but the adverse effects related to these molecules can be harmful for the patients. Due to peak and valley fluctuations, conventional therapy is non-targetable in tissues and organs and high dose frequency is also the main problem associated with allopathic medicines which lead to poor patient compliance [1].

A number of phytoconstituents belonging to nature have different biological activities against chronic diseases and have wide therapeutic potencies. Phytoconstituents are beneficial as they exhibit free from adverse effects treatment where none of the medication can do. Although, some physiochemical factors like less solubility, less permeation and non-targeting at the active site will act as a barrier which create problems to its therapeutic efficacy. Therefore, various novel formulation techniques are discovered to overcome these barriers and achieve uniform drug targeting at the active site in desired concentration and enhanced therapeutic potency. These novel formulation techniques include emulsion-based formulations, phytosomes, liposomes, microspheres, topical based formulations and nanoparticles which are available in commercial level to enhance the bioavailability of the poorly soluble herbal drug [2].

From the past few decades novel drug delivery system (NDDS) is used and gained the attention related to further development in these novel systems. The two ideal requirements for a system to be novel are:-

- Drug delivery at a predetermined rate and for predetermined span of time;
- Conveying the active entity to the target site.

Currently, there is no such system which can fulfill all these requirements. So a lot of research work is required to accomplish them using novel strategies. These targets can be achieved by studying the drug distribution through unifying drug into a carrier system, modification in molecular drug composition or by controlling drug release in the bioenvironment to achieve desired distribution profile. Novel drug delivery systems can be effectively minimize the side effects and maintain uniform and potent levels of drug in the body. These carriers have the ability to restrict the drug action specifically in diseased tissue or organ or adjacent to it [3].



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# COVID-19: clinical presentation and detection methods

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## Abstract

The unending outburst of COVID-19 has reinforced the necessity of SARS-CoV-2 identification approaches for the prevention of infection transmission and the proper care of severe and critical patients. As there is no cure, a prompt and reliable diagnosis of SARS-CoV2 is vital to counter the spread and to provide adequate care and treatment for the infection. Currently, RT-PCR is a gold standard detection method for the qualitative and quantitative detection of viral nucleic acids. Besides, enzyme-linked immunosorbent assay is also a primarily used method for qualitative estimation of viral load. However, almost all the detection methods have their pros and cons in terms of specificity, accuracy, sensitivity, cost, time consumption, the need for sophisticated laboratories, and the requirement of skilled technical experts to carry out the detection tests. Thus, it is suggested to integrate different techniques to enhance the detection efficiency and accurateness for SARS-CoV2. This review focuses on preliminary, pre-confirmatory, and confirmatory methods of detection such as imaging techniques (chest-X-ray and chest- computed tomography), nucleic acid detection methods, serological assay methods, and viral culture and identification methods that are currently being employed to detect the presence of SARS-CoV-2 infection along with recent detection method and applicability for COVID-19.

**Keywords:** COVID-19; ELISA; corona; serological assay; viral culture.

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# Novel archetype in psoriasis management bridging molecular dynamics in exploring novel therapies

Krishna Yadav, Deependra Singh, **Manju Rawat Singh**

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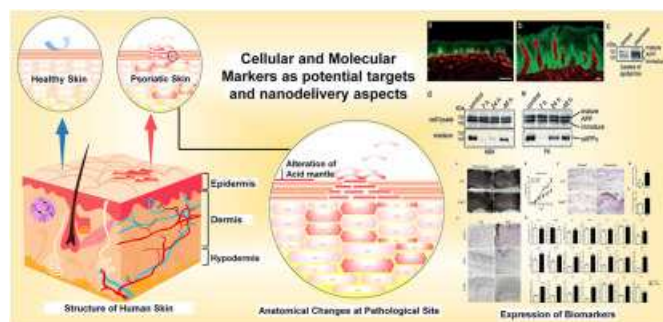
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## Abstract

Psoriasis is an autoimmune chronic inflammatory condition of skin affecting 125 million populaces around the globe. It is implicated as a result of multifaceted phenomena involving various cell and subcell activities with the aid of numerous cellular and molecular components including signaling aisle and regulatory proteins owing to the development of such hyperproliferative dermatological conditions. This involves a deeply complex and conflicting pathology owing to genetic and immunological deviations resulting from the unusual presentation of different signaling pathways and regulatory proteins. Explorations of these biomarkers and intervention of molecular and cellular processes in psoriasis are yet to be investigated and could be an exceptional aspect for understanding pathology with successful targeting of disease. In the presented study, we have integrated molecular insights, including signaling molecules, pathways, and proteins implicated in pathogenesis, and we have attempted to link this knowledge to the targeting of these phenomena in order to manage the conditions precisely. Further, therapeutic delivery approaches for targeting distinct layers of skin have also been investigated based on the application of different nanocarriers for successful psoriasis treatment.

## Graphical abstract



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## RESEARCH ARTICLE

# Development and Characterization of Corticosteroid loaded Lipid carrier system for Psoriasis

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## ABSTRACT:

Psoriasis is a highly complex autoimmune disease of skin with keratinocytes that differentiate abnormally. Because of the inaccessibility of the adequate delivery system, a very favored treatment approaches contemplating topical treatment with current delivery approach are unreliable in targeting disease symptoms. The current work involved the development and characterization of Triamcinolone acetonide loaded solid lipid nanoparticles (TAC-SLNs) and their *invitro* characterization. The findings revealed that SLNs would substantially increase TA drug permeation across the skin, limiting them to dermis epidermis and helping to achieve the full clinical value of medications. It was also able to sustain the release of drug from lipid carrier. The outcomes of this research concluded that SLNs may efficiently deliver corticosteroids for the efficient treatment of psoriasis.

**KEYWORDS:** Psoriasis, Hyperproliferation, keratinocytes, triamcinolone acetonide, solid lipid Nanoparticles.

## 1. INTRODUCTION:

Psoriasis is an immunological skin condition that interferes with T-cells and is predisposed to the creation of an inflamed, thick, hyperproliferative state that is controlled genetically, immunologically and environmentally <sup>1,2</sup>. It greatly influences the quality of health of the individual, with an incidence of 2-5 per cent of the world's population. Medication and psoriasis management are highly complex and unpredictable based on the severity and rigor of the condition <sup>1,3,4</sup>. Becoming a domain of pathological expression, the topical route is the most favored route for psoriasis-targeted drugs to successfully enter the proximity of the active site below the surface. Psoriasis is a multisystem condition that involves a multi-directional therapy approach that used a specific molecule that works by more than one pathway for optimum clinical benefit <sup>5,6</sup>. Of all treatment therapies, topical corticosteroid therapies are ideally used globally for successful psoriasis treatment. Variety of existing methods with the aid of corticosteroids for therapeutic applications are available <sup>7,8</sup>.

Triamcinolone acetonide (TAC) is by far the most extensively used glucocorticosteroid with a different pharmacological potency as an anti-inflammatory, immunosuppressive, vasoconstrictive and anti-proliferative component in dermal abnormalities that indicates the significance of TA in the treatment of psoriasis. Pharmacodynamically corticosteroids are capable of inhibiting A2 phospholipase, which is the primary regulating factor for the evocation of arachidonic acid, prostaglandin biosynthesis and leukotriene, which tends to be among the big pathogenic cause <sup>8-12</sup>.

Technologies have been proposed innovative delivery mechanisms based on lipids for resolving penetration issues, suggesting transdermal delivery for psoriatic skin. It has known that the efficacy of the therapeutic agents can be assured by the delivery approaches. It involves an adequate range of drug carrier schemes. A newer version of this area is the transdermal delivery of drugs by solid lipid nanoparticles (SLNs). SLNs are strengthened with cardinal features, which include effective drug infiltration and relatively high drug capture <sup>13-15</sup>. SLNs are nano-sized lipid carriers possessing a profound hydrophobic lipid structure stabilized by a surfactant <sup>6,16-20</sup>. Thus, SLNs appear to be an intriguing strategy to the successful delivery of antipsoriatic drugs via the

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# Polymers in topical delivery of anti-psoriatic medications and other topical agents in overcoming the barriers of conventional treatment strategies

Krishna Yadav<sup>1</sup> · Akanksha Soni<sup>1</sup> · Deependra Singh<sup>1</sup> · Manju Rawat Singh<sup>1</sup>

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## Abstract

In recent decades, topical treatments to dermal disorders have shown ineffectiveness in delivering the medication at a particular location without a suitable drug carrier. Psoriasis treatment is hindered because of the ineffective delivery and efficacy of conventional pharmaceutical treatment. In conventional medication formulation approach, it is difficult to breach the transdermal layer of a skin membrane for topical drugs, i.e. cyclosporine, methotrexate. This problem is further complicated by extreme disease-associated conditions such as hyperkeratosis and irritation. Intending to assure better drug delivery carriers, this review emphasizes the therapeutic efficacy of polymers and their potential to deliver the drug into the deeper layer of the skin membrane. The polymers are essential in structural and physiochemical perspectives as it works as a carrier for the medication. A vast variety of delivery carriers is available nowadays but their applicability in such dermal cases like psoriasis is still lacking due to less knowledge on an appropriate polymer. The current investigation of suitable polymer would assist in brushing our expertise to optimize the advantages of a wide spectrum of polymers to fulfill the topical targeting of psoriasis.

**Keywords** Psoriasis · Hyperkeratosis · Inflammation · Polymeric carrier · Immune-mediated skin disorder

## Introduction

Psoriasis is an inflammatory, chronic autoimmune disorder of the skin that affects epidemiologically 1–3 percent of the world's population with a negative effect on patient life (Yadav et al. 2018b; Pradhan et al. 2018). Psoriasis is a multiple-factor disease regulated by abnormal keratinocyte proliferation and migration of T cells to the skin by stimulated immune systems. Later, the T cell release cytokines and chemokines, which ultimately regulate disease etiology including aggravating inflammation and premature hyperkeratosis (Elder et al. 2010; Rahman et al. 2015; Yadav et al. 2018a).

The initiation and progression of the disorder are regulated by the immune system in individuals with a genetic susceptibility to psoriasis. The pathomechanism is orchestrated to stimulate various mediators, such as cytokines,

chemokines, and growth factors, to facilitate hyperkeratosis, epidermal thickening, neovascularization, and keratinocyte proliferation (Sala et al. 2018). Physiologically, induction of T lymphocytes and inflammatory infiltrates into the skin is responsible for hyperkeratosis in which antigen-presenting cells conjugate with MHC, leading to large cytokines being recruited, i.e. TNF- $\alpha$ , Interleukin-23 (IL-23), and IL-17 playing key functions in the production of inflammatory psoriatic lesions (Roberts et al. 2017). The studies revealed that IL-17 and IL-23 are crucially involved in psoriasis pathogenesis (Tonel et al. 2010; Kuwabara et al. 2017). A sequential process that occurred during the pathogenesis of psoriasis has been demonstrated in Fig. 1.

The treatment of psoriasis involves topical application through the cream, lotion, gel as well as phototherapy, or/and systemic therapy depending on the rigorosity of disease as mild to severe. Topical therapy was frequently utilized for psoriasis treatment but the major challenge includes deliverance of active constituents into the transdermal layer (Chandrashekar 2012; Pradhan et al. 2018; Abed et al. 2019). Several specific drugs are now commonly used for topical treatment of psoriasis in variable dosage formulations. Despite all challenges of topical treatment including low

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## RESEARCH ARTICLE

# Genetic Fingerprinting of Herbal Medicinal Plant- *Lannea corromandelica* linn. Using PCR-RFLP

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## ABSTRACT:

DNA based authentication techniques have been extensively used as a method for herbal drugs in present days. Consumption of herbal drugs is assumed as a safe, but there are some reported serious reaction demands development of effectual markers system for isolation and identification of the phyto-constituents. Numerous analytical and molecular techniques have also been developed for quality control of drugs from plant origin, but still there is no universal consensus to adopt the same. In this approach, we set to solve this problem by DNA based technique by developing a universal primer PCR-RFLP assay by developing genetic marker. These method use different variable lengths of mitochondrial DNA for amplification using a pair of universal primers. PCR amplifications yielded 531 bp length fragments of *L. coromandelica*. The limit of detection in range of 0.01 to 0.05 ng of genomic DNA. This developed PCR-RFLP assay was sufficient to distinguish with variable fragment patterns.

**KEYWORDS:** PCR, Restriction Enzyme, *L. coromandelica*, RFLP, Genetic fingerprint.

## 1. INTRODUCTION:

Gene or a DNA sequence with a known location on a chromosome and associated with a particular gene or a character” is currently designated as genetic marker. Numerous molecular markers associated with morphological traits and chemical compositions are gaining more importance in the present days. Herbal drugs are integrated part of both traditional and modern systems of medicine and frequently found to be adulterated with other concomitants. Traditional methods of authentication, to check for adulteration of herbal drugs depend heavily on morphological/anatomical characterization, organoleptic markers (odor, color, texture) and/or chemical testing. Analytical techniques used to detect adulteration or authentication of food and agricultural commodities include physical methods, chemical/biochemical methods, immunoassays and more recently DNA based molecular tools [1].

As for the synthetic drugs, there exist a standardized authenticated process for its quality control, but till date no such mechanism exists for raw materials or finished products in the traditional drugs. Hence it is not possible to check the adulteration in the finished drug in traditional medicines. Parallel advances in numerous integrated molecular technology, DNA analysis methods have been in rapid development. Many DNA analysis based assay, especially PCR-based methods, have been developed now a days for species identification in foodstuffs [2].

When restriction fragment length polymorphism (RFLP) assays is compared with other PCR methods, the combination of universal primer PCR and RFLP assays has advantages of increased simplicity, sensitivity, and specificity and has been used in many meat identification practices. On simultaneously advancement, a few modified PCR assays combining universal primer with specific primer or RFLP had been developed [3].

DNA based markers have their applications in fingerprinting genotypes, determining the seed purity and in phylogenetic analysis by which the conservation of the plant can be made easy. The innovation of

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## RESEARCH ARTICLE

# Genetic Fingerprinting of Herbal Medicinal Plant- *Lannea coromandelica* linn. Using PCR-RFLP

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## ABSTRACT:

DNA based authentication techniques have been extensively used as a method for herbal drugs in present days. Consumption of herbal drugs is assumed as a safe, but there are some reported serious reaction demands development of effectual markers system for isolation and identification of the phyto-constituents. Numerous analytical and molecular techniques have also been developed for quality control of drugs from plant origin, but still there is no universal consensus to adopt the same. In this approach, we set to solve this problem by DNA based technique by developing a universal primer PCR-RFLP assay by developing genetic marker. These method use different variable lengths of mitochondrial DNA for amplification using a pair of universal primers. PCR amplifications yielded 531 bp length fragments of *L. coromandelica*. The limit of detection in range of 0.01 to 0.05 ng of genomic DNA. This developed PCR-RFLP assay was sufficient to distinguish with variable fragment patterns.

**KEYWORDS:** PCR, Restriction Enzyme, *L. coromandelica*, RFLP, Genetic fingerprint.

## 1. INTRODUCTION:

Gene or a DNA sequence with a known location on a chromosome and associated with a particular gene or a character” is currently designated as genetic marker. Numerous molecular markers associated with morphological traits and chemical compositions are gaining more importance in the present days. Herbal drugs are integrated part of both traditional and modern systems of medicine and frequently found to be adulterated with other concomitants. Traditional methods of authentication, to check for adulteration of herbal drugs depend heavily on morphological/anatomical characterization, organoleptic markers (odor, color, texture) and/or chemical testing. Analytical techniques used to detect adulteration or authentication of food and agricultural commodities include physical methods, chemical/biochemical methods, immunoassays and more recently DNA based molecular tools [1].

As for the synthetic drugs, there exist a standardized authenticated process for its quality control, but till date no such mechanism exists for raw materials or finished products in the traditional drugs. Hence it is not possible to check the adulteration in the finished drug in traditional medicines. Parallel advances in numerous integrated molecular technology, DNA analysis methods have been in rapid development. Many DNA analysis based assay, especially PCR-based methods, have been developed now a days for species identification in foodstuffs [2].

When restriction fragment length polymorphism (RFLP) assays is compared with other PCR methods, the combination of universal primer PCR and RFLP assays has advantages of increased simplicity, sensitivity, and specificity and has been used in many meat identification practices. On simultaneously advancement, a few modified PCR assays combining universal primer with specific primer or RFLP had been developed [3].

DNA based markers have their applications in fingerprinting genotypes, determining the seed purity and in phylogenetic analysis by which the conservation of the plant can be made easy. The innovation of





## A Bird Eye view on Recent Covid-19 Data Reports Over Less Abundant Superficial Information

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### ABSTRACT

Recent episode of Coronavirus (SARS-CoV-2) was first announced from Wuhan, China in late 2019. Its contamination proliferates around the world swiftly with a reformist pattern towards mortality of residents. Representing a potential danger to living beings, SARS-CoV-2 spread from animal to-human and then to general populace with manifestations ranging from mild to severe sick conditions and consequently numerous deaths, affirming two measures for proclaiming COVID-19 a pandemic. The disease shows a reformist pattern in symptomatology, going from mild to serious pneumoniae to respiratory and multi-visceral failure that frequently shows pattern to death of patients with comorbidity within a short period of time. Escalated research endeavors on various parts of this human microbe are in progress across the globe towards clarifying viral transmission courses and the mechanisms employed to overcome host defense responses. With colossal infective potential, clinical examinations are being done enthusiastically to create compelling diagnostics and remedial mediations including re-purposing antiviral medicines and vaccine development. In this context, we depict the structural configuration of SARSCoV-2 genome; its pathogenicity, transmission; and we sum up risk appraisal and approaches applied in preventing infection. Lastly, we talk about significant parts of the improvement of diagnostic probes and restorative countermeasures that can possibly help in controlling the COVID-19 pandemic.

**Key words:** Pandemic, viral transmission, pathogenicity, vaccine, preventive measures, diagnostic probe.

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### INTRODUCTION

Pandemics of various infectious diseases with millions dying have been recorded in the history for the past several centuries. The most well known in the history have been pandemic due to plague in Asia and several pandemics of influenza that killed millions of people. [1-2] The pandemics continued in the current millennium too, and COVID-19 is the latest and certainly not the last pandemic. COVID-19 pandemic erupted in the Wuhan City of People's Republic of China in December 2019. The virus is being identified as a new coronavirus by Chinese officials [3]; which was later denoted as severe acute respiratory syndrome (SARS)-CoV-2 by the International Committee on Taxonomy of Viruses. [4] The WHO also named the disease due to this virus as COVID-19. [5]

### DESCRIPTION OF COVID-19 VIRUS

COVID-19 is a  $\beta$ -coronavirus belonging to the family of *Coronaviridae*. [6] It is a zoonotic disease and was firstly identified in 1965 (HCoV-229E). Thereafter two outbreaks of same potencies were occurred - in 2003 and 2012, respectively (SARS-CoV and MERS-CoV). [7-8]

COVID-19 is a RNA type virus. According to the Phylogenetic studies, it is possible that the actual suspect of SARS-CoV-2 is another unidentified host instead of bats, which was possibly being sold at Wuhan seafood market before the outbreak. [9] However bat-SL-CoVZC45 and bat-SL-CoVZXC21 genomic sequences are 89% similar, there is a doubt regarding its direct ancestors. [10]

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# जूड़ो में स्थिर संतुलन पर वजन वर्ग का प्रभाव

चन्द्रशेखर बांधे

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## सार संक्षेप

**उद्देश्य:** अध्ययन का उद्देश्य जूड़ो में स्थिर संतुलन क्षमता पर वजन वर्ग का प्रभाव ज्ञात करना था।

**प्रतिदर्श का चयन:** अध्ययन में कुल 160 जूड़ो खिलाड़ी प्रतिदर्श के रूप में सम्मिलित किये गये। प्रत्येक वजन वर्ग से (कुल 08 वजन वर्ग) 10 प्रतिदर्श लिये गये। जूड़ो खिलाड़ियों की आयु 18 से 25 वर्ष के बीच थी। अध्ययन में सम्मिलित खिलाड़ी राष्ट्रीय स्तर के थे।

**चरों का चयन:** अध्ययन में वजन वर्ग (आठ वजन वर्ग) को स्वतंत्र चयन के रूप में लिया गया एवं स्थिर संतुलन को आश्रित चर के रूप में लिया गया।

**अध्ययन अभिकल्प:** अध्ययन का आयोजन स्थिर समूह तुलनात्मक अभिकल्प के आधार पर किया गया जिसमें आठ स्थिर समूह थे जो कि प्रत्येक वजन वर्ग के आधार पर थे, (60 कि.ग्रा. से कम वजन वर्ग, 60 कि.ग्रा., 66 कि.ग्रा., 73 कि.ग्रा., 81 कि.ग्रा., 90 कि.ग्रा., 100 कि.ग्रा., 100 कि.ग्रा. से अधिक)

**सांख्यिकीय विश्लेषण:** जूड़ो में स्थिर संतुलन पर वजन वर्ग का प्रभाव ज्ञात करने के लिए One Way Variance (ANOVA) का प्रयोग किया गया जिसमें सार्थकता का स्तर 0.05 था।

### निष्कर्ष:

- जूड़ो खेल में स्थिर संतुलन वजन वर्ग द्वारा प्रभावित होता है। क्योंकि विभिन्न वजन वर्गों के बीच स्थिर संतुलन में सार्थक अन्तर पाया गया।
- समान प्रकार के वजन वर्गों का स्थिर संतुलन पर प्रभाव नहीं पड़ता है क्योंकि समान प्रकार के वजन वर्गों के बीच स्थिर संतुलन संबंधित सार्थक अन्तर नहीं पाया गया।

## प्रस्तावना

जूड़ो खेल में कई प्रकार के शोध अध्ययन किए गए हैं जैसे की उदाहरण के तौर पर प्रयोगात्मक और तुलनात्मक अध्ययन किया गया। जूड़ो (Judo) का खेल जापान के प्राध्यापक डॉ. जिगारो कानो द्वारा स्थापित किया गया था। सन् 1882 में जूड़ो की शुरुआत की गई जिसे जापानी कुश्ती भी कहा जाता है। जूड़ो को शाब्दिक शब्दों में Ju-Gentle Do-Giving the Way इस खेल का उद्देश्य Maximum Efficiency को Maximum Effort द्वारा प्राप्त करना है।

जूड़ो एक द्वंद्वत्मक खेल है जिसमें दो प्रतिद्वंद्वी कौशल के आधार पर अंक अर्जित करने का प्रयास करते हैं। जूड़ो की प्रतियोगिताएँ विभिन्न वजन वर्गों के नियमों के आधार पर आयोजित की जाती हैं जिसमें 8 वजन वर्ग होते हैं: 60 किलोग्राम से कम वजन वर्ग, 60 किलोग्राम वजन वर्ग, 66 किलोग्राम वजन वर्ग, 73 किलोग्राम वजन वर्ग, 81 किलोग्राम वजन वर्ग, 90 किलोग्राम वजन वर्ग, 100 किलोग्राम वजन वर्ग और 100 किलोग्राम से अधिक वजन वर्ग।

जूड़ो खेल में संतुलन क्षमताओं का विशेष उपयोग है क्योंकि प्रत्येक तकनीक का उपयोग संतुलन अवस्थाओं में ही किया जाता है। स्थिर संतुलन क्षमता में खिलाड़ियों के द्वारा लम्बी समय अवधि तक स्थिर अवस्था में अपनी स्थिति को बनाये रखने को स्थिर संतुलन कहलाता है। स्थिर संतुलन और जूड़ो का संबंध था।

## उद्देश्य

अध्ययन का उद्देश्य जूड़ो में स्थिर संतुलन क्षमता पर वजन वर्ग का प्रभाव ज्ञात करना था।

# जूड़ो में गतिशील संतुलन पर वजन वर्ग का प्रभाव

चन्द्रशेखर बांधें

शोधार्थी शारीरिक शिक्षा अध्ययनशाला, पंडित रविशंकर शुक्ल विश्वविद्यालय, रायपुर, छत्तीसगढ़, भारत

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## प्रस्तावना:

भारत में जूड़ो खेल लोकप्रियता के आधार पर निरंतर अग्रसर है। जूड़ो आधुनिक मार्शल आर्ट और लड़ाकू खेल है जिसे जापानी कुश्ती भी कहा जाता है। जापान के प्राध्यापक डॉ. जिगारो कानो द्वारा स्थापित किया गया जिसे जूड़ो शिक्षक के अलावा जूड़ो शिक्षाविद के नाम से जाना गया। जूड़ो खिलाड़ियों पर विभिन्न प्रकार के शोध अध्ययन किये गये हैं।

इस खेल में प्रयुक्त होने वाले कौशल को तीन वर्गों में विभाजित किया जाता है। पहला वर्ग नागेवाजा, दूसरा वर्ग कतामे वाजा एवं तीसरा वर्ग आत्मेवाजा। पहले दो वर्गों की तकनीकों को प्रतियोगिता में लगाया जाता है तथा तीसरे वर्ग की तकनीकों केवल आत्मरक्षा के लिये उपयोग में लाई जाती है। कुछ ऐसी तकनीकें होती हैं जिन्हें विशेष वजन वर्ग के जूड़ो खिलाड़ी ही अधिक प्रयोग करते हैं।

जूड़ो की प्रतियोगिताएं अंतराष्ट्रीय जूड़ो फेडरेशन के विभिन्न वजन वर्गों के नियमों के आधार पर आयोजित की जाती हैं जिसमें 8 वजन वर्ग होते हैं: 60 किलोग्राम से कम वजन वर्ग, 60 किलोग्राम वजन वर्ग, 66 किलोग्राम वजन वर्ग, 73 किलोग्राम वजन वर्ग, 81 किलोग्राम वजन वर्ग, 90 किलोग्राम वजन वर्ग, 100 किलोग्राम वजन वर्ग और 100 किलोग्राम से अधिक वजन वर्ग।

जूड़ो खेल में संतुलन क्षमताओं का विशेष योगदान है क्योंकि जूड़ो की प्रत्येक तकनीक का उपयोग संतुलन अवस्थाओं में ही किया जाता है। गतिशील संतुलन अवस्था में खिलाड़ियों के द्वारा लम्बी अवधि तक अपने शरीर की स्थिति को स्थिर बनाये रखना गतिशील संतुलन कहलाता है। गतिशील संतुलन क्षमता और जूड़ो का संबंध था।

## उद्देश्य :

अध्ययन का उद्देश्य जूड़ो में गतिशील संतुलन क्षमता पर वजन वर्ग का प्रभाव ज्ञात करना था।

## प्रक्रिया:

### प्रतिदर्श का चयन:

अध्ययन में कुल 160 जूड़ो खिलाड़ी प्रतिदर्श के रूप में सम्मिलित किये गये। प्रत्येक वजन वर्ग से (कुल 08 वजन वर्ग) 10 प्रतिदर्श लिये गये। जूड़ो खिलाड़ियों की आयु 18 से 25 वर्ष के बीच थी। अध्ययन में सम्मिलित खिलाड़ी राष्ट्रीय स्तर के थे।

### चरों का चयन:-

अध्ययन में वजन वर्ग (आठ वजन वर्ग) को स्वतंत्र चयन के रूप में लिया गया। 60 किलोग्राम से कम वजन वर्ग, 60 किलोग्राम वजन वर्ग, 66 किलोग्राम वजन वर्ग, 73 किलोग्राम वजन वर्ग, 81 किलोग्राम वजन वर्ग, 90 किलोग्राम वजन वर्ग, 100 किलोग्राम वजन वर्ग और 100 किलोग्राम से अधिक वजन वर्ग एवं गतिशील संतुलन को आश्रित चर के रूप में लिया गया।

### अध्ययन अभिकल्प:-

अध्ययन का आयोजन गतिशील समूह तुलनात्मक अभिकल्प के आधार पर किया गया जिसमें आठ स्थिर समूह थे जो कि प्रत्येक वजन वर्ग के आधार पर थे, (60 कि.ग्रा. से कम वजन वर्ग, 60 कि.ग्रा., 66 कि.ग्रा., 73 कि.ग्रा., 81 कि.ग्रा., 90 कि.ग्रा., 100 कि.ग्रा., 100 कि.ग्रा. से अधिक)

### सांख्यिकीय विश्लेषण:-

जूड़ो में गतिशील संतुलन पर वजन वर्ग का प्रभाव ज्ञात करने के लिए One Way Variance (ANOVA) का प्रयोग किया गया जिसमें सार्थकता का स्तर 0.05 था।



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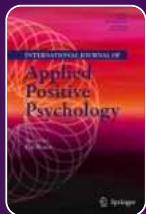
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# A Study on Comparison of Financial Management Practices in Sports Department of Public and Private Colleges of Chhattisgarh (AbstractView.aspx?PID=2021-27-1-7)



## A Study on Comparison of Financial Management Practices in Sports Department of Public and Private Colleges of Chhattisgarh

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### Abstract

The purpose of this study is to analyze and compare financial management practices in sports department in public and private colleges in Chhattisgarh. To achieve this purpose questionnaire was used as an instrument and were distributed to 100 subjects including sports officer, chief coach, senior coach from public and private colleges in Chhattisgarh. The questionnaire contained two parts A and B. Part A contained questions related with the demographic profile and Part B contained statements on financial management practices. The collected data were statistically analyzed using chi square to test the hypothesis at 0.05 alpha level of significance using SPSS version 16.

