CRITERION-III

EVIDENCE(S), AS PER SOP

METRIC No. 3.4.5	Number of research papers published per teacher in the Journals as notified on UGC website during the last five years
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छत्तीसगढ़ के अभिलेखों में साहित्यिक अभिव्यक्तियां

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अध्यक्ष-प्राचीन भारतीय इतिहास संस्कृति एवं पुरातत्व अध्ययन शाला
पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर (छ.ग.)

अभिलेख सभी ऐतिहासिक साक्ष्यों में सबसे महत्वपूर्ण तथा विश्वस्त साक्ष्य है। अभिलेख उत्कीर्णन का उद्देश्य भले ही कुछ भी रहा हो, परंतु सभी अभिलेख मानवीय भावों की अभिव्यक्ति का सशक्त माध्यम रहा है। इसीलिए प्राचीन काल में जो भी अभिलेख उत्कीर्ण किये गये है, उसमें रस, छन्द, अलंकार, गुण, रीति और काव्य तथा रूढ़ियां आदि साहित्यिक गुण विद्यमान रहे है। अतः इन्हीं साहित्यिक विशेषताओं से परिपूर्ण होने के कारण ही कुछ अभिलेख को काव्य एवं ग्रन्थ कहा गया है। आचार्य मम्मट ने काव्य का प्रयोजन बतलाते हुये कहा है[1], कि काव्य की रचना यश के लिये, धन के लिए, व्यवहार-ज्ञान के लिए, अनिष्ट निवारण के लिये, तथा परमानन्द प्राप्ति के लिये और कान्ता सम्मित उपदेश के लिये की जाती है। लगभग यही उद्देश्य अभिलेख उत्कीर्णन का भी रहा है। यह कुछ अभिलेखों में उल्लिखित भावाभिव्यक्तियों से ज्ञात होता है। जैसा कि कलचुरी शासक पृथ्वी देव द्वितीय के कोनी प्रस्तर अभिलेख[2] के रचनाकार कासल ने लिखा है यदि मनुष्यों द्वारा किये गये सत्कार्य युद्ध में शत्रुओं पर विजय और ऐश्वर्य प्राप्ति आदि का वर्णन कवियों द्वारा न किया जाए तो ये सभी गहन अंधकार में किये गए नृत्य की भांति लुप्त हो जाऐंगें। इससे यह स्पष्ट होता है कि जिसके बारे में अभिलेख लिखे जाते है उसका यश तो सुरक्षित होता ही है उसके साथ अभिलेखों के रचियता या कवि या लेखक का भी यश अमर हो जाता है। इसी भाव-भूमि में अभिलेखों के रचना का प्रारंभ हुआ होगा जिसका प्रमाण अनेक साहित्यिक अभिलेखों के रूप में मिलता है।

साहित्यक अभिलेख के संदर्भ में छत्तीसगढ़ क्षेत्र में प्राप्त प्राचीन अभिलेखों का अवलोकन एवं अध्ययन करने पर ज्ञात होता है कि इस क्षेत्र से विभिन्न संदर्भो में जारी और अब तक प्राप्त अभिलेखों की संख्या लगभग 200 है।[3] जिसमें से अधिकांश अभिलेख दान लेख एवं प्रशस्ति लेख के रूप में उत्कीर्ण किये गये है।

दान लेखों का विषय वस्तु सीमित होने के कारण इसमें निहित साहित्यिक संदर्भो के संबंध में कुछ अधिक नहीं कहा जा सकता है, किन्तु इन अभिलेखों का इस क्षेत्र के साहित्यिक इतिहास के संदर्भ में इनमें प्रयुक्त भाषा की सौष्ठवता तथा लेखन कला के विकास की दृष्टि से इनका महत्वपूर्ण स्थान है। परंतु इस क्षेत्र से प्राप्त प्रशस्ति लेखों का पृष्ठभूमि ऐतिहासिक के साथ-साथ साहित्यिक भी है और उनका साहित्यिक संदर्भो में अध्ययन तथा विश्लेषण करने पर ज्ञात होता है कि इनमें उच्च कोटि की साहित्यिक रचना के सभी तत्व विद्यमान है। इसीलिए इनका स्थान साहित्य के रूप में स्थापित किया जा सकता है।

छत्तीसगढ़ क्षेत्र से प्राप्त अभिलेखों के भाषा, शैली एवं रचना की दृष्टि से अवलोकन करने पर ज्ञात होता है कि इनके रचनाकाल के आधार पर मुख्य रूप से तीन भागों में विभाजित किया जा सकता है। प्रथम चरण के अंतर्गत द्वितीय शताब्दी ईसापूर्व से चौथी शताब्दी ईसापूर्व के मध्य अभिलेखों को लिया जा सकता है।[4] इस काल में जारी

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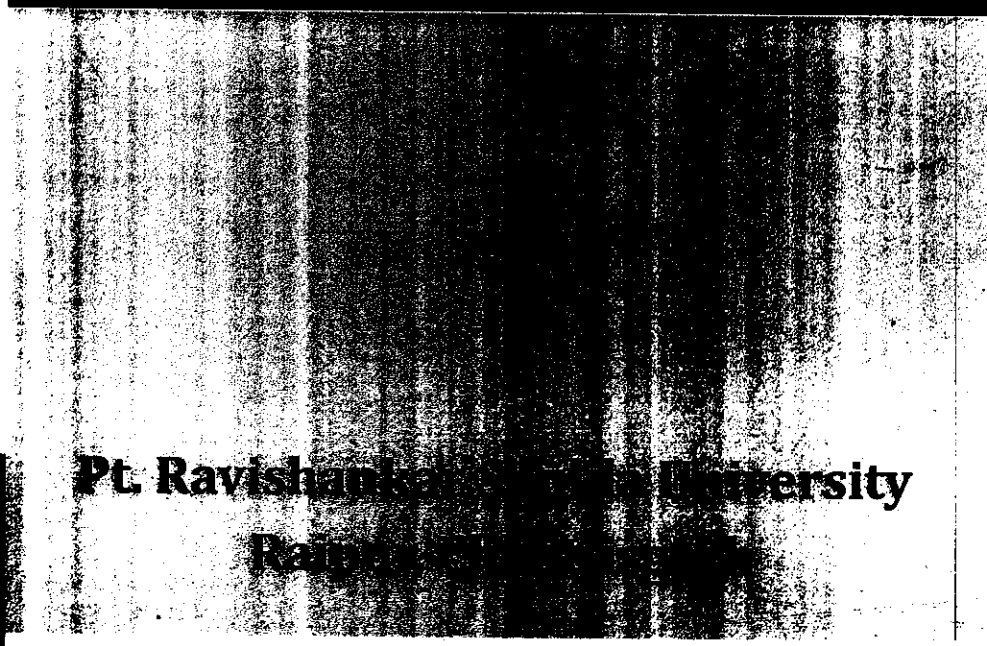

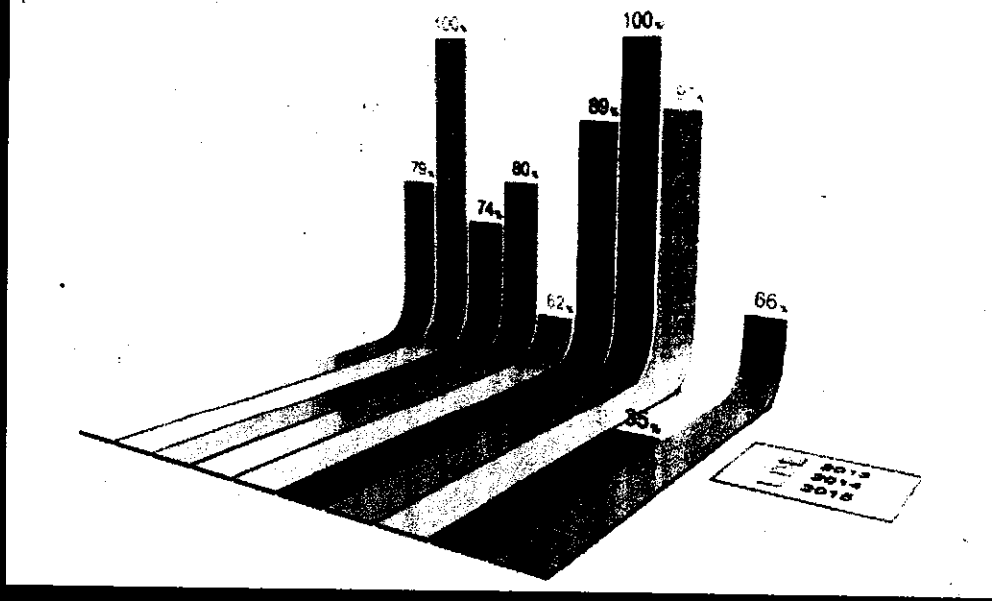

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छत्तीसगढ़ का पुरा पर्यावरण एवं प्रागैतिहासिक संस्कृतियों का विकास

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सारांश

छत्तीसगढ़ राज्य भारत के कुछ सौभाग्यशाली राज्यों में एक है जहाँ प्रकृति की विशेष कृपा है। इस राज्य में वनों का आच्छादन बहुत बड़े क्षेत्र पर है साथ ही महानदी, शिवनाथ, जोंक, अरपा, पैरी, एवं इन्द्रावती जैसी सदानीरा नदियों से इस राज्य का बहुत बड़ा भाग सिंचित रहता है। पृथ्वी की उत्पत्ति के पश्चात् जीव जगत के विकास पर पर्यावरण ने बहुत गहरा प्रभाव डाला है इसी क्रम में मानव का आगमन आज से लगभग 25 लाख वर्ष पूर्व हुआ उस समय का जो पर्यावरण था उसे पुरा पर्यावरण कहा जाता है। पुरा पर्यावरण के अन्तर्गत प्रतिनूतन काल एवं नूतन काल आते हैं जिसके प्रमाण भारत के विभिन्न क्षेत्रों से प्राप्त हुये हैं। इस प्रकार के प्रमाणों को छत्तीसगढ़ से भी अन्वेषित किया गया है। छत्तीसगढ़ राज्य प्रागैतिहासिक संस्कृतियों के विकास के लिये आदर्श क्षेत्र रहा है इसीलिये यहाँ पुरा पाषाण काल, मध्य पाषाण काल एवं नव पाषाण काल के सांस्कृतिक अवशेषों का खोजा जा सका है। उल्लेखनीय है कि इस क्षेत्र से मध्यपाषाण काल के दर्जनों पुरास्थलों की प्राप्ति हुयी है जबकि नव पाषाण काल के अपेक्षाकृत कुछ कम सांस्कृतिक अवशेषों की प्राप्ति हुयी है। इसका कारण संभवतः प्रागैतिहासिक अनुसंधानों एवं सर्वेक्षणों का अपेक्षाकृत कम होना माना जाना चाहिये। इस शोध पत्र के माध्यम से इस क्षेत्र के पुरा पर्यावरण एवं प्रागैतिहासिक संस्कृतियों की रूपरेखा को स्पष्ट करने का प्रयास किया गया है।

भूमिका

छत्तीसगढ़ राज्य का गठन 1 नवंबर 2000 को भारत गणराज्य के 26 वें प्रदेश के रूप में किया गया था।[1] प्राचीन काल में इस क्षेत्र को दक्षिण कोसल के नाम से जाना जाता था। पौराणिक मान्यताओं के अनुसार यह क्षेत्र मर्यादा पुरूषोत्तम श्री राम का ननिहाल था।[2] सर एलेक्जेण्डर कनिंघम ने इसे महाकोसल के रूप नाम वर्णित किया है।[3] इस क्षेत्र पर प्रकृति की विशेष कृपा निश्चित रूप से हैं क्योकि प्राकृतिक संसाधनों की दृष्टि से यह अत्यंत समृद्ध है। यहां पर वनों का प्रतिशत प्रति वर्ग मी. भारत के अन्य प्रदेशों से ज्यादा है। यहां अयष्कों की प्रचुर मात्रा में प्राप्ति होती है साथ ही मेकल एवं

(4)

कोसल

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प्राचीन छत्तीसगढ़ क्षेत्र के मौद्रिक साक्ष्यों में धर्म का स्वरूप

दिनेश नंदिनी परिहार*
शुभ्रा रजक**

इतिहास साक्ष्य सापेक्ष होता है, इतिहास लेखन में प्राचीन मुद्राओं का विशिष्ट स्थान है। प्राचीन भारतीय इतिहास के अनेक तथ्यों के साक्ष्य के रूप में मुद्राएँ ही प्रमुख साधन हैं। जिसके द्वारा इतिहास के अज्ञात तथ्य का उद्घाटन होता है। सभ्यता के विकास के साथ ही मानवीय आवश्यकताओं की पृष्ठभूमि में मुद्रा निर्माण के लिए मानव प्रेरित हुआ और शनैः–शनैः वर्तमान काल तक उसके स्वरूप में संशोधन होता रहा है। भारतीय मुद्राओं के संदर्भ में यह माना जाता है कि सर्वप्रथम व्यापार–वाणिज्य एवं नगरीकरण के फलस्वरूप व्यापारी संगठनों द्वारा इसका प्रवर्तन किया गया। मुद्राओं के सूक्ष्म एवं गहन विश्लेषण से अनेक अनसुलझे ऐतिहासिक तथ्यों का प्रकाशन किया जा सकता है, जिसमें उत्कीर्ण प्रतीक चिन्हों की भूमिका मुख्य है। प्रारम्भिक मुद्राओं पर विभिन्न आकृतियाँ जैसे–वनस्पति, पशु–पक्षी, अस्त्र–शस्त्र एवं मानव आकृतियाँ अंकित है।

कला–सृजन की प्रक्रिया में प्रतीकों का अंकन तथ्यपूर्ण और मौलिक प्रेरणा के रूप में ग्रहण किया जाता है। ऐतिहासिक क्रम में कुषाण शासकों के आगमन के पश्चात् मुद्राओं पर विभिन्न धार्मिक आकृतियों का अंकन प्रारम्भ हो गया, जिनमें भारतीय धर्म से जुड़े हुए देवी–देवताएँ सम्मिलित है। लगभग 200 ईसा पूर्व से प्राप्त होने वाले इन लेखांकित मुद्राओं पर चिन्हांकित प्रतीक प्रमाणिकता की दृष्टि से अधिक महत्वपूर्ण है। इन शासकों द्वारा प्रचलित मुद्राओं ने धीरे–धीरे भारतवर्ष के प्राचीन आहत मुद्राओं को चलन से बाहर कर दिया। जिसके परिणामस्वरूप विदेशी मुद्राओं की प्रतीक विधान की रूपरेखा का प्रभाव भारतीय शासकों की मुद्राओं पर परिलक्षित होता है। जिसे राजकीय नीति के द्वारा उन्होंने भारतीय जनमानस में स्थापित करने के उद्देश्य से द्विभाषी मुद्राओं का प्रचलन किया। जिसमें देवी–देवताओं को साकार रूप देने में इसका महत्वपूर्ण योगदान रहा है। मुद्राओं पर उत्कीर्ण धार्मिक अंकन के कारण ही, यह समकालीन धार्मिक प्रवृत्तियों को प्रकाशित करने में बहुधा सक्षम रहा है साथ ही इतिहास के विविध पक्षों के उद्घाटन में सहायक सिद्ध हुये हैं।

जे. एन. बैनर्जी ने अपनी पुस्तक 'डेव्हलपमेन्ट ऑफ हिन्दू आइक्नोग्राफी' में उल्लेख किया है कि भारतीय देवी–देवताओं की प्रतिमाओं के रूप–स्वरूप के ऐतिहासिक विकासक्रम में मुद्राओं का विशिष्ट योगदान रहा है। इसी कारण मुद्राओं पर प्रतीक चिन्हों की प्राप्ति विभिन्न धर्म से संबंधित एक उल्लेखनीय स्रोत माने गये है। जिनसे समकालीन समाज में प्रचलित धर्म का स्वरूप ज्ञात होता है।

धर्म एक मानसिक अभिव्यक्ति का माध्यम है जिसके अंतर्गत मानव ऐसी उच्चतर अदृश्य शक्ति के प्रति विश्वास प्रकट करता है, जो उसके भविष्य का नियंत्रक है। अदृश्य शक्ति को विभिन्न धर्मों ने विभिन्न स्वरूपों में स्वीकार किया है। प्रायः समाज में धर्म का वही रूप मान्य होता है, जो परंपरागत रूप से पीढ़ी दर पीढ़ी प्रचलित रहा है, जैसे – वैदिक कालीन धार्मिक उपासना का लक्ष्य मंत्र और यज्ञ के माध्यम से अलौकिक

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CONCEPT OF SUSTAINABLE DEVELOPMENT: A REVIEW

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School of Studies in Sociology,
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Abstract: In the present era, every undeveloped and developing country trying to become a developed country. Processes of development are very complex. Any country which becomes a developed country need natural and man resources. The process of development makes some favourable and some unfavourable changes. Favourable or positive changes called development and negative or unfavourable changes called social problems. Development defines as a positive change which helps to solve the social problems, growth all dimensions of life and try to increase human facilities. The present era is era of material of consumption. So, all materials that make human life easy encourage industries, and industries want natural resources for production. All countries know that natural resources are limited, but they used it more and more. Natural resources are not for us, but it was also for future generation. So, every country wants to save it for future. These concepts called sustainable development. Generally, we think sustainable developments are related to economical dimension, but it was related to socio-cultural, political and environment dimensions. Concept of sustainable development believed in save nature, natural resources and human resources for future generations and as well these concepts provide techniques for balanced development. According to these concepts, we want to use natural resources, which are necessary for our survival not for facilities. Present review paper tried to show sustainable development us method. We need our works are sustained. Present paper tried to explore importance for sustainable development in present era and also tried to explain the concept of sustained development. Researchers of any field want to search small to the smallest medium that is helpful for sustain works.

Key Words: Development, Sustainable Development, Natural and Human resources.

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Sociological review of Mendicancy

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Online published on 8 August, 2018.

Abstract

The present era known us era of development. What is development? What are the measurenment of development? What leve stishfied levels of development? These are questions which makes two different views about development. Process of developr result of changes. Every changes of socities origion some positive and some negative results. Positive result called developmer negative changes called social problems and mendicancy is one of them. Every undeveloped and developing country is sufferir these problems. Mendicancy affected directly baggers and their families. Human are primary unit of society so if one man effect some problem naturally all family member are affected. There are no satishfied definitions of mendicancy in social sciences; ts t and work behavioure we can define it as social problem like "Mendicancy is a socio-economic problem, which is done by poor a physically hanicaped men, women and children for their survival;" Mendicancy is generally affected childem and old age men/w Mendicants are suffering for basic needs of life like food, cloths and shelters. Generally mendicancy is known economic problen that is socio-cultural problems also. Present paper tries to know mendicant problems in old age men and woemen. What are the because of old age men/women expend their whole life in mendicancy? If they are come suddenly in this field so what are the n All the old agers are not poor as well as phycially hanicaped so why they are in these field? Present paper tried to know answer questions. Present research work conduct in three major railway stations Durg, Raipur and Bilaspur of Chhattisgarh state. Trina methods (quantitative and qualitative) are used in present work. Present work reveled division of labour in socity and concept of family are major factors of mendicancy.

Keywords

Mendicancy, old age, division of labour.