**Keywords**-Financial management, sports, public, private college

### 1. Introduction

From the outset, it's important to define the relevant basic term 'Comparative' it stems from the Latin word 'compare' aiming to observe two or more things so as to get any relationships or similarities or differences. DeSensi, Kelley, Blanton, and Beitel (1990, p.33) defined sport management as "any combination of skills associated with planning, organizing, directing, controlling, budgeting, leading, and evaluating within the context of a corporation or department whose primary product or service is said to sport and/or physical activity".

The need for sport management was evident in 1957, when Walter O'Malley, owner of the L. a. Dodgers, wrote, I ask the question, where would one attend find an individual who by virtue of education has been trained to administer a marina, race track, resort, auditorium, stadium, theatre, convention or exhibit hall, a public camp complex, or an individual to fill an executive position at a team or league level in junior athletics like baseball league baseball, football, scouting, CYO, and youth activities, etc. (Mason, Higgins, & Wilkinson, 1981, p. 44). the necessity for Sports management was felt more in India when IPL - Indian Premier League (cricket) started in 2008 and by now we've Hockey India League (started in 2013), Pro Kabaddi League (started in 2014), ISL - Indian Super League (for football, started in 2013), Indian Badminton League (started in 2013) then on. Currently India features a few Institutes which are focusing purely on Sports Management Education unlike in other Countries where a student has an option of selecting a Master's degree from quite 16 Sports Management Master's Degree available in several areas catering to Sports as an Industry. the subsequent parameters are suggested for measuring sports management (1) finance (2) facilities (3) equipment (4) personnel (5) sports policies, (6) recruitment, (7) organizational structures (8) public relation (9) motivation



## EFFECTS OF SUB-MAXIMAL LOAD ON BODY COMPOSITION OF 31 TO 40 YEARS OBESE MALES

□ Pramod Dalal\*  
Dr. Rajeev Choudhary\*\*

### ABSTRACT

In this study, 60 obese men with BMI between (25 to 30) participated. The study's selection of body composition variables included body weight, fat percentage, and BMI. For the study, a sample of all obese male participants was taken, and they were divided into two equal groups: the control group (n=30) and the experimental group (n=30). Each of the three body composition factors was pre-tested on each group. The experimental group in the study completed a training regimen created by the researcher, while the control group was allowed to continue with their regular everyday activities. A 12-week continuous training regimen was followed in this investigation, after which samples from both groups were again collected. According to the data from the latest analysis, the submaximal load had a substantial impact on the experimental group's body weight, BMI, and fat percentage in connection to these variables of body composition, but not on the control group's variables. The data from the study were computed using ANCOVA.

**Keywords :** bodycomposition, age group, and submaximal Load.

### INTRODUCTION

A sound mind and a healthy body are the foundations of human life. WHO defines "Health as a state of complete physical, mental, and social wellbeing, not merely the absence of disease or infirmity" (WHO, Constitution, 2021). A condensed definition of health states, "Health is the quality of life that enables the person to live most and serve best" (Vairavasundaram, Jany, & Itoo, 2020). Health is thus a level of functional efficiency of a living being and a general condition of a person's mind, body, and spirit. Most diseases have their origin in mind. A person can be referred to as healthy when his or her body is healthy, and the mind is clear and calm. Health is the foundation upon which rest the people's happiness and the nation's strength.

Nowadays, more than 90% of people are leading a mechanical life. They do not find time to care for their health and mind. Sound health and essential fitness are given less importance in the present-day world. With the

availability of several modes of transport facilities and mechanization of industries, the proportion of people who lead sedentary lives has been increasing daily. Public health is influenced by their lifestyles, with dietary choices and regular physical activity being the two most essential aspects, regardless of sex, age, or place of origin. This poses a significant threat to an individual's health because it can increase or progress in the Risk of Obesity. The World Health Organization (WHO, 2006) has described Obesity as one of the most neglected public health problems, affecting every region of the globe. The epidemic of Obesity is a substantial health burden worldwide, and its impact is equally felt in developing countries as well (Sunyer, 2015).

Obesity is not only a physical condition in the current years but has emerged as a severe problem in recent years. It is believed that as age progress, the physical capabilities of the body start decreasing, and the person starts becoming obese. Exercise act as a medicine

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## Abstract View

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# Prediction of Libero's Performance on the basis of Selected Anthropometric Characteristics (AbstractView.aspx?PID=2021-27-1-12)

Author(s): Mithilesh Kumar Singh ([search.aspx?key=Mithilesh Kumar Singh](search.aspx?key=Mithilesh%20Kumar%20Singh)), Rajender Lal ([search.aspx?key=Rajender Lal](search.aspx?key=Rajender%20Lal)), Rakesh Kumar Patel ([search.aspx?key=Rakesh Kumar Patel](search.aspx?key=Rakesh%20Kumar%20Patel)), Rajeev Chaudhary ([search.aspx?key=Rajeev Chaudhary](search.aspx?key=Rajeev%20Chaudhary))



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Original



## Effect of eight-week core muscles strength training on physical fitness and body composition variables in male players of team games

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### ABSTRACT

**Objective:** To find out the effect of core muscles strength training for eight weeks (five days/week) on fitness and body composition variables in male players of team games.

**Methods:** Fifty five male players were selected for the study. Subjects were randomly divided into experimental (n: 30) and control group (n: 25). Lateral trunk endurance, endurance and explosive power of leg, abdominal muscles endurance, body weight, body fat percentage, essential fat mass, non-essential fat mass, absolute total body fat and body surface area were measured before and after intervention.

**Results:** The significant effect of core training program was observed ( $p < 0.05$ ) in lateral trunk endurance, explosive power of leg, abdominal muscles endurance (respectively; 38.29%,  $p < 0.001$ ; 10.57%,  $p < 0.001$ ; 71.23%,  $p < 0.002$ ). Also, significant changes were found in bodyweight, fat %, essential fat, non-essential fat, absolute total body fat, body surface area, lean body and fat free body mass (respectively; F: 28.88,  $p < 0.001$ ; F: 4.25,  $p: 0.41$ ; F: 28.88,  $p < 0.001$ ; F: 5.37,  $p < 0.001$ ; F: 5.80,  $p: 0.20$ ; F: 27.93,  $p < 0.001$ ; F: 2.40,  $p: 0.141$ ; F: 2.03,  $p: 0.16$ ).

**Conclusion:** The eight-week core muscles strength training program used in this study was very effective for producing significant benefits to fitness level performance and body composition, as well as lowering the weight of male players.

**Keywords:** Core training; Swiss ball exercises; Body composition; Muscles activation.

## Efecto del entrenamiento de fuerza muscular del Core de ocho semanas en las variables de aptitud física y composición corporal en jugadores masculinos de juegos de equipo

### RESUMEN

**Objetivo:** Averiguar el efecto del entrenamiento de fuerza de los músculos del Core durante ocho semanas (cinco días / semana) sobre las variables de estado físico y composición corporal en jugadores masculinos de juegos de equipo.

**Métodos:** Cincuenta y cinco jugadores masculinos fueron seleccionados para el estudio. Los sujetos se dividieron aleatoriamente en grupo experimental (n: 30) y grupo control (n: 25). La resistencia lateral del tronco, la resistencia y el poder explosivo de la pierna, la resistencia de los músculos abdominales, el peso corporal, el porcentaje de grasa corporal, la masa de grasa esencial, la masa de grasa no esencial, la grasa corporal total absoluta y el área de superficie corporal se midieron antes y después de la intervención.

**Resultados:** Se observó el efecto significativo del programa de entrenamiento del Core ( $p < 0.05$ ) en la resistencia lateral del tronco, la potencia explosiva de la pierna y la resistencia de los músculos abdominales (38.29 %,  $p < 0.001$ ; 10.57%,  $p < 0.001$ ; 71.23%,  $p < 0.002$  respectivamente). Además, se encontraron cambios significativos en el peso corporal, % de grasa, grasa esencial, grasa no esencial, grasa corporal total absoluta, área de superficie corporal, masa magra y masa corporal libre de grasa (F: 28.88,  $p < 0.001$ ; F: 4.25,  $p: 0.41$ ; F: 28.88,  $p < 0.001$ ; F: 5.37,  $p < 0.001$ ; F: 5.80,  $p: 0.20$ ; F: 27.93,  $p < 0.001$ ; F: 2.40,  $p: 0.141$ ; F: 2.03,  $p: 0.16$ , respectivamente).

**Conclusión:** El programa de entrenamiento de fuerza muscular del Core de ocho semanas utilizado en este estudio fue muy efectivo para producir beneficios significativos para el rendimiento del nivel de condición física y la composición corporal, así como para reducir el peso de los jugadores masculinos.

**Palabras clave:** Entrenamiento Core; Ejercicios pelota suiza; Composición corporal; Activación muscular.

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## Shuttle run performance of national soccer players in relation to menstrual cycle

**Dr. Vivek Mishra and CD Agashe**

### Abstract

The aim of the present study was to assess speed and agility in national female soccer players during different menstrual cycle. The sample of the present study was chosen with the help of non-probability sampling. 50 inter-university female soccer players were selected for this study. The average age of selected female soccer players was 23.18 years with no irregularity in their menstrual cycle. To assess speed and agility in national female soccer players, 100 yard Shuttle run (R) test was used. In the shuttle run, the subject covers a 25 yard course four times. Total timing to complete the test was recorded. Results indicate that speed and agility of female soccer players gets reduced prior to menstruation as well as during menstruation as compared to post menstruation condition. Based on results it was concluded that agility of national female soccer players was compromised during menstruation phase as compared to pre-menstrual and post-menstrual phase.

**Keywords:** female soccer players, agility, menstrual cycle

### Introduction

Like track and field events, speed is important in soccer but in a different manner. Soccer is not a linear sport and a player needs to have speed along with quickness and ability to change direction. Soccer not only required speed at a stretch but agility to execute basic skills. Agility is made up of quickness and ability to change direction quickly, so it is a combination of both speed and changing direction at will. When the change of direction is less than 90° it is a quick cut or manouring and when the angle is greater than 90° it is a sharp cut. The change of direction in soccer is carried according to position of opponent and it is very demanding for muscles and energy sapping. In female soccer players, the basics of the game are same as far men's but with a difference. Female soccer players have to deal with menstrual cycle which is a natural phenomena. In this connection number of researchers namely Greeves *et al.* (1999) [3]; Janse de Jonge *et al.*, 2001 [4]; Middleton and Wenger, 2006 [7]; Casey, Hameed and Dhaher, 2014 [1] reported that physical fitness, neuro muscular coordination, muscle strength and psychomotor abilities decreased during menstruation. Contrary to these findings, Jurkowski, *et al.* (1996) [6] and Girija and Veeraiah, 2011 [2] reported that physical fitness, motor fitness and neuro muscular coordination of female players remains the same even during menstruation phase. In the light of these contradictory findings, the impact of menstrual cycle on speed and agility of soccer players was analysed in the present study.

### Objective

The objective of the present study is to find out the effect of menstrual cycle on speed and agility of national soccer players.

### Hypothesis

It was hypothesized that the speed and agility of national soccer players as assessed by shuttle run timings will show significant variation during three phases of menstrual cycle.

### Methodology

The following methodological steps were taken in order to conduct the present study.

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## Optical properties of rare earth (Ce) and transition metal (Ti) doped ZrO<sub>2</sub> phosphors

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**Abstract.** Thermoluminescence and Photoluminescence of un-doped as well as Titanium (Ti<sup>3+</sup>) & Cerium (Ce<sup>3+</sup>) doped ZrO<sub>2</sub> phosphors, prepared via solid-state reaction method. For the characterization of the sample FTIR, XRD, EDAX and FESEM study were done. FTIR confirms the presence of conventional impurities (such as NO<sub>3</sub>, OH-) present in the prepared sample. Structural characterization technique (XRD) shows the monoclinic formation and reveals the average grain size in the nano region. EDAX study confirms the chemical composition and through FESEM morphological status is studied. For kinetic parameters study thermoluminescence studies is carried out and try to correlate the XRD results with thermoluminescence behavior of prepared phosphors. Photoluminescence emission spectra show the blue and green emission band for Ti and Ce doped ZrO<sub>2</sub> phosphors respectively.

### 1. Introduction

Phosphors are most commonly used materials in photonics as well as in optics fields due to its superior hardness, high refractive index, optical transparency, chemical stability, high thermal expansion coefficient, low thermal conductivity and high thermo-mechanical resistance. Zirconium Oxide (ZrO<sub>2</sub>) phosphors are most promising host material in the field of electro-optical materials, due to its electrical, mechanical, chemical and optical characteristics. Zirconia has a wide band gap (= 5.4 eV) semiconductor material, has good optical transparency and low phonon energy of 470 cm<sup>-1</sup> [1]. This will increase the number and probability of radiative transition and reduce non radiative multiphonon relaxation [2,3]. And hence, it has vast application areas in oxygen sensor, Solid State electrolytes, thermal barrier coatings, and in the field of photonics [4,5,6]. Zirconia is a IV group member, in periodic database table and the main source of zirconia is Baddeleyite (ZrO<sub>2</sub>) and zircon (zirconium ortho-silicate ZrSiO<sub>4</sub>). Hafnium, Hamatite (Fe<sub>2</sub>O<sub>3</sub>) Fe and Ti are the major impurities found in a commercial zirconia due to closeness in their crystal radii (Zr<sup>4+</sup> 0.79 Å<sup>0</sup>, Hf<sup>4+</sup> 0.78 Å<sup>0</sup>) [7].

ZrO<sub>2</sub> exhibits three polymorphs with increasing temperature at a normal atmospheric pressure: the monoclinic phase (m-ZrO<sub>2</sub>) that is stable from room temperature (RT) to 1175°C; the tetragonal phase (t-ZrO<sub>2</sub>) stability ranges between 1175°C to 2370°C and cubic phase (c-ZrO<sub>2</sub>), exceptional stable at 2370°C to 2750°C (melting point). However, the substitution of dissimilar elements into the ZrO<sub>2</sub> host develops oxygen ion vacancies and as a consequence the phase of the phosphor material stabilized through charge compensation mechanism [8,9]. Phosphors or luminescent materials are mostly inorganic materials consisting of a host lattice intentionally doped with impurities or activators.



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## Full length article

Generation of cold white light by using energy transfer process in single phase  $\text{Ce}^{3+}/\text{Tb}^{3+}$  co-doped  $\text{CaSrAl}_2\text{SiO}_7$  phosphorShweta Sharma<sup>a</sup>, Nameeta Brahme<sup>b</sup>, D.P. Bisen<sup>c</sup>, Pradeep Dewangan<sup>d</sup>, Ritu Gupta<sup>a</sup><sup>a</sup> Department of Physics, Adarsha Science, J. B. Arts and Birla Commerce College, Dhamangaon (Rly), Maharashtra 444607, India<sup>b</sup> School of Studies in Physics and Astrophysics, Pt. Ravishankar Shukla University, Raipur, Chhattisgarh 492010, India<sup>c</sup> Department of Physics, Faculty of Science, Shri Rawatpura Sarkar University, Raipur, Chhattisgarh 492010, India<sup>d</sup> Department of Physics, National Institute of Technology, Raipur 492010, India

## ARTICLE INFO

## Keywords:

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Cerium terbium co-doped phosphor  
Energy transfer process  
Sensitizer and activator

## ABSTRACT

Single phased  $\text{CaSrAl}_2\text{SiO}_7$  phosphor singly doped with different concentrations of trivalent cerium and terbium; and co-doped with varying  $\text{Tb}^{3+}$  concentration were prepared by standard solid state reaction (SSR) method. The crystallinity and particle morphology of the product samples were analysed by using XRD and TEM characterizations. Photoluminescence characterizations of singly doped and co-doped samples were studied in detail.  $\text{CaSrAl}_2\text{SiO}_7:\text{Ce}^{3+}, \text{Tb}^{3+}$  phosphor exhibit a broad blue emission band at 410 nm and some sharp emission bands in blue green and yellow regions, which originate from  $\text{Ce}^{3+}$  and  $\text{Tb}^{3+}$  ions, respectively. By increasing the concentration of  $\text{Tb}^{3+}$  ions while fixing  $\text{Ce}^{3+}$  concentration in the host lattice energy transfer takes place from  $\text{Ce}^{3+}$  to  $\text{Tb}^{3+}$  ions which create luminescence emission in white region.  $\text{CaSrAl}_2\text{SiO}_7:\text{Ce}^{3+}, \text{Tb}^{3+}$  phosphors are proved to be promising candidates for white lighting for outdoor illumination.

## 1. Introduction

Phosphors that are the luminescent materials are widely utilized in our daily life; some of the best applications of phosphors are color television screen, fluorescent lamps, scintillators, dosimeters, X-ray storage, screen intensifying phosphors, sensors, LEDs, watch dials, laser materials etc. The white light sources based on light emitting diode have so many valuable advantages as compare to conventional incandescent lamps. White LEDs have longer lifetime, better reliability, environmentally characteristics and higher efficiency which provide significant contractions in power consumption and pollution from fossil fuel power plants. In recent years, researchers have been concentrating on investigation of single composition white-light-emitting phosphors that are excited by UV-LED to prevent some difficulties like the cross-color, instability of color temperature, and expensive cost problems. The process of co-doping of sensitizer and activator into one host matrix is one of the best ways to fabricate a single-phased white-light-emitting material by utilising the principle of energy transfer from sensitizer to activator. Now a days the white light can be obtained from co-doping of divalent and trivalent rare earth elements in a single phase host, white light emission was investigated in  $\text{Eu}^{2+}$ ,  $\text{Mn}^{2+}$  co-doped  $\text{Ca}_8\text{MgY}(\text{PO}_4)_7$ ,  $\text{Ce}^{3+}$ ,  $\text{Tb}^{3+}$  co-doped  $\text{Ba}_2\text{Ln}(\text{BO}_3)_2\text{Cl}$  ( $\text{Ln} =$

$\text{Gd}$  and  $\text{Y}$ ),  $\text{Ce}^{3+}$ ,  $\text{Dy}^{3+}$  co-doped  $\text{Ca}_3(\text{P}_{1-x}\text{B}_x\text{O}_4)_2$  and  $\text{Dy}^{3+}$ ,  $\text{Sm}^{3+}$  co-doped  $\text{Lu}_3\text{Ga}_5\text{O}_{12}$  systems. Due to predominant  $^5\text{D}_4 \rightarrow ^7\text{F}_5$  transition (545 nm) of  $\text{Tb}^{3+}$  ion it is the best candidate for green luminescence among all rare earth ions. However, within the 4f configurations of the  $\text{Tb}^{3+}$  ion, the electric dipole transitions is both spin and parity forbidden, which results in the weak absorption intensity in the near UV region and the narrow width. Therefore a suitable sensitizer is must for the  $\text{Tb}^{3+}$  activated phosphors. From the very beginning to recent years,  $\text{Ce}^{3+}$  ion is proven to be an excellent sensitizer for  $\text{Tb}^{3+}$  ion.  $\text{Ce}^{3+}$  ion transfer a fraction of its energy to  $\text{Tb}^{3+}$  ion depending up on its lowest 5d electronic state and broad absorption and emission bands associated with 4f – 5d transitions.

In the present work we synthesized a novel single phase  $\text{CaSrAl}_2\text{SiO}_7:\text{Ce}^{3+}, \text{Tb}^{3+}$  phosphor by solid state reaction (SSR) method for generation of cool white-light emission. Photoluminescence (PL) behaviour shows that the present co-doped phosphor covers the entire range of visible region which can create cool white emission which was resulted from the energy transfer from  $\text{Ce}^{3+}$  to  $\text{Tb}^{3+}$  ions. To the best of our knowledge, luminescence properties and energy transfer between  $\text{Ce}^{3+}$  and  $\text{Tb}^{3+}$  in  $\text{CaSrAl}_2\text{SiO}_7$  host lattice have not been reported so far. PL spectrum of  $\text{Ce}^{3+}, \text{Tb}^{3+}$  co-doped sample was compared with PL spectra  $\text{Ce}^{3+}$  and  $\text{Tb}^{3+}$  single doped sample. Preparation of powder samples was

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Original research article

# Study of Photoluminescence, Thermoluminescence, and Afterglow properties of $\text{Dy}^{3+}$ doped $\text{Ba}_2\text{ZnSi}_2\text{O}_7$ phosphor

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## ARTICLE INFO

## Keywords:

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## ABSTRACT

Barium Zinc Silicate  $\text{Ba}_2\text{ZnSi}_2\text{O}_7$  (BZS) phosphor doped with Dysprosium ( $\text{Dy}^{3+}$ ) was prepared at  $1200^\circ\text{C}$  in the air by a solid-state reaction method. The prepared phosphor shows an efficient blue and yellow emission centered around 480 nm and 580 nm, respectively under UV excitation, which is believed due to incorporation of  $\text{Dy}^{3+}$  ion. The optimum concentration for  $\text{Dy}^{3+}$  ion is at 2 mol% and concentration quenching is attributed to exchange interaction. The CIE diagram is drawn for the whole series of phosphor samples prepared and it confirms that emission color had, indeed, tuned with the incorporation of  $\text{Dy}^{3+}$  ion in the BZS samples. The afterglow properties and Thermoluminescence (TL) have also been studied. TL curve confirms the presence of at least four traps in the phosphor material. The present results suggest BZS: $\text{Dy}^{3+}$  phosphor is a promising one for display and dosimetry application.

## 1. Introduction

The light-emitting diode (LED) is the best choice at the moment among the most energy efficient devices to produce light. Presently phosphor converted LEDs receives much attention, so there is a considerable amount of research involved in search of new phosphor materials for better white light emission. Inorganic phosphors are widely studied materials for this purpose. These inorganic phosphors are available in various forms such as aluminate, silicate, phosphate, etc. [1–3]. Doping plays a very important role for the enhancement of luminescent properties of the inorganic phosphor. The rare-earth elements are used extensively for this purpose because of their intrinsic properties which are due to their unpaired 4f electrons. It enhances their chemical, optical and electronic characteristics. Due to this unique electronic configuration, rare earth doped inorganic phosphor produces a wide emission, which covers the range from ultraviolet to near infra-red region. Hence, rare-earth doped materials are always preferred as potential candidates for making multicolor light-emitting devices [4]. Among the rare-earth ions,  $\text{Dy}^{3+}$  is the center of attraction due to its white light emission property. In general,  $\text{Dy}^{3+}$  phosphor gives two strong emission peaks in blue and yellow regions. Near-white light emission can be achieved by altering the ratio of the intensity of yellow to blue. Thus,  $\text{Dy}^{3+}$  activated phosphor materials have drawn much attention, because of their applications as promising single-phase white emitting phosphors [5]. These phosphors always contain some intrinsic defects and incorporation of impurity may create new defects. These defects play an especially important role in the

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# Studies on structural properties, luminescence behavior and zeta potential of Dy<sup>3+</sup> doped alkaline earth *ortho*-silicate phosphors

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## ABSTRACT

Alkaline earth orthosilicate (Sr<sub>2</sub>SiO<sub>4</sub>) phosphor doped with Dy<sup>3+</sup> was synthesized by a traditional high-temperature solid-state reaction method. XRD analysis confirmed the formation of the phosphor with the orthorhombic crystal structure and their phase purity was checked using theoretical fitting Rietveld refinement. Zeta potential measurements of parent phosphor in different medium were performed to check its stability. The Zeta potential measurements of the phosphors were examined using SEM and EDX, surface morphology and the elemental composition of the phosphors represents the respectively. The optical behavior is determined by PL analysis. CIE coordinates of the phosphors represents the white light emission characteristics of Sr<sub>2</sub>SiO<sub>4</sub>: Dy<sup>3+</sup> phosphors. Due to white light emission characteristic, this work will open a new window for its use in W-LED applications. Thermoluminescence (TL) behavior of phosphor was studied and its TL kinetic parameters were estimated based on computerized glow curve deconvolution (CGCD) fitting.

## 1. Introduction

Recently, Solid State Lighting (SSL) based white light emitting diodes (W-LEDs) is the topic of research and considered as lighting system for future generation. White light emission through White light emitting diodes (WLEDs) shows lots of advantages over the traditional fluorescent and incandescent lamps because of lightweight, small size, long lifetime, pollution-free, flat packaging, good stability, high luminous efficiency, and environment-friendly characteristics along with energy savings. Now, researchers have proposed various technologies to generate white light by coupling of blue/UV (Ultraviolet) LEDs with the phosphors. At present, several strategies have been followed by the researchers to develop W-LEDs with high quantum efficiency and better color rendering index (CRI). There are two common approaches to produce white light (i) a yellow emitting YAG: Ce<sup>3+</sup> phosphor pumped with blue LED, (ii) combination of RGB phosphors excited by UV-LED. First approach has some drawbacks such as low CRI, halo effect, high CCT and the second approach suffers from low luminescent efficiency due to re-absorption of blue light. Therefore it has drawn much attention of the researchers to solve the above difficulties. Many researchers have focused to find out the single phase white light emitting phosphors with high luminosity and CRI, when excited by Ultraviolet

(UV) or near Ultraviolet (n-UV). Nowadays, rare earth doped phosphors are on demand in the market due to its wide applications in various fields. Especially Europium (Eu), Cerium (Ce) and Dysprosium (Dy) doped silicate phosphors have better spectroscopic properties i. e. emission and excitation spectra. Dy<sup>3+</sup> doped phosphors shows two emission peaks at 460–480 nm (Blue region) and 570–590 nm (yellow region) simultaneously, although the combination of yellow and blue emission gives white light. By adjusting the yellow to blue intensity ratio (Y/B) value appropriately, it is possible to obtain pure white light from Dy<sup>3+</sup> activated phosphors. To obtain, efficient white light emitting phosphor, selection of the host is a key factor. Now, silicate based phosphors have been investigated because of their properties of stability (Physical, Chemical and Crystal structure). Among the various silicate based phosphors, *ortho*-silicates has proved to be excellent candidate for the white light emission in SSL applications as it exhibits long-wavelength excitation properties, facile synthesis and cheap raw material (SiO<sub>2</sub>). In the *ortho*-silicates such as Ca<sub>2</sub>SiO<sub>4</sub>, Ba<sub>2</sub>SiO<sub>4</sub>, CaBaSiO<sub>4</sub>, CaSrSiO<sub>4</sub> etc., Sr<sub>2</sub>SiO<sub>4</sub> is the suitable and potential candidate for W-LEDs because of wide lighting applications. Sr<sub>2</sub>SiO<sub>4</sub> has two crystallographic phases namely α-Sr<sub>2</sub>SiO<sub>4</sub> and β-Sr<sub>2</sub>SiO<sub>4</sub> and it is easy to find the desired single phase by changing the synthesis conditions and calcinations temperature as per requirement

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## Synthesis and Concentration Dependent Luminescent Characterization of BaMgSiO<sub>4</sub>: Eu<sup>3+</sup> Phosphor

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### Abstract

The Eu<sup>3+</sup> doped BaMgSiO<sub>4</sub> powder phosphors are synthesized by the high temperature and conventional solid state reaction method (SSRM). The X-ray diffraction (XRD) for phase determination, scanning electron microscopy (SEM) and transmission electron microscopy (TEM) for morphological investigation, energy dispersive X-ray (EDX) analysis for elemental composition and Fourier transform infrared (FT-IR) and Raman spectroscopy for bonding details are used to characterize the samples. In the photoluminescence (PL) spectra of the as-synthesized phosphors, two characteristic emission peaks recorded at 596 nm and 614 nm are attributed to <sup>5</sup>D<sub>0</sub> → <sup>7</sup>F<sub>1</sub> (orange region) and <sup>5</sup>D<sub>0</sub> → <sup>7</sup>F<sub>2</sub> (red region) of Eu<sup>3+</sup> ions. The BaMgSiO<sub>4</sub>: Eu<sup>3+</sup> exhibits enhancement in PL intensity, which is quenched at 5 mol% of Eu<sup>3+</sup> ions. The Commission Internationale d'Eclairage (CIE) chromaticity coordinates of a BaMgSiO<sub>4</sub>: Eu<sup>3+</sup> excited at 396 nm (<sup>7</sup>F<sub>0</sub> → <sup>5</sup>L<sub>6</sub>) wavelengths present a red-shift with increasing concentration of Eu<sup>3+</sup> ions. Thermoluminescence (TL) glow curves are recorded and TL parameters are estimated using peak shape method. Apart from these, correlated color temperature (CCT) and color rendering index (CRI) are also computed and analyzed using CIE coordinates.

**Keywords:** BaMgSiO<sub>4</sub>: Eu<sup>3+</sup>; X-ray diffraction; Phosphors; Photoluminescence; CCT; CRI





## Investigation of structural and thermal response of $\text{Sm}^{3+}$ doped $\text{Sr}_3\text{MgSi}_2\text{O}_8$ phosphors

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### Abstract

Present study deals with the effect of  $\text{Sm}^{3+}$  doping on crystal and optical behaviour of  $\text{Sr}_3\text{MgSi}_2\text{O}_8$ . For these studies prepared phosphor was characterized by using X-ray powder diffraction and luminescence spectra by recording excitation and emissions spectra. Emission spectra have emission wave lengths centered at 490 nm and 545 nm. Effect of  $\text{Sm}^{3+}$  ion concentration shows dipole–dipole interaction was responsible for the quenching shown by phosphor. The thermoluminescence curves were used to define the ability of the trap to trapping the carriers for  $\text{Sm}^{3+}$  doped  $\text{Sr}_3\text{MgSi}_2\text{O}_8$  phosphor.

**Keywords**  $\text{Sr}_3\text{MgSi}_2\text{O}_8:\text{Sm}^{3+}$  · Solid state reaction method · Luminescence

### 1 Introduction

Rare earth doped  $\text{Sr}_3\text{MgSi}_2\text{O}_8$  phosphors have been broadly contemplated by scientists inferable from their interesting physical and optical properties. These nanomaterials have been used in device fabrication, enthusiasm for examination of their conceivable ease of use in various fields of gadget applications. They may take jobs in part of gadgets, for example, opto-electronics, sensors, identifiers, im-petuses, luminescent and bio-medical gadgets. A few kinds of silicate-based phosphor have been found and examined (Talwar et al. 2009; Klasens et al. 1957; Barry 1968; Blasse et al. 1968; Liu et al. 2014; Pan et al. 2011).

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## Photoluminescence and comparative thermoluminescence studies of UV/ $\gamma$ -irradiated Dy<sup>3+</sup> doped bismuth silicate phosphor

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### Abstract

A series of Bi<sub>4</sub>Si<sub>3</sub>O<sub>12</sub>:Dy<sup>3+</sup> phosphor have been synthesized via conventional solid-state reaction method and its luminescence properties were investigated as near cool white light emitting and long afterglow phosphor. Crystal structure and phase structure characterization is determined using X-ray diffraction (XRD). SEM and EDS. Rietveld structural refinement and XRD confirms that prepared sample exhibit pure cubic structure [space group I-43d]. Photoluminescence spectra of both doped and undoped Bi<sub>4</sub>Si<sub>3</sub>O<sub>12</sub> phosphor were efficiently excited in the range of 200–450 nm, and prepared phosphor under 272 nm excitation exhibit three emission peaks located at 463 nm (blue), 482 nm (blue) and 576 nm (yellow) corresponding to <sup>3</sup>P<sub>1</sub> → <sup>1</sup>S<sub>0</sub>, <sup>4</sup>F<sub>9/2</sub> → <sup>6</sup>H<sub>15/2</sub> and <sup>4</sup>F<sub>9/2</sub> → <sup>6</sup>H<sub>13/2</sub> transitions. Characteristic emission peaks of Dy<sup>3+</sup> centered at 482 nm and 576 nm were assigned for white light emission. The calculated Commission Internationale de l'Eclairage (CIE) chromaticity confirms that with Dy<sup>3+</sup> doping, the luminescence co-ordinates of Bi<sub>4</sub>Si<sub>3</sub>O<sub>12</sub> phosphor shift to near white (x = 0.316, y = 0.358) region which is close to commercial pc-LED (Blue LED + YAG:Ce<sup>3+</sup>) (x = 0.320, y = 0.320) co-ordinates. Computation of correlated color temperature 6184 K endorses that prepared phosphor is cool in nature and can be served as white light emitting phosphor. Comparative thermoluminescence study of UV and  $\gamma$ -irradiated Bi<sub>4</sub>Si<sub>3</sub>O<sub>12</sub>:Dy<sup>3+</sup> phosphor is performed for the dosimetry application. TL intensity is recorded maximum at 30 min under UV irradiation (256 nm), and for  $\gamma$  irradiation, it was recorded at 10 kGy dose rate.  $\gamma$ -irradiated Bi<sub>4</sub>Si<sub>3</sub>O<sub>12</sub>:Dy<sup>3+</sup> phosphor TL study is reported for the first time at different dose rate and concentration for high dosimetry application. The defect characteristic is examined, Trap depths and other kinetic parameters are also evaluated by Chen's peak shape method. Decay and fading measurement under UV/ $\gamma$  irradiation are performed to examine the long after glow properties of prepared samples. TL emission spectrum studies are also performed.

### 1 Introduction

The development of the long lasting phosphors has been a subject of keen interest during last decade [1]. Rare-earth-doped inorganic phosphor emitting white light has broad application in the field of display devices, solid-state lighting, medical devices, smart agriculture and dosimetry [2]. This very potential application of rare-earth-doped phosphor has always drawn keen interest of researchers from past few decades. Compared to other solid-state lighting devices, LEDs have its own merits such as high luminescence efficiency, long lifetime, and low-energy consumption. One of the most prominent and general way for generation of white

LEDs is using yellow Ce<sup>3+</sup> YAG phosphors excited by blue LED chip [3].

Radiation detection devices are important to identify the external or internal contamination from which our environment or humans have been exposed to. No single device can detect all the radiations. Thermoluminescence properties of Dy<sup>3+</sup> doped Bi<sub>4</sub>Si<sub>3</sub>O<sub>12</sub> phosphor under UV/ $\gamma$  irradiation has been studied and can be a promising candidate for TL dosimetry application. An important aspect of the present work is to provide an efficient luminescent material having low toxicity, good TL dosimetry application and also a phosphor which have long after glow silicon-based micro-structure system for generation of white light.

Bismuth compound has received very little attention as a host material for optical application in spite of their promising features. Indeed, most of the photoactive properties of bismuth compounds have been exploited for catalyst or electrochemical applications rather than optical devices and dosimetry application [1, 4]. Bi<sup>3+</sup> ions in Bi<sub>4</sub>Si<sub>3</sub>O<sub>12</sub> are

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# A comparative photoluminescence and Judd–Ofelt study on aluminosilicate phosphors

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## Abstract

In this article, un-doped and (0.01)  $\text{Eu}^{3+}$ -activated series of  $\text{M}_2\text{Al}_2\text{SiO}_7$  ( $\text{M} = \text{Ca}, \text{Sr}, \text{Ba}$ ) phosphors have been prepared via traditional high temperature solid-state reaction method. Phase purity and structural characterization of prepared phosphors were done by XRD. Estimated particle size of un-doped and  $\text{Eu}^{3+}$  activated  $\text{M}_2\text{Al}_2\text{SiO}_7$  ( $\text{M} = \text{Ca}, \text{Sr}, \text{Ba}$ ) phosphors are 23.77, 19.76, 14.19 nm, 27.38, 18.21 and 16.84 nm, respectively, using Scherrer formula. To confirm the elemental composition and presence of hydrated phase EDX and FTIR analysis were performed. Photoluminescence studies and Judd–Ofelt (J–O) analysis were done. Photoluminescence studies show that all the doped phosphors show intense red emission centered at 618 nm, 619 nm and 613 nm, when excited at 394 nm due to  $^5\text{D}_0 \rightarrow ^7\text{F}_J$  ( $J = 0, 1, 2, 3$ ) transition of  $\text{Eu}^{3+}$ . Calculated CIE coordinates of all the phosphors are very close to commercial phosphor  $\text{Y}_2\text{O}_3:\text{Eu}^{3+}$ . Calculated Judd–Ofelt (J–O) parameter reveals that  $\Omega_2$  is greater than  $\Omega_4$  and in all the three cases it is much greater for  $\text{Ba}_2\text{Al}_2\text{SiO}_7$ . Thus, these phosphors can act as potential candidate for novel red-light-emitting phosphor.

## 1 Introduction

In the present era of science and technology, various techniques are emerging day by day to make our life simpler. Of these technologies the one is lighting system, which is essential for the present day. Development of solid-state lighting has made a great revolution in this field which uses LED's, OLED's for lighting purpose. But now a day's various researchers get much attracted towards the development of WLED's because they have high efficiency, long after-glow and ecofriendly properties. Generally, WLED's can be developed by two ways, the first one is by combining the  $\text{Ce}^{3+}$ -doped YAG (most commonly used commercial yellow phosphor) with a InGaN blue LED chip while the second one is to introduce the UV LED chip coated with three colors (Red, Green and Blue), but there are several disadvantages of these two methods for generating WLED's: like color rendering index is not good, correlation color temperature is high and scarcity of red component [1–3]. Thus,

it is very essential to develop phosphor, which generate red component because it is the most essential component of white light-emitting diodes (WLED's) [4].

The main building blocks of phosphors are host matrix and activator. Therefore, for preparing the efficient phosphor the choice of host matrix and activator is the most important task. Besides sulfides and aluminates, silicate-based phosphors are used because they have high chemical stability and good water resistance properties [5]. The second most important point is the choice of activator. Mostly, rare earth ions act as a good activator because they have large number of energy levels and hence produce a wide emission in ultraviolet, visible and infrared region of electromagnetic spectrum. In order to generate the red-light emitting phosphor,  $\text{Eu}^{3+}$  is the widely used rare earth ion because it produces most intense emission peak in between 610 and 620 nm [4, 6]. Several works have been done on alkaline earth aluminosilicate phosphors. Guanghan Li et al. investigated luminescent properties of  $\text{Sr}_2\text{Al}_2\text{SiO}_7:\text{Ce}^{3+}, \text{Eu}^{2+}$ ; Photoluminescence and scintillation properties of  $\text{Ce}^{3+}$ -doped  $\text{Sr}_2\text{Al}_2\text{SiO}_7$  had reported by Taiki Ogawa et al. and Qi Ye et al. reported the long persistent and PSL properties of  $\text{Sr}_2\text{Al}_2\text{SiO}_7:\text{Eu}^{2+}/\text{Tm}^{3+}$  etc. [7–11], but no systematic studies have been made to compare all the three  $\text{M}_2\text{Al}_2\text{SiO}_7$  ( $\text{M} = \text{Ca}, \text{Sr}, \text{Ba}$ ) phosphors.  $\text{Ba}_2\text{Al}_2\text{SiO}_7$  is first time reported in this article.

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# Photoluminescence, Synthesis, Characterization of MgO Nanophosphors Influenced by Dy<sup>3+</sup> Ions Concentrations

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**Abstract** . The present paper reports the synthesis, characterization and photoluminescence (PL) studies of MgO:Dy<sup>3+</sup> nanoparticles. In this work, MgO:Dy<sup>3+</sup> nanophosphors were prepared through solution combustion synthesis method using magnesium nitrate as oxidizer and urea as a fuel. The as-obtained MgO:Dy<sup>3+</sup> nanomaterials were characterized by powder X-ray diffraction (XRD), energy-dispersive X-ray (EDX) analysis, Fourier transformation infrared (FTIR) spectroscopy, scanning electron microscopy (SEM), high resolution transmission electron microscope (HRTEM), photoluminescence (PL) spectra and afterglow curve analysis. The cubic structure of the MgO phosphors is confirmed by XRD analysis and crystalline size calculated by Scherer's formula using XRD data shows the nanocrystalline nature of the phosphor. No phase change is observed with increasing concentrations of Dy<sup>3+</sup> ions. The surface morphology of the prepared phosphors is determined by SEM, which shows a sphere-like structure and good connectivity of the grains. The confirmation of the nanocrystalline phosphors is examined by HRTEM analysis. The photoluminescence studies revealed that the emission spectra of the prepared phosphors shows the broad emission centered at 435 nm and 480 nm due to the transition arises from the 4f→5d defect band transition of Dy<sup>3+</sup> ions. The afterglow decay characteristics of different as synthesized MgO:Dy<sup>3+</sup> nanophosphors are conceptually described. This is the first reported that on the synthesis of nanocrystalline MgO:Dy<sup>3+</sup> materials by combustion method using urea as a fuel.

**Keywords** : X-ray diffraction, energy-dispersive X-ray, Fourier transformation infrared, high resolution transmission electron microscope, photoluminescence

## Introduction

II-VI semiconductor nanocrystals are recently developed class of nanomaterials whose unique photophysical properties are helping to create a new generation in the field of photonics and microelectronics. Owing to small size, nanoparticles show properties, which are surprisingly different from those of the bulk material. Since their properties can be engineered during synthesis and processing steps, the metal oxide nanomaterials are of great technological importance due to their grain size dependant properties. There are a number of methods for preparing nano-crystalline materials viz. Inert gas condensation, physical vapour deposition, laser ablation, chemical vapour deposition, sputtering, molecular beam epitaxial etc (Chowdhury et al., 2006; Cha and Cheng, 1981, Kumar and Kumar, 2008; Godowsky et al., 2001; Jun et al., 2004; Vosen and Kern, 1991). In addition there are a number of solution-chemistry routes also. Among the available solution-chemistry routes, the combustion technique is capable of producing the nanocrystalline powders of metal oxides at a lower calcinations temperature in a surprisingly short time. Generally the powder obtained by this technique has the highest degree of phase purity coupled with the improved powder characteristics like narrow particle size and better sinter ability (Kim et al., 2005; Hojrup et al. 2004). The very high amount of heat generated during combustion manifests in the form of either flame or fire and hence, the process is termed as auto-combustion process. MgO is an exceptionally important material for its wide applications in catalysis, refractory materials, paints, superconductor products and so on. Recently, much research has been focused on the fabrication and characterization of MgO nanostructures due to novel properties superior to their bulk counterparts, as well as promising utilizations in optics, electronics and microelectronics. A lot of work has been done to research on the synthesis of this compound and many crystal morphologies are reported (Kaviyarasu et al., 2011; Emena et al., 2010; Melgunov et al., 2003; Yang et al., 1996; Kondawar et al., 2006; Balamurugan et al., 2014; Mahamuni et al., 1993). Recently the observations on the optical absorption studies of nano size MgO powder indicate that the synthesized MgO is quite suitable for adsorption and dissociation of polar molecules, toxic waste remediation, etc. Further it is also noted that the synthesized MgO nano powder contains F- and M-defect centres, which are responsible for creating energy levels within the band gap (7.8 eV) of MgO (Liang et al., 1986; Tisone et al., 1975; Haubold et al., 1992). K.im et al. studied the effect of acetic acid addition to Magnesium methoxide on the stability of the precursor and the crystallization behaviour of sol-gel derived MgO nanosize powder (Mishakov et al., 2002). Additionally, Chowdery and Kumar have synthesized MgO with high degree of crystallinity and tubular morphology using magnesium acetate as a precursor (Kern et al., 1996). The aim of this work is to prepare MgO and cadmium doped MgO nanocrystals with different molar concentrations, study the effect of these dopants on the structural characteristics of MgO and correlate between the obtained structure characteristics and dielectric properties of the cadmium doped MgO nanocrystals. In the present study, the synthesis and micro structural characterization of MgO and Cd doped MgO nanoparticles synthesized by combustion method are discussed. Magnesium nitrate is used as an oxidizer and urea as fuel. The





# Predicting effect of Personality Traits and Age on Emotional Intelligence

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**Keywords:** Emotional Intelligence, Neuroticism, Extraversion, Structure equation model.

## Abstract

People who have high emotional intelligence create understanding or know how to manage their own emotions and they know how to read emotions of others. Emotional intelligence was positively connected to physical, psychosomatic and mental health. The studies on the predictors of emotional intelligence, particularly in India are limited. For this purpose focus of the present study was to investigate the predicting effect of personality traits (neuroticism & extraversion) on emotional intelligence among the student of Raipur, India. A sample of the study comprised 300 P.G. students (male=50; female=50). Mangal Emotional Intelligence Inventory and Eysenck's Maudsley Personality inventory (M. P. I.) were used to measuring emotional intelligence (EI) and personality traits. SPSS 16th version, structure equation model (SEM) with ADANCO, jamovi. (Version 1.0) were used for analysis. Measurement model was excellent fit in the samples [CFI = .968, TLI=0.904, SRMR=.033 and RMSEA = 0.11 (RMSEA 90% CI: Lower-0.0495, Upper-0.189)]. The findings revealed that personality traits, neuroticism emerged as significant predictors of emotional intelligent, intra personal awareness, inter personal awareness and inter personal management. Age emerged as significant predictors of emotional intelligent and its dimension. The findings also revealed that

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## JOURNAL ARTICLE

# Effect of computerized biofeedback relaxation on stress related physiological parameters

Mahendra Kumar, **Priyamvada Srivastava**, Manoj K Sahu and Saparya Tripathi

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## Abstract

Background: Mental health diseases such as insomnia, anxiety, stress and depression all have a close relationship with the autonomic nervous system. The physiological parameters of autonomic activity viz. galvanic skin resistance, electromyography, respiration and pulse rate can be regulated with the help of computerized biofeedback relaxation training. The main objective of this study was to see the effect of computerized biofeedback relaxation training on psychophysiological parameters of autonomic activity. Methods: In the present study 40 high stress post graduate students were selected. All participants were randomly divided into two group i.e. computerized biofeedback relaxation training (group-1) and placebo group (group-2). Forehead muscle tension, respiration rate, pulse rate and galvanic skin resistance were assessed, and inventories measuring stress were administered pre-randomization. Descriptive, Paired sample 't' test, F-test and Mann-Whitney U test were used to analyze the data with the help of SPSS 16 version. Results: Biofeedback group reported a significant change in muscle tension ( $p=0.27$ ), respiration rate ( $p=0.01$ ) and galvanic skin response ( $p=0.35$ ) after relaxation but at the same time control group reported moderate increase in muscle tension. Additionally, the computerized biofeedback group was able to maintain the stress level while the control group had a significant increase in the stress level over the 10 days of relaxation training. Conclusions: Biofeedback relaxation useful alternative therapy for management of stress and emotional disturbance in graduate students. During a stressful period this may also be helpful to promote overall psychological health.



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**ORIGINAL ARTICLE**

**PERSONALITY PROFILE AND PREVALENCE OF  
PSYCHOPATHOLOGY AMONG INSTITUTIONALISED YOUTH OF  
MAOIST CONFLICT REGIONS**

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**ABSTRACT**

**Background:** 16 out of 27 districts in Chhattisgarh state are in the grip of maoist insurgencies, due to which schooling of children is severely hampered, especially in dense forest areas. As a solution to this problem children are institutionalised under Nishkthha welfare scheme where they get education along with all other essential amenities.

**Aim:** Present study aimed at comparison of personality profile and prevalence of psychopathology of Nishkthha students with students who are residing with their families.

**Method:** All 36 high school students of Nishkthha scheme and randomly selected 36 high school students of state school aged 16-18 years were taken as sample. Clinical Analysis Questionnaire by Cattell was employed as assessment tool.

**Results:** t-test results show that experimental group is significantly high on Sensitivity, Shrewdness, Insecurity, Radicalism, Agitation, Anxious Depression, Guilt, Psychopathic deviation, Schizophrenia and Psychesthesia and low on Emotional stability.

**Conclusion:** Institutionalised students have more behavioural and emotional problems than non institutionalised students. Prevalence of psychopathology is also higher in these students.

**INTRODUCTION**

Armed conflict can be defined as, the use of armed violence to resolve local, countrywide or global differences between people and groups that have a political, financial, cultural or public cause (Mir et al., 2016). According to the data released by Govt of India in Feb 2016, 106 districts of 10 states in the country are affected by maoists insurgencies. Chhattisgarh is one of the most fatally affected states by maoist violence. 16 out of 27 districts of the state are officially declared as Maoist violence hit districts. According to ministry of home affairs, maoists desire to grab the residents in their tough holds and to disconnect them from the mainstream environment. To fulfil this intention, civilians are threatened, kidnapped and killed. The school buildings are



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# A STUDY ON ACADEMIC PERFORMANCE OF HIGHER SECONDARY SCHOOL STUDENTS BASED ON CULTURE, GENDER, MULTIPLE INTELLIGENCES AND STUDY HABITS

□ Mrs. Preeti Shukla\*  
Dr. Kamal Narayan Gajpal\*\*  
Dr. Meeta Jha\*\*\*

## ABSTRACT

The present study was aimed to study the academic performance of higher secondary school students based on culture, gender, multiple intelligences and study habits. To conduct the study, 1000 higher secondary school students from Chhattisgarh were selected as a sample. The sample comprises 500 boys and 500 girls with equal weight age being given to their tribal-non tribal belongingness. The age range of subjects was 16 to 18 years. The sample for this study was selected stratified random sampling. To assess the study habits of selected higher secondary school students, SHI-MS prepared by Mukhopadhyaya and Sansanwal (2005) and a scale constructed by Agarwal and Pal (2008) was used to assess multiple intelligences. Academic performance is measured by the obtained percentage of previous class examination (Board Examination). In the present study, the percentage was taken as the academic performance score. To predict the academic performance of secondary school students based on culture, gender, multiple intelligences and study habits, a stepwise regression was used. The criterion variable was academic performance while culture, gender, multiple intelligences and study habits were entered as an independent sample. The  $R^2$  for the final regression model was .530 which indicates that culture, multiple intelligence, gender and study habits accounted for 53% variance in academic performance of adolescent students from higher secondary students. Based on results, it was concluded culture, multiple intelligences, gender and study habits were predictors of academic performance and were able to create 53% variance on the dependent variable academic performance while other variables accounted for the remaining variance. It may also be concluded that the entire teaching-learning process should be designed carefully to achieve desired academic performance in higher secondary school students keeping the importance of culture, gender, study habits and multiple intelligences in a broad perspective.

**Keywords :** Academic performance, culture, gender, study habits, multiple intelligences

## INTRODUCTION

The entire teaching-learning process in most educational institutes is carried out to achieve academic excellence. This process also includes co-curricular activities. In India, academic performance/achievement carries a great value and that is why parents and teachers try their level best so that student can flourish in academics.

Academic performance is reflective of students qualitative and quantitative learning in a

given period. The academic performance is assessed across different academic subjects from which the students have chosen. This is typically done by either performance in the classroom or some standard assessment test. The conceptual framework of academic performance makes it complex. According to Caballero et al. (2007), the academic program refers to a set of goals or achievements of an educational program that the students are attending. Some noted educationists denoted academic performance as knowledge in specific

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# A Study on Effect of Social Networking Sites on the Self Esteem of Adolescent Girl Students of State of Chhattisgarh, India

By **Dr.Archana Verma**

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2021, Shodh Sanchar Bulletin, Vol 2, No. 4, 454-459

🔖 Education, Adolescent Education (Education), Self-Esteem, Academic Performance,  
Social Networking Sites

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Young generation has become a very frequent user of the Social Networking Sites (SNS) throughout the world today. Use of SNS is affecting the young people in many ways be it professional, social or the personal spheres of their lives. In the present paper the effect of SNS on the self-esteem of the adolescent schoolgirls of Chhattisgarh State is investigated. Multi-stage probability sampling is carried out among the girl students belonging to urban rural, and tribal areas of the State. Standard questionnaires, namely Rosenberg Self Esteem Scale and Facebook Intensity Scale are administered to collect the required data. The analysis finds that the self-esteem of adolescent girls using Facebook across locale and type of school is not significantly different. In other words, it can be deduced that use of Facebook by tribal girls has improved their self- ... [Read more](#)

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School of Regional Studies and  
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University Raipur

## “Studying about study habits among undergraduate students studying in college”

**Summary:** In view of the present circumstances the proposed minor research work, this problem is very important and burning in the field of education. The research work will help the teacher to give information about the educational results of the students studying in his college, and information related to the improvement in the educational results of the students with the low education results: The study habits of the graduate students studying in the college were surveyed.

**Study statement:** To study the study habits of undergraduate students studying in college.

**Objective:** 1) To study the study habits of the boys and girls studying in the college.

2) To study the study habits of boys and girls of undergraduate level arts and science faculty studying in college.

3) To study the study habits of graduate level boys and girls studying in government and non-government colleges.