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INTERNATIONAL RESEARCH JOURNAL OF HUMANITIES, ENGINEERING & PHARMACEUTICAL SCIENCES
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HUMANITIES

Title	HEALTH STATUS OF PREGNANT AND LACTATING WOMEN OF RURAL AREA (SPECIAL REFERENCE OF VILLAGE-TUTA, RAIPUR, CHHATTISGARH)
Authors	Shailendra Kumar & Mitashree Mitra
Page No	18-28
Code	Int./JAN17/H1306
Affiliation	Pt. Ravishankar Shukla University, Chhattisgarh, INDIA
Abstract	*The health of women is central to the successful social and economic development by the family and community. It determines the well being of the mother on the fetus the infant and the child and in turns the next generation's mother. The individuals health and nutrition result on the body provide the substrate for the physiological system that permit normal health and successful reproduction poor maternal health status impede normal fetus growth and development and limit the physical mental and social functions that are critical to reproduction and mother hood. The present study was taken in the village TUTA of Abhanpur block belonging to Raipur district. It is a nearly village having a distance of 16 km. from the capital Raipur. The present study comprises the lactating & pregnant women of Tuta village to assess their health status. During the present investigation total 12 pregnant & 58 lactating women were studied. Eight anthropometric measures, hemoglobin test and blood pressure of were measured. In the present study the nutritional indices used for grading of health status of the pregnant and lactating women as suggested by Rao and Singh's (1970), Body mass index (BMI), Rohrer's index and Gomeg index. Some are age dependent some are age independent indices. Among pregnant women there is significant positive correlation between BMI and Calorie needs (0.82) and BMI and Total family members (0.64). However, total no. of children and age at marriage are not shown any significant correlation with BMI. Among lactating women there is significant positive correlation was found between BMI and Age at marriage (0.60). The present study will provide the substrate for the physiological system that permits normal health and successful reproduction. Poor maternal health status impedes normal fetus growth and development and limits the physical mental and social functions that are critical to reproduction and mother hood.*
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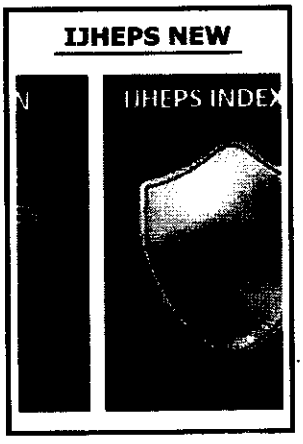

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Domestic Violence against Tribal Women: With Special Reference to Pardhi and Gond Tribes of Chhattisgarh

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ABSTRACT:
"An angry dispute or altercation; a disagreement marked by a temporary or permanent break in friendly relations" are called quarrel. Violence against women is a serious problem in India. Overall, one-third of women age 15-49 have experienced physical violence and about 1 in 10 has experienced sexual violence. In total, 35 percent have experienced physical or sexual violence. The aim of the present study is to achieve following objectives: to find out incidences of quarrel with Pardhi and Gond women of Chhattisgarh, to explore causes of quarrel with Pardhi and Gond women of Chhattisgarh, to suggest some advice for reducing violence against tribal women. Five villages of Dhamtari District (Chhattisgarh), namely: Kosmarra, Chararra, Bhushrenga, Kanharpuri and Bhalujhula have been selected by the random sampling. After that, 200 married and unmarried women belonging to the Pardhi tribe and Gond tribe, aged 15-56 years were chosen by random sampling method from those five villages. The interview cum structured schedule was used to collect the primary data. Group discussion technique was also used to collect and cross- checks the data. Almost all the respondents among Pardhi and the Gond tribal women have tormented by quarrel from time to time. Some of the women have faced every day this type of terrible situation, this vulnerable group of women may have victims of physical violence. Husbands of the Pardhi and the Gond women are the main accused of such kinds of domestic violence. The disappointment of the performance of housework of the respondents is the main cause of quarrel. There is no significant divergence found on the variation of the various issues for the domestic quarrel with women of the Pardhi and the Gond.

KEYWORDS: Domestic Violence. Tribal. Women. Pardhi . Gond. Chhattisgarh.

INTRODUCTION:
The Protection of Women from Domestic Violence Act of 2005 of Section 3 of the Act, defines that "any act, omission or commission or conduct of the respondent shall constitute domestic violence in case it: harms or injures or endangers the health, safety, life, limb or well-being, whether mental or physical, of the aggrieved person or tends to do so and includes causing physical abuse, sexual abuse, verbal and emotional abuse and economic abuse; or harasses, harms, injures or endangers the aggrieved person with a view to coerce her or any other person related to her to meet any unlawful demand for any dowry or other property or valuable security; or has the effect of threatening the aggrieved person or

Anthropological Perspectives of Art and Tattoo: With Special Reference to Bhunjia Tribe of Chhattisgarh

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Abstract

The anthropology of art focuses on historical, economic and aesthetic dimensions in non-Western art forms, including what is known as 'tribal art'. One of the central problems in the anthropology of art concerns the universality of 'art' as a cultural phenomenon. This study is focuses on to achieve the following objectives: to conserve various tattoo form of the Bhunjia tribe of Chhattisgarh with their scientific documentation and to discuss anthropological perspectives of the tattoo of the Bhunjia. The interview guide was used to collect the primary data. Group discussion technique was also used to collect and cross check the data. The photographs were taken for validation of data based on the given situation and incidents related to the subject. Bhunjia is numerically small and little-known tribes which mostly reside in the Nuapada district of Orissa and Gariaband district of Chhattisgarh. Bhunjia customarily craft tattoos by cutting drawings into the skin and rubbing the resulting wound with ink, ashes or other agents. Tattoo is called as Godna by the Bhunjia. A *Godna* is a form of body modification, made by inserting indelible ink into the dermis layer of the skin to change the pigment. This traditional Tattoo has religious and beauty significance for Bhunjia tribe. Bhunjia people think that *Godna* will accompany them even after their death. Various kind of art including tattoo of the Bhunjia are vanished. The younger generation of this community has forgotten their spiritual and aesthetic sense of tattoos. They don't want to draw the tattoo on their body. Ethnographic documentations should be conducting among the Bhungia of Chhattisgarh for conserve such kind of intangible cultural heritage.

Keywords: Art; Tattoo; Bhunjia; Tribe; Chhattisgarh.

Introduction

Art a diverse range of human activities and the products of those activities, usually involving imaginative or technical skill. In their most general form, these activities include the production of works of art, the criticism of art, the study of the history of art, and the aesthetic dissemination of art, visual arts, which include the creation of images or objects in fields including painting, sculpture, printmaking, photography, and other visual media. Architecture is often included as one of the visual arts; however, like the decorative arts, it involves the creation of objects where the practical considerations of use are essential—in a way that they usually are not in a painting, for example. Music, theatre, film, dance, and other performing arts, as well as literature and other media such as interactive media, are included in a broader definition of art or the arts.

Boas[1], one of the pioneers of modern

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Involvement of men in reproductive and sexual health: An anthropological perspective

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Abstract
Human reproductive behaviour and human sexual behaviour are subsumed under generic human behaviour. But when discriminated in a subtle way, we see that though both look alike, they are quite different from each other. When, on the one hand, the human reproductive behaviour is mainly socio-cultural in nature and on the other hand it is physio-psychological too. Age at coitus refers to be the age at which a man experiences heterosexual relationship for the first time. If a sexual relationship is established forcefully by a male against the wishes or willingness of the female, then such a physical contact is called imposed coitus. Contrary to imposed coitus is showing a total disinclination to sex (mainly by the male partner) resulting into a sexual deprivation of the woman. If a male declines even when the woman shows her desire for sex and are ready for coitus with him. From such illustrations, the point is clear that different conceptions are at work behind human reproductive behaviours and sexual behaviour. But from the point of view of reproductive health both human behaviour are of paramount importance. Keeping such groundswell of conceptions and consideration in mind, to measure the reproductive and sexual behaviour of the males, the parameters like age at first coitus, frequency of coitus, imposed coitus, sexual indifference, sexual apathy, premarital and post-marital sexual relationship, coitus during pregnancy, menstruation, etc., will be held up to evaluation and their effect on reproductive health of any community should be critically examined.

Keywords: Involvement of Men, Reproductive Health, Sexual Health, Anthropological, Sexual Deprivation, Imposed Coitus

Introduction

In a broad way, human reproductive behaviour and human sexual behaviour are subsumed under generic human behaviour. But when discriminated in a subtle way, we see that though both look alike, they are quite different from each other. When, on the one hand, the human reproductive behaviour is mainly socio-cultural in nature and on the other hand it is physio-psychological too. In both kinds of behaviour, man and woman as a couple, cohabit/ copulate together. But in reproductive behavior, the objective, besides being physio-psychological, transcends such personal limit and vines, though the birth of

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Concerns and Compasses for the Anthropological Research on the Fetal and Infant Death among Tribal and Rural Settings in India

Babita Bain, Jitendra Kumar Premi

Children are important properties of a country, for that reason, diminution in infant and child mortality is likely the most important purpose of the Millennium Development Goals. Neonatal survival is a very sensitive indicator of population growth and socio-economic development. World Health Organization has generated enormous data related to these kinds of research. It has provided definitions, terminologies and technical guidelines in addition to throwing valuable information on fetal and infant death across the countries. Theoretically, these types of research have mainly quantitative though partially qualitative while on the basis of applied perspectives, it could be diagnostic as well as exploratory in nature. Multi-stage random sampling can be appropriate sampling for the study of concerning issues. Structured Interview Schedule will be used for interviewing the women, to provide a complete reproductive history of the births. This information will be used to calculate norms for direct estimates of fetal and infant mortality, according to Barfield & Committee on Fetus and Newborn. The result of these types of studies will identify the root causes of fetal and infant death in the tribal and rural settings of India. It would improve our understanding of the causes of failure of the health services in tribal and rural regions. Besides, it can be of help, to design the new health strategies and programs for the tribal and rural India. On the basis of above all discussion, it is urgent need to conduct such type of research in tribal and rural India.

Keywords: Fetal death Infant death Tribal Rural India Public Health Research Anthropological Research

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Y-Chromosomal and Mitochondrial SNP Haplogroup Distribution in Indian Populations and its Significance in Disaster Victim Identification (DVI) - A Review Based Molecular Approach

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Abstract

Disaster Victim Identification is an important aspect in mass disaster cases. In India, the scenario of disaster victim identification is very challenging unlike any other developing countries due to lack of any organized government firm who can make these challenging aspects an easier way to deal with. The objective of this article is to bring spotlight on the potential and utility of uniparental DNA haplogroup databases in Disaster Victim Identification. Therefore, in this article we reviewed and presented the molecular studies on mitochondrial and Ychromosomal DNA haplogroup distribution in various ethnic populations from all over India that can be useful in framing a uniparental DNA haplogroup database on Indian population for Disaster Victim Identification (DVI).

Keywords: Disaster Victim identification; Uniparental DNA; Haplogroup database; India

Introduction

Disaster Victim Identification (DVI) is the recognized practice whereby numerous individuals who have died as a result of a particular event have their identity established through the use of scientifically established procedures and methods [1]. Deceased identification is crucial in mass disaster cases not only on humanitarian ground but also on legal grounds. A huge figure of peoples as victims of disaster remains unrevealed in every case of mass disasters as the bodies of victims are mostly ruined afar from identification. In India, the scenario of disaster victim identification is very challenging unlike any other developing countries. For dealing with mass fatalities in India, there is lack of any organized theoretical and practical outlook. Conventional identification methods are available but these methods failed in gathering information from highly degraded remains. Advancement in technical aspects of DNA based methods makes forensic DNA profiling a method of choice. In mass disasters, for Disaster Victim Identifications (DVIs) comparison were made of victims (deceased) sample to the DNA available from victim's body claimant for DNA profiling. Those bodies are identified and victim's charters were given but problem arises where bodies were not identified due to non-availability informative reference samples. Environmental conditions of places where disaster has occurred results in disintegration, decaying and intermixing of deceased remains. In such situations, simply doing a DNA Profiling is not sufficient. In the way of determining the individual identity of deceased additional information on geographical origin of such mutilated bodies will became the gold standard for disaster victim identification.

Genetic markers used in DVI

In DVI, the choice of genetic markers should be consistent with the necessity mentioned above which can reveal the fact that the human genome variation is not uniform. This inconsequential assertion put forward characteristics of a number of markers ranging from its distribution in the genome, their power of discrimination and population restriction, to the sturdiness nature of markers to the process of degradation and their willingness for multiplex and automated analysis. The characteristics of different markers and the technical approaches presently used in personal genetic identification were discussed further.

Short tandem repeats (STR) markers

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DNA FINGERPRINTING APPLICATIONS IN FORENSIC INVESTIGATIONS

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Project: DNA Polymorphisms

Authors:

Moumita Sinha
Guru Ghasidas University

Arjun Rao Isukapatla
Guru Ghasidas University

Mitashree Mitra
Pt. Ravishankar Shukla University

Abstract and Figures

Each person on the planet can be, distinguished polymorphism in the succession of his or her DNA, which he or she acquires from his or her biological parents and is Identical in each cell of the body. DNA fi recognizable proof is called, can affirm with sureness the parentage of a person. The utilization of DNA profiling in the criminal equity framework is a vital issue in criminal specialists today. The innovation is changing q profiling has been depicted as an effective achievement in criminological science. The forensic use of DNA profiling is a noteworthy commitment to an innovation which can help not offender additionally to avoid the innocent. In this article an endeavor is made to expound the changing situation of the innovation in the late years and in addition to introduce the some genuine situations where distinctive variati connected in understanding the criminal cases in the research centers. Copyright©2017, Moumita Sinha et al. This is an open access article distributed under the Creative Commons Att use, distribution, and reproduction in any medium, provided the original work is properly cited.

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Ethnomedicinal Practices among Gond & Halba Tribe of Chhattisgarh, India

Praveen Kumar Soni, Aniksha Varoda, Mitashree Mitra

This study presents the findings of an investigation on ethnomedicinal practices of various diseases among Gond & Halba tribe of Chhattisgarh, India. The main aim of the study was to understand the dependency of Halba tribe on herbal plant resources for their health care practices. Primary data were collected through Anthropological tools and techniques like non-participant observation, in-depth interview, interview-cum-schedule, case study technique.29 medicinal plants were identified with relevant information and documented with regard to their botanical name, family, local name & plant parts used and utilization for treatment of 18 types diseases. The Halba tribe use many medicinal plant species for the treatment of common skin ailments, wounds, eczema as well as gastro-intestinal problems such as diarrhea, dysentery, constipation, jaundice, cardio vascular disease, paralysis, cold and cough, asthma, tuberculosis, malaria, arthritis and also for snake bite, scorpion bite, dog bite, fracture of bone, etc.

Keywords: Ethnomedicinal Practices, Medicinal Plant, Gond Tribe, Halba Tribe, Chhattisgarh

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Classroom Environment as a predictor of Academic Achievement

Article *in* Asian Man (The) - An International Journal · January 2015

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Human Dopamine Receptor D2 (DRD2) Polymorphisms among Four Tribal Populations of Chhattisgarh, India

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Abstract

Dopamine receptor gene plays an important role in central nervous system and helps in the proper functioning of neural circuits in the human brain. Polymorphisms of this gene affect the functioning of brain activities. Association of Dopamine receptor D2 gene (DRD2) polymorphisms with cognitive disorders and alcoholism has been reported in various studies now-a-days. The interest on DRD2 polymorphism is not only limited to psychiatric disorders or alcoholic behaviors or pharmacology but it is also a promising gene for evolutionary genetic studies and studies on genetic variations among populations. The present study is an attempt to understand the extent of genetic variations in four tribal populations by using the allele frequencies, haplotype frequencies and the distribution patterns of the three Taq I polymorphic sites of DRD2 gene. 197 unrelated blood samples were collected with individual informed consent and analysed by using standard protocols. All the three sites were found to be polymorphic among the four studied populations. The allele frequency distribution patterns and sharing of haplotypes in this study suggest genetic proximity among the populations.

Top

Keywords

Dopamine Receptor Gene, Linkage Disequilibrium, Haplotype, Ancestral Allele, Single Nucleotide Polymorphism, Tribal, Chhattisgarh.

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Socio-Demographic Profile of Cervix Cancer Patients of Chhattisgarh

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Abstract

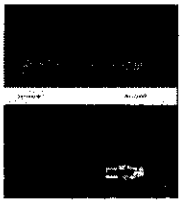
Cervix cancer is one of the leading causes of morbidity and mortality amongst gynaecological cancers worldwide. India has the highest number of cervix cancer patients in the world with 1,32,000 new cases per year and 74,000 deaths per year (Laikangbam et al., 2007). India accounts for 27% of the total cervix cancer deaths. The present study was conducted on 200 married women of age group 25–80 years to assess the socio-demographic and life style variables associated with cervix cancer among women of Chhattisgarh. They were diagnosed patients of cervix cancer attending the Indira Gandhi Regional Cancer Centre and Gynaecology Department of Dr. B.R. Ambedkar Hospital, Raipur (C.G.). More than half (62.5%) of the study population belonged to the age group of 31–50 years. 87.5% respondents got married before the age of 18 years, 60.61% had their first child before the age of 18 years and 33.5% respondents had 5 or more issues. 96.5% women used cloth rather than pads during menstrual cycle and of that 61.66% women used their menstruation clothes for more than 7 months up to 1 year whereas 21.76% respondents used the same cloth for more than 1 year. 47% women had tobacco chewing habit. 30% women reported white discharge. 27% reported blood discharge while 40.5% reported both as the first symptom of the cervix cancer. Early age at marriage, low socio-economic status, multi-parity, use of tobacco and lack of menstrual hygiene are potential risk factors observed in the study population. This emphasises the need for integrating extensive awareness building measures in cancer control programmes. A multi-pronged approach is essential to cover women belonging to various socio-economic groups.

Top

Keywords

Cervix Cancer, Socio-demography, Life Style Variables, Menstrual Hygiene, Raipur, Chhattisgarh, India.

Top



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Original Article

Epidemiological Study of Malaria among the Oraon Tribe of Jashpur District

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Abstract

Oraon is a predominant tribe of Northern part of Chhattisgarh state. Chhattisgarh accounts for 2% of the total population of the country but it contributes more than 16% of the total malaria cases. For the present investigation two development blocks were selected from Jashpur district in order to report the precise knowledge of local epidemiological features of malaria among the Oraons.Outs of 243 households selected for the purpose 10.7% were affected with Malaria. Females of reproductive age showed a higher occurrence of malaria in 20-44 years age group as compared to males. Correlation of malaria with type of house, animal domestication, excreta disposal, drainage system showed non significant results. Only toilet facility showed significant results .

Keywords: Epidemiology; Malaria; Oraon; Jashpur; Chhattisgarh.

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Somatic Problems and Coping Strategies of Adolescents with Sickle Cell Disease

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ABSTRACT

Out of total sample of the study 72.7 % adolescents were homozygous and 76.7 % were heterozygous. Male and females of Age group 14-16 years were maximum number. Percentage of heterozygous males complaining somatic problems is higher, whereas percentage of homozygous females complaining somatic problems is high. There is significant positive relationship between Maladaptive coping style and somatic problems. Somatic problems emerge as significant predictor in variation of criterion variable somatic problems. The t values explain significant difference in somatic complaints among sickle cell adolescents with respect to gender and zygosity.

Keywords: *Adaptive and Maladaptive coping, Sickle Cell Anemia, Adolescents, Somatic problems.*

Sickle cell disease is a molecular hereditary hemolytic disorder of hemoglobin molecule in which glutei acid at position 6 of β-polypeptide chain of hemoglobin is replaced by another amino acid, valine (Ingram, 1957). It causes infection, organ failure, chronic lung disease, anemia, stroke and thrombosis resulted unpredictable and recurrent episodes of pain (Smith, 1989). Sickle cell disease patients have psychosocial behavior problems, repeated absences in school & impaired peer relationships (Barbarin, 1994; Yang, Cepeda, Price, Shah, & Mankad, 1994). Coping is the process of executing a potential response which is related to secondary appraisal (Lazarus, 1966) consist problem focused or problem solving coping and emotion focused coping or managing the emotional distress (Carver, Scheier & Weintraub, 1989;

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Anaemia among Bhunjia tribal women of Chhattisgarh, India and their correlation with BMI

In Chhattisgarh, 42 groups have been identified as scheduled tribes. They form approximately 32 percent of the total population of Chhattisgarh. Bhunjia tribe is one of the vulnerable tribe of Chhattisgarh. Bhunjia tribe inhabit hilly forests of Gariyaband district of Chhattisgarh state. Bhunjia mainly comprise of two social groups - Choukhutiya and Chinda Bhunjia [2,3,4,5]. Population of Bhunjia tribe of Chhattisgarh is declining[1]. The health and nutritional problems are most common in tribal women of India. Nutritional anaemia is one of the major problems of Indian rural and tribal women. According to WHO the prevalence of anaemia is 37.7% to 41.5% among non-pregnant women and 38.9% to 48.7% among pregnant women in developing countries[6]. Present study was carried out among 227 Bhunjia women consisting of 178 lactating and 49 pregnant women. Interview schedule and observation technique was used for data collection. For estimation of Hb HemoCue technique was followed. 90.17 percent lactating and 87.76 percent pregnant women were observed to be anaemic. Pearson correlation showed positive correlation between Hb level and BMI at 0.05 level of significance.
Key Words : Anaemia, Bhunjia, Women, and Chhattisgarh.

SATYAJEET SINGH KOSARIYA* & DR. MOYANA CHAKRAVARTY**

Introduction :

Health is one of the major components of human development. There are huge gaps in commitment and achievement with regard to health status of Indians and affordability of health care. Tribal women of India are at a great disadvantage due to illiteracy and ignorance. Although several studies on maternal health and nutritional status have been carried out in various populations of India there is dearth of information pertaining to the health of women in tribal populations. Women have health problems linked to their child bearing and conception. The socio-economic and cultural background influences the perception of health and the utilization of health services. Despite several growth oriented policies adopted by the government, the widening economic and regional disparities are posing challenges for the health sector.

The National Family health survey (NFHS-3) reported that anaemia is major health problem especially in tribal women and children. Anaemia is prevalent among low education group and schedule tribes. Therefore, an attempt has been made to study the maternal health of Bhunjia with special reference to BMI and anaemia.

Bhunjia is a minor group amongst the 42 scheduled tribes of Chhattisgarh. Its population according to 2001 census was 9357. Bhunjia is a small Dravidian tribe of Chhattisgarh.They inhabit the remote forest at Udandi wild life century and adjoining villages along with kamar (a vulnerable primitive tribe of Chhattisgarh) of Gariyaband, Dhamtari District. Bhunjia have two major sub-divisions viz Choukhudia and Chinda Bhunjia[3,4,5]. Choukhutia Bhunjia have originated from marital relationship among Halbas and Gond[2]. Bhunjia left shifting cultivation and started settled agriculture. They still practice collection of roots, fruits, Mahuwa, Chaar, Tendu leaves etc from forest and sell valuable minor forest products. Wage earning as farm labourers, working on road for cutting timbers[7], GMNREGA, brick workers, agriculture and working as agricultural labourers are their primary occupation. Aboriginal tribes of this area invariably lead an isolated life from the general stream. They belong to different ethnic groups and have low levels of education, poor social, cultural and political development. Bhunjia tribe of this region is regarded backward in each and every aspect of life like agriculture, education and even in health indicators[8].

Methodology :

For the present empirical study 223 households from Chhura, Gariyaband and Mainpur block of Gariyaband District were selected out of 227 women. All the villages were inhabited by Bhunjia. Census survey method was used for selection of pregnant (49) and lactating (178) Bhunjia women. 5 women refused to participate for weight-height and Hb test. Structured Interview Schedule and Semi-participatory observation technique were used for data collection. Anthropometric measurements viz height vertex and weight were taken on the position of FHP by the use of anthropometer and weighing machine[9]. Hb was observed

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Cross Sectional Study of Osteoporosis among Pre and Post Menopausal Women of Raipur City

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Abstract: ***Being diagnosed with osteoporosis is serious and breaking a bone due to osteoporosis is even worse. Millions of people are struggling with their bone health and develop a feeling, as if, their future is completely out of their control. But our body is a miraculous machine and over thousands of years it has been designed for life. We need the right information, at the right time, to make smart choices to lead a better life when it comes to the health of our bones . In other words, if an individual is diagnosed , way before that he or she might be a victim of osteoporosis and have a chance of getting a fracture, then measures can be taken to avoid such a situation. The present paper was an approach to identify the individuals with osteoporosis who have never been diagnosed before from the otherwise normal volunteers willing to participate in the study. The data was analyzed and the results showed a high prevalence of osteopenia and osteoporosis among the pre and post menopausal women attending the various gynaecological centres of Raipur city with some obstetric problems. Significant difference was observed between osteoporosis and previous fracture, menopausal status, frequent falls and age . On the other hand, BMI , weight and caste distribution showed non – significant difference .***

Keywords: Osteoporosis , Bone mineral density , BMI,QUS

1. Introduction

Osteoporosis is a skeletal disorder characterized by compromised bone strength predisposing to an increased risk of fracture. Osteoporosis is a disease charactertized by reduction in the bone mass and disruption of bone architecture leading to impaired skeletal strength and increased susceptibility of fractures (Lane, 2006) .It occurs silently and progressively, reflected only in a low bone mineral density, and generally not realized until the first fracture occurs.

Osteoporosis is a major cause for morbidity and mortality in adult Indian men and women and is widely prevalent in India (Gupta, 1996).It is estimated that approximately 26 million Indians are affected by osteoporosis with the numbers projected to increase to 36 million by the year 2013 (Action Plan Osteoporosis : Consensus Statement of an Expert Group, 2003).Studies have showed that osteoporotic fractures occur 10- 20 years earlier in Indian women and men than their western counterparts (Alekel, Mortillaro, & Hussain, 1999)Osteoporosis, which literally means porous bones , is a serious global health issue affecting one in every third woman and one in every five men over the age of 50 (Melton et al., 2005). There is a positive correlation between BMD and body weight to the order of 0.3 to 0.6(Felson et al., 1993).The key for early diagnosis of osteoporosis is to measure the bone mineral density, so that effective preventive and therapeutic measures could be taken at the earliest. Low trauma fracture, being the ultimate consequence of osteoporosis , is a global health concern because of its close association with increased mortality , morbidity ,health care costs and reduced quality of life (Center et al., 1999; Cummings & Melton, 2002).

Due to the lack of awareness as well as due to lack of facilities available for the measurements of bone mineral density a proper screening for the people who are likely to be affected by osteoporosis is not done in Indian context. Limited numbers of population based studies have been done so far in our country .Hence the prevalence of osteoporosis in India has not been established yet. Therefore, such kind of studies are essential for knowing the prevalence of the disease, area and region wise.

The prevention of osteoporotic fracture is an important clinical goal since it will reduce mortality, morbidity as well as the expenditure on health care. Due to the availability of several drugs which can help to increase the BMD and reduce fracture risk, the relevance of identifying those with osteoporosis before any fracture has occurred is more important. These medications can achieve significant reductions in fracture rate even in elderly patients with low bone mass and previous fractures.

With both life style predictors and chemical occurrence in the body a great deal is coming to light on osteoporosis revealing new insights to medical professionals. There is rarely one single explanation for the onset of bone density loss but instead there are a series of interdependent bodily changes leading to condition's development .However, there are several demographic features like ethnicity , which indicate some individuals to be at high risk groups hence more actively recommended for screening .Those having a family history of bone density loss or osteoporosis and the post-menopausal women other than elderly individuals are most impacted and demanding for screening.

2. Materials and Methods

A cross sectional community based epidemiological study was conductedin order to study the prevalence of osteopenia and osteoporosis. The present study was carried out between September 2014 to July 2015. Camps were organized in various gynecological centres. Total of 191 women above the age of 35 years attended the camps. Sociodemographic variables were collected by means of semi structured schedule. The present study was approved by the institutional ethics committee. Consent was taken from all the respondents. Informations on calcium intake, sunlight

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Maternal Health Status of Choukhutiya Bhunjia Tribe of Gariyaband District of Chhattisgarh, India

Satyajeet Singh Kosariya, Moyna Chakravarty

Objectives To assess the maternal health status of Choukhutia Bhunjia and to highlight the health related problems of pregnant and lactating Choukhutia Bhunjia women with regard to anaemia and nutritional status. Methods The present study was conducted at Gariyaband district of Chhattisgarh, India.15 predominated Bhunjia villages were selected for primary data collection for which 114 women (21 pregnant and 93 lactating women) were selected by census survey method. Structured interview schedule, semi-participatory observation technique were used for data collection. Anthropometric measurements viz. height and weight were taken (Weiner & Lourie, 1981). Hemocue 301was used for assessment of haemoglobin level. Results Prevalence of anaemia was observed to be very high among lactating and pregnant Choukhutiya Bhunjia women.64.92 % lactating women were found to be under underweight category and only 4.39 % under over weight. Pearson correlation between BMI and anaemia was observed to be positively correlated. Conclusion Maternal health of Bhunjia women were observed to be very low. The prevalence of anaemia was noted to be very high among the Bhunjia women. Quality of maternal nutrition and lack of health services might be responsible for the low maternal health of the Bhunjia women. Good antenatal, intranatal and post natal care and enhancement of health care delivery system might be helpful in upliftment of maternal health status of Choukhutia Bhunjia women.

Keywords: BMI, Anaemia, Maternal health, Choukhutia Bhunjia, Chhattisgarh

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Relationship between Somatic Problems and Socio-demographic Factors among Sickle Cell Anaemic Adolescent of Chhattisgarh, Central-East India

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Abstract. The main objective of the study was to see association if any, between somatic symptoms/clinical manifestations with various socio-demographic factors which affect somatic problems in sickle cell anaemic adolescents. The data was collected purposively from 309 sickle cell anaemic (HbAS/HbSS) adolescents of both the sexes hailing from various districts of Chhattisgarh by using Interview schedule and a checklist of clinical manifestation. Out of 309 sickle cell anaemic adolescents, 72 were homozygous (23.3 percent) and 237 were heterozygous (76.7 percent). Study revealed that 63.1 percent patients felt that weakness was higher in females as compared to males. 50.2 percent patients were anaemic which was also observed to be higher in females. Maximum (79.3 percent) patients belonged to lower socio-economic status. The highest percentage of sickle cell anaemia (21.0 percent) was observed in the 17 year age group. Significant negative relation was observed between somatic symptoms with age, gender, educational status of the patients, age at onset of sickling, family income, and socio-economic status. Only blood transfusion and zygosity showed positive correlation with somatic symptoms. The mean and standard value of different variables revealed that each patient with sickle cell anaemia had on average 3.64 problems. Mean age was 15.5 years and most of the patients were diagnosed at 12.23 years of age. Number of hospitalizations during the last one year was 3.25 (SD- 3.7). Blood transfusion during hospitalization was 1.29 (0.63 percent) and mean age at menarche was 13.2 (1.4 percent). The study observed significant contribution of independent variable of change on dependent variables.

Keywords: Sickle Cell Anemia, Adolescents, Somatic symptoms, Socio-demographic factors, Chhattisgarh

Introduction

Sickle cell anaemia is a hereditary haemolytic disorder which is a structural variant of haemoglobin in which a glutamic acid at position 6 of β-polypeptide chain of haemoglobin is replaced by valine (Ingram, 1957) and Haemoglobin (Hb) molecule becomes mutant which is the cause of crescent/ sickle shaped red cells, therefore, it is known as sickle cell. The homozygous (Sickle cell disease) condition is more severe than heterozygous (Sickle cell trait). A person with sickle cell trait (HbAS) leads a normal life but the Sickle cell disease (HbSS) person suffer from various complications throughout the life such as anaemia, jaundice, foot and hand syndrome, recurrent infection, osteomyelitis, necrosis of bone, aplastic crisis, abdominal pain, splenic sequestration crisis, hepato-splenomegaly etc. (Serjeant and Serjeant, 2001). There is no permanent treatment for sickle cell disease however; hydroxyurea, blood transfusion, stem cell transplantation are some of the methods used to reduce the problems.

It is an important public health challenge which causes a high degree of morbidity, mortality and fetal wastage in vulnerable communities (Balgir, 2007). World Health Organization estimated that 5 percent of the world population is carrier for hemoglobin disorders. Out of which 2.70 crore carriers reside in India. High incidence of sickle cell anaemia was found in Africa and Mediterranean countries (WHO, 2006). The sickle cell gene was reported with highest frequency in Orissa followed by Assam, Madhya Pradesh, Uttar Pradesh, Tamilnadu and Gujrat (Balgir, 1996) specially recognized widely in central India (Negi, 1975).

The occurrence of vaso-occlusive pain is higher in adolescents than children (Dampier *et al.*, 2002; Platt *et al.*, 1991). Patra *et al.* (2013) studied 330 clinically suspected sickle cell disease patients (comprising 195 HbSS and 135 HbAS) to know epidemiological profile of sickle cell disease children of Chhattisgarh and showed general weakness was the most common symptom in sickle cell anaemia (87.7 percent) compared to sickle cell trait (60 percent). 75.4 percent and 61.5

Plant Tissue Cult. & Biotech. 26(2): 151-157, 2016 (December) **PTC&B**

Effect of Different Cytokinins and Media Types on *In vitro* Shoot Proliferation of *Asparagus racemosus* Willd.

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Key words: Asparagus racemosus, Shoot proliferation, Media types

Abstract

The evaluation of the effects of different cytokinin concentrations and media types on *in vitro* shoot proliferation of *Asparagus racemosus* Willd. is reported. Maximum shoot number and shoot lengths were found with 0.25 mg/l BA which was statistically similar with 0.1 mg/l Kn. Maximum multiplication and growth were found in MS. The protocol could thus be helpful for *in vitro* mass propagation of *A. racemosus*.

Introduction

Asparagus racemosus Willd. is an important medicinal herb belonging to Asparagaeceae. This species is found in the tropical and subtropical regions in India. It is characterized by thorny woody stems and leaves reduced to cladodes. Storage roots are tuberous and tapering at both ends. The plant is traditionally being used for the treatment of female related disorders as it possesses phytoestrogenic properties and is extensively used in combating menopausal symptoms (Sabnis et al. 1968, Mitra et al. 1999). Steroidal saponins called Shatavarin I - X are the major phytoconstituents in *A. racemosus* which impart major properties to it as immunomodulant, galactogauge, adaptogen, antitussive, anticarcenogenic, antioxidant and antidiarrhial (Rao 1952, Joglekar et al. 1967, Gaitonde and Jetmalani 1969, Thatte et al. 1987, Rice 1988, Shao et al. 1997, Oketch Rabah 1998). Due to indiscriminate use, natural population of *A. racemosus* is shrinking. It has been included in the list of 32 prioritized medicinal plants for conservation and development by the National Medicinal Plants Board (NMPB 2002). The plant species is at the verge of being threatened and conditions would be more adverse if not properly managed.

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Variation in Aeromycoflora of Raipur city with special reference to allergic diseases

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Abstract

Raipur is a capital of Chhattisgarh and also an industrial and commercial hub of the state. Air pollution poses serious problems to human health in the city. More than 20- 30% of the world population is known to suffer from one or other allergic ailments such as allergic fungal sinusitis, allergic rhinitis, allergic asthma, eczema, atopic dermatitis, aspergillosis, mycosis etc. The main objective of the present study was to survey the diversity of aeromycoflora of Raipur city and to identify the important fungal spores or allergens responsible for various allergic diseases prevalent in Raipur city. In light of above facts aeromycological survey of some indoor sites and outdoor sites of Raipur city was conducted in monthly interval during the year 2013-2014 .The fungal spores was studied by using Petri plate method. The results of the study indicated 67 fungal species in indoor sites while, a total of 82 fungal species in outdoor sites of Raipur city. The class wise respective number of fungal species in indoor sites was Zygomycotina 9, Ascomycotina 3, Anamorphic Fungi 54 and Mycellia sterillia type 1 while, in outdoor site number recorded was Zygomycotina 8, Ascomycotina 5, Anamorphic Fungi 67 and Mycellia sterillia 2. Survey on allergic diseases in Raipur city revealed that the allergic rhinitis and allergic asthma were dominant allergic diseases in Raipur city. Fungal spores of 11 species viz. *Cladosporium cladosporides, Aspergillus niger, Cladosporium oxysporium, Aspergillus versicolor, Penicillium chrysogenum, Curvularia lunata, Alternaria alternata, Aspergillus flavus, Fusarium monalliformis, Phoma exigua, and Rhizopus nigricans* were found to be the main cause of allergic diseases in Raipur city.

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अलका कौशिक एवं एस के जाधव
जैवप्रौद्योगिकी अध्ययनशाला, पं. रविशंकर शुक्ल विश्वविद्यालय रायपुर 492 010 (छत्तीसगढ़)

सारांश : अनुसंधान के विभिन्न विषयों में ईंधन सेल भी एक महत्वपूर्ण विषय है। सूक्ष्म-जैविक ईंधन सेल एक नये प्रकार के ईंधन सेल हैं जो नवीनकरणीय बॉयोमास का उपयोग करते हुये सूक्ष्म-जीवों के माध्यम से जैव-बिजली उत्पन्न कर सकते हैं। विभिन्न कारकों को ध्यान में रखते हुये सूक्ष्मजैविक ईंधन सेल (एमएफसी) के प्रदर्शन में सुधार व विकास किये जा सकते हैं। कुछ प्रभावी कारक जैसे सब्सट्रेट के प्रकार एवं इलेक्ट्रोड की संरचना, एमएफसी के प्रदर्शन में एक महत्वपूर्ण भूमिका निभा सकते हैं। निम्नलिखित अध्ययन में एक दोहरे कक्ष वाले एमएफसी का निर्माण किया गया है। जिसमें जैव-बिजली के उत्पादन के साथ-साथ अपशिष्ट जल के उपचारित होने की भी जांच की गयी है। इस शोध कार्य में प्रायोगिक जांच के आधार पर इलेक्ट्रोड की सर्वश्रेष्ठ जोड़ी का चयन किया गया। एनोड/कैथोड सामग्रियों के विभिन्न संयोजकों के रूप मे कॉपर, जिंक, एल्युमिनियम एवं कार्बन का व्यवस्थित अध्ययन किया गया और यह पाया कि जिंक-कॉपर इलेक्ट्रोड जोड़ी उच्च वोल्टेज प्रदान करने वाली सर्वश्रेष्ठ जोड़ी है। गुढ़ियारी नाला के अपशिष्ट जल को सब्सट्रेट की तरह उपयोग करने पर 1.24 ± 0.001 वोल्ट की वोल्टेज एवं 3.28 ± 0.012 मिलिएम्पीयर का जैव-बिजली प्राप्त हुआ। इसके साथ ही अपशिष्ट जल का विश्लेषण, प्रयोग के पहले एवं बाद में भी किया गया है। विश्लेषण के दौरान केमिकल ऑक्सीजन डिमांड (सीओडी) में 66.67 प्रतिशत की महत्वपूर्ण गिरावट दर्ज की गयी। जो यह प्रमाणित करता है कि इस प्रक्रिया से अपशिष्ट जल का उपचार भी किया जा सकता है। आगामी वर्षों में बिजली की जरूरतों को पूर्ण करने व जीवाश्म ईंधन पर निर्भरता कम करने के लिये एमएफसी के कारकों के अनुकूलन हमारी सहायता कर सकते हैं।

Optimization of electrode material for bioelectricity production through microbial fuel cell

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Abstract

Fuel cells are one of the most essential topics in research. Microbial fuel cell is a newest type of fuel cells that can generate electricity from renewable biomass by means of microorganisms as biocatalysts. There are diverse factors that can be considered in the development and improvement of MFC performance. Among effective parameters in Microbial Fuel Cells, substrate types and electrode composition play a crucial role in its performance. In this study, a dual chamber MFC is fabricated to check its dual function of bioelectricity production and simultaneously wastewater treatment. The present work is an experimented investigation concerned with selection of the best pair of electrodes. The various combinations of anode/cathode materials as copper, zinc, aluminium and carbon for Microbial Fuel Cells has been systematically studied and out of which Zn/C pair gave higher voltage output of 1.24±0.001 V and current of 3.28±0.012 mA with Gudiyari nala wastewater. Simultaneously, analysis of wastewater was also performed before and after the operation. Significant reduction in COD by 66.67 % with Gudiyari nala wastewater, indicated effective wastewater treatment in batch experiments. This work may help in the optimization of parameters for maximum production of bioelectricity to recompense the upcoming need of electricity as well as reduces the dependency of fossil fuels.

प्रस्तावना

ऊर्जा की मांग दिन-प्रतिदिन बढ़ती जा रही है जिसके कारण जीवाश्म ईंधन पर हमारी निर्भरता भी बढ़ रही है। जीवाश्म ईंधन, ऊर्जा का एक सीमित स्रोत है एवं कार्बन डाइऑक्साइड के निष्कासन के कारण यह पर्यावरण पर नकारात्मक प्रभाव भी डाल रहे हैं। वैश्विक ऊर्जा की मांग में बढ़ोत्तरीय, सीमित प्राकृतिक संसाधन व पर्यावरण के

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Semi-quantitative expression studies of genes involved in biosynthesis of curcuminoid in *Curcuma caesia* Roxb.