## छत्तीसगढ़ राज्य के जनजातीय बच्चों में कुपोषण: एक तुलनात्मक अध्ययन (उत्तर बस्तर कांकेर जिला के अंतागढ़ तहसील के विशेष संदर्भ में)

अरखराम बघेल<sup>1</sup>, निस्तर कुजूर<sup>2</sup>

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### सारांश:-

विकासशील देशों में कुपोषण एक प्रमुख समस्या रही है, भारत देश भी इस समस्या से प्रारंभ से ही जुड़ा रहा है देश में मैदानी क्षेत्रों की तुलना में पहाड़ी एवं अन्दरूनी क्षेत्रों में यह समस्या और अधिक है। वर्तमान में तुलनात्मक रूप से देखें तो भारत में बच्चों की संख्या सर्वाधिक है। देश के विकास की कार्यसूची में बच्चों का विकास पहली प्राथमिकता है; ऐसा इसलिए नहीं कि ये सबसे अधिक असुरक्षित है, बल्कि इसलिए कि ये बच्चे हमारी सर्वोत्तम परिसंपत्ति है। हमारे देश के भविष्य की मानव संसाधन शक्ति है। विश्व स्वास्थ्य संगठन की एक रिपोर्ट के अनुसार-55 प्रतिशत शिशुओं की मृत्यु का कारण प्रत्यक्ष व अप्रत्यक्ष रूप से कुपोषण है। यह कुपोषण जनजातीय बच्चों में देखें तो और भी चुनौतिपूर्ण है। भारत में जनजातीय क्षेत्र के बच्चों में आईसीडीएस कार्यक्रम वयस्क होते बच्चों में कुपोषण; दुर्बलता; रूग्णता; और मृत्यु के दोषपूर्ण चक्र को तोड़ना आज भी चुनौती बना हुआ है। प्रस्तुत अध्ययन छत्तीसगढ़ के उत्तर बस्तर कांकेर जिला के अंतागढ़ तहसील पर आधारित है, यह बस्तर संभाग के जनजातीय बाहुल्य क्षेत्र में से एक है।

कुजी शब्द: जनजाति, बच्चों, कुपोषण, पोषाहार, शिशु मृत्यु दर।

### प्रस्तावना:-

किसी भी राष्ट्र का भविष्य उस देश के सभी बच्चों को जीवन रक्षा, विकास, संरक्षण और भागीदारी का अधिकारी दिलाने पर निर्भर होता है। शिशु कुपोषण विश्व में खास तौर से भारत में सबसे बड़ी समस्याओं में से एक है; क्योंकि जीवन के प्रारंभ के वर्ष मानसिक व शारीरिक विकास की दृष्टि से महत्वपूर्ण है और बच्चों को जीवन पर्यन्त स्वास्थ्य समस्याओं जैसे- अंधापन; कमजोर अस्थि संरचना; बौद्धिक क्षमता में कमी के साथ कई और परिणामों का सामना करना पड़ता है। बाल्यायावस्था का कुपोषण एक व्यापक समस्या है; जो अनेक कारकों के संयोजन से उत्पन्न होती है। जिसमें अपर्याप्त अथवा अनुपयुक्त अहार लेना बाल्यायावस्था की बीमारियों; बच्चों की देखभाल के नुकसानदेह तरीके तथा बीमारी के दौरान अनुपयुक्त देखभाल ये सब खराब स्वास्थ्य और प्रति वर्ष लाखों लोगों की मृत्यु का कारण बनते हैं। यह जीवन के उत्तरवर्ती वर्षों में रूग्णता के जोखिम एवं मृत्यु के जोखिम को प्रभावित करता है।



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## भारत में कोरोना माहामारी नियंत्रण की नीति एवं जनजीवन पर प्रभाव: समाजशास्त्रीय विश्लेषण

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## A STUDY ON THE EFFECTIVENESS OF A COMMUNITY BASED OBSERVATION OF DIRECTLY OBSERVED TREATMENT (DOT)

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<b>Abstract</b>	<i>Tuberculosis (TB) is an infectious disease usually caused by Mycobacterium tuberculosis (MTB) bacteria tuberculosis generally affects the lungs, but can also affect other part of the body. Awareness of Directly Observed Treatment (DOT) for Tuberculosis, The analysis of study 45 patients with Tuberculosis aged more than 25 years was carried out Village-Kanchanpur,, Block &amp; Teh.-Baikunthpur,, District - Korea, State - Chhattisgarh for a period of 3 months from (1<sup>st</sup> October 2018 to 30<sup>th</sup> December 2018) The score of patients there was significant difference score according to sex, socioeconomic status, occupation, statistically significant difference in quality of life score was not seen with respect to age, locality, religion, marital status, type of family, educational status, occupation, alcohol intake, smoking, diet. Our study finding how that community Directly Observed Treatment (DOT) was more effective than other treatment in terms of tuberculosis patients. The treated by Directly Observed treatment (DOT) have excellent cure rates with lesser default rates.</i>
<b>Keywords</b>	<i>Tuberculosis, DOT, CBO</i>

### INTRODUCTION

According to the World Health Organization (WHO), one-third of the world's population is currently infected with the tuberculosis bacillus (WHO Fact sheet No. 104 Revised March 2007). World Health Organization estimates that 9.27 million new cases of tuberculosis occurred in 2007 (139/100,000 population) compared with 9.24 million new cases (140/100,000 population) in 2006 (WHO/HTM/TB/2006.362). Of these 9.27 million new cases, 44% or 4.1 million (61/100,000 population) were smear-positive cases. India, China, Indonesia Nigeria and South Africa rank first to fifth in terms of the total number of incident cases. The report further states that of the 15 countries with the highest estimated tuberculosis incidence rates remains the most common opportunistic infection and leading cause of death in people living with Human Immunodeficiency Virus (HIV) in low and middle income countries (Joint United Nations Program on HIV/AIDS (UNAIDS). In 2007, approximately 14 million people were co-infected with TB and HIV1 worldwide and 70% of these people live in Africa. In some African countries, up to 75% of TB patients are co-infected with HIV and affected by the Acquired Immune Deficiency Syndrome (AIDS).

According to the World Health Organization, the global estimated number of HIV and tuberculosis or infected cases and deaths are now substantially higher than in previous years, HIV-related immune suppression involves much more than treatment with antiretroviral therapy as people living with HIV/AIDS are at an increased risk of a broad range of debilitating and life-threatening conditions. As a result of the synergistic relationship between HIV and tuberculosis, all people living with HIV/AIDS should be screened for active tuberculosis. After excluding active tuberculosis, it is recommended that treatment of latent tuberculosis infection with a 6 to 9 months course of preventive therapy should be considered for all people living with HIV/AIDS.

Tuberculosis (TB) is an infectious disease usually caused by *Mycobacterium tuberculosis* (MTB) bacteria tuberculosis generally affects the lungs, but can also affect other parts of the body. Most infections do not have symptoms, in which case it is known as latent



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### RESEARCH ARTICLE

## बच्चों के व्यक्तित्व विकास पर सोशल मीडिया का प्रभाव

**डॉ. हेमलता बोरकर वासनिक**

सहायक प्राध्यापक समाजशास्त्र वा समाज कार्य अध्ययनशाला, पं. विशंकर शुक्ल विश्वविद्यालय,  
रायपुर.

\*Corresponding Author E-mail: hemlataborkar@gmail.com

### **ABSTRACT:**

आज का युग सोशल मीडिया का युग है इस मीडिया ने पुरे भारतीय समाज पर प्रभाव डाला है, इस प्रभाव से बच्चे भी अछूते नहीं हैं। आज के बच्चे का सबेरा कार्टून चैनल से प्रारंभ होता है एवं रात भी कार्टून चैनल से समाप्त होता है। बच्चे अपने माता-पिता या नाना-नानी, दादा-दादी, मामा-मामी या परिवार के अन्य सदस्यों के साथ समय बिताने की अपेक्षा कार्टून चैनल के साथ समय बिताना पसंद कर रहे हैं उन्हें परिवार के अन्य सदस्यों के साथ कोई आचार-व्यवहार करना पसंद नहीं है वे अपनी कार्टून चैनल की दुनिया में इतने अधिक व्यस्त हैं कि उन्हें न खुद को क्या करना है, की परवाह है न दूसरों कि टेलीविजन एवं मोबाईल्स पर आने वाले कार्टून चैनलों ने इन पर इतना अधिक प्रभाव डाला है कि ये अपना खाना-पीना भी भूल जाते हैं। कार्टून चैनल पर दिखाई जाने वाले एपिसोड ने उनके व्यवहार एवं नैतिकता को बुरी तरह से प्रभावित किया है बच्चे न अपने माता-पिता की सुनते हैं और न ही किसी अन्य सदस्य की। इन चैनलों के कारण इनके व्यक्तित्व का विकास अवरुध हो रहा है प्रस्तुत शोध पत्र द्वितीयक तथ्यों पर आधारित है, इसमें बच्चों के व्यक्तित्व पर सामाजिक मीडिया के प्रभाव को बतलाने का प्रयास किया गया है।

**KEYWORDS:** वीडियो गेम्स, टेलीविजन, कम्प्यूटर, मोबाईल, कार्टून चैनल्स, वाट्सअप एवं फेसबुक।

### **प्रस्तावना :-**

भारत की जनगणना 2011 के अनुसार भारत में करीब 27.5 प्रतिशत जनसंख्या 0-14 वर्ष के बच्चों का है। कुल आबादी के एक-तिहाई बच्चों को आज कई प्रकार की परेशानियों से घिरा हुआ माना जा सकता है।

ये बच्चे अब अकेले समय व्यतीत करना पसंद कर रहे हैं, कारण है सोशल मीडिया का इन पर हावी होना। वर्तमान में माता-पिता द्वारा अपने बच्चों को कुछ देर भांत रखने के लिए टेलीविजन पर कार्टून चैनल, वीडियो गेम्स दिखाना महंगा पड़ रहा है। ये माता-पिता बच्चों को यदि अपने माता-पिता या रिश्तदारों के साथ रखते तो भायद बच्चों पर इसकी लत नहीं लगती आज के बच्चे कार्टून चैनल्स, वीडियो गेम्स, यू ट्यूब पर फिल्में देखने के आदी हो गये हैं इस आदत ने इन्हें अपनों से अलग कर दिया है। बच्चे न अपने माता-पिता की सुनते हैं, न अपने किसी सदस्य की परिणामस्वरूप बच्चों का यह

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## A Comparative Analysis of Socio-Economic Status of Muria Tribe With Special Reference to Bastar District of Chhattisgarh

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### ABSTRACT

The Muria are scheduled tribe of Bastar district of Chhattisgarh, India. The Muria is a prominent tribe of Chhattisgarh. They are economically homogenous and strive to work collectively. This research paper is to compare and analyze socio-economic status of Muria tribe nearest distance (0-15 km) to Lohandiguda block and farthest distance (16-30 km) from Lohandiguda block of Bastar district of Chhattisgarh. The objectives of the research paper are to compare and analyze socio-economic status. The present research paper was based on primary and secondary data. The present research paper was conducted in 6 villages of Bastar district of Chhattisgarh. The sample size of the study is 300 Muria respondents (150 respondents from nearest distance + 150 respondents from farthest distance) and purposive sampling was used. In this research paper mean, percentage and Kuppaswamy's Socio Economic Status Scale (2019) was implemented. Results shows that average age of respondents is 45 years, socio-economic status of Muria tribe belong upper lower class for nearest, farthest and overall distance as per Kuppaswamy's Socio Economic Status Scale Chhattisgarh.

**KEYWORDS:** Socio-economic, Muria tribe, Bastar district.

## नक्सल प्रभावित क्षेत्र की जनजातियों पर कोविड-19 लॉकडॉउन का प्रभाव (कांकेर जिले के दुर्ग कोंदल विकासखण्ड के विशेष संदर्भ में)

डॉ. हेमलता बोरकर वारानिक

सहायक प्राध्यापक

समाजशास्त्र एवं समाज कार्य अध्ययन शाला

पंडित रविशंकर शुक्ल विश्वविद्यालय रायपुर

संपूर्ण विश्व अनेक प्रकार की समस्याओं से जूझ रहा है। कोविड-19 समकालीन समाज की सबसे बड़ी समस्या है इसी कारण विश्व स्वास्थ्य संगठन ने इसे वैश्विक माहामारी घोषित किया है। कोविड-19 ने जब से पूरे देश में दस्तक बोला है तब से यह संपूर्ण विश्व के लिये चुनौती बन चुका है। इस माहामारी की संख्या लगातार बढ़ती जा रही है। भारत में 31 जुलाई 2020 की स्थिति में लगभग 17 लाख से अधिक कोरोना केस दर्ज हो चुके हैं तथा मरने वालों की संख्या 36 हजार के आसपास है।

सार – संपूर्ण विश्व अनेक प्रकार की समस्याओं से जूझ रहा है। कोविड-19 समकालीन समाज की सबसे बड़ी समस्या है इसी कारण विश्व स्वास्थ्य संगठन ने इसे वैश्विक माहामारी घोषित किया है। कोविड-19 ने जब से पूरे देश में दस्तक बोला है तब से यह संपूर्ण विश्व के लिये चुनौती बन चुका है। इस माहामारी की संख्या लगातार बढ़ती जा रही है। भारत में 31 जुलाई 2020 की स्थिति में लगभग 17 लाख से अधिक कोरोना केस दर्ज हो चुके हैं तथा मरने वालों की संख्या 36 हजार के आसपास है। छत्तीसगढ़ राज्य में भी कोरोना केस की संख्या निरंतर बढ़ती जा रही है। 31 जुलाई 2020 की स्थिति में छ.ग. राज्य में कुल कोरोना पीड़ितों की संख्या 9642 है तथा मरने वालों की संख्या 54 हो चुकी है। छ.ग. राज्य के लगभग सभी जिलों में कोरोना फैल चुका है। अध्ययन क्षेत्र के जिले कांकेर में कोविड-19 की संख्या 90 के आसपास है। दुर्गकोंदल विकासखण्ड में कोरोना पीड़ित व्यक्तियों की वर्तमान में एक भी नहीं है। दुर्गकोंदल विकासखण्ड एक जनजातीय बाहुल्य क्षेत्र है। दुर्गकोंदल की जनजातियाँ सामान्यतः कृषि, पशुपालन तथा वनोपज संग्रहण का कार्य करती हैं। यहाँ के जनजातियों की शैक्षणिक स्थिति निम्न है। ये जनजातियाँ काफी पिछड़ी हुई हैं जिसके कारण अभी तक इसका सामाजिक-आर्थिक एवं शैक्षणिक विकास नहीं हो पाया है। कोविड-19 से संपूर्ण विश्व प्रभावित हुआ है। कोविड-19 का जनजातियों की सामाजिक-आर्थिक एवं शैक्षणिक स्थिति पर क्या प्रभाव पड़ा है? प्रस्तुत आलेख में इसे बतलाने का प्रयास किया गया है। प्रस्तुत आलेख प्राथमिक एवं अनुभवजन्य तथ्यों पर आधारित है।

शब्द कुंजी – जनजाति, कोविड-19, सामाजिक-आर्थिक एवं शैक्षणिक प्रभाव ।

प्रस्तावना :-

कोविड-19 समकालीन समाज की सबसे बड़ी वैश्विक समस्या है। कोविड 19 माहामारी ने संपूर्ण समाज को प्रभावित किया है लेकिन सर्वाधिक रूप से इसने निम्न सामाजिक-आर्थिक स्थिति वाले व्यक्तियों को प्रभावित किया है। 31 जुलाई 2020 की स्थिति में संपूर्ण विश्व में कोविड-19 के केसों की संख्या 17 करोड़ के लगभग है तथा कोविड-19 के कारण जान गवाने वालों की संख्या 6 लाख के लगभग है। भारत देश में कोरोना-19 से पीड़ित व्यक्तियों की संख्या लगातार बढ़ती जा रही है तथा मरने वालों की संख्या में भी वृद्धि होती जा रही है। आज की स्थिति में भारत के लगभग 31 राज्य कोविड 19 से प्रभावित हैं। भारत में कोविड-19 का प्रथम केस मार्च में आया था। विश्व स्वास्थ्य संगठन ने संपूर्ण देश में बढ़ते इसके प्रभाव को देखते हुए 12 मार्च 2020 को कोविड 19 को वैश्विक माहामारी घोषित किया। भारतीय आयुर्विज्ञान अनुसंधान परिषद (2020) की रिपोर्ट के अनुसार – एक कोरोना पॉजिटिव मरीज 1 महीने में 406 लोगों को संक्रमित कर सकता है यदि उसे बिना आइसोलेशन में रहने दिया जाए तो इसलिए कोविड-19 मरीज को आइसोलेशन में रखा जाता है तथा जाने अनजाने कोई भी व्यक्ति करीब ना आ पाए इसलिए सरकार लॉकडाउन का पालन करवाती है। कोविड-19 की स्थिति को नियंत्रित करने हेतु ICMR ने लोगों से शारीरिक संपर्क न रखने को कहा गया है जिसके अंतर्गत लोगों से हाथ मिलाने, सामाजिक समारोह या अन्य प्रकार के समारोह पर प्रतिबंध लगाया गया



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**Relevance of Marxist Approach in the  
Study of Indian Society**

***Dr. Hemlata Borkar Wasnik* \* &  
*Satish Kumar Borkar* \*\***

**Abstract**

*Karl Marx's thinking and philosophy - collectively known as "Marxism" - has shaped human societies in significant ways, specifically through spread of communism and socialism across many countries.*

*It has been more than a hundred years since Marx propounded his views on capitalism and resulting inequality, and yet they remain relevant. India, since its independence, has seen periods of high growth since economic liberalisation. Yet, a large section of Indian society lives in poverty. It is natural to ask if Marxist approach is relevant in understanding and addressing the issues of inequality in Indian societies. It can be argued that communism in general and Marxism in particular, has had only a limited influence in Indian context.. This article attempts to present a more balanced view of relevance of Marxist approach in Indian society.*

**Keywords:** *Karl Marx, Industrialization, Mechanization, Exploitation, Revolution, and Development.*

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## जनजातियों की सामाजिक: आर्थिक स्थिति पर नक्सलवाद का प्रभाव

हेमलता बोरकर वासनिक

सहायक प्राध्यापक, समाजशास्त्र एवं समाज कार्य अध्ययन शाला, पंडित रविशंकर शुक्ल विश्वविद्यालय रायपुर, छत्तीसगढ़, भारत

### सारांश

भारत एक विशाल जनसंख्या बाहुल्य देश है। यहां पर विविध समुदाय के लोग निवास करते हैं। भारत की कुल जनसंख्या का 8.6 प्रतिशत भाग जनजातियों का है ये जनजातियाँ सुदूर घने जंगलों एवं पहाड़ी क्षेत्रों में निवास करती हैं। छ.ग. राज्य भी एक जनजाति बाहुल्य राज्य है। यहां लगभग 7.8 प्रतिशत जनजाति निवास करती हैं। यहां की अधिकांश जनजातियाँ ग्रामीण क्षेत्रों में निवास करती हैं। बस्तर संभाग के कांकेर जिले के दुर्गकोंदल विकासखंड के अंदर निवास करने वाली जनजातियाँ सुदूर घने पहाड़ी क्षेत्रों में निवास करती हैं। बस्तर संभाग का यह क्षेत्र नक्सल प्रभावित क्षेत्र के अंतर्गत आता है। भारत में नक्सलवाद शब्द की उत्पत्ति पश्चिम-बंगाल से हुई थी 1967 में चारु मजूमदार एवं कानू सान्याल के द्वारा इस शब्द का प्रयोग किया गया था। मार्क्सवादी एवं लेनिनवादी विचारों से प्रभावित होकर चारु मजूमदार ने सामाजिक असमानता के विरोध में 1969 में कम्यूनिस्ट पार्टी का गठन किया था। कम्यूनिस्ट पार्टी के गठन का मुख्य उद्देश्य जनजातियों को जमींदारों के शोषण से बचाना था तथा उनके सामाजिक अस्तित्व को बनाए रखना था। प्रारंभ में छोटे-छोटे किसान एवं मजदूर अपनी गिरवी जमीन को छुड़वाने के लिए हथियारबंद नक्सलवादी विचारधारा को अपनाया करते थे। सन् 1972 में चारु मजूमदार की मृत्यु के पश्चात् इसने हिंसा का रूप ले लिया। आज नक्सलवाद एक बड़ा संगठन बनकर उभर कर आया है।

छत्तीसगढ़ राज्य में नक्सलवाद का उदय 2003 से माना जा रहा है। छत्तीसगढ़ राज्य का सर्वाधिक नक्सल प्रभावित क्षेत्र बस्तर संभाग है। यहां अक्सर नक्सली वारदात होते रहते हैं और इसका सीधा प्रभाव जनजातियों की सामाजिक-आर्थिक स्थिति पर पड़ता है। छत्तीसगढ़ के बस्तर संभाग में नक्सलवाद के उदय होने का कारण बहुराष्ट्रीय कंपनियों का विरोध करना है क्योंकि इन कंपनियों के खुलने से संपूर्ण जनजाति समाज प्रभावित होने वाला था। नक्सलवादी संगठनों का उदय होने के पीछे अन्य कारण जनजातीय समुदाय के जीविकोपार्जन के साधनों पर बहुराष्ट्रीय कंपनियों के आधिपत्य को हटाने के लिए नक्सलवादी संगठनों का उदय होना माना जाता है परंतु वर्तमान में नक्सलवादी संगठनों का दहशत इतना अधिक बढ़ गया कि लोगों का जीना दूभर हो गया है। प्रस्तुत शोध आलेख में जनजातियों के सामाजिक-आर्थिक स्थिति पर नक्सलवाद के प्रभाव का अध्ययन किया गया है। यह शोध आलेख प्राथमिक तथ्यों पर आधारित है। प्राथमिक तथ्यों का संकलन साक्षात्कार-अनुसूची उपकरण के माध्यम से किया गया है।

मूल शब्द: जनजाति, नक्सलवाद, सामाजिक-आर्थिक प्रभाव

### प्रस्तावना

भारत एक विशाल देश है। 2011 की जनगणना के अनुसार यहां की कुल जनसंख्या 121 करोड़ है। इनमें से 10.04 प्रतिशत आबादी जनजातियों की है अर्थात् कुल जनसंख्या का 8.6 प्रतिशत भाग जनजातियों का है। भारत की अधिकांश 89.97 प्रतिशत जनजातियाँ ग्रामीण क्षेत्रों में एवं केवल 10.3 प्रतिशत जनजातियाँ शहरी क्षेत्रों में निवास करती हैं। छत्तीसगढ़ राज्य में जनजातियों का प्रतिशत 7.8 है।

छत्तीसगढ़ राज्य के अधिकांश जनजातियाँ बस्तर संभाग में निवास करती हैं। बस्तर संभाग के अंतर्गत कांकेर जिला के विकासखंड दुर्गकोंदल को भी शामिल किया गया है। दुर्गकोंदल विकासखंड एक जनजाति बाहुल्य विकासखंड है। ये जनजातियाँ घने सुदूर जंगलों एवं पहाड़ी क्षेत्रों के बीच अपना जीवन यापन कर रही हैं। इन क्षेत्रों में लगभग 10 वर्षों से नक्सलवाद की घटनाएँ घटित होती जा रही हैं। इन क्षेत्रों के जनजातियों पर नक्सलवाद के प्रभाव को देखने के लिए यहां के जनजातीय समुदाय से तथ्यों का संकलन किया गया है। नक्सलवाद वर्तमान समय की सबसे बड़ी चुनौती है। नक्सलवाद की घटनाओं को सुनने पर लगता है कि इसने लाल आतंक को बढ़ावा दिया है, क्या सचमुच में नक्सलवाद ने जनजाति समुदाय को नुकसान पहुंचाया है? इस प्रश्न का उत्तर तभी मिल सकता है। जब यहाँ के समुदाय के लोगों से तथ्यों का संकलन किया जाए। प्रस्तुत अध्ययन इस दिशा में एक प्रयास कहा जा सकता है।

अध्ययन का उद्देश्य - जनजातियों की सामाजिक-आर्थिक स्थिति पर नक्सलवाद के प्रभाव को ज्ञात करना।

अध्ययन पद्धति - अध्ययन पद्धति को चार भागों में वर्गीकृत किया गया है।

(अ.) अध्ययन क्षेत्र का संक्षिप्त परिचय- छत्तीसगढ़ राज्य में कुल 27 जिले हैं। कांकेर जिला छत्तीसगढ़ राज्य का 15वाँ जिला है पूर्व में यह बस्तर जिले के अंदर सम्मिलित था। वर्तमान में इसे एक स्वतंत्र जिला घोषित कर दिया गया है। यह बस्तर संभाग का सबसे बड़ा शहर है। कांकेर जिला के अंतर्गत सात विकासखंडों को शामिल किया गया है। दुर्गकोंदल विकासखंड इनमें से एक है। अध्ययन क्षेत्र राउलवाही एवं पेंडावरी ग्राम पंचायत दुर्गकोंदल विकासखंड से 15 किलोमीटर की दूरी पर स्थित है। राउलवाही की कुल जनसंख्या 1044 है इनमें 916 जनजाति परिवार हैं। पेंडावरी की कुल जनसंख्या 622 है तथा यहां जनजाति परिवार की संख्या 436 है।

(ब.) उत्तरदाताओं का चयन- प्रस्तुत अध्ययन हेतु राउलवाही से 40 तथा पेंडावरी से 20 अर्थात् कुल 60 उत्तरदाताओं का चयन उद्देश्यपूर्ण विदर्शन के द्वारा किया गया है।

(स.) तथ्य संकलन हेतु प्रयुक्त उपकरण एवं प्रविधि- प्रस्तुत अध्ययन प्राथमिक स्रोतों एवं अनुभवजन्य तथ्यों पर आधारित है। प्राथमिक तथ्यों के संकलन हेतु साक्षात्कार-अनुसूची उपकरण का





## महात्मा गांधी के समाजवादी व मानवतावादी विचारों का विश्लेषण

हेमलता बोरकर वासनिक

सहायक प्राध्यापक, समाजशास्त्र अध्ययनशाला, पं. विशंकर शुक्ल विश्वविद्यालय, रायपुर, छत्तीसगढ़, भारत

### सारांश

समाजवादी एवं मानवतावादी विचारों की अवधारणा एक व्यापक अवधारणा है इसके अंतर्गत लैंगिक समानता, समानाधिकार समावेशी विकास, आर्थिक समानता एवं सदाचार पूर्ण व्यवहार को रखा जा सकता है। स्वतंत्रता प्राप्ति के पूर्व देश में काफी असमानताएं थी रंगभेद, जातिवाद, छूआछूत, लैंगिक भेदभाव, शोषणिक असमानता से जुड़ी घटनाएं आम बात थी जिसके कारण से एक वर्ग विशेष लोगों का ही समाज पर प्रभुत्व था तथा समाज दो वर्गों में बंट गया था शोषक एवं शोषित वर्ग। इससे समाज में काफी हिंसक घटनाएं घटित होती थी तथा उन घटनाओं का विरोध करने की किसी में हिम्मत भी नहीं होती थी, और लोग चुपचाप भय के कारण घटना का सामना करते थे। उस समय न्याय व्यवस्था एक दम जटिल थी केवल विशेष वर्ग का व्यक्ति ही इसका लाभ ले सकता था, आम व्यक्तियों के लिए न्याय व्यवस्था का कोई महत्व नहीं था। इन विसंगतियों को जब सामाजिक कार्यकर्ताओं जैसे राजाराम मोहन, ईश्वर चंद्र विद्यासागर, केसवचंद्र सेन, डॉ. भीमराव अम्बेडकर, महात्मा गांधी एवं रानाडे, सरदार वल्लभभाई पटेल, स्वामी दयानंद सरस्वती ने एक साथ मिलकर इन विसंगतियों को समाज से दूर करने का प्रयास किया। महात्मा गांधी ने सामाजिक उत्थान से संबंधित कई कार्य किए जिनमें से स्वदेशी वस्तुओं के उपयोग, सामाजिक अस्पृश्यता की रोकथाम, महिला शिक्षा, महिला सशक्तिकरण एवं जन स्वाधिनता से संबंधित कार्य हैं। इसके अलावा मानवतावाद एक समाजवाद पर भी इन्होंने कार्य किए हैं।

प्रस्तुत अध्ययन में गांधी जी के समाजवादी एवं मानवतावादी विचार धाराओं का विश्लेषण करने का प्रयास किया है। प्रस्तुत शोधपत्र द्वितीयक स्त्रोतों पर आधारित है।

मूल शब्द: समानता, स्वतंत्रता, सामाजिक न्याय, अहिंसा एवं मानवता

### प्रस्तावना

महात्मा गांधी एक सामाजिक विचारक, समाजसेवक एवं दार्शनिक थे। सामाजिक विचारक एवं दार्शनिक होने के कारण इन्होंने सामाजिक विकास हेतु समाजवादी एवं मानवतावादी विचारों का सुत्रपात किया। इनका मनना था कि जब तक समाज से असमानता, अराजकता एवं शोषण का अंत नहीं होगा तब तक समाज का विकास होना असंभव है, इसलिए इन्होंने जमींदारी प्रथा, मालगुजारी प्रथा अस्पृश्यता, लैंगिक शोषण एवं वर्ग भेद को दूर करने के लिए अथक प्रयास किया, इस हेतु आंदोलन किया एवं अनशन पर बैठे। इनके आंदोलन का केवल एक मकसद होता था, वर्गभेद, लैंगिक असमानता, महिला शोषण एवं विदेशी वस्तुओं का विरोध करना। वे महिला शिक्षा, सामाजिक एवं लैंगिक समानता के पक्ष-धर थे वे कुटीर उद्योगों के विस्तार एवं स्वदेशी वस्तुओं के उत्पादन एवं उपभोग को बढ़ावा देना चाहते थे इस हेतु इन्होंने चरखा का प्रचार प्रसार किया तथा खादी वस्त्रों के उपभोग को प्रोत्साहित किया।