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The development of functional genomics, proteomics, metabolomics and bioinformatics tools has given a new facet to plant secondary metabolites study. The biosynthetic pathway involved in the curcuminoids formation was not clear for the long time. The development of turmeric EST database by David Gang's group has formed a landmark for elucidating curcuminoids biosynthetic pathway in *Curcuma longa* and other species of the genus. The present study reports on the expression profiling of genes involved in curcuminoids synthesis in *C. caesia* Roxb. The study involved primer designing from EST/CDS regions of the major genes (CURS, CURS2, CURS3, DCS & CHS1) involved in curcuminoids synthesis, RNA extraction from rhizome (5- month & 10-month-old) and leaves of the plant, cDNA preparation and semi-quantitative expression studies of genes. All the genes showed higher expression in rhizome compared to leaves and, among all the genes, CURS showed maximum expression, followed by DCS, CHS1, CURS2 and least by CURS3. The 5-month-old rhizome showed four-fold higher CURS expression as compared to the 10-month-old. Overexpressing this selective gene in *in vitro* culture by elicitation can help in up scaling the bioactive compound in this plant species.

Keywords: Curcuminoids, expressed sequence tags, functional genomics, genes, rhizome

Introduction

Plants are valuable sources of a variety of chemicals including drugs. The biosynthetic pathway that directs the generation and accumulation of important metabolites in different tissues are not fully understood in many medicinal plants. Thus, one important purpose to investigate medicinal plants is to understand genes and enzymes that govern the biological metabolic process to produce bioactive compounds. Genome wide high throughput technologies based on genomics, transcriptomics, proteomics and metabolomics with bioinformatics and system biology can help reach that goal. The genus *Curcuma* belongs to the family Zingiberaceae and plants accumulate pharmacologically important curcuminoids in their rhizomes. Curcumin and two of its derivatives de-methoxycurcumin and bis-demethoxycurcumin are collectively called as curcuminoids. Despite the importance of turmeric as a major food additive and as a drug in various traditional system of medicine, the molecular and functional analyses of its medicinal value was hampered by lack of tools, such as, expressed sequence tags (EST) and ordered genomic contigs. The biosynthetic pathway involved in the curcuminoid formation was not clear for a long time. But the development of turmeric EST database by David Gang's group, named Aromatic Rhizome Expressed Sequence Tags (ArREST), has opened doors for elucidating curcuminoids biosynthetic pathway in *C. longa* and also proposed that type III polyketide synthases are involved in the pathway[1]. These findings can also help to study pathway for curcuminoid biosynthesis studies in other important species of the genus. *C. caesia* Roxb., the lesser known turmeric, is important medicinally and used as folklore medicine for the treatment of inflammation, wounds, cold, cough, fever, pneumonia, bronchitis, asthma, leucoderma, tumors, piles, rheumatic pains, infertility *etc*. The main bioactive substances which have been reported to exert multiple biological effects are curcuminoid, flavonoids, phenolic and high level of alkaloids, which are widely distributed in plants[2]. The present study involved primer designing of the genes involved in curcuminoid synthesis, RNA extraction from rhizome and leaf of the plant, cDNA preparation and semi-quantitative expression studies of genes involved in different tissue of *C. caesia*.

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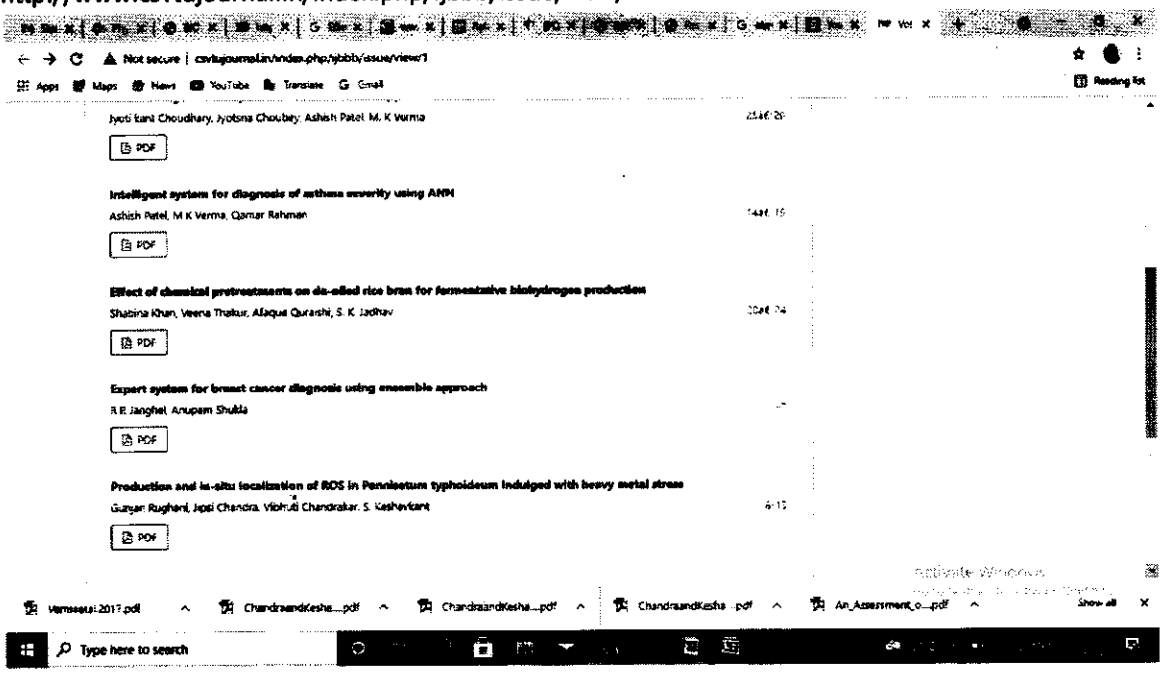

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Comparative Studies of *Saccharomyces cerevisiae* MTCC 4780 and *Pichia kudriavzevii* for Bioethanol Production Using Sal (*Shorea robusta*) Seeds

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ABSTRACT

The most valuable bioenergy source today is bioethanol, which is produced by fermentation of sugar, starch or cellulose containing biomass using various microorganisms. Bioethanol represents closed carbon dioxide cycle, after burning of bioethanol, the released carbon dioxide is recycled back into plant material because plants use carbon dioxide to synthesise carbohydrates during photosynthesis; therefore, no net carbon dioxide is added to the atmosphere, thus making bioethanol an environment-friendly energy source. Different substrates play an important role in bioethanol production process. In the present study, sal seed was used as a carbohydrate source with Saccharomyces cerevisiae MTCC 4780 and Pichia kudriavzevii for bioethanol production and parameters which play an important role in fermentation were also optimised.

Keywords: Bioethanol, Bioenergy, Carbohydrate, Energy, Environment, Fermentation, Parameter

1. INTRODUCTION

Renewable energy is one of the most efficient energy to achieve sustainable development. Increasing its share in the world matrix will help prolong the existence of fossil fuel reserves, address the threats posed by climate change and enable better security of the energy supply on a global scale[1]. Biomass represents an abundant carbon-neutral renewable resource for the production of bioenergy and biomaterials, and its enhanced use would address several societal needs. Advances in genetics, biotechnology, process chemistry and engineering are leading to a new manufacturing paradigm for converting renewable biomass to valuable fuels[2]. The most valuable bioenergy source today is bioethanol, which is produced by fermentation of sugar, starch or cellulose containing biomass using various microorganisms. Bioethanol represents closed carbon dioxide cycle and emit less carbon dioxide in comparison to other fossil fuels[3,4]. Bioethanol is a safe versatile fuel and fuel additive to gasoline. It reduces petroleum use, boosts the octane of blend and provides oxygen in the fuel to promote more complete combustion and reduce tailpipe emissions that contribute to air pollution[5]. Both, the choice of substrate for bioethanol production and the microorganism used for fermentation process are very important and have been the major focus for many researchers. Yeasts are the primary organisms used in the fermentation process for bioethanol production. Bioethanol fermentation has been focused on taking up of renewed interest in research works in several areas such as use of improved mutant strains, yeast strain development, use of cheaper source of raw materials, optimum reactor design, better nutrients for optimum cell growth and optimisation of fermentation factors[6,7]. It can be produced from a wide variety of carbohydrate-containing substrates such as corn, sugarcane, potato, sweet potato and others. These feedstocks could be included in the animal or human food chain, thus diverting food away from the human food chain, potentially leading to food shortages and price rises. Thus, a more viable solution is to produce bioethanol from non-food crops[8]. Many researchers used different substrates such as rice bran, de-oiled rice bran, jatropha oil cake, fruit waste and azolla[9–13]. One such substrate used in the present study are the high carbohydrate (62.7%) containing sal seeds which are not edible and forms a cheaper easily available renewable raw material in Chhattisgarh, India for bioethanol production.

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Research Article

Correlation Between Iron Pollution and Physicochemical Characteristics of Effluent of Steel Industries from Urla, Raipur (Chhattisgarh), India

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Abstract

Objective: In the present study the status of iron concentrations and various physicochemical parameters of the effluents of steel and iron casting industries were assessed. **Methodology:** The monthly observations showed that the iron concentrations ranged between 0.72-6.89 mg L^{-1} and physicochemical parameters were observed in the following ranges; pH 1.92-8.13, EC 0.9-8.33 mS cm^{-1}, TDS 488.43-5444 ppm, TSS 30-436.67 mg L^{-1}, turbidity 0.16-81.51 NTU, COD 22.4-147.2 mg L^{-1}, DO 0.2-10.6 mg L^{-1} and BOD 0.2-7.9 mg L^{-1}. The observations revealed that some of the parameters were out of permissible limits of water quality standards formulated by the CBCB and BIS. **Results:** Further, results showed the significant positive correlation of iron concentration with EC ($r=0.594$), TDS ($r=0.516$), DO ($r=0.611$) and significant negative correlation with pH ($r=-0.818$) at $p<0.01$. **Conclusion:** In conclusion the industrial effluents may affect the quality of water resources, later may be then hazardous to human health.

Key words: Steel and iron casting industries, effluents, physicochemical parameters, water quality standards

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Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

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Synthesis and *in vitro* Antifungal Activity of Phosphate Esters

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Fungal infections have increased at an alarming rate. Due to the increasing development of drug resistance to antifungal agents, demand for searching novel antifungal agents is being increased. The present study was conducted to evaluate *in vitro* antifungal activity of mono and di phosphate esters against four fungal species *i.e.*, *Aspergillus niger*, *Aspergillus flavus*, *Alternaria redecina* and *Cladosporium oxysporum*. Bavistin was used as a positive control to check bioactivity. Both phosphate esters showed significant growth retarding effect against selected fungal species. Di-2-methyl-5-nitroaniline phosphate has been found more sensitive as compared to mono-6-chloro-2,4-dinitroaniline phosphate. Minimum inhibitory concentration (MIC) was determined for each fungal species. Growth inhibition at different concentrations has been calculated.

Keywords: *in vitro* Antifungal activity, Biomass, Phosphate esters, Minimum inhibitory concentration.

INTRODUCTION

Fungi are most common microbiota in the environment. The fungal kingdom comprises yeasts, molds, fungal rusts and mushrooms [1]. There are approximately 1.5 million different species of fungi on earth, but only about 300 of those are known to make people sick [2,3]. Human fungal infections have increased at an alarming rate mainly among immune compromised individuals [4]. During the last few years, due to the increasing development of drug resistance to antifungal agents in human dermatophytic fungi, demand for searching novel antifungal agents is being increased [5]. Fungal diseases are also of major concern in postharvest decay of fruits and vegetables which reduces shelf life and market value. Contaminations by storage fungi and their mycotoxins reduce the quality of food products [6]. In recent years fungal infections have emerged as a major cause of disease and mortality in human and plant both.

Phosphate esters have flourished with considerable intensity because of their potential bioactivity against wide range of microorganisms [7-10]. Moreover, organophosphates have many interesting biological properties. These are used as herbicides, insecticides, pesticides and enzyme inhibitors [11-13]. Nucleoside derivative of phosphate esters have found to be extremely important agents for anticancer and antiviral therapy [14]. Prodrugs of phosphate esters have been successfully utilized to overcome a variety of drug delivery problems.

A potential approach to overcome the resistance problem is, to design new and innovative agents with a completely different mode of action so that no cross resistance with the present pharmaceuticals can occur. So the present study was planned to synthesize phosphate esters and evaluate their antifungal activity as a novel class of antifungal agents that may act as efficient weapons for controlling the most potent destructive plant and human diseases caused by different pathogens and others.

EXPERIMENTAL

Synthesis of phosphate esters: Mono-6-chloro-2,4-dinitroaniline phosphate and di-2-methyl-5-nitroaniline phosphate were synthesized by method described by Awadhiya [15]. Mono-6-chloro-2,4-nitroaniline phosphate prepared by the reaction of parent compound 6-chloro-2,4-dinitroaniline and P_2O_5 in 1:1 mole ratio in benzene solvent. Preparation of di-2-methyl-5-nitroaniline phosphate involves the reaction of 2-methyl-5-nitroaniline with $POCl_3$ in 2:1 mole ratio in benzene solvent. All the chemicals used were of AR grade. Characterization of these synthesized compounds was done by melting point determination, elemental and IR spectral analysis data [16,17].

Collection of pure culture of fungal species: Four fungal species *viz.*, *Aspergillus niger*, *Aspergillus flavus*, *Cladosporium oxysporum* and *Alternaria redecina* were procured from the

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Relation between Sugar Consumption and Bioethanol Production Potential in Lignocellulosic biomass

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Abstract

Bioethanol more appropriately termed as alternative transportation fuel play a key role in reducing the world dependence on fossil fuels. Bio-ethanol is an oxygenated fuel that contains 35% oxygen which reduces particulate and nitrogen oxides (NO_x) emissions from combustion. Henceforth using bio-ethanol blended fuel for automobiles can significantly reduce petroleum use green house gas emission. Developing ethanol as fuel, beyond its current role as fuel oxygenates will require developing lignocellulosic biomass as a feedstock because of its availability and low cost.

In present study Azolla, lignocellulosic biomass is used as a substrate as it is cheap and has cellulose content 15.19 ± 1.35 % of its dry weight which can be converted into the fermentable sugar through biological pretreatment. This fermentable sugar is used by the fermenting microorganism i.e. Saccharomyces cerevisiae MTCC 4780 and through anaerobic oxidation converted into bioethanol. It has been found that there is co-relation among the fermentable sugar concentration and bioethanol production. As the concentration of reducing sugar is determined by the dinitrosalicylate method (DNS Assay), a relation among the value of DNS and the bioethanol production is established. In the present study maximum sugar consumption by Saccharomyces cerevisiae MTCC 4780 is 0.42 mg/ml which results in maximum bioethanol production 4.06% (w/v). As various parameters get optimized, the bioethanol production potential from the consumed sugar level is also enhanced and the maximum production which was obtained in presence of 1 ml 1% KCl solution is 5.20%.

Keywords: Bioethanol, Lignocellulosic biomass, DNS assay, *Saccharomyces cerevisiae*.

Introduction

Bioethanol more appropriately termed as alternative transportation fuel plays a key role in reducing the world dependence on fossil fuels. Bio-ethanol also has value as oxygenate in clean-burning gasoline to reduce vehicle exhaust emissions. Bio-ethanol is an oxygenated fuel that contains 35% oxygen which reduces particulate and nitrogen oxides (NO_x) emissions from combustion. Using bio-ethanol blended fuel for automobiles can significantly reduce petroleum use and exhaust greenhouse gas emission[1]. Ethanol can be produced from three main types of feedstock: (a) Sugar based feedstock (b) Starch based feedstock and (c) Lignocellulosic feedstock.

Developing ethanol as fuel, beyond its current role as fuel oxygenates will require developing lignocellulosic biomass as a feedstock because of its abundantly available and low cost. Bioethanol produced from non-food biomass sources, mainly lignocellulosic biomass is referred as second generation biofuel. Lignocellulose biomass can be divided into six main groups: crop residues (cane bagasse, corn stover, wheat straw, rice straw, rice hulls, barley straw, sweet sorghum bagasse, olive stones and pulp), hardwood (aspen poplar), softwood (pine, spruce), cellulose wastes (newsprint, waste office paper, recycled paper sludge), herbaceous biomass (alfalfa hay, switchgrass, reed canary grass, coastal Bermudagrass, thimothy grass), and municipal solid wastes (MSW)[15]. In this type of feedstock, hydrolysis of carbohydrate is pre-required.

Azolla a pteridophyte water fern also has the potential to act as potential substrate for the bioethanol production as it has cellulose content 15.19 ± 1.35 % of its dry weight which can be converted into the fermentable sugar through biological pretreatment and it is easy to cultivate and is cheap in comparison to other substrates.

Material and Methods

Feedstock: Fresh *Azolla* sample collected from the culture pond was washed and dried at 70°C in hot air oven for overnight. Dried samples were ground and autoclaved for 30 min at 121°C, 15 lbs pressure.

Sachharifying microorganism: *Aspergillus niger* is used to hydrolyze *Azolla* cellulose as it is able to produce the cellulose enzyme which can be tested by CMC test. The cellulase enzyme converts the cellulose into fermentable sugar monomers which can be readily utilized by fermenting microorganism.

Fermenting microorganism: In the present study Saccharomyces *cerevisiae* MTCC 4780 was maintained in yeast peptone dextrose broth used as fermenting microorganism.

Enzymatic hydrolysis of substrate: Prepared sample (5% w/v) was subjected to biological pretreatment by inoculating it with full-fledged *Aspergillus niger* mat (grown in Potato Dextrose Broth for 7 days). *Aspergillus*

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In vitro slow-growth storage of *Chlorophytum borivilianum* Sant. et Fernand: a critically endangered herb

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Abstract A simple, *in vitro* multiplication and mid-term conservation system was developed for *Chlorophytum borivilianum* Sant. et Fernand, which is documented as a critically endangered herb on the International Union for Conservation of Nature and Natural Resources red list. *In vitro* shoot multiplication was achieved by culture on Murashige and Skoog medium supplemented with 2 mg L^{-1} 6-benzyladenine and 0.2 mg L^{-1} naphthalene acetic acid. Continuous shoot proliferation was observed up to the seventh subculture cycle on this medium. A production cycle of 1 yr was completed when rooting and acclimatization times were included in the subculture cycle. *In vitro*, slow-growth storage was efficiently used for mid-term conservation of elite clones when the sucrose concentration of the medium was 120 g L^{-1}, which enabled 100% survival from cultures stored for 4 mo without any subculture or medium addition. After 4 mo of *in vitro* storage, cultures transferred to the standard medium exhibited 100% regeneration, and the shoots were morphologically identical. These shoots were rooted in a medium supplemented with 2 mg L^{-1} indole-3-butyric acid. Rooted plantlets were transferred to the field and showed 95% survival after acclimatization. This is the first report of *in vitro* conservation *via* slow-growth storage of this important medicinal plant.

Keywords Micropropagation · Mid-term conservation · Slow-growth · Subculture · Sucrose

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Introduction

Chlorophytum borivilianum Sant. et Fernand, generally known in India as Safed Musli, belongs to the family Liliaceae. It has been documented as critically endangered on the red list of the International Union for Conservation of Nature and Natural Resources (IUCN 2015) and as a rare taxon by the Botanical Survey of India (Nayar and Sastry 1988). Its tuberous root contains steroidal saponins and sapogenins, the contents of which greatly vary among genotypes, from 2% to 17% of dry weight (Bordia *et al.* 1995). A demand for these roots has been estimated to be 35,000 t per annum (Kaushik 2005). Dried, tuberous roots have been sold in the Indian market at US$30 per kg, *i.e.*, INR 1500/− (Dave *et al.* 2003). Reports are available on the impact of this herb on diabetes, arthritis, joint pain, rheumatism, and its aphrodisiac potential (Kaushik 2005; Acharya *et al.* 2008, 2009). Because of its high medicinal importance, *C. borivilianum* is one of the 32 nationally prioritized plants of India for trading purposes by the National Medicinal Plant Board, New Delhi (NMPB 2002).