गांधी जी का सामाजिक विकास में बहुत अधिक योगदान है, इन्होंने समाज के हर तबके के व्यक्तियों के लिए उनकी सामाजिक-आर्थिक दशा सुधारने के लिए अथक प्रयास किये। इन्होंने कार्ल मार्क्स के मार्क्सवादी चिंतन एवं आंबेडकर के समाजवादी विचारों को सामाजिक विकास का आधार स्तंभ माना है। इन्होंने न केवल पूंजीवादी अर्थव्यवस्था का विरोध किया है अपितु आधुनिक सभ्यता का भी विरोध किया। वे मशीनीकृत उत्पादन कार्य के विरोधी थे इसलिए इन्होंने चरखा को अपनाया और खादी के वस्त्रों का स्वयं उत्पादन करने लगे। महात्मा गांधी स्वावलंबी बनने को कहते थे, उनका मानना था कि यदि ग्रामों में लोग स्वयं के द्वारा अपनी जरूरतों को पूरा करने हेतु उत्पादन का कार्य करेंगे तो ग्रामीण बेरोजगारी दूर होगी तथा समाज का विकास होगा। गांधी जी सदैव समाजवादी एवं मानवतावादी विचारों पर चलने को आग्रह किया करते थे।

उद्देश्य-प्रस्तुत शोध पत्र में गांधी जी के समाजवादी एवं मानवतावादी विचारधाराओं की विवेचना की गयी है।

अध्ययन पद्धति- समाजवादी एवं मानवतावादी विचारधाराओं का विश्लेषण द्वितीयक तथ्यों पर आधारित है, इसके लिए उपलब्ध साहित्य, पुस्तकों एवं समाचार पत्रों से प्राप्त द्वितीयक सामग्री का विश्लेषण किया गया है।

समाजवादी व मानवतावादी विचारों का विश्लेषण - गांधीजी ने समाजवादी विचारों का सामाजिक परिप्रेक्ष्य में विश्लेषण किया उनके अनुसार समाजवादी विचार वह है जिसमें प्रत्येक व्यक्ति के लिए जीवन की अनिवार्य मूलभूत आवश्यकता को प्राप्त करने के तरीके सम्मिलित होते हैं इन तरीकों के मदद से आम आदमी अपनी आवश्यकताओं की पूर्ति सरलता एवं सहजता से कर लेता है। समाजवादी समाज की स्थापना होने से संपत्ति का समान वितरण हो सकेगा इससे कोई भी व्यक्ति न अधिक संपन्न होगा और न ही अधिक गरीब सबको जीविकोपार्जन करने के लिए अनिवार्य वस्तुएँ आसानी से उपलब्ध हो जाएंगी इससे समाज से ऊंच-नीच का वर्गभेद मिटेगा तथा समाज में समानता की स्थिति उत्पन्न होगी। गांधी जी ने समाज में हर वर्ग को समानाधिकार मिलने की बात कही है, उनका कहना है कि इस पृथ्वी में सभी व्यक्तियों में एक समान रंग का रक्त का प्रवाह होता है। सभी में किसी न किसी प्रकार की बौद्धिक क्षमता जरूर पायी जाती है तथा उसका उपयोग उनकी बुद्धि के अनुकूल करना चाहिए। गांधी जी ने सभी वर्गों को समान अधिकार दिलाने के लिए अहिंसात्मक तरीकों का प्रयोग किया तथा वे इस प्रयोग में सफल भी हुए यही कारण है कि समाज में अब सभी व्यक्तियों को ऐसे अधिकार देने की बात कही गयी है।

जॉन रस्किन की रचना अन टू दिस लास्ट के द्वारा गांधी जी ने सर्वोदय आंदोलन की चर्चा की थी सर्वोदय आंदोलन का मुख्य उद्देश्य समाज के प्रत्येक व्यक्ति के उन्नति एवं विकास से है। इन्होंने सत्य एवं अहिंसा के माध्यम से सर्वोदय का सिद्धांत दिया। गांधी जी बुनियादी शिक्षा के पक्षधर थे। महिला सशक्तिकरण को बढ़ावा देने के लिए इन्होंने महिला कौशल योजना को प्रोत्साहित किया इन्होंने मानवाधिकार संबंधी विचारों की नींव रखी। इनकी विचारधारा के प्रशंसकों में मार्टिन लूथर किंग, दलाईलामा, नेलसन मंडेला आनसान सूकी एवं बराक ओबामा

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## जनजातीय क्षेत्र में नक्सलवाद के प्रभाव का समाजशास्त्रीय अध्ययन (छत्तीसगढ़ राज्य के कांकेर जिले के दुर्गकोंदल विकासखण्ड के विशेष संदर्भ में)

□ डॉ. हेमलता बोरकर वासनिक

भारत विविधताओं भरा देश है यहाँ विभिन्न जाति, समुदाय

जनजातियों अपने कठोर कार्यों एवं संस्कृति को विद्यमान

एवं धर्म के लोग निवास करते हैं।

भारत अपनी इसी विविधताओं

भरी संस्कृति के कारण संपूर्ण विश्व

में प्रसिद्ध है। भारत की विविधताओं

को दर्शाने में यहां की जनजातीय

संस्कृति की भी बहुत बड़ी भूमिका

है। भारत में कुल जनसंख्या का

लगभग 6 प्रतिशत जनजातियाँ

निवास करती हैं। छत्तीसगढ़ राज्य

में लगभग 8 प्रतिशत जनजातियाँ

निवास करती हैं। वस्तर संभाग

का एक जिला कांकेर है, जिसका

दुर्गकोंदल विकासखण्ड जनजाति

बाहुल्य वाला क्षेत्र है। ये जनजातियाँ

वर्तमान में नक्सल प्रभावित क्षेत्र

के अंतर्गत आती हैं। छत्तीसगढ़

राज्य में 1980 के दशक में

नक्सलवाद का उदय सरगुजा एवं

वस्तर में हुआ। छ.ग. राज्य के

जनजातीय क्षेत्रों का उपयोग

माईनिंग (खदान) एवं उद्योग की

स्थापना हेतु किया जाने लगा है

इससे जनजातियों का कृषि भूमि

का अधिग्रहण हो रहा है।

छत्तीसगढ़ राज्य में 2005 के पूर्व

नक्सल प्रभावित जिलों की संख्या

10 थी जो बढ़कर वर्तमान में 18

हो गयी है इसलिए यह वर्तमान

समाज की गंभीर समस्या बन गयी

है।

भारत एक जनसंख्या बाहुल्य देश है। 2011 की जनगणनानुसार इस देश में लगभग 121 करोड़ जनसंख्या निवास करती है। यहाँ विविध समुदाय के लोग निवास करते हैं। जनजाति समुदाय भी इनमें से एक है। भारत में लगभग संपूर्ण जनसंख्या का 6 प्रतिशत हिस्सा जनजातियों का है। छत्तीसगढ़ राज्य भारत का 26वाँ राज्य है यहाँ लगभग 8 प्रतिशत जनसंख्या जनजातियों की है। ये जनजातियाँ प्राचीन काल से अपने आखेट एवं कठोर परिश्रम के लिये प्रसिद्ध हैं। 1967 के पूर्व शिक्षा एवं जागरूकता के अभाव के कारण भूस्वामियों द्वारा इनकी जमीन को हड़प लिया जाता था तथा इनसे बंधुआ मजदूरी करवायी जाती थी जिसके कारण उनमें आक्रोश की भावना पनपी और यहीं से नक्सलवाद का जन्म हुआ। जनजातियाँ कठोर परिश्रम करने के बावजूद आज भी निम्न स्तर का जीवन जीने को लाचार हैं। स्वतंत्रता के पश्चात् इनके लिए कई योजनाएँ बनायी गयी हैं फिर भी ये शिक्षा, स्वास्थ्य, एवं जागरूकता के दृष्टिकोण से पिछड़ी हुई हैं। छ.ग. राज्य मानव विकास सूचकांक की दृष्टि से सबसे निम्न स्थान पर है। जीवन स्तर, स्वास्थ्य स्तर, स्वच्छता, हाइजिन की दृष्टि से काफी पिछड़ा हुआ है। छत्तीसगढ़ राज्य में 1980 के दशक में नक्सलवाद का उदय सरगुजा एवं वस्तर में हुआ। छ.ग. राज्य के जनजातीय क्षेत्रों का उपयोग माईनिंग (खदान) एवं उद्योग की स्थापना हेतु किया जाने लगा है इससे जनजातियों का कृषि भूमि का अधिग्रहण हो रहा है। छत्तीसगढ़ राज्य में 2005 के पूर्व नक्सल प्रभावित जिलों की संख्या 10 थी जो बढ़कर वर्तमान में 18 हो गयी है इसलिए यह वर्तमान समाज की गंभीर समस्या बन गयी है। यह आलेख प्राथमिक एवं अनुभवजन्य स्रोतों पर आधारित है जिसमें जनजातियों के सामाजिक-सांस्कृतिक, आर्थिक एवं शैक्षणिक स्थिति पर नक्सलवाद के प्रभाव को जानने का प्रयास किया गया है।

वनाये रखने के लिये प्रसिद्ध हैं। ये

जनजातियाँ प्राचीन काल से अपने

आखेट एवं कठोर परिश्रम के लिये

प्रसिद्ध हैं। जनजातियाँ कठोर परिश्रम

करने के बावजूद आज भी पिछड़ी

हुई हैं। आज भी जनजातियाँ निम्न

स्तर का जीवन जीने को लाचार हैं।

स्वतंत्रता के पश्चात् इनके लिए कई

योजनाएँ बनायी गयी हैं फिर भी ये

शिक्षा, स्वास्थ्य, एवं जागरूकता के

दृष्टिकोण से पिछड़ी हुई हैं। 18 वीं

शताब्दी के पूर्व शिक्षा एवं जागरूकता

के अभाव के कारण भूस्वामियों द्वारा

इनकी जमीन को हड़प लिया जाता

था तथा इनसे बंधुआ मजदूरी करवायी

जाती थी जिसके कारण उनमें आक्रोश

की भावना पनपी और यहीं से

नक्सलवाद का जन्म हुआ। प्रारंभिक

चरण में नक्सलवाद आंदोलन का

मुख्य उद्देश्य गरीब किसानों को

भूस्वामियों के चंगुल से छुड़ाकर

सामाजिक न्याय दिलाना था अर्थात्

नक्सलवाद आंदोलन का प्रादुर्भाव

सामाजिक, आर्थिक, राजनैतिक एवं

प्रशासनिक व्यवस्था में परिवर्तन लाने

के दृष्टिकोण से किया गया था।

प्रारंभिक चरण में चारू मजूमदार के

नेतृत्व में नक्सलवाद आंदोलन मार्क्स

एवं लेनिन के अहिंसात्मक सिद्धांत

पर कार्य करता था लेकिन वर्तमान में यह अपने मार्ग से

□ असिस्टेंट प्रोफेसर, समाजशास्त्र एवं समाजकार्य अध्ययनशाला, पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर (छ.ग.)

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S.O.S. in Sociology & Social Work,  
Pt. R.S.U., Raipur (C.G.)



## छत्तीसगढ़ राज्य के गोंड एवं हल्बा जनजाति की तीज-त्यौहार एवं मान्यताओं में परिवर्तन का तुलनात्मक अध्ययन

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<sup>2</sup>शोधार्थी, मानवविज्ञान अध्ययनशाला, पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर (छ.ग.),

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<sup>3</sup>सेवानिवृत्त प्राध्यापक, समाजशास्त्र एवं समाजकार्य अध्ययनशाला, पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर (छ.ग.)

<sup>4</sup>सह-प्राध्यापक, समाजशास्त्र एवं समाजकार्य अध्ययनशाला, पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर (छ.ग.)

### सारांश :-

छत्तीसगढ़ राज्य के जनजातियों को “संस्कृति का धनि” कहा जाता है क्योंकि इनके द्वारा प्रत्येक महिने में कई प्रकार के तीज-त्यौहार एवं अन्य सांस्कृतिक कार्यक्रम संपन्न किये जाते हैं जो कि अन्य जाति के सदस्यों की तुलना में अधिक है। प्रस्तुत अध्ययन तुलनात्मक प्रकार की है जो छत्तीसगढ़ राज्य के कांकेर जिले के भानुप्रतापपुर विकासखण्ड के अन्तर्गत आने वाले 6 गाँव जिसमें अपेक्षाकृत हल्बा एवं गोंड की जनसंख्या अधिक है उसमें सन् 2018 में किया गया है। अध्ययन में प्राप्त आँकड़ों से ज्ञात हुआ है कि 20 वर्ष पूर्व की तुलना में वर्तमान में तीज-त्यौहार मनाने के तरीकों एवं मान्यताओं में अपेक्षाकृत अधिकतम परिवर्तन हुआ है। प्रस्तुत शोध-पत्र में यह भी ज्ञात हुआ है कि विकासखण्ड से अधिक एवं मध्यम दूरी समूह की तुलना में कम दूरी समूह के अपेक्षाकृत अधिकतम गोंड एवं हल्बा जनजाति परिवार में तीज-त्यौहार मनाने के तरीकों एवं मान्यताओं में अपेक्षाकृत अधिकतम परिवर्तन हुआ है। कम दूरी समूह के उत्तरदाताओं में विकासखण्ड के अपेक्षाकृत नजदीक होने के कारण शहरीकरण/नगरीकरण का प्रभाव तुलनात्मक रूप से अधिक पड़ा है जिससे तीज-त्यौहार मनाने के तरीकों एवं मान्यताओं में ज्यादा परिवर्तन दृष्टिगोचर होती है।

### कुंजी शब्द-

गोंड एवं हल्बा जनजाति, तीज-त्यौहार, परिवर्तन, तुलनात्मक अध्ययन।





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## भारतीय समाज पर सामाजिक मीडिया का प्रभाव

✉ डॉ० श्रीमती हेमलता बोरकर वारतनिक\*

### शोध सारांश

समकालीन समाज में सामाजिक मीडिया का प्रभाव पूरे विश्व जगत में दिखलाई पड़ रहा है। आज दुनिया की ऐसी कोई खबर या घटना नहीं जो आम आदमी की पहुंच से दूर हो, यहाँ तक की किसी भी सामाजिक घटना के पक्ष एवं विपक्ष की बातें आज चंद मिनटों में विश्व के प्रत्येक मानव को उपलब्ध हो रही है जिसका सकारात्मक एवं नकारात्मक प्रभाव भारतीय समाज पर देखा जाये लगा है। भारत में इलेक्ट्रॉनिक सोशल मीडिया का जन्म 1995 के आसपास माना जाता है। 1995 में क्लास मेट्स डॉटकॉम साइट्स की शुरुआत की गयी। सन् 1996 में वोटर डॉट कॉम तथा 1997 में एशियन एवेन्यू डॉट कॉम साइट्स लॉंच किया गया। 2004 में फेसबुक, 2009 में वाट्सअप साइट, 2010 में लिंकडिन तथा आर्कुट 2014 में लॉंच किया गया। प्रस्तुत शोधपत्र प्राथमिक तथ्यों पर आधारित है। प्रस्तुत शोधपत्र में वाट्सअप एवं फेसबुक के प्रति उपभोक्ताओं के दृष्टिकोण को एवं भारतीय समाज पर इसके सकारात्मक एवं नकारात्मक प्रभाव को ज्ञात करने का प्रयास किया गया है। प्राथमिक तथ्यों के संकलन हेतु साक्षात्कार अनुसूची उपकरण एवं अवलोकन प्रविधि का उपयोग किया गया है, इसके अलावा प्रत्यक्ष एवं अप्रत्यक्ष वार्तालाप के द्वारा भी तथ्यों का संकलन किया गया है।

**Keywords:** वाट्सअप, फेसबुक, प्रभाव एवं परिणाम।

#### प्रस्तावना

सामाजिक मीडिया एक ऐसा इलेक्ट्रॉनिक माध्यम है जिसके जरिये लोग उक्त माध्यम में शामिल सदस्यों के साथ विचारों का आदान-प्रदान कर सकते हैं। समकालीन समाज में सामाजिक मीडिया का प्रभाव पूरे विश्व जगत में दिखलाई पड़ रहा है।

आज दुनिया की ऐसी कोई खबर या घटना नहीं जो आम आदमी की पहुंच से दूर हो, यहाँ तक की किसी भी सामाजिक घटना के पक्ष एवं विपक्ष की बातें आज चंद मिनटों में विश्व के प्रत्येक मानव को उपलब्ध हो रही है जिसका सकारात्मक एवं नकारात्मक प्रभाव भारतीय समाज पर देखा जाये लगा है। विश्व भर में लगभग 200 सोशल नेटवर्किंग साइट्स जिनमें वाट्सअप, फेसबुक, ट्वीटर, आर्कुट, माईस्पेस, लिंकडिन तथा इंस्टाग्राम सबसे अधिक लोकप्रिय सोशल साइट्स की श्रेणी में हैं। एक सर्वे के मुताबिक विश्वभर में संप्रति 1 अरब 28 करोड़ फेसबुक यूजर्स हैं। 15 करोड़ इंस्टाग्राम, 20 करोड़ व्यक्ति लिंकडिन, 3 करोड़ माईस्पेस एवं 9 करोड़ व्यक्ति ट्वीटर से जुड़े हुए हैं।<sup>1</sup>

भारत में इलेक्ट्रॉनिक सोशल मीडिया का जन्म 1995 के आसपास माना जाता है। 1995 में क्लास मेट्स डॉटकॉम साइट्स

की शुरुआत की गयी। सन् 1996 में वोटर डॉट कॉम तथा 1997 में एशियन एवेन्यू डॉट कॉम साइट्स लॉंच किया गया। 2004 में फेसबुक, 2009 में वाट्सअप साइट, 2010 में लिंकडिन तथा आर्कुट 2014 में लॉंच किया गया।<sup>2</sup>

#### सामाजिक मीडिया की परिभाषा –

आक्सफोर्ड डिक्शनरी के अनुसार – ऐसी वेबसाइट और ऐप्लिकेशन जो उपभोक्ताओं को सामग्री तैयार करने और साझा करने में समर्थ बनाता है सोशल मीडिया कहलाता है।<sup>3</sup>

**अध्ययन का उद्देश्य –** प्रस्तुत शोधपत्र के निम्नलिखित उद्देश्य हैं –

1. वाट्सअप एवं फेसबुक के प्रति उपभोक्ताओं के दृष्टिकोण को ज्ञात करना।
2. वाट्सअप एवं फेसबुक का भारतीय समाज पर सकारात्मक एवं नकारात्मक प्रभाव को ज्ञात करना।

#### अध्ययन परिकल्पना –

1. महिलाओं की तुलना में पुरुषों के द्वारा सामाजिक मीडिया का अधिक उपयोग किया जाता है।
2. वृद्ध की तुलना में युवा वर्ग अधिक सामाजिक मीडिया के संपर्क में रहते हैं।

\*सहायक प्राध्यापक, समाजशास्त्र एवं समाजिकी अध्ययनशास्त्राचार्यशिक्षक, सुकल विश्वविद्यालय रायपुर (छ.ग.)



## गांधीजी का ग्रामीण स्वावलंबन में योगदान

M. geyr ch d j ok ifud\*

## शोध सारांश

ग्रामीण स्वावलंबन की अवधारणा एक विस्तृत अवधारणा है। इस अवधारणा का मूल उद्देश्य ग्रामीण समुदाय को सामाजिक एवं आर्थिक रूप से सशक्त करना था ताकि ग्रामीण समुदाय का समुचित विकास हो सके। महात्मा गांधी जी दार्शनिक थे इसलिए वे प्राकृतिक संसाधनों की गुणवत्ता को पहचानते थे अतः वे इनका बेहतर उपयोग करना चाहते थे, इसके अलावा वे कुटीर उद्योग, पशुपालन एवं स्वदेशी वस्तुओं के उत्पादन एवं उपभोग पर जोर देते थे उनका मानना था कि अपने हाथों से बनी वस्तुओं का उपयोग को बढ़ावा दिया जाना चाहिए वे विदेशी वस्तुओं के विरोधी थे। इन्होंने मशीनी एवं प्रौद्योगिकी पर आधारित उत्पादित वस्तुओं का बहिष्कार किया था वे जानते थे इससे केवल गरीबी, बेरोजगारी एवं सामाजिक असमानता की दर में वृद्धि होने वाली है, इसलिए वे हाथ के द्वारा उत्पादित वस्तु को प्राथमिकता देते थे। आज भारत में गांधी जी के विचारों को दरकिनार कर दिया गया है इससे सामाजिक असमानता की दर बढ़ी है तथा ग्रामीण समाज में शोषित व्यक्तियों की संख्या में वृद्धि हुई है। प्रस्तुत आलेख में गांधीजी के ग्रामीण स्वावलंबन की विचारधारा को देखने का प्रयास किया गया है जिससे ग्रामीण समुदाय का समुचित एवं तीव्र विकास हो सके। प्रस्तुत आलेख द्वितीयक तथ्यों पर आधारित है।

**Keywords:** प्राकृतिक संसाधन, कुटीर उद्योग, पशुपालन, एवं स्वावलंबन।

**प्रस्तावना :** गांधी जी एक दार्शनिक थे इसलिए वे भारतीय समाज में होने वाले सामाजिक परिवर्तन से चिंतित थे। वे जानते थे कि भारत में यदि औद्योगिकरण होगा तो पूरे समाज की संरचना को प्रभावित करेगा, इसलिए वे इसका हमेशा से विरोध किया करते थे। गांधी जी ने देखा की नयी मशीनें किस तरह समाज में गरीबी, बेरोजगारी एवं स्वार्थी व्यक्तियों को जन्म दे रही है। इन्होंने देखा कि ग्रामीण लोगों के आय अर्जित करने के प्राकृतिक एवं अप्राकृतिक साधनों का पूंजी पति लोग कैसा इस्तेमाल कर रहे हैं। ग्रामीणजन पहले नीम, बबूल के वृक्षों के डंठल को तोड़कर दातून बनाया करते थे तथा उसे बेचकर पैसा जुटाया करते थे, खादी कपड़ों की बुनाई, भेड़, मुर्गी, गाय, भैंस, पालन करके अपनी आय में वृद्धि करने का कार्य करते थे परंतु जब से वैश्विक संस्कृति का बोलबाला हुआ तब से दातून की जगह दूध पेस्ट ने, पशुपालन के स्थान पर डेयरी उद्योग ने, कृषि व वनोपज संग्रहण का कार्य सरकारी लोगों के हाथ में चला गया। नारियल की जूट की डोरी की जगह रस्सी ने, बांस की चटाई की जगह चीन की चटाई, धान कूटने एवं आटा चक्की की जगह मशीनों ने ले लिया है इससे गाँव में बेरोजगारी की दर बढ़ी परिणाम स्वरूप सामाजिक विकास अवरुद्ध होने लगा है तथा

व्यक्तिवादिता प्रवृत्ति को बढ़ावा मिल रहा है। व्यक्तिवादिता ने व्यवहार मानवीय व्यवहार को प्रभावित किया है।

**अध्ययन पद्धति—** प्रस्तुत आलेख द्वितीयक तथ्यों पर आधारित है। इस आलेख में गांधी जी के ग्रामीण स्वावलंबन की विचार धारा को देखने का प्रयास किया गया है।

**ग्रामीण स्वावलंबन की अवधारणा —** ग्रामीण स्वावलंबन की अवधारणा बहुत पुरानी अवधारणा है इस अवधारणा को लाने का श्रेय सामान्यतः गांधी जी को जाता है। गांधीजी ने सामाजिक विकास के परिप्रेक्ष्य में ग्रामीण स्वावलंबन को देखने का प्रयास किया है। ग्रामीण स्वावलंबन शब्द दो शब्दों से मिलकर बना है प्रथम ग्रामीण एवं दूसरा स्वावलंबन। ग्रामीण का अर्थ गांव के व्यक्तियों से तथा स्वावलंबन का अर्थ आत्मनिर्भर होने से है अर्थात् गांव के व्यक्तियों को आत्मनिर्भर बनाना ही ग्रामीण स्वावलंबन है। गांधी जी कहते थे कि व्यक्ति को अपनी निजी अनिवार्य आवश्यकताओं की पूर्ति के लिए दूसरों पर आश्रित रहने की जरूरत नहीं है, लोगों को आत्मनिर्भर बनकर अपनी आवश्यकताओं को पूर्ण करने के लायक बनना होगा इसके लिए इन्हें ज्ञानार्जन करना होगा जिससे ये अपनी अनिवार्य आवश्यकताओं की पूर्ति स्वयं ही कर सकें।

\*सहायक प्राध्यापक — समाजशास्त्र एवं समाजकार्य अध्ययनशाला, पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर।

## भारत में कोरोना माहामारी नियंत्रण की नीति एवं जनजीवन पर प्रभाव: समाजशास्त्रीय विश्लेषण

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### सारांश:

नोवल कोरोना कोविड-19 जानलेवा माहामारी है। आज के उत्तर-आधुनिकता समाज के इस दौर में यह सबसे त्रासदी वाला माहामारी सिद्ध हो चुका है। दुनिया के समक्ष इससे निपटने के लिए सावधानियां (लाकडाऊन) के अतिरिक्त कोई खास औषधि निर्माण नहीं किया जा सका है। माहामारी ने मानव की दुर्दशा बतौर कर दिया है लोग अपने मृत व्यक्ति को अंतिम समय में देख नहीं पार रहे हैं। चिकित्सालय के गैलरियों में शवों की कतार बढ़ता मानव को भयभीत कर दिया है। दिसम्बर 2019 में चीन के बुहान से प्रारंभ हुई, यह संक्रमण देखते-ही-देखते यूरोप और समूचा विश्व को अपने चपेट में ले लिया है। यहां सारा मानव समाज लाचार-सा हो गया है। माहामारी ने पूरे मानव स्वास्थ्य सुविधाओं के पोल खोलकर रख दिया है तथा राजनीतिक नेताओं के बड़े-बड़े दावे एक तरह से निर्थक सिद्ध कर दिया है। माहामारी मानव समाज के समक्ष कई चुनौतिया पैदा की है। शोध पत्र में इन्हीं चुनौतियों को प्रस्तुत करने का प्रयास किया गया है।

**शब्द कुंजी:** नोवल कोरोना कोविड-19, समाज, मजदूर, प्रभाव, नीति, समस्या।

### प्रस्तावना:

भारत देश में नोवल कोरोना का पहला प्रकरण केरल के त्रीसूर जिला से 30 जनवरी 2020 को पाजीटिव मिला, इसका संबंध बुहान विश्वविद्यालय चीन से था। इसके बाद 2 फरवरी 2020 को पुनः 03 प्रकरण





# EFFECTIVENESS OF DIRECTLY OBSERVED THERAPY AND TO COMPARE WITH SELF ADMINISTERED THERAPY IN PATIENTS WITH TUBERCULOSIS

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## Abstract

Tuberculosis (TB) remains the major cause of morbidity and mortality in India and affects largely the most productive members of the society. The major concern is increasing number of TB cases due to inadequate and improper treatment of primary and post primary TB cases. Extent of Awareness of Tuberculosis, Directly Observed Treatment (DOT) in Rural Community. A cross sectional study on 90 patients with stroke aged more than 25 years was carried out Village-Kantpur, Block & Tehsil-Bharatpur, District-Korea, State-Chhattisgarh for a period of 4 months from (1st August 2018 to 30th November 2018). The statistical analysis were performed by using Microsoft Excel and SPSS version 22 respectively. Observe mean, standard deviation and mean percentage of knowledge interview were and respectively. The score of patients there was significant difference seen in quality of life score according to sex, socioeconomic status, occupation, statistically significant difference in quality of life score was not seen with respect to age, locality, religion, marital status, type of family, educational status, occupation, alcohol intake, smoking, diet. In this study the aspects like knowledge of TB patients as well as their family members so that need based information can be provided and get them motivated to get their patient treated in the hospital. The findings of the study showed that majority of the samples had inadequate, had moderate adequate and only had adequate knowledge. DOT program will continue to be effective in treating TB, and with some improvements will allow more positive outcomes to occur. TB impacts whole communities, and its treatment. Patients treated by Directly Observed Therapy (DOT) have excellent cure rates with lesser default rates.