Commercial importance is a major cause of over-collection of this species from forests (Kaushik 2005). Seed germination is very poor (8–16%; Jat and Bordia 1990; Kaur *et al.* 2009). Hence, the tuberous root of this species is the only propagule which can be marketed or utilized for cultivation the next year (Joshi and Purohit 2012). In addition, elite clones can only be maintained through vegetative propagation, as sexual reproduction leads to genetic segregation (Gopal and Chauhan 2010). However, an extended period of subculture increases the possibility of somaclonal variation (Bairu *et al.* 2011; Hrahsel *et al.* 2014; Devi *et al.* 2014). Thus, to reduce cost of production and risk of somaclonal variation, growth of the cultures should be suppressed. Therefore, slow-growing cultures are being used to reduce frequent subculturing.

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A comprehensive review on pharmacological properties and biotechnological aspects of Genus *Chlorophytum*

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Abstract Genus *Chlorophytum* Ker Gawl secures its position chiefly as commercial plants with a wide range of applications, right from pharmaceutical to ornamental, and with a promising economical return also. Few species of this genus are now enlisted under "threatened plant category" due to rash harvesting from its wild habitat, as it is utilized extensively in various industries. Great challenges are associated with its conventional propagation approach. The accomplishment and rapidity in the propagation of few species of *Chlorophytum* have constantly been a key concern for farmers and researchers. In this regard, in vitro propagation is an efficient technique to triumph over regeneration-associated problems. Available literature was surveyed rigorously to extract the information on pharmacological utilities and recent advancements in in vitro regeneration of genus *Chlorophytum*. Since 1990s to till now, a number of efforts were made in different aspects of *Chlorophytum* under both in vitro and ex vitro conditions. Current review intends to provide a comprehensive overview of important properties and biotechnological aspects, viz. bioactive constituents and inherent properties of such as aphrodisiac potential, anti-diabetic, anti-microbial, anti-tumor and anti-oxidant, and in vitro production of genus *Chlorophytum*. Conclusively, proposed article is an attempt to provide overall update of various studies conducted with members of *Chlorophytum* genus that will possibly be helpful in proper, fullest and sustainable utilization of this important group.

Keywords Anti-microbial · Cytological aspect · Cytotoxicity · In vitro propagation · Phytoremediation · Saponin

Abbreviations

2-iP	2-Isopentyladenine
2,4-D	2,4-Dichlorophenoxy acetic acid
AC	Activated charcoal
AdS	Adenine sulfate
AFLP	Amplified fragment length polymorphism
BA	6-Benzyladenine
BAP	6-Benzylaminopurine
CCC	2-Chloroethyl-trimethylammonium chloride
IAA	Indole-3-acetic acid
IBA	Indole-3-butyric acid
ISSR	Inter simple sequence repeats
Kn	Kinetin
MS	Murashige and Skoog
NAA	α-Naphthalene acetic acid
RAPD	Random amplified polymorphic DNA
SE	Somatic embryogenesis

Introduction

Continuous and improper dwindling of forest diversity led to the cultivation of plants of medicinal as well as commercial values. Members of genus *Chlorophytum* occupy an important place as Ayurvedic crude drugs and also the herb of higher trade value. It also has obliged for

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REVIEW

Arsenic-induced metabolic disturbances and their mitigation mechanisms in crop plants: A review

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Abstract: Arsenic (As) is one of the highly toxic metalloids distributed ubiquitously in nature. Two inorganic forms of As are present abundantly: arsenite (As^{III}) and arsenate (As^{V}), former being 100 times more toxic than latter. Arsenic is a well known inducer of reactive oxygen species (ROS) in crop plants either directly during conversion of As^{V} to As^{III} or indirectly *via* inactivation of the antioxidants by binding to their thiol groups. Arsenic-mediated oxidative stress causes an array of metabolic dysfunctions in plants. Therefore, in recent years, demonstration of various mechanisms to improve crop productivity and/or alleviation of As toxicity has become a prime concern. Modulation of cellular thiol molecules for protection against ROS-induced damage has been used as a strategy against As. Accrual of proline, polyphenols and exogenous application of salicylic acid, nitric oxide, phosphate and potassium show protection against As-mediated injuries in crop plants. Proline, nitric oxide and salicylic acid display defensive functions by activating antioxidant machinery of crop plants whereas phosphate and potassium reduce As toxicity by controlling As-uptake or maintaining cellular protein and antioxidant enzymes in plants. Likewise, polyphenols serve as antioxidants and reduce activities of ROS synthesizing enzymes, thereby confering As-stress tolerance. In this review we have attempted to collate recent advances on 1) mechanism(s) of As uptake by plants, 2) toxicity responses [physiological, biochemical and molecular] exerted by As, and 3) roles of varied molecules in amelioration of As effects in crop plants. Gaps in the existing knowledge and future research prospects have also been highlighted in this review.

Key words: arsenic toxicity; nitric oxide; oxidative stress; proline; reactive oxygen species; salicylic acid.

Introduction

Arsenic (As), one of the non-essential metalloids, is extremely hazardous to all living beings including crop plants and animals (Zhao et al. 2009; Mirza et al. 2014) (Fig. 1). Earth's crust is the principal natural source of As. It is the 20th most abundant element on the Earth's crust with an average availability of 1 mg to 100 g kg^{-1} (Mirza et al. 2014). By and large, the permissible limit of As is 20 mg kg^{-1} soil in agricultural fields but for sensitive plants even 5 mg kg^{-1} soil is injurious (Panda et al. 2010). High amounts of As in groundwater have been reported in Chile, China, Argentina, Hungary, Mexico, United States, Bangladesh, Italy and India (Pigna et al. 2009). Arsenic levels, almost 3 fold higher than the permissible concentration, have been estimated in the paddy growing soils of United States and Bangladesh (Panda et al. 2010). Arsenic is introduced into the nature through weathering and mineralization of the Earth's crust, mining activities, use of As-based wood preservatives, insecticides, herbicides and irrigation of crops with As-loaded groundwater (Mirza et al. 2014). Arsenic enters into food chain primarily through drinking contaminated water or by consumption of food materials, such as seeds, fruits and vegetables grown on As affected fields (Finnegan & Chen 2012). In India and Bangladesh, consumption of As through contaminated dietary food accounts for about half of the total intake of As (Panda et al. 2010). Arsenic exists in four oxidation states, of which (+III) and (+V) are inorganic and more deadly forms whereas, (-III) and (0) are organic as well as less lethal (Panda et al. 2010; Finnegan & Chen 2012). Further, amongst the inorganic forms, arsenite (As^{III}) is approximately 100-fold more soluble, mobile and cytotoxic in nature than arsenate (As^{V}) (Nath et al. 2014).

Exposure of crop plants to As results in an array of adverse effects that includes several physiological disorders including reduced nodulation in legumes (Lafuente et al. 2010, 2015). Crop plants absorb As predominantly as As^{V} (Garg & Singla 2011). Being an analogue of phosphate, As is also transported across the plasma membrane (PM) of root cells *via* phosphate transport system (Panda et al. 2010). Exposure of crop plants to inorganic As results in uncontrolled production of reactive oxygen species (ROS), such as super-

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PHYSIOLOGICAL AND BIOCHEMICAL CHANGES DURING SEED DEVELOPMENT AND MATURATION IN *MADHUCA LATIFOLIA* ROXB.

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Key words: Ascorbate peroxidase, Electrolyte leakage, Guaiacol peroxidase, Superoxide dismutase, Water content.

Abstract

Seed development comprises a series of events involving cell division/histo-differentiation, reserves deposition and desiccation. Development of Madhuca (*Madhuca latifolia* Roxb.) seed has been divided into eight consecutive stages; 10, 18, 26, 34, 42, 50, 58, 66 days after fertilization (DAF). Seed colour was finally found to turn dark-brown from initial creamish-white. Length, circumference, fresh and dry mass increased gradually throughout. In contrast, water content (WC) and electrical conductance were declined (1.4- and 94-folds, respectively) suggesting deposition of reserves and improvement in membrane integrity in parallel to development. During seed development, sugar was declined (3-folds), while starch and protein contents were increased (4- and 13-folds, respectively) suggesting their supportive role in germination and early seedling growth. Activities of antioxidants exhibited rising trend (1.6 - 21-folds) between initial and last stages of development advocating their defensive function. Data suggested that ideal time for Madhuca drupes/seeds harvesting was 66 DAF.

Introduction

Seed development in the life cycle of any higher plant is a crucial process providing the link between two different sporophytic generations (Baud *et al.* 2002). Generally, seed development involves an orchestrate programme of pattern, which includes formation, reserves deposition and desiccation. Formatibn of a seed is initiated after double fertilization that takes place in an embryo sac, and then repeated cell division occurs in order to establish the seed structures (Baud *et al.* 2002). Then, seed filling phase starts during which the water content (WC) declines and storage reserves accumulate, resulting into cell expansion. Carbohydrates, lipids and storage proteins are three chief storage reserves generally accumulated in most of the seeds. Seed filling is highly complex process, as many genes and a number of enzymes are involved to regulate storage of each component (Weber *et al.* 2005). For the process of seed filling, the monomers of various macromolecules *viz.*, amino acids, fatty acids and monosaccharides are translocated through sieve elements of phloem to synthesize their long chain polymers (Weber *et al.* 2005). Next, the seed enters into maturation drying phase where changes in the seed size and huge fall in WC occurs (Berjak and Pammenter 2008). Maturation drying phase is absolutely absent in recalcitrants therefore, these seeds possess high amount of water (30 - 70%) at the time of shedding from mother plant (Berjak and Pammenter 2008).

Process of seed development is genetically programmed, and developing seed converts the precursors of carbon and nitrogen, into stable reserves required later for various processes (Weber *et al.* 2005). During development, as a by-product of metabolic reactions reactive oxygen species (ROS) are generated, which are shown to play dual functions either cytotoxic (when exists in high amount) or playing a role in development, dormancy breakage and defence against biotic and abiotic stresses (Berjak and Pammenter 2008). These ROS are popularly known to react with all

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RESPONSES OF PLANTS TO FLUORIDE: AN OVERVIEW OF OXIDATIVE STRESS AND DEFENSE MECHANISMS

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ABSTRACT: The fluoride ion (F) is widespread in the environment and toxic for all living organisms. Prolonged exposure to F leads to physiological, biochemical, and molecular modifications in plants. F is known as a potential metabolic inhibitor, interfering with the overall responses of plants including seed germination, growth and productivity, biomass accumulation, photosynthesis, enzyme activities, protein synthesis, gene expression patterns, and reactive oxygen species (ROS) production. It has also been shown to amend the functionalities of various antioxidants leading to oxidative stress inside plants. However, in recent years, a few attempts have been made to mitigate the ill effects of F on plants and their productivity responses. Modulation of cellular thiol molecules for protection against ROS-induced injury has been considered to be one of the effective strategies against F toxicity. In addition, the accumulation of proline and exogenous supplementation with salicylic acid have been shown to be potential measures for protecting the plants from F toxicosis. The present review covers the information available so far on the mechanism(s) of F uptake by plants, the F-induced physiological, biochemical, and molecular amendments in plants, and the potential for mitigation of F-stress in plants by using various molecules. The authors have also attempted to highlight the gaps in the existing knowledge for F toxicity in plants and the future research prospects.

Keywords: Antioxidants; Fluoride toxicity; Growth responses; Oxidative stress; Salicylic acid.

INTRODUCTION

Contamination by the fluoride ion (F) of ground water and soils is a great concern in several countries when it is present at levels above the permitted guidelines.[1] The World Health Organization set in 1984, and reaffirmed in 1993, a guideline for a "desirable" upper limit of F in drinking water of 1.5 ppm (mg/L). The country standards are lower in India (1 ppm) and Senegal, West Africa, (0.6 ppm) with a rider to the Indian limit noting "lesser the fluoride the better, as fluoride is injurious to health." F is not an essential trace element for plants, animals, or humans although some consider it to have a beneficial effect in reducing dental caries when applied topically to the teeth. Chronic exposure to F induces an array of deleterious impacts in domestic[2-8] and experimental[9] animals, humans,[10-13] and a variety of plants.[14] Some plants accumulate F and are able to grow even at high F concentrations (4000 µg/g) without showing any signs of injury while several other plants sustain damage if exposed to even low F concentrations (<20 µg/g).[15] Exposure to F for a prolonged period primarily leads to chlorosis and then necrosis in the leaves of plants.[16] It was long been known as a potential metabolic inhibitor, interfering with the overall responses of plants including seed germination, growth and productivity, biomass accumulation,

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RESEARCH ARTICLE

Modulation of antioxidant enzymes by salicylic acid in arsenic exposed *Glycine max* L.

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Abstract

To investigate the physiological and metabolic attributes of arsenic (As) stress tolerance conferred by exogenous salicylic acid (SA), *Glycine max* L. (variety JS 335) seeds were aseptically germinated over filter paper moistened with SA (500 µM) and/or10 and 100 µM As (Sodium arsenite was used). On 2nd and 5th days of germination, the growing radicles were harvested, and analyzed for growth and different metabolic attributes. Findings exemplified that As significantly decreased germination percentage, radicle length, dry mass and activities of superoxide dismutase (SOD), catalase (CAT) and ascorbate peroxidase (APX), while stimulated the contents of As, reactive oxygen species (ROS), lipoxygenase (LOX), guaiacol peroxidase (POD) and proline. Additionally, isozymes of antioxidants were also scrutinized over Native-PAGE gels and were found to be altered considerably under As-stress. However, exogenous SA remarkably enhanced germination percentage, growth indices, activities of SOD, CAT and APX, and proline accumulation along with reduced As, ROS and LOX, and restoring POD in As-stressed seedlings. In conclusion, SA confers As-stress tolerance to *Glycine max* L. by regulating the antioxidant enzymes and proline accumulation thereby reduced As content and ROS production. Further study is intended, particularly at gene level, to understand precise mechanism(s) involved in SA-mediated As-stress tolerafice.

Keywords: Antioxidant enzymes, arsenic toxicity, oxidative stress, reactive oxygen species, salicylic acid

Review Article

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An Assessment on threatened classification of *Gloriosasuperba* L.

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Abstract:

This article gives an overview of categorization of threatened status of *Gloriosasuperba* L., medicinal plant in the present status. The available literature related to these aspects drawn from studies done in various interest areas of threatened condition viz. extinct, critically endangered and endangered, vulnerable (VU), data deficient (DD), low risk (LR) and not evaluated (NE). The supporting literature obtained from standard web sources and available authentic data from national and international research agencies. The relative analysis is definitely promoted to actual classifying of *G. superba*L. in national, IUCN system and as well an international database. Throughout to individual afford required of a botanist, biotechnologist, conservationists and policy makers , an obligatory to conserve it and develop techniques for *in-situ* and *ex-situ* conservation. Further, the threatened medicinal plant will be available for future, accordingly essential need a development method for molecular study, germplasm conservation and phytochemistry etc.

Keywords: Medicinal plant, threatened, IUCN, *in-situ*, *ex-situ*, phytochemistry

Introduction:

India is a wealth of plant biodiversity, its containing 8% of the worlds and 12.5% of the world's phyto-biodiversity. According to Anonymous, (2000) India is included among the top 12 mega-biodiversity nations in the world. However, this prosperous biodiversity recently reached in severe threatened status; due to the habitation destruction and over-exploitation of the natural resources byhuman for indigenous welfare. The present situation is a very dangerous concerning for medicinal plant diversity. Rainaet *al.* (2011) stated that 80% of the world's populations directly rely on traditional medicine. In the current scenario, it was felt that due to the absence of a scientific system of collection and fostering regeneration of such plants, many plant species have been completely lost or have become endangered and many more on the verge of extinction with varying degrees. That is affecting on a genetic erosion and causing a loss of biodiversity (Mishra, 2011). In India, medicinal plants are extensively used by all segments of the population, and now it has been estimated that in total more over 7500 plant species are

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Conversion of waste to electricity in a microbial fuel cell using newly identified bacteria: *Pseudomonas fluorescens*

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Abstract The present study deals with the capability of pulp industry wastewater to produce bioelectricity with isolation and screening of native electrogenic bacteria from wastewater. In the screening process, three bacterial isolates were obtained; they were studied on the basis of morphology and biochemical characteristics. The maximum bioelectricity producing bacteria was identified by sequencing method and was identified as *Pseudomonas fluorescens*, and it is a novel bacteria reported in bioelectricity production from pulp industry wastewater. Further, the work focuses on optimization of various parameters, i.e., inoculum size, pH, temperature, mediators and its concentration. It was observed that with pulp industry wastewater, inoculum size of 1.5% gave the maximum voltage and current of 1.244 ± 0.003^{d} V and 5.946 ± 0.005^{d} mA, respectively. A pH of 7.0 gave maximum voltage and current of 0.956 ± 0.009^{e} V and 2.692 ± 0.016^{e} mA. At 35 °C temperature, maximum production of voltage and current of 1.045 ± 0.003^{d} V and 2.167 ± 0.037^{d} mA were recorded. Among the various mediators, humic acid was found to be most effective as it produced a voltage of 1.054 ± 0.004^{f} V and current of 1.070 ± 0.004^{d} mA. Maximum voltage of 1.291 ± 0.021^{f} V and current of 1.896 ± 0.006^{f} mA were recorded with 200 μM of humic acid. Physicochemical analysis of the effluent was conducted before and after experimental run, and the values suggested that the microbial fuel cell technology is an efficient method for biological treatment of wastewater.

Keywords Bioenergy · Electrogenic · Mediators · Parameters · Wastewater

Introduction

The rising energy demand due to rapid urbanization has led to an increased waste generation around the globe. Consequently, the leading problem is waste disposal system which includes discharge and disposal of untreated or partly treated wastewater, which if released into the surface water bodies creates a potential environmental threat. This environmental threat can be diminished by converting the biodegradable fraction of the organic waste into untapped renewable energy with environmental friendly waste management system. This technology has opened up new ways of waste to energy production and hence provides sustainable energy for society. Energy, in different forms, can be recovered from the organic matter through bacteria mediated reactions as bioethanol (Tiwari et al. 2015) via fermentation, biohydrogen (Thakur et al. 2015) employing dark fermentation and direct electricity using microbial fuel cells (MFCs). Among these alternatives, MFCs are gaining much attention in recent years because they produce society's most widely useful energy form, i.e., electricity, directly without combustion, simultaneously with wastewater treatment and it depicted efficient treatment than traditional anaerobic process (Krishna et al. 2014).

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AIRBORNE *Penicillium* IN THE ATMOSPHERE OF PANABARAS, RAJNANDGAON DISTRICT

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ABSTRACT

Aerobiological studies are widely used to determine the fungal spectrum in the air. One year survey of airborne *Penicillium* was carried out in the atmosphere of Panabaras, Rajnandgaon district with help of gravity petriplates method containing PDA (Potato Dextrose Agar) medium. The survey revealed a total 12 species of *Penicillium* with marked seasonal and annual variations. *Penicillium chrysogenum* (20.15%) was found to be the most dominant atmospheric fungal species throughout the season followed by *Penicillium spinulosum* (14.72%), *P. jenseni and P. multicolor* (13.17%), *P. notatum* (12.41%), *P. verruculosum* (7.75%) and *P. turbatum* (6.21%) etc. Aim of the present work was to analyze the behavior of *Penicillium* species and to study the relationship between the fungal spore levels and the environmental factors.

KEYWORDS: Airborne *Penicillium*, Panabaras, Environmental factors.

The air is abundant of fungal spores although it is not a good medium for growth unlike the soil, water, surfaces of living organisms and non-living materials (Deacon 1980). The knowledge of air-spora not only contributes to the understanding of their abundance and seasonal variations, but is also helpful in forecasting the epidemics of crop plants (Waggoner, 1960). Geographical location, climate, and short-term meteorological conditions are responsible for outdoor types and levels of fungal spores. Many aerobiological studies have confirmed that *Aspergillus* and *Penicillium* spores are the most abundant species found in indoor ambient (Garret et al. 1998; Ren et al. 1999; Aira et al. 2002; Gorny and Dutkiewiczi 2002; Archana and Aarti 2004; Cho et al. 2008; Sen and Asan 2009). The small size and the ease dispersion of their propagules favour the presence of high concentrations of fungal spores in both indoor and outdoor environments (Aira et al. 2002). Evaluation of airborne fungal contaminants has gained importance because of the health hazards caused by the spores or microbial metabolites (Sen and Asan 2009). Therefore; the purposes of our study were to determine variations in the composition and concentration of the aeromycoflora in tribal area.