## Keywords

Tuberculosis, DOT, HIV/AIDS

## INTRODUCTION

Tuberculosis (TB) is an infectious disease usually caused by *Mycobacterium Tuberculosis* (MTB) bacteria tuberculosis generally affects the lungs, but can also affect other parts of the body. Most infections do not have symptoms, in which case it is known as latent tuberculosis. About 10% of latent infections progress to active disease which, if left untreated, kills about half of those infected. The classic symptoms of active TB are a chronic cough with blood-containing sputum, fever, night sweats, and weight loss. It was historically called "consumption" due to the weight loss. Infection of other organs can cause a wide range of symptoms. Tuberculosis is spread through the air when people who have active TB in their lungs cough, spit, speak, or sneeze. People with latent TB do not spread the disease. Active infection occurs more often in people with HIV/AIDS and in those who smoke.

According to the World Health Organization (WHO), one-third of the world's population is currently infected with the tuberculosis bacillus (WHO Fact sheet No. 104 Revised March 2007). World Health Organization estimates that 9.27 million new cases of tuberculosis occurred in 2007 (139/100,000 population) compared with 9.24 million new cases (140/100,000 population) in 2006 (WHO/ITM/TB/2006.362). Of these 9.27 million new cases, 44% or 4.1 million (61/100,000 population) were smear-positive cases. India, China, Indonesia Nigeria and South Africa rank first to fifth in terms of the total number of incident cases. The report further states that of the 15 countries with the highest estimated tuberculosis incidence rates remains



कोविड-१९

# लॉकडाउन का दिहाड़ी मजदूरों की सामाजिक-आर्थिक स्थिति पर प्रभाव

(छत्तीसगढ़ राज्य के दुर्ग जिले के ग्रामीण-शहरी मजदूरों के विशेष सन्दर्भ में)

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**ABSTRACT :** प्रस्तुत शोध पत्र कोविड-१९ वैश्विक महामारी के दौरान लगाए गये लॉकडाउन-१ तथा लॉकडाउन-२ की दैनिक मजदूरों के सामाजिक-आर्थिक स्थिति पर प्रभाव से सम्बन्धित है। अध्ययन अनुभवजन्य तथ्यों पर आधारित है। अध्ययन हेतु १०० दैनिक मजदूरों (५० ग्रामीण तथा ५० शहरी) का चुनाव उद्देश्यपूर्ण निदर्शन प्रविधि के द्वारा किया गया है। अध्ययन छत्तीसगढ़ राज्य के दुर्ग जिले पर आधारित है। अध्ययन इस उद्देश्य पर आधारित रहा है कि लॉकडाउन का दिहाड़ी मजदूरों के पारिवारिक सम्बन्धों पर क्या प्रभाव पड़ा है? कोरोना महामारी के प्रति मजदूरों में किस प्रकार की जागरूकता है? तथा कोरोना महामारी ने मजदूरों की आर्थिक स्थिति को किस प्रकार से प्रभावित किया है। अध्ययन से प्राप्त तथ्य यह दर्शाता है कि अधिकांश मजदूरों के मन में कोरोना महामारी को लेकर डर है। यही कारण है कि ये सभी इससे बचने हेतु सुझाए गये उपायों- मास्क लगाने, शारीरिक दूरी बनाकर रखने तथा उपलब्धता के आधार पर सेनेटाइजर का उपयोग करते हैं। लॉकडाउन ने दिहाड़ी मजदूरों की आर्थिक स्थिति को बुरी तरह से प्रभावित किया है। अधिकांश मजदूरों को उनके नियोजक द्वारा लॉकडाउन-अवधि में कोई आर्थिक सहायता प्रदान नहीं किया गया। लॉकडाउन अवधि में उनकी निर्भरता पूर्णतः सरकारी राशन दुकान से प्राप्त सहायता तथा स्थानीय पार्षद से प्राप्त सहायता पर रही है। लॉकडाउन ने पारिवारिक सम्बन्धों को भी प्रभावित किया है, जिसमें मुख्य रूप से परिवार के खर्च को लेकर तनाव बढ़ना तथा भविष्य की चिंता सताना मुख्य है। यदि लॉकडाउन के सकारात्मक प्रभाव की चर्चा करें, तो यह ज्ञात हुआ है कि इस दौरान दिहाड़ी मजदूर भी तंगी के बीच गुजारा करना सीख गये तथा उन्हें अपने बच्चों से भवनात्मक रूप से ज्यादा प्रबलतापूर्वक जुड़ने का अवसर प्राप्त हुआ।

## प्रस्तावना

आज जब पूरा विश्व कोविड-१९ की समस्या से जूझ रहा है, जिसके कारण ७९४ लाख लोग इस रोग से प्रभावित हैं और लगभग १७ लाख लोगों की जान जा चुकी है, ऐसी स्थिति में इसका गहरा प्रभाव पूरी दुनिया की अर्थव्यवस्था पर पड़ा है तथा उत्तर कोविड-१९ में स्थिति और भी चिंताजनक हो सकती है। एक विकासशील देश के रूप में भारत के समक्ष भी अनेक आर्थिक चुनौतियाँ आ सकती हैं।

पूरी दुनिया की आबादी में लगभग २० प्रतिशत लोग मजदूर के रूप में कार्य करते हैं। डब्ल्यू. एच. ओ. की नवीनतम रिपोर्ट भी यह बताती है कि कोविड-१९ के कारण पूरी दुनिया

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नामन (अर्द्धवार्षिक) वर्ष १४ : अंक २३-२४

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## SOCIO-ECONOMIC PROFILE AND ACHIEVEMENT MOTIVATION Level OF THE ENTREPRENEURS IN ANIMAL HUSBANDRY – A COMPARATIVE STUDY OF TRIBAL AND NON-TRIBAL OF BASTAR DISTRICT (CHHATTISGARH)

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### Abstract

**Aim and Objective:** The aim of the present study is to identify and compare the socio-demographic and economic profile and degree of need for achievement of two entrepreneur groups (Tribal and Non-Tribal) engaged in animal husbandry business in Bastar district of Chhattisgarh state. It also aims to investigate the magnitude of the relationship between variables of socio-economic status and need for achievement in both the groups.

**Subjects and Methods:** The present research study was explanatory as well as exploratory in nature. The study was conducted in the tribal dominated Bastar district of Chhattisgarh. Both, the simple and purposive random sampling methods, were used to draw a sample of 300 entrepreneurs engaged in animal husbandry business. Eligible participants that fulfilled the inclusion criteria, such as those who were engaged in cattle/dairy farming, goat farming, piggery farming, poultry farming and Kadaknath farming entrepreneurship for more than one year etc. were included in sample. 150 Tribal and 150 Non-Tribal entrepreneurs were purposively selected from 45 villages of all seven blocks of Bastar district of Chhattisgarh. The interview schedule was administered to collect the information to fulfill the objectives. Modified Kuppaswamy's socio-economic status (SES) scale (2019) was used to measure socioeconomic status of a family and Achievement Motive Test (ACMT) developed by Bhargava (1994) was used to assess the degree of need for achievement. Data were analyzed using SPSS.

**Conclusion:** The findings revealed that family income, occupation and socio-economic status were significantly varied between Tribal and Non-Tribal entrepreneurs. Socio-economic status is significantly associated with the educational level and Achievement Motivation Level in both the entrepreneur groups. Non-Tribal entrepreneurs were high achievers than the Tribal. Thus it can be concluded that education and motivation play an important role to inculcate entrepreneurial spirit





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## जनजातीय समुदाय में मातृत्व एवं बाल स्वास्थ्य की स्थिति : कांकेर जिला के अन्तागढ़ तहसील के विशेष संदर्भ में

अरख राम बघेल\*  
निस्तर कुजूर\*\*

### शोध सारांश

भारत के अधिकतर राज्यों में गर्भवती महिलाओं, नवजात बच्चों और शिशुओं की स्वास्थ्य संबंधी स्थितियाँ काफी कमजोर हैं और उन पर कई क्षेत्रों में तुरंत ध्यान देने की आवश्यकता है। भारत सरकार ने 1996-97 में "प्रजनन एवं बाल स्वास्थ्य कार्यक्रम" प्रारंभ किया था एवं गुणवत्तापूर्ण सेवाएं प्रदान करने और बहुमुखी उद्देश्य प्राप्त करने की आशा की थी। छत्तीसगढ़ में भौगोलिक दृष्टिकोण से अनेकों असमानताएं हैं। यहां जनजातीय बाहुल्य आबादी है इनका जीवन स्वास्थ्य समस्याओं के ईदगीर्द होती है। क्षेत्र के लोगों में प्रजनन मातृत्व एवं बाल स्वास्थ्य संबंधी संकेतों की स्थिति काफी खराब है। प्रस्तुत अध्ययन में मातृत्व एवं बाल स्वास्थ्य की स्थिति को ज्ञात करने का प्रयास किया गया है।

**Keywords:** अन्तागढ़, जनजाति, मातृत्व एवं बाल स्वास्थ्य।

#### प्रस्तावना :

महिलाओं एवं बच्चों की स्वास्थ्य की स्थिति के संबंध में प्रधानमंत्री पं. जवाहरलाल नेहरू कहा था कि-किसी राष्ट्र की महिलाओं की सेहत देखकर उस राष्ट्र की स्थिति बतायी जा सकती है। इसका तात्पर्य यह है कि एक स्वस्थ महिला अपने परिवार की देखभाल व पोषण संबंधी आवश्यकताओं को सुचारु रूप से क्रियान्वित करने में उसकी हमत्ती भूमिका होती है। छत्तीसगढ़ जनजातीय बाहुल्य आबादी वाला राज्य है, कांकेर में आधे से अधिक लगभग 55 प्रतिशत आबादी जनजातियों का है। जनजातीय क्षेत्र के महिलाओं एवं बच्चों के स्वास्थ्य की स्थिति काफी खराब है। वर्तमान में यहां के लोगों में स्वास्थ्य के प्रति जागरूकता, सोंच-विचार के मामले में काफी पीछड़ा है। शासन द्वारा स्वास्थ्य के स्तर में सुधार लाने और स्वास्थ्य सेवाओं के विस्तार के लिए अनेक कदम उठाये गये हैं, किन्तु आदिवासियों के कुछ शिक्षित परिवार को छोड़कर इनकी बड़ी आबादी आज भी अंधविश्वास, भूत-प्रेत, जादू-टोना आदि में विश्वास करता है, जो इनके स्वास्थ्य स्तर को सीधे प्रभावित करती है।

जनजातीय महिलाओं की स्वास्थ्य व उनके प्रजनन शक्ति के स्तर पर सामाजिक-आर्थिक परिस्थितियाँ जैसे-शिक्षा का स्तर; रहन-सहन, आवास, विवाह की आयु, बच्चों के जन्म के बीच अंतर आदि कारक ऐसे हैं जो मातृत्व एवं बाल स्वास्थ्य के स्तर को प्रभावित करता है। इसके फलस्वरूप इन क्षेत्रों में

मातृ-मृत्यु एवं शिशु मृत्युदर अधिक देखने को मिलता है। वैश्विक परिप्रेक्ष्य में देखें तो भारत में सभी जीवित जन्म लेने वाले बच्चों का 19 प्रतिशत शिशु मृत्युदर तथा 27 प्रतिशत मातृ-मृत्यु दर है।

वर्ष 1984 की स्वास्थ्य नीति; जिसमें 2001 तक सबके लिए स्वास्थ्य नारा दिया गया था; इसमें वर्ष 2001 तक प्रति 1,00,000 जीवित जन्म पर एम.एम.आर. (मातृ मृत्यु) 300 तक नीचे लाने का निश्चय किया गया था। किन्तु 2005 में एम.एम.आर. की आंकड़ा 400 से उपर बनी हुई थी। इसी तरह शिशु मृत्यु (आई.एम.आर.) 2004 में यह प्रति 1000 जीवित जन्म पर 64 थी जो पिछले दो दशकों में बढ़कर 70 के आस-पास पहुंच गई थी।

गर्भवती महिलाओं को प्रसव पूर्व; प्रसव के समय एवं प्रसवोत्तर अवधि में पूर्ण देख-भाल उपलब्ध कराना अनिवार्य शर्त है, किन्तु अध्ययनगत क्षेत्र की महिलाओं एवं बच्चों में यह शर्त को पूर्ण करना किसी चुनौति से कम नहीं है। इसका दूश-परिणाम यह हो रहा कि इनमें मातृत्व एवं शिशु देख-भाल की स्थिति बेहद खराब हो गई है। चौबे, कैलाश (1998),<sup>1</sup> ने अपने अध्ययन में बस्तर के जनजातीय लोगों के आहार में पोषक-तत्वों का अभाव होने के कारण इन्हें रोगों का अधिक खतरा होना तथा कमजोर रोग-प्रतिरोध क्षमता होने और आहार संबंधी आदतों का दोषपूर्ण होना, खाद्य पदार्थों का चयन, निर्धनता, अज्ञानता एवं परम्पराएं आदि कुछ ऐसे कारक हैं, जो उनकी पोषण को प्रभावित करता है। मिनी एवं मौली (2005)<sup>2</sup> ने इसके लिए जिम्मेदार कारक

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## सामाजिक उत्थान में महिला कमांडो की भूमिका (छत्तीसगढ़ राज्य के बालोद जिले के विशेष सन्दर्भ में)

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डॉ. (श्रीमती) हेमलता बोरकर वासनिक\*\*

### शोध सारांश

महिला समाज की धुरी है विश्व की जनसंख्या का आधा हिस्सा है। उनके बिना परिवार, समाज नामक संस्था की कल्पना भी नहीं की जा सकती है। प्रस्तुत शोध छत्तीसगढ़ राज्य के बालोद जिले में कार्यरत महिला कमांडो नामक एक महिला स्वैच्छिक संगठन के सामाजिक उत्थान कार्यों पर आधारित है। सामाजिक उत्थान से आशय है समाज के उन वर्गों का विकास करना जो पिछड़े हुए हैं तथा उन क्षेत्रों पर विशेष ध्यान देना जो समाज में पिछड़ापन लाते हैं जिसके कारण परिवार, समाज, देश की उत्पादकता, विकास में कमी होती है। शोध का उद्देश्य सामाजिक उत्थान में महिला कमांडो की भूमिका को जानने का प्रयास करना है। यह शोध भविष्य में अन्य महिलाओं को सामाजिक उत्थान कार्यों को करने के लिए प्रेरित कर सकता है। शोध में उत्तरदाताओं के चयन हेतु उद्देश्यपूर्ण निर्देशन पद्धति का प्रयोग करते हुए अध्ययन क्षेत्र के 6 ग्रामों का चयन किया गया है जिसमें प्रत्येक ग्राम से 20 सामान्य नागरिक होंगे, इस प्रकार कुल 120 उत्तरदाता होंगे।

**Keywords:** सामाजिक उत्थान, महिला कमांडो, स्वैच्छिक संगठन, विकास

**प्रस्तावना—** सामाजिक उत्थान की अवधारणा समाज के किसी एक पक्ष पर केन्द्रित न हो कर सभी पक्षों पर समान प्रभाव रखती है। उत्थान शब्द विकास का ही पर्याय है जब हम सामाजिक विकास के बहुआयामी विषय की चर्चा करते हैं तब हम समाज में व्याप्त विभिन्न रुढ़ियों, मान्यताओं की भी चर्चा करते हैं। जो समाज के अलग-अलग वर्गों को किसी न किसी प्रकार से दर्शाने का प्रयास करती है।

छत्तीसगढ़ राज्य में कार्यरत महिला कमांडो नामक महिला स्वैच्छिक संगठन मुख्यतः समाज में व्याप्त इन्हीं रुढ़ियों, मान्यताओं, बुराईयों अपराध को दूर करने का प्रयास कर रही है जो किसी भी साधारण महिला को उसके दैनिक दिनचर्या में प्रभावित करती है।

यह संगठन ग्राम की सामान्य गृहिणी महिलाओं के द्वारा स्वैच्छिक रूप से बनाया गया है जिनका उद्देश्य समाज में स्थायी एवं चिरकालिक परिवर्तन लाना है क्योंकि वे नई चाहती की जिस स्थिति का सामना उन्होंने किया है वह आगे की पीढ़ी को भी सहना पड़े। महिलाओं के इस सराहनीय कार्य में पुलिस प्रशासन ने भी सहयोग दिया है। महिलाओं का यह संगठन सामाजिक बुराईयों को समाप्त करने के साथ-साथ महिला सशक्तिकरण हेतु भी स्वयं सहायता समूह के माध्यम से व्यस्त रह रही है

जिससे उनकी आर्थिक, सामाजिक तथा मानसिक स्थिति में परिवर्तन आया है। अब वे महिलाएं आत्मनिर्भर हो रही हैं, तथा किसी भी अधिकारी नेतागण या समाज के बड़े व्यक्ति के सामने अपने बातों को रखने और समझाने का साहस करने लगी हैं। साथ ही वे ग्रामों की साफ-सफाई, वृक्षारोपण, तालाबों की सफाई, सतत विकास के लक्ष्यों को बेहतर बनाने वाले कृषि पद्धति, पर्यावरण सुरक्षा, यातायात सुरक्षा आदि क्षेत्रों में भी कार्य कर रही हैं।

छत्तीसगढ़ भारत का आदिवासी बाहुल्य वाला प्रदेश है यहां लगभग एक तिहाई जनसंख्या जनजातीय समाज से संबंधित है।

छत्तीसगढ़ की साक्षरता दर देश के अग्रणी साक्षर राज्यों की तुलना में अत्यन्त कमजोर कही जा सकती है पिछड़ेपन की इसी दशा के कारण समाज में विभिन्न कुरीतियां व्याप्त हैं जिसका नकारात्मक प्रभाव समाज पर पड़ता है चूंकि महिलाओं की स्थिति आदिकाल से ही खराब थी अतः समाज में उपस्थित किसी भी बुराई का सर्वाधिक प्रभाव उन्हीं पर पड़ता है। स्वतंत्रता पश्चात् संविधान निर्माताओं द्वारा इसी बात को ध्यान में रखते हुए विभिन्न प्रावधान किये गये ताकि महिलाओं के सामाजिक स्तर को ऊंचा उठाया जा सके, समय समय पर विभिन्न कानून यथा देहेज प्रथा

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वैश्विक महामारी कोविड-19 का प्रवासी श्रमिक परिवारों के वृद्धजनों पर प्रभाव-एक समाजशास्त्रीय अध्ययन  
(छत्तीसगढ़ राज्य के रायपुर जिले के विशेष संदर्भ में) □ अशोक कुमार देवांगन\*  
डॉ० एल.एस. गजपाल\*\*

## शोध सारांश

प्रवास सार्वभौमिक तथ्य के रूप में सर्वमान्य हैं। प्रवास के अनेक सकारात्मक एवं नकारात्मक कारण हो सकते हैं, प्रायः प्रवास के लिए उत्प्रेरित कारक श्रमिकों के लिए सामाजिक-आर्थिक जटिलता एवं समस्याएं उत्पन्न करता हैं। सामान्यतः प्रवास के प्रकृति को आपदा से जोड़कर देखा जाता है। वैश्विक महामारी कोविड-19 इन्ही आपदाओं में से एक हैं, जिससे समाज का हर वर्ग प्रभावित हुआ है किन्तु देश में सबसे अधिक चर्चा के केन्द्र पर रहे प्रवासी श्रमिकों के संदर्भ में यह विषय और अधिक चिंतनीय हो जाता हैं। प्रस्तुत शोधपत्र वैश्विक महामारी कोविड-19 का प्रवासी श्रमिक परिवारों के वृद्धजनों पर हुए प्रभाव का एक समाजशास्त्रीय अध्ययन पर आधारित हैं। अधिकतर प्रवासी श्रमिक परिवारों के वृद्धजन कामगार सदस्यों पर आश्रित होते हैं, किन्तु सामान्य दशा में वे अपने जीवन-यापन के लिए कुछ भागीदारी करते हैं किन्तु कोविड-19 के कारण निर्मित सामाजिक-आर्थिक एवं स्वास्थ्यगत समस्याओं का अध्ययन शोधपत्र के माध्यम से किया गया हैं।

**Keywords :** प्रवासी श्रमिक, वृद्धजन, वैश्विक महामारी कोविड-19।

### प्रस्तावना :-

कोविड-19 का पहला मामला चीन के वुहान प्रांत में आने के बाद वैश्विक परिदृश्य में काफी बदलाव परिणत हुए हैं। भारत में नोवल कोरोना का पहला प्रकरण केरल के त्रीसूर जिला से 30 जनवरी 2020 को प्रकाश में आया। इसका संबंध वुहान विश्वविद्यालय, चीन से रहा। कोविड-19, कोरोना वायरस का एक नया स्वरूप हैं जिसका संक्रमण व्यापक एवं जानलेवा हैं, जिसके चलते 11 मार्च 2020 को विश्व स्वास्थ्य संगठन द्वारा इसे वैश्विक महामारी घोषित किया गया हैं।<sup>१</sup> कोविड-19 की स्थिति इतनी भयावह रही है कि पूरी दुनिया को अपने ज्ञान, विज्ञान और प्रौद्योगिकी के क्षेत्र में सर्वश्रेष्ठ मानने वाले पश्चिमी देश इस महामारी से सर्वाधिक प्रभावित रहे हैं। समाजविज्ञान की तकनीक दुनिया को सामाजिक दूरी (Social Distancing) के नाम पर राहत दी है। यह एक शब्द वैश्विक परिदृश्य में समाज विज्ञान के महत्व को स्थापित करता है।

वैश्विक महामारी कोविड-19 के कारण पहली बार सम्पूर्ण विश्व ने विशेषकर भारत में प्रवासी श्रमिकों की समस्याओं को पूरे देश ने बहुत निकट से देखा और अनुभव किया। देश की अर्थव्यवस्था में महत्वपूर्ण योगदान देने के बाद भी श्रमिकों की सामाजिक-आर्थिक स्थिति बहुत खराब हैं, अनेक शोध अध्ययन

यह दर्शाते हैं कि श्रम प्रवास के सकारात्मक कम बल्कि नकारात्मक प्रभाव ज्यादा होते हैं। श्रमिक परिवार के वृद्धजनों के लिए यह सुखद नहीं रहा है। वैश्विक महामारी कोविड-19 के कारण औद्योगिक स्थगन एवं निर्माण कार्य में अवरुद्धता के कारण प्रवासी श्रमिकों का जीवन कठिन दौर में प्रवेश कर गया, जिससे उनके मूलनिवास एवं प्रवास स्थान दोनों ही स्थलों पर जीवन संकट पैदा हुआ हैं जिसका परिवार के वृद्धजनों पर सामाजिक-आर्थिक एवं स्वास्थ्यगत प्रभाव का अध्ययन इस शोधपत्र का मुख्य उद्देश्य हैं।

**कियात्मक अवधारणा-** वैश्विक महामारी कोविड-19 का प्रवासी श्रमिक परिवारों के वृद्धजनों पर प्रभाव-

एक समाजशास्त्रीय अध्ययन (छत्तीसगढ़ राज्य के रायपुर जिले के विशेष संदर्भ में), अध्ययन इकाई के रूप में पलायन एवं श्रमकार्य के स्थगन से प्रभावित प्रवासी श्रमिक परिवारों के वृद्धजनों को लिया गया हैं एवं तथ्य संकलन किया गया है ताकि समस्याओं की वास्तविक स्थिति प्राप्त हो सके।

**अध्ययन का समाजशास्त्रीय महत्व:-**

वैश्विक महामारी कोविड-19 के कारण कामगार श्रमिक सदस्यों पर जीविकोपार्जन संकट मंडराने से आश्रित वृद्धजनों पर निःसंदेह प्रभाव पड़ता हैं जिसे शोधपत्र के माध्यम से प्रकाश में

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**A STUDY ON COTPA COMPLIANCE (FOR SECTION 6, SECTION 7, 8, 9  
OF CIGARETTE AND OTHER TOBACCO PRODUCTS  
ACT 2003) IN DHAMTARI, CHHATTISGARH**

Dr. Falendra Kumar  
Dr. L.S. Gajpal\*\*

## ABSTRACT

The Present Research Paper is based on the evaluation of the compliance status of the Cigarette and Other Tobacco Products Act (COTPA)-2003 (Section 6,7,8,9) in the Kurud Nagar Panchayat area of Dhamtari district of Chhattisgarh state. The selection of 50 respondents in the study has been done through purposive sampling and the study has been done through a questionnaire for the collection of data. The data obtained from the research study shows that in Kurud Nagar Panchayat, the compliance of Section 6-A is 20% and Section 6-B is 34%, however, 96% compliance of Sections 7, 8, and 9 is observed. Tobacco Control Policy requires compliance with Sections 6-A and 6-B of the COTPA Act 2003. Law enforcers should take action against those who violate the law.

**Keywords :** Compliance Assessment, Cigarettes and Other Tobacco Products Act, Sec.

## INTRODUCTION

Despite the efforts of the Government of India and the World Health Organization (WHO) to control the menace of tobacco, the prevalence of tobacco use in India is growing at an alarming rate among children and adolescents. In a survey conducted by the 'National Sample Survey Organization' of the Government of India, this shocking fact has come to the fore that 200 million children between the age of 10-14 years consume tobacco, and 5500 new people (20 lakhs every year) are exposed to it every day, are joining. According to the 2015-2016 report of the Union Ministry of Health, 5500 new youth start consuming tobacco every day in our country. More than 3,500 people die every day due to the consumption of tobacco in the country. In India, out of 100 patients who die of cancer, 40 die due to tobacco use.

According to the census 2011, the population of Chhattisgarh is 2 crores 56 lakhs, in which there are 65 thousand cancer patients, out of which 28 thousand cancer patients are due to tobacco consumption. 16 percent of students in the state consume tobacco.

Annually 33 thousand people are examined in OPD at Indira Gandhi Regional Cancer Institute located at Ambedkar Hospital. of these, about 4000 are new and the rest are old patients. These include mouth, lung, throat, and all types of cancer patients. On the basis of this, surgeons of the hospital are claiming that cigarettes, tobacco, and pan masala, are the major causes of cancer. Tobacco Prohibition Day is celebrated every year on May 31 by the World Health Organization to reduce the growing addiction to tobacco consumption. The Tobacco Prohibition Act was first enacted by the Government of India in 1975. Cigarette smoking is injurious to health, Following the same Cigarette Act 1975, statutory warnings are given on these products. Smoking and spitting in public places is prohibited under the Prevention and Control of Pollution Act of 1981. Currently, the COTPA Act enacted in 2003 to curb smoking is in effect. It was implemented from 18 May 2003 all over India.