MATERIALS AND METHODS

Study Site

Samples were collected from February 2005 to March 2006 in the Panabaras of Rajnandgaon district, Chhattisgarh State, India. A suitable substrate or culture medium supporting nutritional needs of fungi was required for our study. For this purpose, Potato Dextrose Agar (PDA) media was used.

Sampling Procedure and Identification of Fungi

The samples were collected at fifteen days intervals using gravity petriplate method for the isolation of fungi. Petriplates were exposed to the air for 10 minutes, so that spores of fungi in the air can fall and settle on the potato dextrose agar in the petriplates. After the exposed petriplates were brought into the laboratory and incubated for 3-5 days at 25±1°C temperature to allow proper growth of the fungal colonies for identification. All the fungi growing on the plates were numbered and later sub cultured onto new potato dextrose agar plates.

After the incubation period, fungal colonies were counted and identified on the basis of morphological characters and available literatures (Barent and Hunter, 1972, Ellis 1971 and Gilmans 1959) and finally identify the authentic authority. The meteorological parameters like temperature (°C), relative humidity (%) and rainfall had intense effect on air-borne fungal species both qualitatively and quantitatively and these were also recorded.

RESULTS AND DISCUSSION

Aerobiological studies are widely used to determine the fungal spectrum in the air. One year atmospheric survey of airborne *Penicillium* was carried out in the atmosphere of Panabaras. The survey revealed a total of 12 species of *Penicillium* with marked and annual variations. The average *Penicillium* percentage contributions as well as number of *Penicillium* species isolated at air are also shown in Table 1. Out of total mycoflora *Penicillium chrysogenum* (20.15%) showing the maximum percentage contribution followed by *P. spinulosum* (14.72%), *P. jenseni* and *P. multicolor* (13.17%), *P.*

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Bioelectricity Production and Comparative Evaluation of Electrode Materials in Microbial Fuel Cells Using Indigenous Anode-Reducing Bacterial Community from Wastewater of Rice-Based Industries

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ABSTRACT. Microbial fuel cells (MFCs) are the electrochemical systems that harness the electricity production capacity of certain microbes from the reduction of biodegradable compounds. The present study aimed to develop mediator-less MFC without using expensive proton exchange membrane. In the present study, a triplicate of dual-chamber, mediator-less MFCs was operated with two local rice based industrial wastewater to explore the potential of this wastewater as a fuel option in these electrochemical systems. 30 combinations of 6 electrodes viz. Carbon (14 cm × 1.5 cm), Zn (14.9 cm × 4.9 cm), Cu (14.9 cm × 4.9 cm), Sn (14.1 cm × 4.5cm), Fe (14cm × 4cm) and Al (14cm × 4.5 cm) were evaluated for each of the wastewater samples. Zn-C as anode-cathode combination produced a maximum voltage that was 1.084±0.016V and 1.086±0.028 and current of 1.777±0.115mA and 1.503±0.120 for KRM and SSR, respectively. In the present study, thick biofilm has been observed growing in MFC anode. Total 14 bacterial isolates growing in anode were obtained from two of the wastewater. The dual chambered, membrane-less and mediator-less MFCs were employed successfully to improve the economic feasibility of these electrochemical systems to generate bioelectricity and wastewater treatment simultaneously.

Keywords: Membrane-less, Microbial Fuel Cells, Biofilm, Wastewater, Electrogenic.

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1. Introduction

In recent years, impressive progress has been made in the development of clean energy technologies. Surging demand for fossil fuels and other non-renewable resources has shadowed the success of these clean and green efforts that have been made in past decades. Implementations of energy efficient technologies are greatly hindered by the ever over demanding industrialization, which largely depends on non-renewable resources (Brown, 2001). The scenario of depletion of fossil fuel based resources and its ever increasing demand has made the path for searching for renewable recourses and utilization of waste materials we accumulated in the past few centuries. Energy in the form of electricity is the backbone for the development of any nation. Electricity markets are assumed to undergo massive transformations which are majorly concern towards the low-carbon power generation. The coal and other fossil fuels, larger hydrothermal plants, nuclear power plants have been associated with the adverse environmental consequences (Wei et al., 2010). The urgent need is to think for alternative resources and shifts the industries towards clean energy based on utilization of waste and attract investors in this particular field.

As the industrialization climbed up in an ever seen manner, the amount of waste generated also increased proportionately. This situation leads to crucial environmental as well as economical challenges remarkably accumulation of bulk of the waste, high handling and management coast, sophisticated treatment and disposal operations. According to World Water Development Report (2003), approximately 2 million tons of wastes per day are disposed of within receiving waters from human excreta; agricultural wastes in the form of fertilizers, pesticide residues and industrial wastes and chemicals, etc.

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Antibacterial properties of amino acid functionalized silver nanoparticles decorated on graphene oxide sheets

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Highlights

- Synthesis of grapheme oxide (GO) sheets decorated with amino acid L-cysteine functionalized silver nanoparticles (GO-L-cys-Ag).
- The antibacterial activities of GO-L-cys-Ag nanocomposite have been investigated.
- Effects of Ag-S interaction on antibacterial activities have been studied.
- The results have been compared with activity of GO-Ag and GO-L-cys-Ag nanocomposite.

Abstract

Graphene oxide (GO) sheets decorated with amino acid L-cysteine (L-cys) functionalized silver nanoparticles (GO-L-cys-Ag) was synthesized by $AgNO_3$, trisodium citrate, and $NaBH_4$. GO-L-cys-Ag nanocomposite was characterized by transmission electron microscopy (TEM), Fourier transform infrared (FTIR) spectra, ultraviolet–visible (UV–vis) absorption spectra, which demonstrated that a diameter of L-cys-AgNPs compactly deposited on GO. Antibacterial activity tests of GO-L-cys-Ag nanocomposite were carried out using *Escherichia coli* MTCC 1687 and *Staphylococcus aureus* MTCC 3160 as model strains of Gram-negative and Gram-positive bacteria, respectively. The effect of bactericide dosage on antibacterial activity of GO-L-cys-Ag nanocomposite was examined by plate count, well diffusion and broth dilution methods. Morphological observation of bacterial cells by scanning electron microscope (SEM) showed that GO-L-cys-Ag nanocomposite was more destructive to cell membrane of *Escherichia coli* than that of *Staphylococcus aureus*. The above technique establish that the bactericidal property of GO-L-cys-Ag nanocomposite with wide range of applications in biomedical science.

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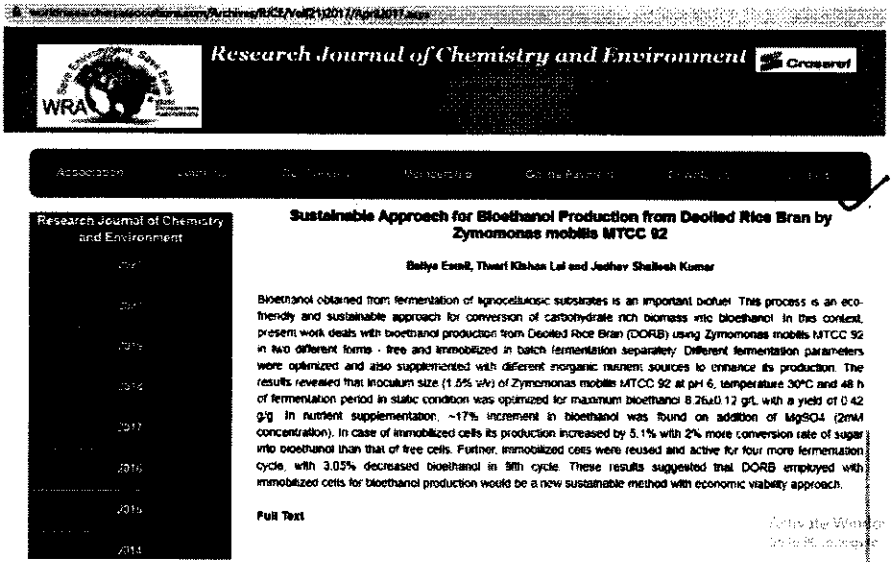

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Sustainable Approach for Bioethanol Production from Deoiled Rice Bran by Zymomonas mobilis MTCC 92

Beliya Esanl, Tiwari Kishan Lal and Jadhav Shailesh Kumar

Bioethanol obtained from fermentation of lignocellulosic substrates is an important biofuel. This process is an eco-friendly and sustainable approach for conversion of carbohydrate rich biomass into bioethanol. In this context, present work deals with bioethanol production from Deoiled Rice Bran (DORB) using Zymomonas mobilis MTCC 92 in two different forms - free and immobilized in batch fermentation separately. Different fermentation parameters were optimized and also supplemented with different inorganic nutrient sources to enhance its production. The results revealed that inoculum size (1.5% v/v) of Zymomonas mobilis MTCC 92 at pH 6, temperature 30°C and 48 h of fermentation period in static condition was optimized for maximum bioethanol 8.26±0.12 g/L with a yield of 0.42 g/g. In nutrient supplementation, ~17% increment in bioethanol was found on addition of MgSO4 (2mM concentration). In case of immobilized cells its production increased by 5.1% with 2% more conversion rate of sugar into bioethanol than that of free cells. Further, immobilized cells were reused and active for four more fermentation cycle, with 3.05% decreased bioethanol in fifth cycle. These results suggested that DORB employed with immobilized cells for bioethanol production would be a new sustainable method with economic viability approach.

Full Text

Physiol Mol Biol Plants
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RESEARCH ARTICLE

Imperative roles of salicylic acid and nitric oxide in improving salinity tolerance in *Pisum sativum* L.

Shrishti Yadu[1] · Teman Lal Dewangan[1] · Vibhuti Chandrakar[1] · S. Keshavkant[1]

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Abstract This study was undertaken to scrutinize efficacy of salicylic acid (SA) and/or sodium nitroprusside [SNP, source of nitric oxide (NO)] to mitigate injury symptoms of saline stress in *Pisum sativum* L. Exposure to sodium chloride (NaCl) was found to be injurious to germinating *P. sativum* L. (var. Shubhra IM-9101) and a direct correlation between severity of toxicity and NaCl-concentrations could be discernible. Both SA and NO serves as signal molecules in plant stress responses, and play crucial roles in key regulatory pathways of growth, development and metabolism. The limiting effects of salinity on radicle length and biomass accumulation were considerably released by SA and/or SNP and among which their combined application was found to be the most promising. Supplemented SA and/or SNP, particularly their cocktail, resulted in a substantial decline in reactive oxygen species accumulation, which later caused reduced accumulations of malondialdehyde, 4-hydroxy-2-nonenal and protein carbonyl, in NaCl subjected germinating *P. sativum* L. seeds. SA and/or SNP had significant inducing effects on activities of superoxide dismutase, catalase, guaiacol peroxidase and ascorbate peroxidase. Additionally, exogenous SA and/or SNP led to the higher proline, sugar and glycinebetaine contents, than that of the control. On the basis of accumulated results, it could be concluded that the cocktail of SA and SNP may be efficiently used to overcome the adverse signatures of salinity stress.

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Keywords Nitric oxide · Oxidative stress · *Pisum sativum* L. · Reactive oxygen species · Salicylic acid · Salinity

Introduction

In the natural environment, plants often experience abiotic stresses like salinity, drought, high or low temperatures, flood, etc., causing serious threats to crop productivity (Keshavkant et al. 2012). Among these, salinity is one of the most brutal environmental constrains limiting productivity of crops and is caused by inappropriate existence of salt in both soil and irrigation water (Agami 2013). Total area of salt affected soils, which includes both saline and sodic soils, was estimated to be 831 million ha and is approximately 6% of world's total land area. In addition, around 1532 million ha of land was reported to be affected by secondary salinity (FAO 2005). Such unfavourable soil of low fertility is generally unsuitable for crop production, culminating unacceptable yield reduction (Khan et al. 2014). Because of the increased need of food production and day-by-day rise in salt dominated soil area throughout the world, researches on plant responses to salinity have rapidly expanded recently.

Majority of crop plants are sensitive to salt even below 30 mM (Keshavkant et al. 2012). Salinity inhibits growth and development in variety of plants in two distinct phases. Initially (Phase 1), growth phenomenon is affected adversely because of osmotic stress imposed cellular responses, and in the subsequent phase (Phase 2) growth is significantly reduced due to cytotoxic effects of accumulated salt. At high levels of salinity, the prominent cause of crop sensitivity may possibly be due to the ionic cytotoxicity via substitution of K^+ with Na^+ and non-covalent interaction of both Na^+ and Cl^- with cellular amino acids

Accepted Manuscript

Arsenic-induced genotoxic responses and their amelioration by diphenylene iodonium, 24-epibrassinolide and proline in *Glycine max* L.

Vibhuti Chandrakar, Bhumika Yadu, Rakesh Kumar Meena, Amit Dubey, S. Keshavkant

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Glycinebetaine reduces oxidative injury and enhances fluoride stress tolerance *via* improving antioxidant enzymes, proline and genomic template stability in *Cajanus cajan* L.

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ABSTRACT

Excess of fluoride (F) in irrigation water is a serious threat inducing variety of deleterious impacts in plants *via* over-production of active oxygen species (AOS), modifying antioxidant enzymes and nucleic acid. Present study was aimed to monitor protective functions of glycinebetaine (GB) against F-toxicity in *Cajanus cajan* L. GB is an osmolyte, serves as quencher of AOS and stabilizes membranes and proteins in stressed tissues. Seeds of *C. cajan* L. were exposed to F (75 ppm of NaF), and its combination with GB (50 μM), for five days. The results indicated that F caused inhibited growth, membrane stability index (MSI) and protein content, which were inversely related with the AOS levels and F sequestered. Moreover, few other stress markers *viz.*; malondialdehyde (MDA), 4-hydroxy-2-nonenal (4-HNE), lipoxygenase (LOX), and DNA polymorphism were found to be enhanced significantly, with a little of proline, in response to F. On the other hand, exogenous addition of GB exhibited improved growth, MSI, genomic template stability, protein and proline accumulations with lower levels of AOS, MDA, 4-HNE, LOX and DNA polymorphism in stressed tissue. Additionally, alterations in the activities/isoforms of superoxide dismutase, catalase, guaiacol peroxidase and ascorbate peroxidase were examined in F-stressed samples, and were found to be up-regulated by GB. This study concludes that GB counteracts F-toxicity strongly *via* restricting accumulation of F, AOS operated membrane deterioration and injury symptoms, and improving proline accumulation, defensive function and genomic template stability. Conducted study for the first time provides evidence that support the protective function of GB against F-toxicity.

1. Introduction

Fluoride (F) is a highly toxic and persistent environmental poison for living organisms. It can be found in air, water and soil, and is readily absorbed by plants (Yadu et al., 2016). Therefore, with respect to agricultural crops growing in these contaminated sites, the sustentative consumption of high-F plant tissue constitutes a substantial threat to human health (Chakrabarti and Patra, 2013). Excessive availability of F inside the plant has been shown to influence the absorption, transportation and usage of both water and nutrients and causing toxicity symptoms including chlorosis, inhibited germination, growth and productivity, biomass accumulation, photosynthesis, activities of enzymes, protein synthesis and secretion, gene expression, *etc.* (Yadu et al., 2016). Although, precise mechanisms of F-induced injury symptoms are not worked out empirically, studies revealed that toxicity of it may contribute, at least in a part, oxidative stress condition (Agarwal and Khan, 2016).

Fluoride could cause the over production of active oxygen species (AOS) like; superoxide ($O_2^{\bullet -}$), hydrogen peroxide (H_2O_2), hydroxyl radical ($OH^{\bullet}$), *etc.* (Yadu et al., 2016), which subsequently leads to membrane deterioration and cellular dysfunction through oxidation of lipids, proteins, and nucleic acids (Parkhey et al., 2014a; Chandra et al., 2015; Chandrakar et al., 2016a). In addition, lipids are also depleted enzymatically by lipoxygenase (LOX), releasing cytotoxic products like malondialdehyde (MDA), 4-hydroxy-2-nonenal (4-HNE), *etc.* in the stressed tissues (Chandrakar et al., 2016b). Over produced AOS could be eliminated by antioxidant enzymes *viz.* superoxide dismutase (SOD), catalase (CAT), guaiacol peroxidase (POD), ascorbate peroxidase (APX), and non-enzymatic antioxidants like ascorbic acid, glutathione, α-tocopherol and flavonoids (Parkhey et al., 2014b). Besides these, plants are also able to synthesize certain compatible solutes such as proline (Pro), sorbitol, mannitol, glycinebetaine (GB), *etc.* to keep them prevented against abiotic stresses. Accumulation of these has been shown to confer stress resistance to the plants by serving as a membrane stabilizer, transient source of both carbon and nitrogen, and direct quencher of free radicals (Chandrakar et al., 2016a). However, in few of the instances natural amassment of antioxidants are not enough to

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Parameter's optimization and kinetics study of α-amylase enzyme of *Bacillus* sp. MB6 isolated from vegetable waste

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3,5-dinitrosalicylic acid (PubChem CID: 11873)
Acrylamide (PubChem CID: 6579)
Magnesium sulphate (PubChem CID: 24083)
Starch (PubChem CID: 439341)
Calcium chloride (PubChem CID: 5284359)
Magnesium sulphate (PubChem CID: 24083)
Dipotassium hydrogen phosphate (PubChem CID: 24450)
Sodium dodecyl sulphate (PubChem CID: 3423265)
Coomassie brilliant blue (PubChem CID: 6333920)

Keywords:
Enzymatic activity
α-Amylase
Bacillus sp. MB6

ABSTRACT

α-Amylase, a very critical enzyme for hydrolysis of starch into simple sugar and it has various applications in industrial settings. This study reports the identification of *Bacillus* sp. MB6 which produces increased amount of enzyme from less required resources. To optimize the yield of enzyme, we used various combinations of parameters. The most optimized conditions for production of amylase enzyme from the bacterium *Bacillus* sp. MB6 are pH of 6, temperature of 37 °C, and incubation period of 48 h. Condition of enzymatic activity were also examined and the results show that pH of 6, a temperature of 55 °C, and a reaction time of 30 min are the best available conditions for its activity. Purification of enzyme by 1.63 fold enhanced the specific activity of enzyme based upon its activity analysis as compared with unpurified enzyme. Enzyme kinetics studies show the Michaelis constant (Km) to be 5.45 mg/ml and maximum velocity of the reaction (Vmax) to be 24.15 mg/ml/min. In conclusion, we report enzyme production and purification methodology that exhibit better yield of alpha-amylase for commercial applications.

1. Introduction

Amylase enzymes hydrolyze starch to simple sugar [1,2]. The α-amylase (*endo*-1,4-α-D-glucan glucanohydrolase (E.C.3.2.1.1)) acts on α-1,4 glycosidic bonds of starch to form glucose, maltose, and a mixture of malto-oligosaccharides [3,4]. Microbial amylases have a myriad of applications in starch-based industries, especially textile, food, detergent, paper, leather, and pharmaceutical industries [5,6]. These enzymes account for ~30% of the global enzyme production [3,7,8]. Globally, the production of this enzyme is worth ~US$ 2.7 billion with an annual increase of ~4% [9]. Bacteria that can produce the amylases are widely present in nature and can easily be screened and tested for the production of amylase [10,11]. Commercially used alpha-amylase is harvested mostly from different species of *Bacillus*. [8,10,12]. However, amylase enzymes are highly unstable and lose their property in various conditions including high temperature, extreme pH, and different chemicals used in the reaction. The enzyme exhibits its complete activity at particular optimum conditions of reaction such as pH, temperature, and incubation timing [9,13]. The aim of this study was to identify the optimum conditions for culture and alpha-amylase production for *Bacillus* sp. MB6 in order to obtain highly stable and large quantity of alpha amylase for commercial applications.