Section 6 (a) of COTPA (Prohibition of selling or getting tobacco products sold to minors) - Rules were

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# समकालीन भारतीय समाज में वृद्धों की स्थिति का समाजशास्त्रीय अध्ययन

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## सारांश

मानव जीवन चक्र की अंतिम अवस्था को वृद्धावस्था कहा गया है। यह एक प्राकृतिक प्रक्रिया है। जीवन की इस अवस्था में शारीरिक कमजोरी बढ़ने के साथ इम्युनिटी क्षमता घटने लगती है। सामान्यतः वृद्धजनों में पुरुषों की अपेक्षा महिला वृद्धजनों की स्थिति बहुत ही दयनीय होती है क्योंकि वृद्ध महिलाएँ अपने पति या अपने बच्चों या परिवार के अन्य सदस्यों पर निर्भर होती हैं।

वृद्धावस्था में व्यक्ति की शारीरिक, मानसिक, सामाजिक और आर्थिक समस्याएँ उत्पन्न होती हैं, जिन वृद्धों को समाज या परिवार द्वारा निम्न समझा जाता है या उनको महत्व नहीं दिया जाता उनकी स्थिति अत्यंत दयनीय हो जाती है, वहाँ दूसरी ओर उन वृद्धों की स्थिति भी दयनीय होती है जो शारीरिक व मानसिक रूप से अस्वस्थ होते हैं तथा जिनके जिवकोपार्जन का कोई आर्थिक साधन न हो, उनका परिवार के लोगों द्वारा अपमान, व तिरस्कार किया जाता है।

समकालीन नगरीय समाज में तो इनकी स्थिति और अधिक दयनीय हो गई है जिसका कारण भारतीय समाज में संयुक्त परिवार प्रणाली में कमी होना माना जा रहा है। आजकल एकाकी परिवार का प्रचलन तीव्रता से बढ़ रहा है जिसके कारण वृद्धजन अपने परिवार से अलग व दूर होते जा रहे हैं, उनकी स्थिति दिनो-दिन खराब होती जा रही है।

प्रस्तुत अध्ययन में वृद्धों की सामाजिक - आर्थिक एवं स्वास्थ्यगत स्थिति को ज्ञात करने का प्रयास किया गया है, इस हेतु द्वितीयक तथ्यों का उपयोग किया गया है। ग्रामीण एवं नगरीय परिवेश में वृद्धों की स्थिति को ज्ञात करने का प्रयास किया गया है।

शब्द कुंजी : नगरीय परिवेश, वृद्ध महिलाएँ, सामाजिक एवं आर्थिक एवं स्वास्थ्यगत समस्या।

## प्रस्तावना

वृद्धावस्था एक सार्वभौमिक घटना है। भारत की 2011 जनगणना रिपोर्ट अनुसार भारत की कुल जनसंख्या 1210.9 मिलियन है, इसमें 60 वर्ष से अधिक उम्र के व्यक्तियों की संख्या 103.9 मिलियन है इनमें पुरुष 51.1 मिलियन तथा 52.8 मिलियन महिलाएँ हैं इसमें भी 73.3 मिलियन वृद्ध गैरों में तथा 30.6 मिलियन वृद्ध नगरों में निवास करते हैं। भारत की जनगणना 2011 की स्थिति में देश की कुल जनसंख्या का लगभग 10 प्रतिशत आबादी वृद्धजनों का है इसमें 9 प्रतिशत जनसंख्या महिलाओं का तथा 8.2 प्रतिशत पुरुषों का है। जनगणना 2011 की स्थिति में देश की कुल जनसंख्या का लगभग 7.8 प्रतिशत वृद्धजनों की आबादी छत्तीसगढ़ राज्य में निवासरत है। एक अनुमान के मुताबिक 2020 तक 60 वर्ष से अधिक उम्र के व्यक्तियों की संख्या 20 करोड़ हो जाएगी और 2030 तक लगभग 26 करोड़, ऐसी स्थिति में देश के समक्ष वृद्धजनों की स्थिति को बेहतर बनाने के लिए कठिन चुनौती सामने होगी। है। 1999 में यूनाइटेड नेशन्स ने अंतर्राष्ट्रीय वृद्ध वर्ष घोषित किया। भारत में वृद्धों के कल्याण हेतु वरिष्ठ नागरिक अधिनियम दिसंबर 2007 में लागू किया गया। ग्रामीण विकास विभाग द्वारा इंदिरा गांधी वृद्धावस्था पेंशन योजना लागू किया गया है। 2010 में स्वास्थ्य कल्याण कार्यक्रम को लागू किया गया है, फिर भी वृद्धों की समस्याएँ बढ़ते जा रही हैं।

वृद्धावस्था से तात्पर्य - भारत सरकार के 1999 के वृद्धों से संबंधित राष्ट्रीय नीति के अनुसार 60 वर्ष से वृद्धावस्था की आयु प्रारंभ मानी जाती है, 60 वर्ष से अधिक की आयु को वृद्धावस्था कहा जाता है।

## समाजशास्त्रीय सैद्धांतिक परिप्रेक्ष्य में वृद्धों की सामाजिक - आर्थिक एवं स्वास्थ्यगत स्थिति का विश्लेषण

कार्ल मार्क्स एवं दुर्खिम का अलगाव का सिद्धांत : वृद्धावस्था एक ऐसी स्थिति को निर्मित करता है, जिसमें व्यक्ति का स्वयं एवं समाज से अलगाव होने लगता है, यही अलगाव कई समस्या को जन्म देती है। कार्ल मार्क्स एवं दुर्खिम द्वारा समाज में अलगाव के कारकों का वर्णन किया गया है। कार्ल मार्क्स ने औद्योगिक समाज में अलगाव का कारण औद्योगिकीकरण से उत्पन्न पूँजीवादी व्यवस्था को माना है दुर्खिम ने अलगाव को एक सामाजिक घटना माना है, तथा अलगाव की स्थिति के परिणामों की चर्चा की है। इस प्रकार कार्ल मार्क्स ने वृद्धावस्था में अलगाव का कारण औद्योगिकीकरण से उत्पन्न पूँजीवादी व्यवस्था को तथा दुर्खिम ने सामाजिक कारकों को माना है।

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अपनी माटी

UGC CARE Listed &amp; PEER Reviewed/Refereed

अपनी माटी

पटिचय सम्पादकीय विमर्श विधाएँ विविधा विशेषांक नवीनतम तारा

सूत्रांक 37

# शोध आलेख : लॉकडाउन में ट्रांसजेंडर समुदाय के सामाजिक सुविधाओं पर पड़ने वाले प्रभावों का अध्ययन / डिसेंट कुमार साहू

सम्पादक, अपनी माटी सोमवार, नवंबर 01, 2021



शोध आलेख

लॉकडाउन में ट्रांसजेंडर समुदाय के सामाजिक और स्वास्थ्य सुविधाओं पर पड़ने वाले प्रभाव

डिसेंट कुमार साहू

शोध सारांश:

अध्ययन का उद्देश्य लॉकडाउन की वजह से ट्रांसजेंडर व्यक्तियों के सामाजिक-आर्थिक जीवन में आये बदलाव और अध्ययन करना है। शोध उद्देश्य को पूरा करने के लिए रायपुर (छत्तीसगढ़) शहर के 10 ट्रांसजेंडर से टेलीफोनिक साक्षात्कार अभिकल्प अन्वेषणात्मक शोध अभिकल्प है। अध्ययन में पाया गया कि कोविड-19 वाइरस के प्रसार को रोकने के लिए ट्रांसजेंडर व्यक्तियों को विभिन्न सामाजिक, आर्थिक व स्वास्थ्य संबंधी समस्याओं का सामना करना पड़ा। उनकी आर्थिक प्रभाव उनके मूलभूत जरूरतों के साथ ही स्वास्थ्य पर भी पड़ा। उन्हें लिंग पुनः पुष्टि सर्जरी (Sex reassignment surgery)

वीज शब्द : ट्रांसजेंडर, कोविड-19, लॉकडाउन, स्वास्थ्य सुविधाएं

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**विशेष रूप से कमजोर जनजाति समूहों में शासन द्वारा संचालित विकास के कार्यक्रमों के प्रति जागरूकता: एक अध्ययन छत्तीसगढ़ राज्य के कबीरधाम जिले के विशेष संदर्भ में**

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एसोसिएट प्रोफेसर एवं विभागाध्यक्ष समाजशास्त्र एवं समाज कार्य अध्ययनशाला पं. रविशंकर विश्वविद्यालय,  
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**ABSTRACT:**

प्रस्तुत शोध अध्ययन छत्तीसगढ़ राज्य की विशेष पिछड़ी जनजाति बैगा पर आधारित है। शोध अध्ययन कबीरधाम जिले के बोड़ला विकासखण्ड के 7 ग्रामों पर केन्द्रित है। अध्ययनक्षेत्र के 277 परिवारों पर अध्ययन किया गया है। शोध अध्ययन में तथ्य संकलन हेतु प्राथमिक तथ्य संकलन साक्षात्कार अनुसूची एवं अवलोकन प्रविधि के द्वारा किया गया है। अध्ययन के माध्यम से इस तथ्य को जानने का प्रयास किया गया है कि वैश्विक परिदृश्य में आदिम जनजाति बैगा समूहों में शासन द्वारा संचालित जनसंख्या गिरावट को रोकने हेतु किये गये सरकारी व गैर सरकारी प्रयासों के प्रति जागरूकता के प्रति चेतना को जानने का प्रयास किया गया है। अध्ययन से यह ज्ञात हुआ है कि बैगाओं की जनसंख्या लगातार विगत वर्षों में घटती जा रही है। शासन ने बैगाओं के जीवन स्तर को सुधारने हेतु अनेक योजनाओं को संचालित किया है जिसके फलस्वरूप भी बैगा वर्तमान समय में भी सरकार द्वारा अनेक रोजगार सम्बंधी स्वास्थ्य सम्बंधी, शिक्षा सम्बंधी योजनाओं से अनभिज्ञ पाये गये हैं। ऐसे में बैगाओं की जनसंख्या में बढ़ती हुयी गिरावट एक गंभीर चिंतनीय विषय है।

**Keywords:**

- बैगा जनजाति
- जनसंख्या गिरावट
- शासन द्वारा संचालित योजनाएं



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1. <http://google,rajyapal pratedan2016-17>

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## वस्तर के जनजाति आर्थिक जीवन में पारम्परिक जनजाति बाजार की प्रासंगिकता : शोध साहित्य का समाजशास्त्रीय समीक्षा

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Nister Kujur\*\*

### शोध सारांश

जनजातीय जीवनशैली में स्थानीय बाजार का अपना महत्व है, वस्तर का जनजातीय बाजार विश्वप्रसिद्ध है। बाजार जनजातीय आजीविका, दैनिक आवश्यकताओं की पूर्ति करने एवं आर्थिक गतिविधियों का केन्द्र है। इमली, महुआ, चिरौंजी, लाख, सहद, जड़ीबूटि आदि वनोपज और लान्दा, सल्फी और महुआ शराब आदि उत्पादों को बाजार में बेचकर परिवार की विभिन्न आवश्यकताओं की पूर्ति करता है और बाजार का जनजाति जीवन में दूसरा पहलूओं को समझना एवं बाजार का जनजातीय प्रासंगिकता को को शोध साहित्य के पुनरावलोकन द्वारा स्पष्ट करने का प्रयास किया गया है।

**Keywords:** जनजाति बाजार, आजीविका, आर्थिक केन्द्र एवं सांस्कृतिक महत्व।

#### प्रस्तावना :

वस्तर की जनजातीय बाजार विश्व में प्रसिद्ध है, इस क्षेत्र में आने वाले अनुसंधानार्ता जनजाति बाजार का अवलोकन बीना वस्तर को समझना अधूरा है। यहां यह भी उल्लेख करना आवश्यक होगा कि जनजातियों का बड़ा समूह है जो केवल इन्हीं बाजार तक सीमित है, इन्हें जगदलपुर, दन्तेवाड़ा, नारायणपुर या अन्य शहरी बाजार में विरले ही देखने में आते हैं। जनजातियों के लिए साप्ताहिक बाजार के मोटे दो उपयोगिता है, प्रथम आजीविका और दूसरा सांस्कृतिक महत्व के। जनजाति समुदाय अपनी आजीविका से संबंधित अनेकों आवश्यकताओं की पूर्ति अर्न्तर्गत बाजार से करते हैं। दूसरे शब्दों में कहें तो जनजातीय बाजार वह स्थान है जहां अपनी वनोत्पाद को बेचकर आवश्यकताओं की वस्तुओं का क्रय करना है। इस प्रकार यह इनके आर्थिक गतिविधियों का केन्द्र है। शहरी बाजार से इनका कोई खास सरोकार नहीं है, क्योंकि इनके पास उतना रुपये है और न ही आवश्यकताएँ। इनमें बैंक व डाकघर में खाता से लेन-देन करना जैसे गतिविधि लगभग शून्य है। स्थानीय बाजार में सामान्यतः महुआ, इमली, चिरौंजी, लाख, कुसूम, गोंद, कंद-मूल, जड़ीबूटि, मड़िया, कोदों, कूटकी, चपोड़ा, सल्फी, लान्दा, शराब, तीतर और मुर्गा आदि, इनके आय के स्रोत हैं। इन्हीं वस्तुओं का बाजार में बेचकर रुपये प्राप्त करते हैं। खरीदी की जाने वाली वस्तुओं में थोड़ी सी खाने का तेल, एकाद साबून, माचिस, गुड़, नमक, खुला हल्दी व धनिया, मिर्ची, दो एक किरम

के तम्बाखु, लान्दा व शराब बनाने की दवाई आदि। इनके बाजार से खरीदी वस्तुओं की मात्रा अत्यन्त सीमित होती है, इससे इनकी आर्थिक स्थिति को असानी से अंका जा सकता है। बाजार का दूसरा सांस्कृतिक पहलू में जनजाति अपने नाते-रिस्तेदार से सम्पर्क करके घंटों वार्तालाप करते और वार्तालाप में सल्फी या महुआ का शराब पीकर कुशलक्षेम से लेकर सभी तरह की जानकारी आपस में चर्चा की जाती है। बाजार नातेदारों में सूचना का केन्द्र रूप में कार्य करती है, बाजार का एक खास पहलू पारम्परिक मुर्गा लड़ाई जो मनोरंजन के साधन रूप में देखा जाता है, लोग दूर-दूर से अपने मुर्गा को लड़ाने के लिए लेकर आते हैं और बड़ी भीड़ मुर्गा लड़ाई का लुफ्त उठाते हैं। वर्तमान में इसमें सट्टा लगाने जैसे बाहरी परम्परा प्रवेश कर रही है।

#### अध्ययन का उद्देश्य :

प्रस्तुत अध्ययन के निम्नलिखित उद्देश्य हैं :-

1. शोधार्थियों में जनजाति बाजार के प्रति दृष्टिकोण को समझना।
2. जनजातियों आर्थिक जीवन में बाजार की प्रासंगिकता को ज्ञात करना।

#### अध्ययन पद्धति :-

प्रस्तुत शोध पत्र पी-एच.डी. शोधार्थी द्वारा प्रस्तुत किया गया है, शोधार्थी का शोध का विषय "आजीविका और जनजाति बाजार" पर आधारित है। अध्ययन द्वितीयत तथ्यों एवं पायलट सर्वे पर आधारित है। अध्ययन में 10 उत्कृष्ट शोध साहित्य का अध्ययन कर समीक्षा करने का प्रयास किया गया है। जनजाति

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# भिलाई इस्पात संयंत्र में निगमित सामाजिक उत्तरदायित्व का विश्लेषण

अब्दुल शाहीद

शोधार्थी, समाजशास्त्र एवं समाजकार्य अध्ययन शाला, पं० रविशंकर वि.वि., रायपुर

डॉ० हेमलता बोरकर

एसोसिएट प्राध्यापक, समाजशास्त्र एवं समाजकार्य अध्ययन शाला, पं० रविशंकर वि.वि., रायपुर

**सारांश-** आज के वैज्ञानिक युग में मानव जीवन के अस्तित्व को बनाये रखने के लिये स्टील एक मूलभूत आवश्यकता है और वह बेहतर जीवन का आधार भी है। मनुष्य के जीवन की आधारभूत आवश्यकताओं में स्टील का महत्वपूर्ण स्थान है, परन्तु स्टील का उत्पादन व निर्माण एक जटिल प्रक्रिया है, इसके उत्पादन में कई मानवीय एवं पर्यावरणीय घटकों का दोहन होता है। यदि कंपनी अपने विकास की प्रक्रिया को दीर्घकाल तक बनाये रखना चाहती है तो उसे अपने अंशधारकों व अन्य हिस्सेदारों के साथ-साथ समाज के प्रति भी उत्तरदायी होना होगा।

निगमित सामाजिक उत्तरदायित्व (सीएसआर) की अवधारणा सभी क्षेत्रों में प्रमुख रूप से उभर रही है। स्टील अथॉरिटी ऑफ इंडिया लिमिटेड (सेल) के भिलाई इस्पात संयंत्र ने सीएसआर को सतत विकास के सामरिक साधन के रूप में अपनाया है। भिलाई इस्पात संयंत्र द्वारा सीएसआर को केवल सामाजिक गतिविधियों के लिए धन निवेश ही नहीं अपितु सामाजिक प्रक्रियाओं के साथ व्यापार के एकीकरण के रूप में देखा जाता है।

**मुख्य शब्द:** सीएसआर, निगमित सामाजिक उत्तरदायित्व, भिलाई इस्पात संयंत्र, योजना

## प्रस्तावना

स्टील अथॉरिटी ऑफ इंडिया लिमिटेड (सेल) भारत की सबसे बड़ी स्टील उत्पादक कंपनी है और टर्नओवर के मामले में 'महारत्न' कम्पनी के साथ शीर्ष सार्वजनिक क्षेत्र के उद्यमों में से एक है। 'महारत्न' कम्पनी सेल सकारात्मक बदलाव के लिए उत्प्रेरक बनने की जिम्मेदारी भी रखती है। इस्पात निर्माण के व्यवसाय के अलावा, कंपनी का उद्देश्य ऐसे तरीकों से व्यवसाय संचालित करना है जिससे उन समुदायों को सामाजिक, पर्यावरणीय और आर्थिक लाभ हो जिनमें वह काम करती है।

सेल के सामाजिक-आर्थिक उद्देश्य इसके मूलमंत्र में प्रतिध्वनित होते हैं, जिसमें व्यवसाय के संचालन में उच्चतम नैतिक मानकों को बनाए रखने और "लोगों के जीवन में सार्थक बदलाव लाने के लिए" अवसर और जिम्मेदारी को महत्व देने की प्रतिबद्धता शामिल है। सेल के मूल मूल्यों में से एक-लोगों के लिए चिंता-बड़े पैमाने पर समाज के प्रति कंपनी की प्रतिबद्धता को भी दर्शाता है, जिसे वह निगमित सामाजिक उत्तरदायित्व (सीएसआर) के तहत व्यापक और विविध पहल और गतिविधियों के माध्यम से पूरा करने का प्रयास करती है।

निगमित सामाजिक उत्तरदायित्व (सीएसआर) का सामान्य अर्थ एक व्यावसायिक प्रतिष्ठान की समाज के प्रति जवाबदेही से है। इसका उदय 1960 के दशक में हुआ। कानूनी प्रावधानों के मुताबिक कोई भी कम्पनी एक पंजीकृत संस्था है जिसकी मिल्कियत उसके अंशधारकों के पास होती है। कंपनी का काम कानून सम्मत कार्य करते हुए अपने अंशधारकों हेतु अधिक से अधिक मुनाफा कमाना है। मूल रूप से कंपनी अपने अंशधारकों के प्रति उत्तरदायी होती है। प्रबंधन की विस्तृत अवधारणा में कंपनी अपने हित संवर्धन के लिये अंशधारकों के साथ साथ अन्य हिस्सेदारी यथा कर्मचारी, ग्राहक, आपूर्तिकर्ता आदि के प्रति भी उत्तरदायी है। इसी क्रम में सीएसआर की अवधारणा का विकास कम्पनियों के दीर्घकालीन एवं स्थायी विकास को ध्यान में रखकर हुआ है। इसके अनुसार यदि कंपनी अपने विकास की प्रक्रिया को दीर्घकाल तक बनाये रखना चाहती है तो उसे अपने अंशधारकों व अन्य हिस्सेदारों के साथ-साथ समाज के प्रति भी उत्तरदायी होना होगा।

प्रस्तुत शोध आलेख भिलाई इस्पात संयंत्र में निगमित सामाजिक उत्तरदायित्व के कार्यक्रमों पर आधारित है।

## शोध आलेख का उद्देश्य

प्रत्येक शोध आलेख का कुछ न कुछ उद्देश्य अवश्य होता है प्रस्तुत आलेख का मौलिक उद्देश्य निम्नलिखित है

जनवरी-फरवरी, 2021

6-4-2020  
Head  
S.O.S. in Sociology & Social Work,  
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(6009)



## A CURVILINEAR TYPE ESTIMATOR OF POPULATION MEAN ON TWO OCCASIONS

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**Abstract :** This paper deals with an estimator of population mean on current occasion based on samples selected over current and previous occasions if a quadratic relationship between study and auxiliary variables exists. Properties of proposed estimator has been discussed and it is ascertained that it is more efficient than usual estimators for optimal choice of constants included in the estimator. An optimum replacement policy of proposed estimator has been studied. Numerical illustrations have been cited in support of the theoretical results.

**Key words:** Auxiliary Information, Curvilinear Relationship, Mean squared error (MSE), Variance.

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### 1. Introduction

The pursuit of estimation of population mean of a variable using auxiliary information has drawn wide attention in sampling from a finite population. The estimators based on utilization of population mean of auxiliary variable are known as ratio, product and linear regression estimators. Among these estimators, regression estimator has been proved to be more efficient theoretically. Let  $U = \{1, 2, \dots, i, \dots, N\}$  be a finite population of size  $N$ , and  $x$  and  $y$  be study and auxiliary variables defined on  $U$  taking the value  $y_i$  and  $x_i$  on the unit  $i$  of  $U$  ( $1 \leq i \leq N$ ) respectively. Let  $\bar{y}$  and  $\bar{x}$  be unbiased estimators of population means  $\bar{Y}$  and  $\bar{X}$  of variables  $y$  and  $x$  respectively, then ratio, product and regression estimators of  $\bar{Y}$  are defined as

$$\bar{y}_r = \bar{y} \left( \frac{\bar{X}}{\bar{x}} \right) \quad (1)$$

$$\bar{y}_p = \bar{y} \left( \frac{\bar{x}}{\bar{X}} \right) \quad (2)$$

$$\bar{y}_{lr} = \bar{y} + b(\bar{X} - \bar{x}) \quad (3)$$

respectively,  $b$  is sample regression coefficient of  $y$

on  $x$ .

For improving efficiency of above estimators, many attempts have been made in literature [Srivastava (1971), Das and Tripathi (1980), Singh *et al.* (2014)] which are almost equally efficient as linear regression estimator for optimum choice of constants involved in the estimators.

Note that regression estimator  $\bar{y}_{lr}$  is used if a linear relationship between  $y$  and  $x$  exists, however, sometimes curvilinear relationship between such variables may also exist. Dubey and Sharma (2003) proposed the estimator of  $\bar{Y}$

$$\bar{y}_g = \bar{y} + K_1(\bar{X} - \bar{x}) + K_2(\mu'_2(x) - m'_2(x)) \quad (4)$$

where,

$$m'_2(x) = \frac{1}{n} \sum_{i=1}^n x_i^2 \text{ is unbiased estimator of}$$

$$\mu'_2(x) = \frac{1}{N} \sum_{i=1}^N x_i^2$$



## SOME MODIFIED ESTIMATORS OF POPULATION MEAN ON TWO OCCASIONS

VYAS DUBEY AND ARUN KUMAR SHUKLA<sup>1</sup>

**ABSTRACT.** This paper deals with some modified estimators of population mean on current occasion based on samples selected over current and previous occasions. Properties of proposed estimators have been discussed and it is seen that they are more efficient than usual estimators for optimal choice of constants included in the estimators. Numerical illustrations have been cited in support of the theoretical results.

## 1. INTRODUCTION

Auxiliary information is highly used for estimating population parameters like mean, total, ratio, variance etc. Estimators so defined are known as ratio, product and regression estimators which are used under different situations. The ratio (product) estimator is used for positively (negatively) correlated variables while regression estimator is useful if variables are linearly related. Amongst all such estimators, regression estimator is theoretically proved to be more efficient. Many a time, value taken by such population parameters changes over different occasions while the units of population may be same. For example, yield of a crop in a geographical area may change from year to year while the fields under the cultivation may be same. In such a situation, the information collected on

<sup>1</sup>corresponding author

2010 Mathematics Subject Classification. 62H12.

Key words and phrases. Auxiliary Information, Bias, Mean Squared Error (MSE), Efficiency, Order of Approximation.



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## A Quadratic Type Estimator of Population Mean on Multi Occasions Using General Sampling Scheme

Authors **Vyas Dubey**, Arun Kumar Shukla

Publication date 2021/6/8

Journal International Journal of Statistics and Reliability Engineering

Volume 8

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**Description** This paper deals with a quadratic type estimator of population mean on multi occasions based on samples selected over current and previous occasions using general sampling scheme provided quadratic relationship between study and auxiliary variables exists. Properties of proposed estimator have been discussed and it is established that the proposed estimator is more efficient than usual estimators for optimal choice of constants involved with the estimator. An optimum replacement policy for proposed estimator has been studied. Numerical illustrations have been cited to support the theoretical results.

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## Emerging Issues in On-line Education : COVID-19 Lock-down Period

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### Abstract

*The corona epidemic started from Wuhan and spreading all over the world resulted all aspects of life have become interrupted on a large scale. The outbreak of corona globally affected the economy, politics, health as well as education. Self-isolation and social distancing is a primary measure of global scale to avoid that spreading. Therefore, various countries have prohibiting all types of activities and closed their all educational institutions as a precautionary measure and shifted to online learning. This paper attempts to collect some important emerging issues in education during period of covid19 lockdown. Suggestions on how to deal with such challenges in future are also presented.*

**Keywords :** Covid19, lockdown & Education.

### Introduction :

The corona pandemic disease (covid-19) that began in Wuhan city of China has been spread rapidly all over the world. The outbreak of corona globally affected the economy, politics, health as well as education. Self-isolation and social discrimination are a primary measure of the global scale to avoid its spread. According to the World Health Organization report, the corona epidemic became the biggest global recession, currently more than one-third of the global population is placed on lockdown. The effects of epidemics that have spread in the past show that whenever such a situation occurs, it has a dramatic impact not only on people's lives, but also on business, politics, economy, education and social structure. The horrors of this disease have created a crisis on the existence of the entire human race. Therefore, as a precautionary measure, various countries have prohibiting all types of activities and closed their all educational institutions and shifted to online learning with no certainty of their reopening. This period of uncertainty is an important time for the education sector- while some board examinations are yet to take place in various institutions, entrance examinations of various universities / courses are to be conducted for admissions to nursery schools as well as competitive examinations, all of these are conducted during this period, which threatens the future of many students has gone. Due to school and universities closures, about 99.4 % of the world's school children and youth are affected due to this pandemic outbreak and are in fear and worry about their future.<sup>[1]</sup> Therefore, a study is needed to explore related problems and possible measures to deal with this epidemic situation.

**Some Emerging Issues related to On-line Education:**



07

## COVID-19 CRISIS: Impact of Virtual Education with reference to Higher Education

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### Abstract:

For the last few months, the entire world has been facing a particular type of public health problem. Till March 2020, the disease had spread to about 188 countries worldwide, with the aim of preventing its spread, many country's governments closed all their educational institutions, nearly 1.8 million children dropped out of their classes as a result. After the closure of higher educational institutions in the fast pace of spread of epidemic infection, there was no time to make educational plans. Prior to the epidemic, all institutions are making efforts in this direction by organizing virtual online education related schemes running in some institutions. In this critical situation, it is important to look at the impact of the COVID-19 epidemic on higher educational institutions and as well as some researches are necessary for helping to our institutions in order to move forward due to this sudden change in the global higher education system. The descriptive survey method was used and conducted on the sample of 120 research scholars and students studying in different higher educational institutions of

Kanpur University. The sample was collected by using simple random sampling technique and self-made questionnaire on Google form was used to collect the data, analysed by percentage technique. The research study concluded that the learning was affected by the sudden lockdown caused by COVID-19. During this period, digital mode of learning was adopted in many institutions teachers are also trying to remove doubts related to students. Certainly, these efforts in the field of virtual education will be significant for future education in the global scenario.