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CHEMISTRY

Kinetic Study of Acidic Hydrolysis of Di-2,3-dichloroaniline Phosphate

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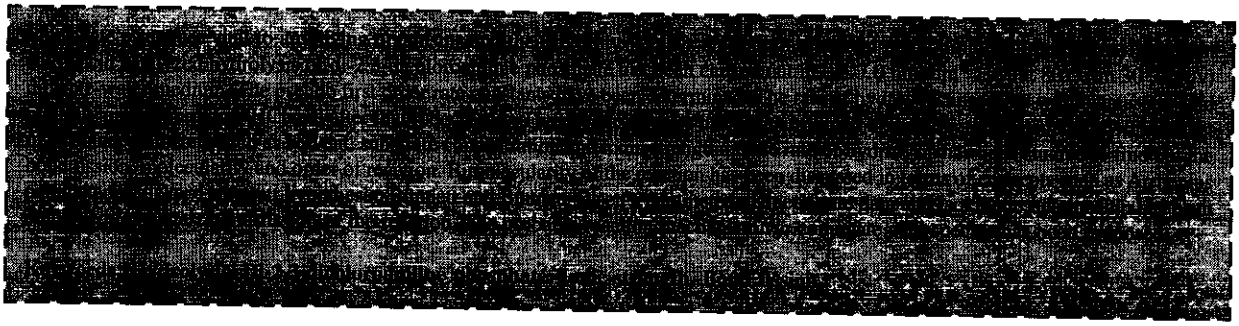
[4 May 2016]



Phosphate esters play important roles in many areas of science. Mono- and di-esters are involved in countless biological processes, most prominently the storage and transmission of genetic information involving DNA and RNA [1-3]. Triesters do not occur naturally, but together with related compounds have found widespread use as herbicides and insecticides since the mid-20th century [4]. C-N-P linkage containing phosphate esters exhibit multifaceted applications in modern organic and medicinal chemistry [5-7]. These esters are used as antibacterial, antiviral, antitumor agents and are normally considered as important pharmacological compounds and have received an increasing amount of attention due to their significant biological interests [8]. In addition to this, they also proved their technical importance for industries. Phosphate esters represent an important class of commercial additives used as flame retardants, plasticizers, hydraulic fluids, solvents, extraction agents, antifoam agents, adhesives and coatings for electronic devices [9]. Hydrolysis of phosphate esters is of crucial importance to biological systems, being involved in energy transduction, biosynthesis, control of secondary messengers and regulation of protein function [10]. The hydrolysis of phosphodiesters is especially important in biochemical and medicinal research [11]. In present investigation attempt was made to study the acid catalyzed hydrolysis of di-2,3-dichloroaniline phosphate in dioxane-water medium.

Di-2,3-dichloroaniline phosphate was synthesized by Rudert method [12] using 2,3-dichloroaniline and phosphorylating agent phosphorus oxychloride in 2:1 mol ratio in benzene (solvent). The crude product obtained of diester was recrystallized by ammonia and HCl solutions to get a pure sample of diester. Synthesized diester was identified by FTIR spectral and elemental analysis.

All the reactions were carried out at 80 ± 0.5 °C employing 5.0×10^{-4} mol dm^{-3} concentration of the synthesized diester in 30 % (v/v) dioxane-water medium. The constant ionic strength was maintained by appropriate mixture of HCl and NaCl. All the chemicals used were of AR grade. The progress of kinetic study of di-2,3-dichloroaniline phosphate was made by systronics spectrophotometer (model no.105) using Allen's modified method [13] which involves the estimation of inorganic phosphate.

Hydrolysis of di-2,3-dichloroaniline phosphate was carried out at 80 °C in the range of 0.5 to 7.0 mol dm^{-3} HCl in 30 % (v/v) dioxane-water medium. The pseudo-first order rate constants were obtained at different acid molarities are summarized in Table-1. From the results, it is found that the rate of hydrolysis of di-ester increases with the increase in acidities up to 4 mol dm^{-3} HCl. The maximum rate at 4 mol dm^{-3}

Spatio-Temporal Measurement of Indoor Particulate Matter Concentrations Using a Wireless Network of Low-Cost Sensors in Households Using Solid Fuels

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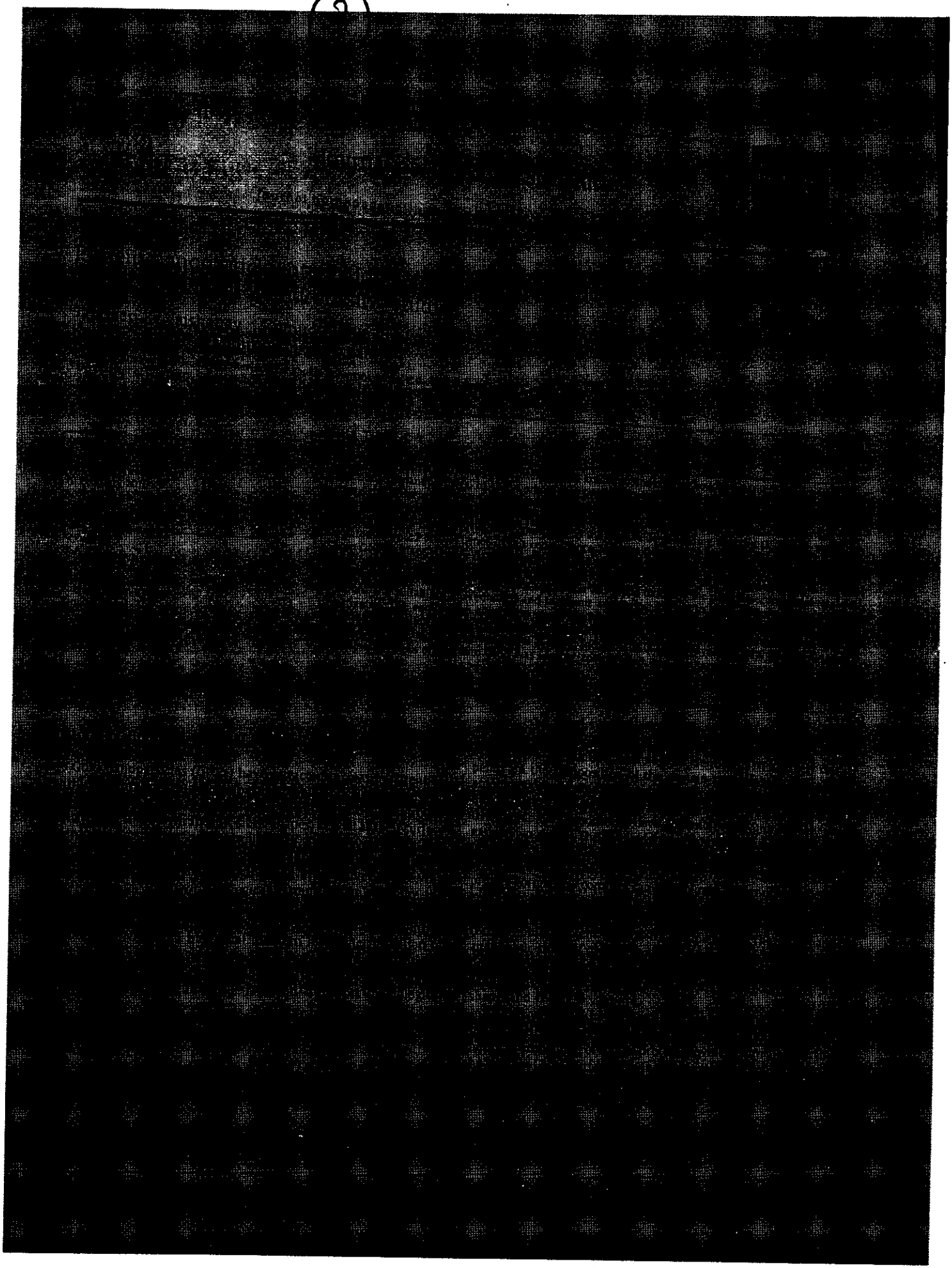

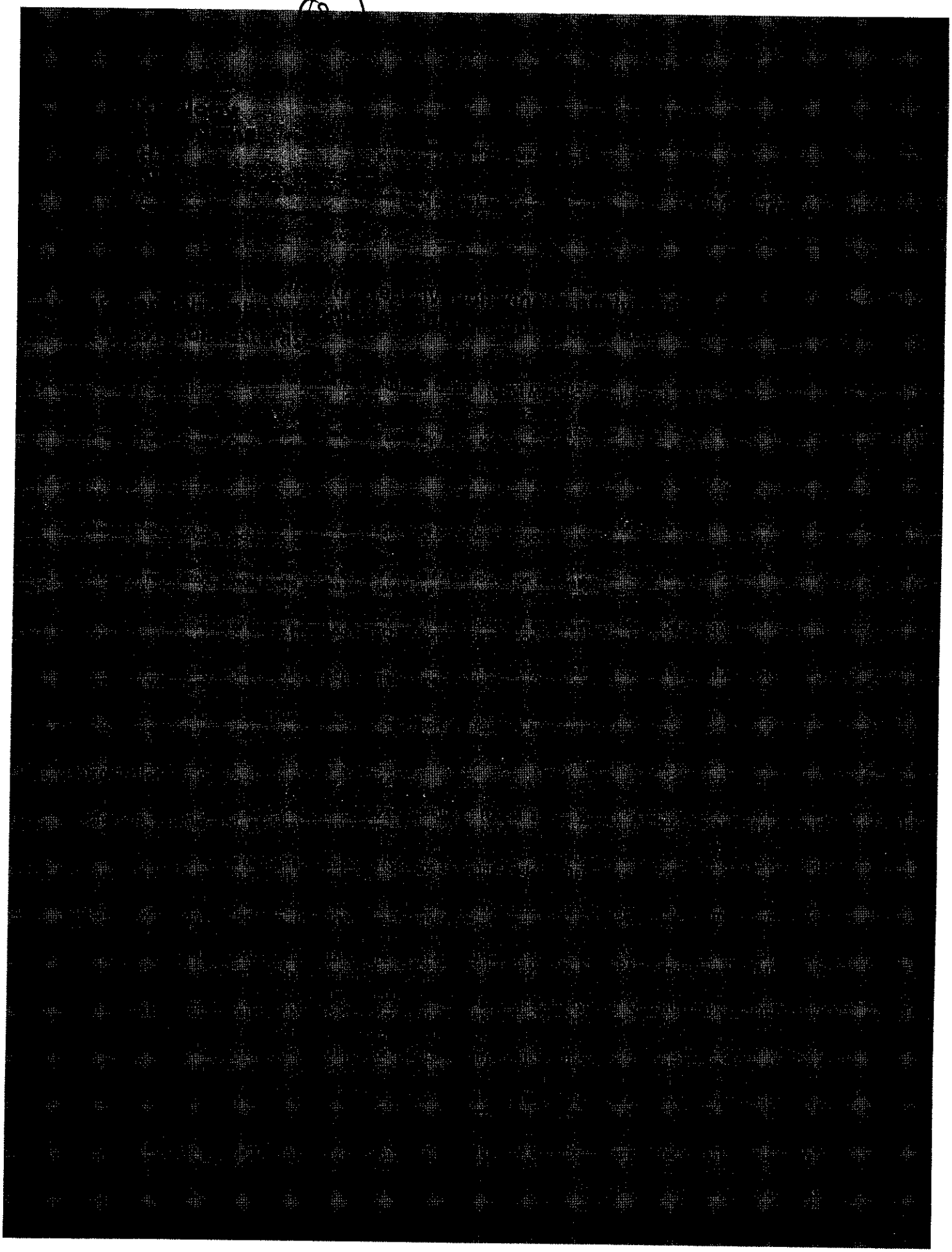

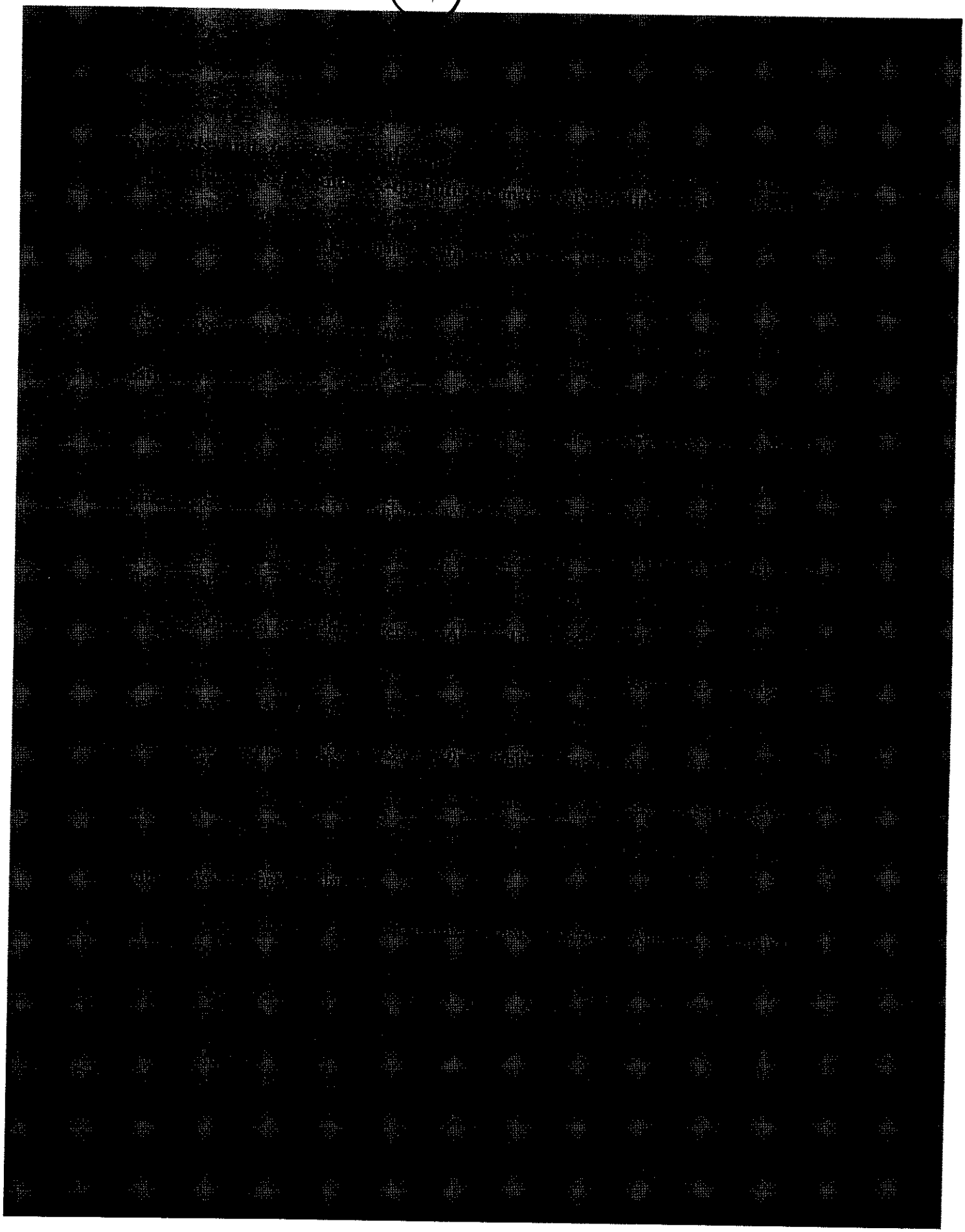

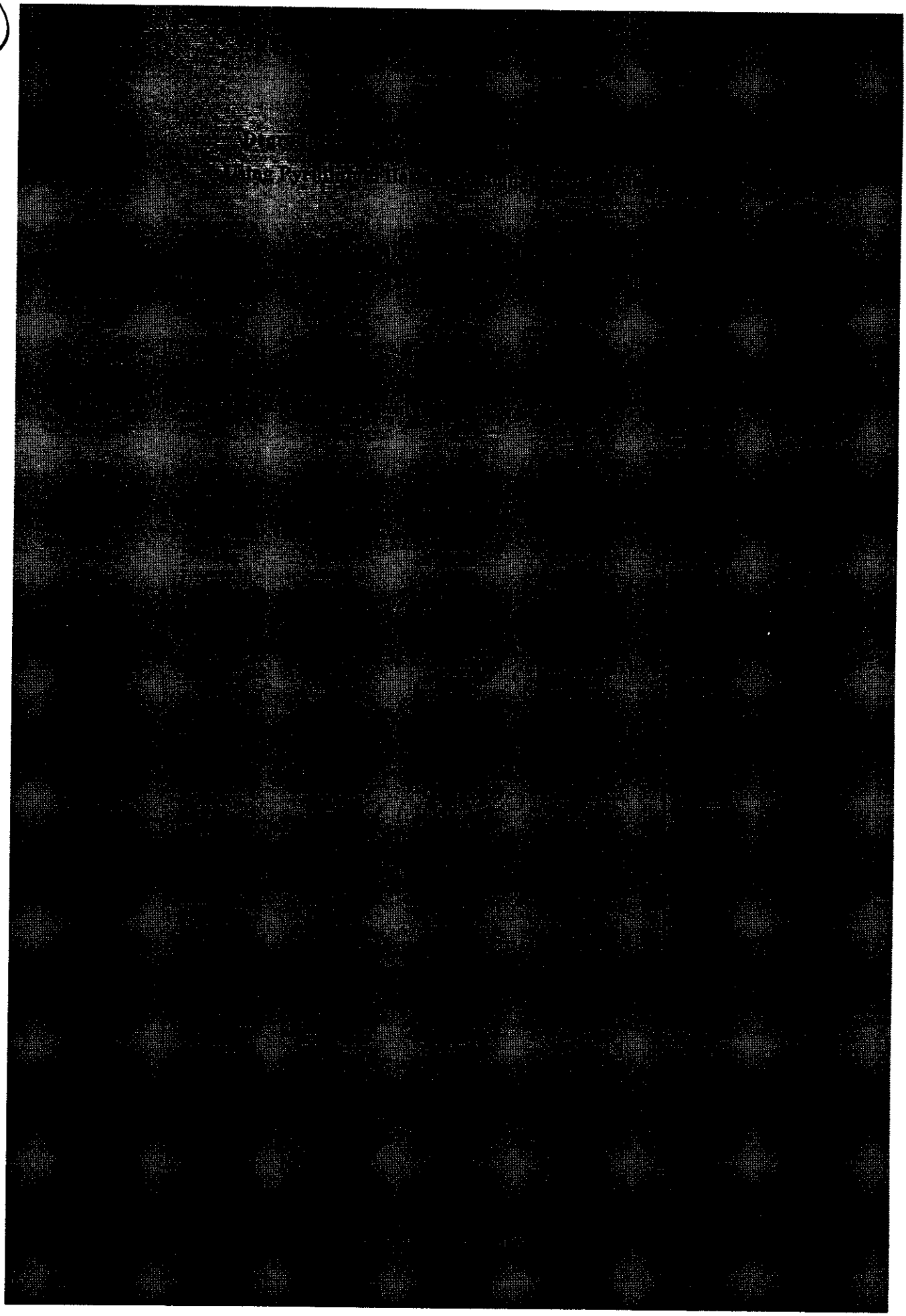

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Green Luminescent CdTe Quantum Dot Based Fluorescence Nano-Sensor for Sensitive Detection of Arsenic (III)

Sandeep K. Vaishanav[1] · Jyoti Korram[1] · Priyanka Pradhan[1] · Kumudini Chandraker[1] · Rekha Nagwanshi[2] · Kallol K. Ghosh[1] · Manmohan L. Satnami[1]

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Abstract Arsenic (As^{3+}) is a hazardous and ubiquitous element; hence the quantitative detection of arsenic in various kinds of environmental sample is an important issue. Herein, we reported L-cysteine capped CdTe Quantum dot based optical sensor for the fluorometric detection of arsenic (III) in real water sample. The method is based on the fluorescence quenching of QDs with the addition of arsenic solution that caused the reduction in fluorescence intensity due to strong interaction between As^{3+} and L-cysteine to form $As(Cys)_3$. The calibration curve was linear over 2.0 nM-0.5 μM arsenic with limit of detection (LOD) of 2.0 nM, correlation coefficient (r^2) of 0.9698, and relative standard deviation (RSD %) of 5.2%. The Stern-Volmer constant for the quenching of CdTe QDs with As^{3+} at optimized condition was evaluated to be 1.17×10^8 L mol^{-1} s^{-1}. The feasibility of the sensor has been analyzed by checking the inference of common metal ions available in the water such as K^+, Na^+, Mg^{2+}, Ca^{2+}, Ba^{2+}, Cu^{2+}, Ni^{2+}, Zn^{2+}, Al^{3+}, Co^{2+}, Cr^{2+}, Fe^{3+} and its higher oxidation state As^{5+}.