**Key words:** Higher educational institutions, Virtual Online classes, Students, Research Scholars.

### Introduction:

From the beginning of the year 2020, the crisis of COVID-19 epidemic on human life on earth changed the nature of human society itself. Due to a ban of social activities like mutual and social interaction, since 11 March 2020, WHO declared COVID-19 as an epidemic (WHO, 2020), a lockdown situation is created in countries all around the world. The worst impact has been on the education sector (Bokde & et al., 2020), colleges and universities around the world have closed down and disruptions in regular educational services (Ganguly, Misra & Goli, 2020). In the month of March, examinations were being conducted in most of the educational institutions in India and some were completed. At the same time, academic activities were going on in courses in the semester system / professional courses, which had to be abruptly discontinued without prior notice. (UNESCO, 2020). As a result, many apprehensions have arisen among the students, parents and faculties member. According to AISHE-2019 that Indian higher education comprises 53,620 institutions with 3 crore 70 lakh students with 48.6% female enrolment and approx.14 lakh teachers are engaged in higher institutions (AISHE-2019). It is imperative to save such numerous students



## प्रमस्तिष्क की संप्रभुता एवं पाठ्य सहगामी क्रियाओं में सहभागिता के मध्य सम्बन्ध का अध्ययन

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### शोध सारांश

शिक्षा व्यक्ति की अंतर्निहित क्षमता तथा उसके व्यक्तित्व को विकसित करने वाली प्रक्रिया है। यह प्रक्रिया उसे समाज में एक जिम्मेदार नागरिक बनने के लिए आवश्यक ज्ञान तथा कौशल उपलब्ध कराती है। प्रमस्तिष्क का अर्थ मस्तिष्क तन्तुओं के केन्द्रीय तंत्रिका तंत्र का नियंत्रण केन्द्र है। मस्तिष्क के द्वारा शरीर के विभिन्न अंगों के कार्यों का नियंत्रण एवं नियमन होता है। वृहद मस्तिष्क के दो भाग होते हैं— बायाँ भाग तथा दायाँ भाग, इसको प्रमस्तिष्क की संप्रभुता कहा जाता है। पाठ्य सहगामी गतिविधियाँ विद्यार्थियों के बौद्धिक, भावात्मक, सामाजिक, नैतिक और सौन्दर्यात्मक विकास में अहम् भूमिका निभाते हैं। ये गतिविधियाँ विद्यार्थियों को खेल, अभिनय, गायन, पाठ-वाचन व परिचर्चा आदि में भागीदारी हेतु प्रोत्साहित करती हैं तथा सामाजीकरण, आत्म-अनुशासन व आत्म-मूल्यांकन का मार्ग प्रशस्त करती हैं। प्रस्तुत शोध अध्ययन में विद्यार्थियों के प्रमस्तिष्क की संप्रभुता एवं पाठ्य सहगामी क्रियाओं में सहभागिता के मध्य कोई सम्बन्ध नहीं पाया गया है।

**Keywords :** प्रमस्तिष्क की संप्रभुता एवं पाठ्य सहगामी क्रियाएं।

#### प्रस्तावना

शिक्षा व्यक्ति की अंतर्निहित क्षमता तथा उसके व्यक्तित्व को विकसित करने वाली प्रक्रिया है यह उसे समाज में एक जिम्मेदार नागरिक बनने के लिए आवश्यक ज्ञान तथा कौशल उपलब्ध कराती है। मस्तिष्क तन्तुओं के केन्द्रीय तंत्रिका तंत्र का नियंत्रण केन्द्र है। मस्तिष्क के द्वारा शरीर के विभिन्न अंगों के कार्यों का नियंत्रण एवं नियमन होता है। वृहद मस्तिष्क के दो भाग होते हैं— बायाँ भाग तथा दायाँ भाग, इसको प्रमस्तिष्क की संप्रभुता कहा जाता है। प्रमस्तिष्क के दायाँ भाग शरीर के बाईं ओर को नियंत्रित करती है अर्थात् दायाँ संप्रभुत्व से सम्पन्न उन कार्यों का प्रदर्शन करते हैं जो रचनात्मकता और कलाओं की क्रियाओं से सम्बंधित होते हैं। प्रमस्तिष्क का बायाँ संप्रभुता शरीर के दायाँ ओर को नियंत्रण करती है एवं कार्यों को करती है जो कि तर्क के साथ कार्य करते हैं जैसे कि विज्ञान और गणित विषय से संबंधित पाठ्य सहगामी गतिविधियाँ विद्यार्थियों के बौद्धिक, भावात्मक, सामाजिक, नैतिक और सौन्दर्यात्मक विकास में अहम् भूमिका निभाते हैं। ये गतिविधियाँ विद्यार्थियों को खेल, अभिनय, गायन, पाठ, वाचन, परिचर्चा आदि में भागीदारी हेतु प्रोत्साहित करती हैं। साथ ही ये गतिविधियाँ विद्यार्थियों को स्वतंत्र रूप से विचार अभिव्यक्त करने में सक्षम बनाती हैं और स्वस्थ प्रतिस्पर्धा

की भावना को विकसित करती है तथा सामाजीकरण, आत्म-अनुशासन व आत्म-मूल्यांकन के मार्ग को प्रशस्त करती है।

#### समस्या कथन

प्रमस्तिष्क की संप्रभुता एवं पाठ्य सहगामी क्रियाओं में सहभागिता के मध्य सम्बन्ध का अध्ययन।

#### अध्ययन का उद्देश्य

1. विद्यार्थियों के प्रमस्तिष्क की संप्रभुता एवं उनके पाठ्य-सहगामी गतिविधियों के मध्य सम्बन्ध का अध्ययन करना।
2. छात्रों के प्रमस्तिष्क की संप्रभुता एवं उनके पाठ्य-सहगामी गतिविधियों के मध्य सम्बन्ध का अध्ययन करना।
3. छात्राओं के प्रमस्तिष्क की संप्रभुता एवं उनके पाठ्य-सहगामी गतिविधियों के मध्य सम्बन्ध का अध्ययन करना।

#### अध्ययन की शून्य परिकल्पना

H01- विद्यार्थियों के प्रमस्तिष्क की संप्रभुता एवं पाठ्य-सहगामी गतिविधियों के मध्य सह-संबंध नहीं पाया जायेगा।

H02- छात्रों के प्रमस्तिष्क की संप्रभुता का व पाठ्यसहगामी गतिविधियों के मध्य सह-संबंध नहीं पाया जायेगा।

H03- छात्राओं की प्रमस्तिष्क की संप्रभुता का व पाठ्यसहगामी

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## CULTURAL ACTIVITIES OF COLLEGE STUDENTS RELATIONSHIP WITH THE BRAIN HEMISPHERE DOMINATION

Amitesh Ku. Singh\*  
Hemlata Sahu\*\*

### ABSTRACT

The present study was aimed to see the relationship of cultural activities of college students with the brain hemisphere domination. For the present study 120 boys and girls from age group of 20 to 30 years respectively were selected from various department of Pt. RSS University, Raipur. The researcher was used Brain Dominant Hemisphere Test (B.H.D.T) prepared by Agashe and Helode (2007). Cultural inventory prepared by self-made was used. Statistical technique Pearson's correlation coefficient was used. The researcher found that there is no relationship with brain hemisphere domination and cultural activities of college students.

**Keywords :** Brain hemisphere domination, cultural activities.

### Introduction

The brain can be described as being divided into left and right cerebral hemisphere. In general the left and right hemisphere of our brain process information in different ways. Left brain is the logical hemisphere. It monitors the areas for speech. It analyses and evaluates factual material in a rational way. It understands the literal interpretation of words and detects time and sequence. It also recognizes words, letters, and numbers written as words. The right brain is the intuitive hemisphere. It gathers information more from images than from words and looks for patterns. It interprets language through context-body language, emotional content, and tone of voice rather than through literal meanings. It specializes in spatial perception and is capable of creativity. It also recognizes places, faces and objects. Humans tend to process information using their dominant side.

The term "extracurricular activities" refers to, any activities that take place outside of the regular (compulsory) school curriculum. "The activities are voluntary, and students do not receive grades for academic credit for them" (Holloway, 2000). These activities are offered outside of school hours, but within

the school setting. The extracurricular activities do not have to be sponsored by your school, that means activities that are outside of your educational curriculum and these are generally optional. They provide scope for democratic living, develop social skills, a sense of cooperation, team spirit and self-discipline, which are important for a citizen to function in a democracy. All this is possible only through students' participation in extra-curricular activities. The extra-curricular is an activity of equal value to the academic activity. Therefore, extra-curricular activities complement the students' academic studies or curriculum and make them more comprehensive and richer. It is the school's goal that through these opportunities, the students will learn life skills such as team work, leadership, and ethical, collaborative and critical thinking.

### Statement of Problem

"Cultural activities of college student's relationship with the Brain Hemisphere Domination"

### Objective of the study

1. Studying the correlation of brain hemisphere domination and cultural activities of students.

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\*\*Assistant Professor - Vivekanand Institute of Education, Raipur



## प्रमस्तिष्क की संप्रभुता एवं पाठ्य सहगामी क्रियाओं में सहभागिता के मध्य सम्बन्ध का अध्ययन

□ अभितेश कुमार सिंह\*  
हेमलता साहू\*\*

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**Keywords :** प्रमस्तिष्क की संप्रभुता एवं पाठ्य सहगामी क्रियाएं।

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की भावना को विकसित करती है तथा सामाजीकरण, आत्म-अनुशासन व आत्म-मूल्यांकन के मार्ग को प्रशस्त करती है।

#### समस्या कथन

प्रमस्तिष्क की संप्रभुता एवं पाठ्य सहगामी क्रियाओं में सहभागिता के मध्य सम्बन्ध का अध्ययन।

#### अध्ययन का उद्देश्य

1. विद्यार्थियों के प्रमस्तिष्क की संप्रभुता एवं उनके पाठ्य-सहगामी गतिविधियों के मध्य सम्बन्ध का अध्ययन करना।
2. छात्रों के प्रमस्तिष्क की संप्रभुता एवं उनके पाठ्य-सहगामी गतिविधियों के मध्य सम्बन्ध का अध्ययन करना।
3. छात्राओं के प्रमस्तिष्क की संप्रभुता एवं उनके पाठ्य-सहगामी गतिविधियों के मध्य सम्बन्ध का अध्ययन करना।

#### अध्ययन की शून्य परिकल्पना

H01- विद्यार्थियों के प्रमस्तिष्क की संप्रभुता एवं पाठ्य-सहगामी गतिविधियों के मध्य सह-संबंध नहीं पाया जायेगा।

H02- छात्रों के प्रमस्तिष्क की संप्रभुता का व पाठ्यसहगामी गतिविधियों के मध्य सह-संबंध नहीं पाया जायेगा।

H03- छात्राओं की प्रमस्तिष्क की संप्रभुता का व पाठ्यसहगामी

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# A Correlational Study of Home Environment and Adjustment with reference to Adolescence Students

By Dr. NAMRATA SINGH and Dr. Amitesh Kumar Singh

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The present study was conducted to assess the correlation between home environment and adjustment of adolescent students of Raipur City. A sample of 120 students, age group between 13-18 years had been taken from randomly selected schools, out of which 8 secondary schools. The sample was collected by using simple random sampling technique. Descriptive survey method was used to collect data. The tools used for this study were (1) Home Environment Scale developed by A. Akhtar and S. B. Saxena ( and (2) Adjustment Inventory developed by A. K. Singh and A. Sen Gupta. After the analysis and interpretation it is concluded that, there were found a good correlation between adjustment problems on all dimension of home environment. ... [Read more](#)

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## कोरोना वायरस संक्रमण काल का प्रभाव – शिक्षा एवं समाज

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### ORIGINAL ARTICLE



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### शोध सारांश :-

वर्तमान समय में विश्व के अधिकांश देशों सहित भारत में भी कोरोना वायरस कोविड -19 का संक्रमण जारी है। कोरोना वायरस के संक्रमण को रोकने के लिए सरकार द्वारा लॉकडाउन किया गया है। लॉकडाउन की स्थिति भारतीय जनता के लिए एक नई परिस्थिति है जिसमें जनता सामंजस्य करने की कोशिश कर रही है। इस कठिन विपदा में शिक्षा सतत चलती रहे इस हेतु शिक्षकों के द्वारा ऑनलाइन शिक्षण प्रदान किया जा रहा है। कोरोना वायरस संक्रमण काल में समाज का एक बड़ा मजदूर वर्ग प्रभावित हुआ है। लोगों की आर्थिक स्थिति प्रभावित हुई है। कर्ज होने व नौकरी खोने का डर, अवसादग्रस्त होने से कई लोग आत्महत्या कर रहे हैं। आपाधापी वाला व्यस्त जीवन व्यतीत करने वाले आज अचानक शांत वातावरण में अपने घरों में रहने को मजबूर हो गए हैं। कार्यशैली में परिवर्तन आया है जिसका प्रभाव समाज पर भी पड़ रहा है।

### मुख्य शब्द :-

कोरोना वायरस, शिक्षा, समाज।

### प्रस्तावना :-

वर्तमान समय में संपूर्ण विश्व कोरोना वायरस कोविड -19 से आक्रांत है। भारत में भी इस वायरस का प्रकोप जारी है जिसका समाधान करने के लिए सरकार एवं जनता निरन्तर प्रयासरत है। वायरस अकोशिकीय अतिसूक्ष्म जीव है जो केवल जीवित कोशिका में ही वंश वृद्धि कर सकते हैं। शरीर के बाहर यह मृत होता है परंतु शरीर के संपर्क में आते ही यह जीवित हो जाता है। इसे क्रिस्टल के रूप में भी इकट्ठा किया जा सकता है। वायरस का शाब्दिक अर्थ विष होता है। सर्वप्रथम सन् 1796 में डॉक्टर एडवर्ड जेनर ने पता लगाया कि चेचक विषाणु के

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General Review Article

Severe Acute Respiratory Syndrome Coronavirus -2 (SARS-CoV-2): A Review on Pathophysiology, Diagnosis, and Investigational Therapeutics

Author(s): [Rahul Sharma](#) , [Dharmendra Khokhar](#) , [Bhanushree Gupta\\*](#) , [Purnendu Saxena](#) , [Kallol Kumar Ghosh](#) , [Arvind Kumar Geda](#) and [Kamil Kuca](#)

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Abstract

There is a new public health crisis threatening the world with the emergence and spread of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease was later named novel coronavirus disease or COVID-19. It was then declared a pandemic by the World Health Organization on March 11, 2020. The virus originated in bats and was transmitted to humans through unknown intermediary animals in Wuhan, Hubei province, China, in December 2019.

As of February 5, 2021, 103 million laboratory-confirmed cases and nearly 2.3 million deaths were reported globally. The number of death tolls continues to rise, and a large number of countries have been forced to maintain social distance in public place and enforce lockdown. As per literature, coronavirus is transmitted human to human or human to animal via airborne droplets. Coronavirus enters the human cell through the membrane ACE-2 exopeptidase receptor. WHO, ECDC, and ICMR advised avoiding public places and close contact with infected persons and pet animals. To date, there is no evidence of any effective treatment for COVID-19. The main therapies being used to treat the disease are antiviral drugs, chloroquine/hydroxychloroquine, and respiratory therapy. Although several therapies have been proposed, quarantine is the only intervention that appears to be effective in decreasing the contagion rate. We conducted a literature review of publicly available information to summarize knowledge about the pathogen and the current epidemic. In the present literature review, the causative agent of the pandemic, epidemiology, pathogenesis, and diagnostic techniques are discussed. Further, currently used treatment, preventive strategies along with vaccine trials and computational tools are all described in detail.

Keywords: [Coronavirus](#), [SARS-CoV-2](#), [Severe acute respiratory syndrome](#), [pandemic](#), [antiviral](#), [quarantine](#), [diagnosis](#), [treatment](#).

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# Journal of Drug Delivery Science and Technology

Volume 61, February 2021, 102308

Review article

## Quantum dots: Prospectives, toxicity, advances and applications

Bina Gidwani <sup>b</sup> , Varsha Sahu <sup>a</sup>, Shiv Shankar Shukla <sup>b</sup>, Ravindra Pandey <sup>b</sup>, **Veenu Joshi <sup>c</sup>**,  
Vikas Kumar Jain <sup>d</sup>, Amber Vyas <sup>a</sup>  

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## Highlights



## Chaos, Solitons &amp; Fractals

Volume 153, Part 1, December 2021, 111521

Frontiers

# Chaos control of chaotic plankton dynamics in the presence of additional food, seasonality, and time delay

Rajinder Pal Kaur <sup>a b</sup>  , Amit Sharma <sup>c</sup>, Anuj Kumar Sharma <sup>d</sup>, Govind Prasad Sahu <sup>e</sup>

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## Highlights

- In this article, the chaos control mechanisms is explored using internal parameters and external forces, viz., availability of additional food for zooplankton and fish, seasonality, predation delay and delayed feedback control.
- The availability of additional food for zooplankton and fish contributes to the rich dynamical behaviour (stable, quasi periodic, double periodic, chaotic) in the plankton-fish dynamics.
- A weak sinusoidal force plays a vital role in suppressing chaos from plankton-fish dynamics.



## चित्रा मुद्राल के उपन्यासों में नारी अस्मिता

नियति अग्रवाल

डॉ. गिरजा शंकर गौतम

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शोध सार:- वर्तमान समय में स्त्री विमर्श साहित्य का केंद्र बिंदु है। आज की स्त्री अपनी अस्मिता के सवाल पर बहुआयामी संघर्ष कर रही है। सदियों से गुपी बनाई गई स्त्री जब बोलना शुरू करती है तो धीरे धीरे उसकी हकलाहट दूर हो जाती है। वह प्रश्न उठाती है और जवाब मांगती है। उसके प्रश्न शोषणकर्ताओं के लिए बौखला देने वाले होते हैं। ऐसे में प्रश्नों का गुबार लिए हिंदी साहित्य की ऊर्जावान और कर्मठ महिला साहित्यकार चित्रा मुद्राल जी हैं जिन्होंने भारतीय स्त्री की संपूर्ण गरिमा का प्रतिनिधित्व किया है तथा लेखन के स्तर पर उतनी ही चेतनासम्पन्न, जागरूक और मुखर तथा सक्रिय हैं। चित्रा जी का कथा साहित्य नारियों के हक की बात करता है। वह कहती हैं - "स्त्री केवल अपनी देह भर नहीं है। उसके पास अपना समूचा व्यक्तित्व है जिसमें उसकी बुद्धि, उसकी संवेदना, उसकी तर्कशक्ति, उसकी निर्णय क्षमता, उसका विवेक, उसका मूल्यबोध सबकुछ अपना निजी हो सकता है। बिना किसी दबाव या अतिक्रमण के स्त्री इन सबका विकास करे और स्वयं को एक स्वतंत्र सत्ता के रूप में गिनवा सके, यही स्त्री-विमर्श का अभीष्ट है।" चित्रा जी के उपन्यासों में अपनी अस्मिता की तलाश करती नारियों को मुख्य विषय बनाया गया है और स्त्री के संघर्ष को उकेरते हुए यह बतावनी भी मुखरित हुई है कि नारी मुक्ति के भ्रामक प्रलोभनों में स्वाधीनता तलाश करती नारी कहीं मात्रा भोग्य बनकर न रह जाए।

आधुनिक युग की सशक्त महिला साहित्यकार 'चित्रा मुद्राल' का हिंदी साहित्य जगत में महत्वपूर्ण स्थान है। चेन्नई में जन्मी और मुंबई में शिक्षित चित्रा मुद्राल औपन्यासिक जगत की बहुचर्चित और सम्मानित रचनाकार हैं। चित्राजी की रचनाओं में नारी अस्मिता एक महत्वपूर्ण और गंभीर मुद्दा रहा है। 'नर' का आधा हिस्सा 'नारी' आज अपनी अस्मिता की खोज में निकली हुई है। अगर यह कहा जाए कि जितना पुराना असमानता और उत्पीड़न पर आधारित सामाजिक संरचनाओं के उद्भव का इतिहास है उतना ही पुराना इतिहास स्त्रियों के शोषण का है तो इसमें कोई अतिशयोक्ति नहीं होगी। स्त्री की अस्मिता के प्रश्न पर चिंता और विचारों के संघर्ष का आगाज दो शताब्दियों से अधिक अमेरिकी और यूरोपीय बुर्जुवा जनवादी क्रांतियों की पूर्वबेला में हुआ था। तब से लेकर आज तक विश्व के प्रायः सभी हिस्सों में स्त्री-पुरुष समानता का, स्त्री के अधिकारों का, स्त्री आंदोलनों का गहरा इतिहास हमारे पीछे पसरा पड़ा है। ऐसे में चित्रा जी की यह विचारधारा कि 'नारी भी पुरुष की तरह मांस-मज्जा धारिणी चेतना रूपा है' इस इतिहास को गति प्रदान कर रहा है। पात्रों के व्यक्तित्व में अस्मिता का एहसास, स्वाभिमान के साथ जीने की कोशिश, पारिवारिक विवशता और बेचारी के चित्रण में चित्रा जी बेजोड़ हैं। समाज में नारियों की स्थिति का

चित्रा जी ने सहज स्वाभाविक चित्रण किया है। नारी की विविध भावनाओं, नैतिकता और अनैतिकता के दोहरे मापदंड के बीच, स्वीकार और अस्वीकार के बीच, नारी की विवशताओं, कुंठाओं तथा समस्याओं के अत्यंत सहज चित्र उनके साथ उपन्यास साहित्य में अंकित हैं।

चित्रा जी का 'आवां' उपन्यास स्त्री विमर्श का महाआख्यान है। उपन्यास की मुख्य नायिका नमिता पांडे है। संपूर्ण कथा इसके इर्द-गिर्द घूमती है। इस उपन्यास में यह बताया गया है कि कैसे नमिता जैसी साधारण, मध्यवर्गीय और स्वाभिमानी लड़की का चतुराई के साथ उपभोग किया जाता है। संजय कनौड़ और पत्नी निर्मला की जिन्दगी में एक शिशु की कमी थी। संजय को एक ऐसी लड़की द्वारा बाप बनना था जो पेशा न करती हो, पवित्र हो और उससे प्रेम करती हो। अतः उसने नमिता को इन सबसे अनभिज्ञ रखकर प्रेम का खेल खेला और उसका शोषण करता रहा। अंत में जब अनजाने ही नमिता का गर्भपात हो गया तब उसे सच्चाई से रुबरू कराया गया जिसके बाद नमिता को खुद से घृणा हो गयी। इस प्रकार इस उपन्यास में मार्मिकता के साथ दर्शाया गया है कि कैसे एक नारी की भावनाओं के साथ खेलकर स्वार्थ के लिए उसका उपयोग किया जाता है और फिर उसे फेंक दिया जाता है। लेखिका ने नमिता के माध्यम से शास्त्रसम्मत नियमों का भी खंडन किया है। जब नमिता के पिता की मृत्यु हो जाती है तो वह कहती है - "क्रियाकर्म में करुंगी पंडितजी, मुखाग्नि भी मैं ही दूंगी। मैं पांडे जी की बड़ी बेटी हूँ, परंतु उन्होंने मुझे हमेशा अपना बेटा माना है।" चित्रा जी की सामाजिक दृष्टि अत्यंत स्पष्ट है। वे लिखती हैं - "प्रतिवाद में तनी आकाश भेदती मुद्रियों से वर्गहीन समाज रचे-गढ़ेंगे, जहां मनुष्य मनुष्य होगा, पूंजीपति या निर्धन नहीं! पकाएंगे अपने समय के आवां को, अपने हाड़-मांस के अभीष्ट ईंधन से, ताकि आवां नष्ट न होने पाए।" आवां उपन्यास में उन्होंने विभिन्न सम्प्रदायों की मानसिकता, उसकी व्यवहारिक वस्तुस्थिति को, मानवीय चेतना संघर्ष को, प्रभावात्मकता के साथ बड़े ही मार्मिक ढंग से प्रस्तुत किया है। इस उपन्यास को सहस्त्रादि का प्रथम अंतर्राष्ट्रीय 'इंदु शर्मा कथा सम्मान', उत्तर प्रदेश हिंदी संस्थान का 'साहित्य भूषण सम्मान', हिंदी अकादमी दिल्ली का 'साहित्यकार सम्मान', के. के. बिड़ला फाउंडेशन के 2003 का 'व्यास सम्मान' प्राप्त है।

चित्रा मुद्राल का उपन्यास 'एक जमीन अपनी' सन 1990 में प्रकाशित प्रथम उपन्यास है। आज विज्ञापन जगत घर-घर को आधुनिक भाषा बोध देने के नाम पर जिस तीखी मिर्ची से चकाचौंध कर रहा है उस ग्लैमर से विभ्रमित कर देने वाली दुनिया में जितना हिस्सा पूँजी का है शायद उससे काम हिस्सेदारी नारी और उसकी देह की नहीं है। इस नए सत्ता प्रतिष्ठान में स्त्री

# Mother Daughter Relationship in Manju Kapur's *Difficult Daughters*

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## **Abstract**

Manju Kapur, a Delhi based Miranda House, teachers of English, has successfully presented the problem of Indian women in a joint family in male dominated society. Her debut novel *Difficult Daughters* won the Commonwealth Writers Best First Book Prize in 1999. It is a feminist literary work and it is also about the partition of 1947. In her novel *Difficult Daughters*, as a post-colonial feminist writer, Kapur intuitively perceives Virmati's (the protagonist) position in the male dominated society and deals with her problems with insight and authenticity.

The title of the novel *Difficult Daughters* itself tells us the importance of mother daughter relationship in the story. Set in the time of partition this novel beautifully presents desires, expectations, dreams for what a mother and her daughter look for each other. A mother always expects a helping hand in her daughter and a daughter always expects a caring, loving dear friend and guide in her mother. At that time the condition of women in society was not as good as it is today and socially weak mother could not help her daughter much if she went against her family. Notwithstanding this helplessness, the novel presents an ideal relationship between the mother, Kasturi and her daughter, Virmati.



# Manju Kapur and Jhumpa Lahiri in Harmony

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## Abstract

More or less all stories are similar in one aspect, that is, they talk about human life. All that makes them different is the 'perspective.' The culture, times, social platform, economic status, the people in the family, the parenting, the education, personal temperament, attitude and psychological and emotional involvement makes a character different. A novel deal with the characters in details and while reading, a reader does not realize when he starts living within the character. At the end, he finds that a bond is built! This happens with several stories and several characters. This happens because there are certain qualities and virtues that are loved by everyone in the world, no matter how different are the ways of life, or the backgrounds. The human heart and its emotions are universally common and speak only one language.

Though Manju Kapur belongs to Delhi, in her novels we find glimpses of Punjab and near- by cities and she has set both her novels in either Punjab or Delhi and its near-by cities like Ayodhya. Indian culture, of Calcutta can be found in Jhumpa Lahiri's work because she belongs to Bengali background and her parents belong to Calcutta therefore Bengali culture appears in both her works even though she lives in America and sets her works in America. This paper deals with the similarities in both the writers' works, a reader recognizes and finds that they share the same platform of being basically Indian. Though they deal with different themes, a reader finds many similarities between them. Both are women writers and their sensibilities are feminine. Both are feminist in their attitude.





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