Keywords CdTe QDs · Detection of As^{3+} · LOD · Fluorescence Nano-sensor

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Introduction

Arsenic (As^{3+}) is a hazardous and ubiquitous element found in environmental samples such as soil, water, rain, aquatics, vegetation and aerosol. Naturally, it is present in metal ore as arsenide of iron copper and nickel [1]. There are several arsenic species (−3, +3, 0, +5) that are highly toxic and fascinate lots of research concerns [2]. Since inorganic species of As^{3+} is more stable than As^{5+} under marginally reducing environments or low pH. Thus, up to 10% of total arsenic exists as As^{3+} in uncontaminated surface and deep ocean waters. As^{3+} is one of the most toxic arsenic species; it has the median lethal dose (LD_{50}) of about 14 mg/kg for rats [3, 4]. Natural and anthropogenic sources such as ore mines, industrial discharge, rock weathering and atmospheric deposition are responsible for accumulation of arsenic contents in soil, water and air [5, 6]. Arsenic compounds have a broad range of applications in agriculture, medical and electronics. The common gate for the arsenic to human body is either by the contaminated water or by the consumption of contaminated vegetation [7]. Chhattisgarh and West Bengal are the most commonly arsenic contaminated states in India, where the arsenic level exceeded the World Health Organization (WHO) standards for drinking water (10 μg L^{-1}) [8]. The chronic exposure of arsenic causes various physiological disorders such as depigmentation, hyper pigmentation, peripheral vascular disorder, keratosis, and black-foot [8, 9]. Such high levels of As^{3+} must be regularly monitored by reliable and low-cost detection techniques. Presently, the standard upper limit of arsenic in drinking water is 10 ppb [10], which is quite low; therefore, a highly sensitive and selective detection method must be innovated.

There are various methods have been reported for the detection of arsenic in different environmental samples such as, air, water, soil and sediment. Commonly employed methods

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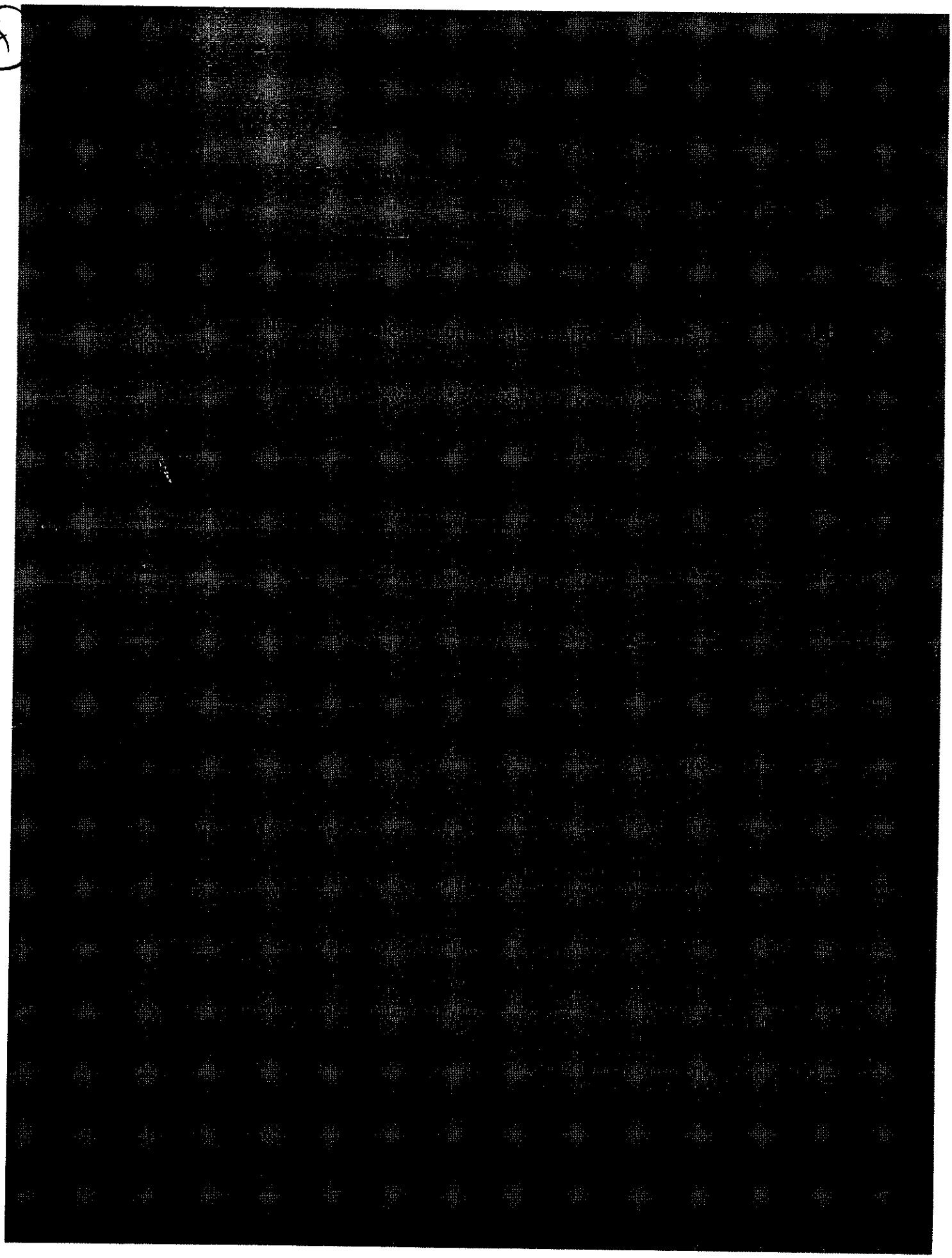

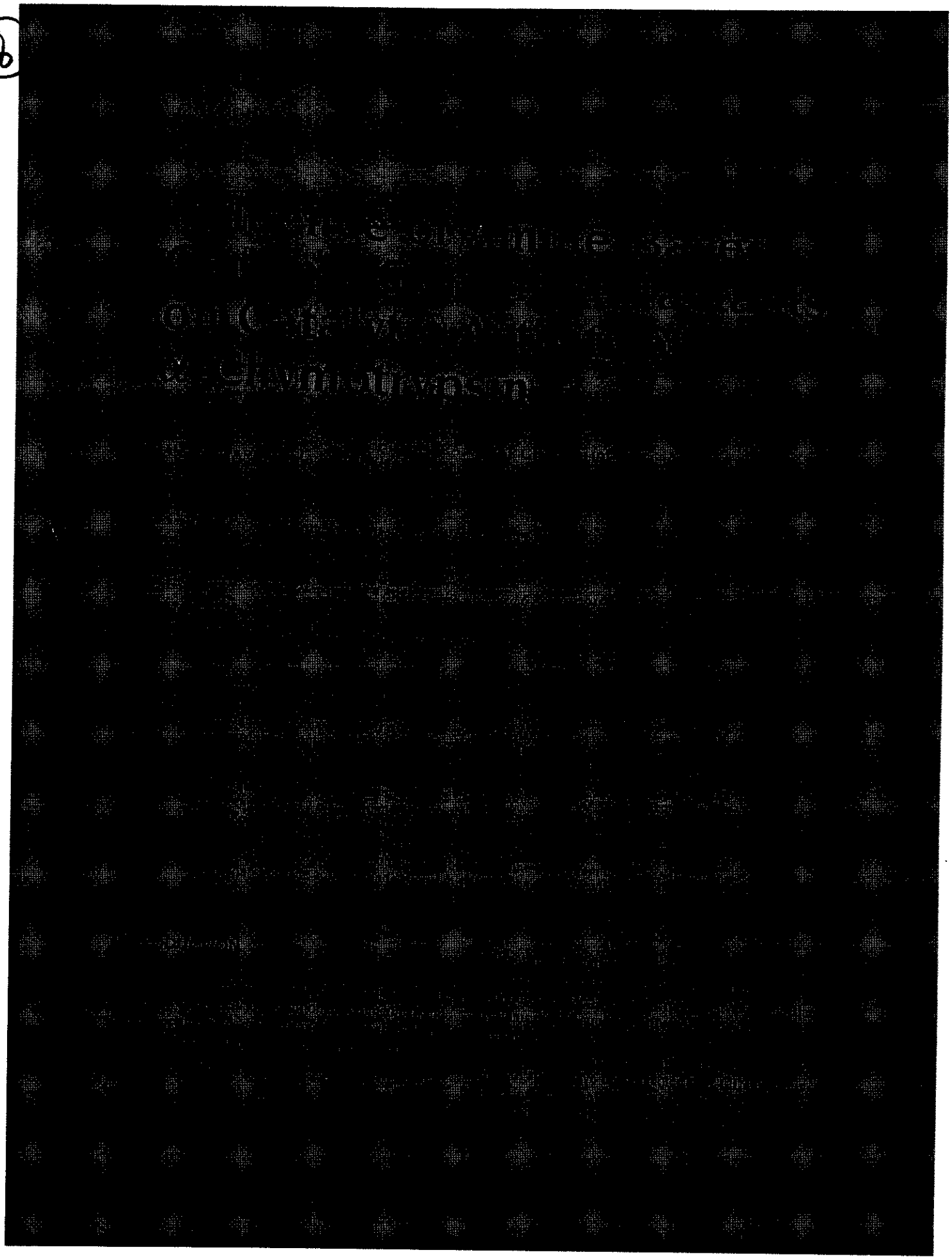

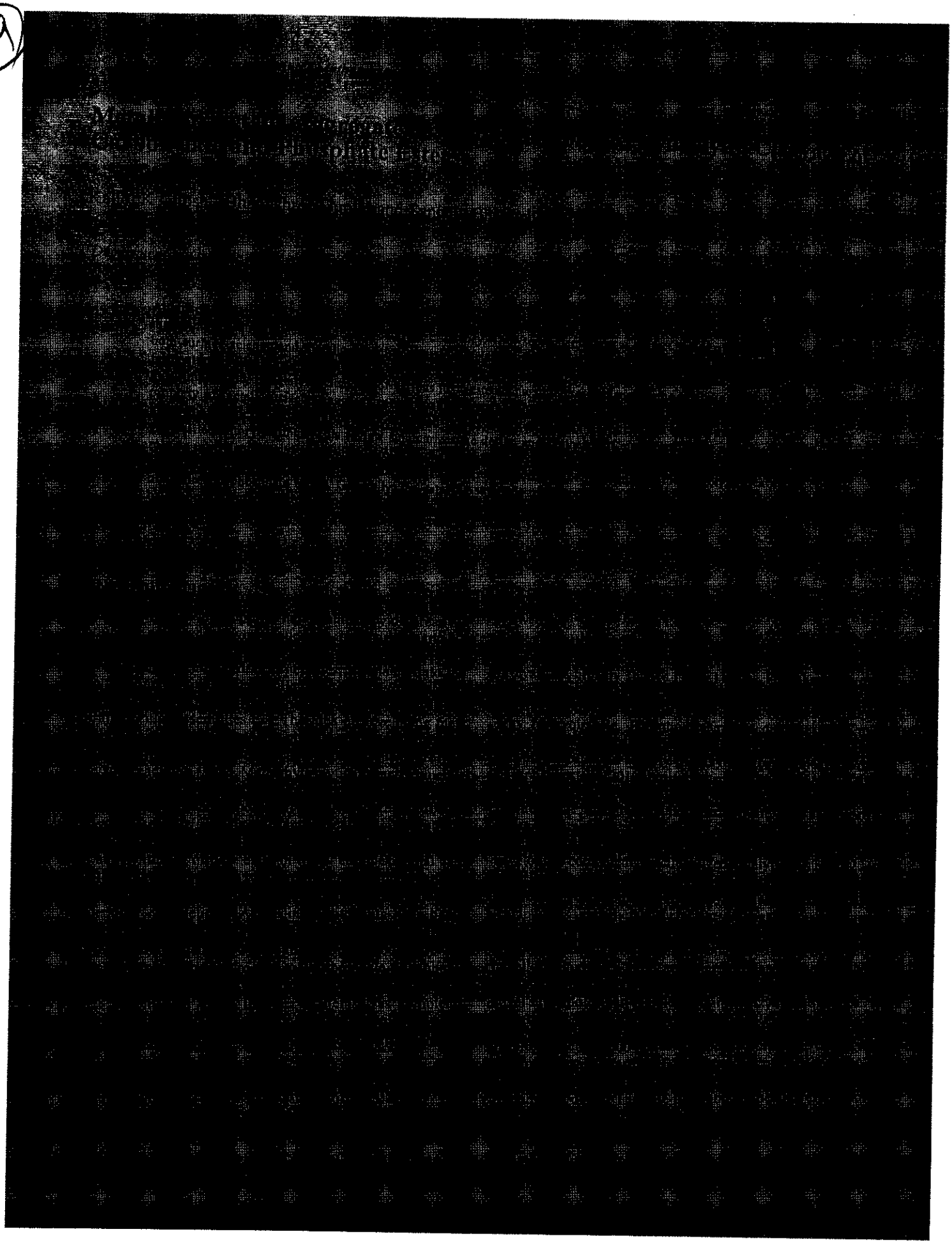

10

Mn^{2+} Doped-CdTe/ZnS Modified Fluorescence Nanosensor for Detection of Glucose

Sandeep K. Vaishanav[1], Jyoti Korram[1], Rekha Nagwanshi[2], Kallol K. Ghosh[1] and Manmohan L. Satnami[1*]

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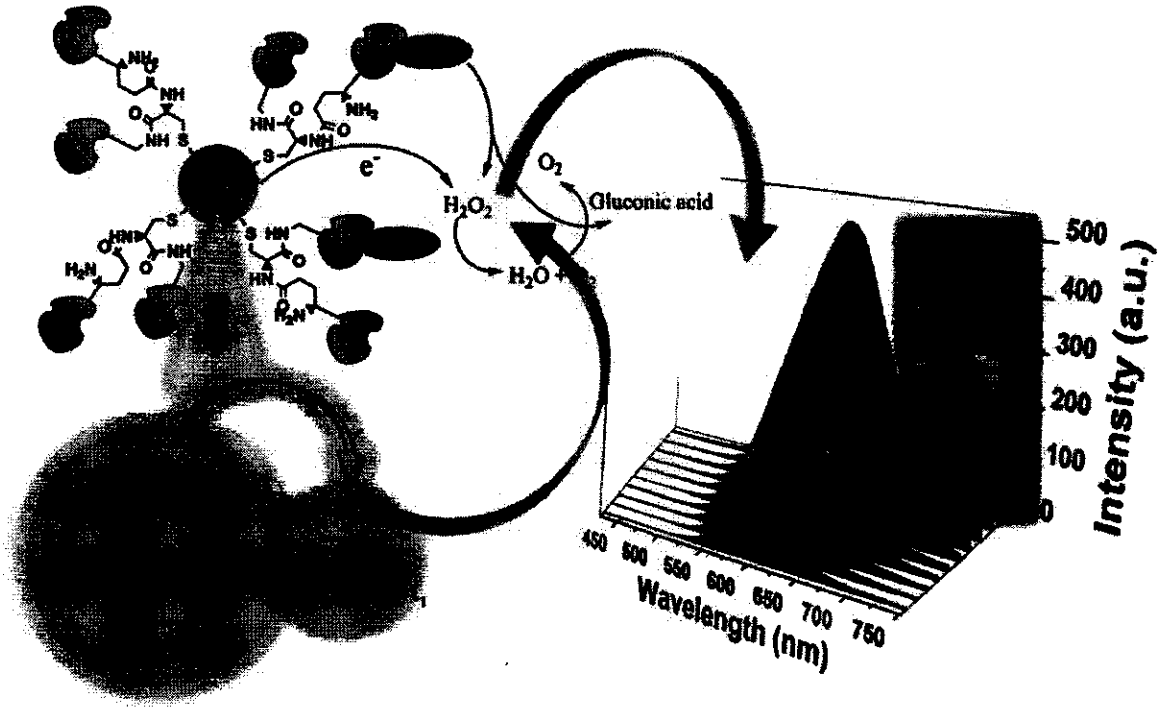
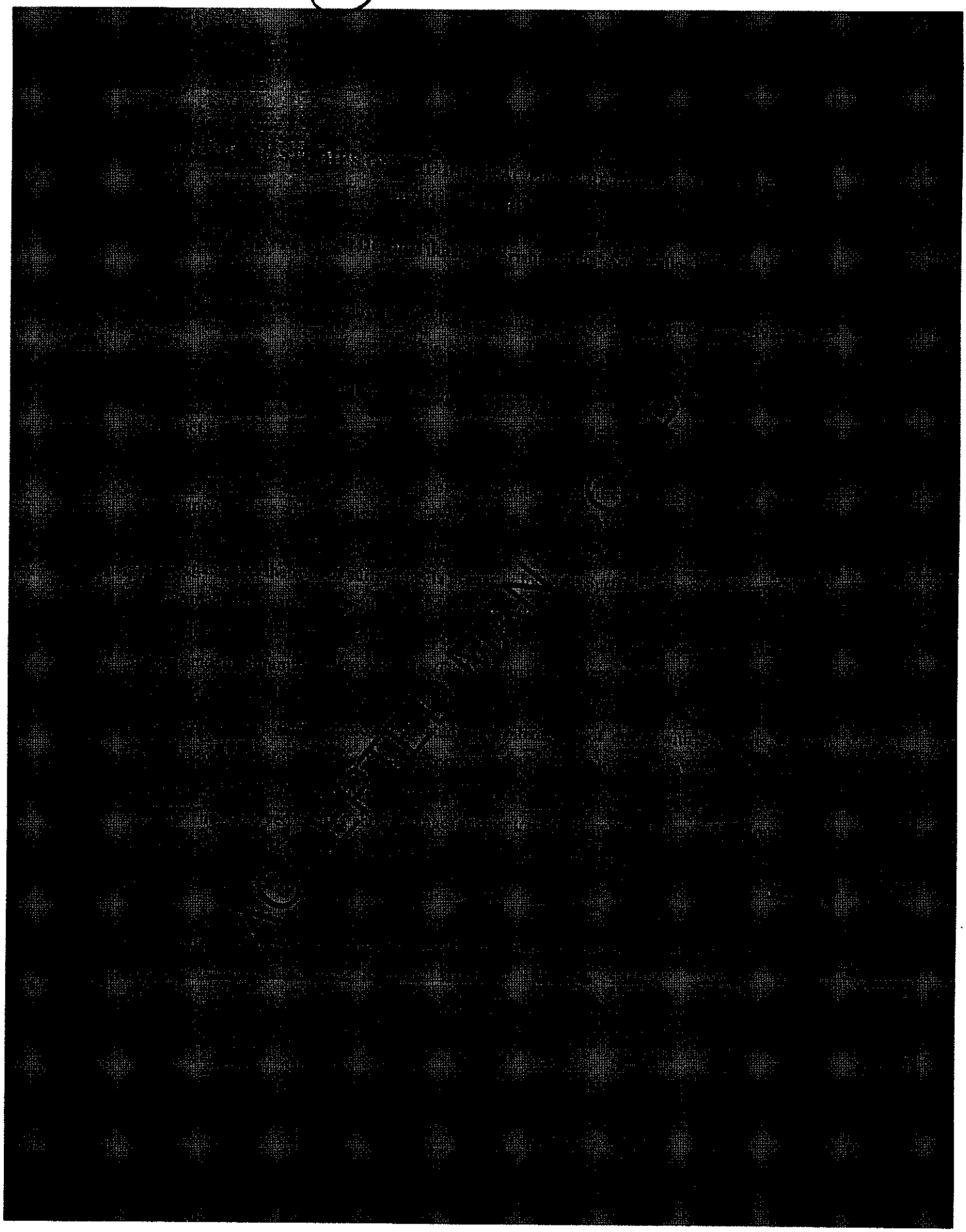
Graphical abstract





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$PM_{2.5}$ pollution from household solid fuel burning practices in Central India: 2. Application of receptor models for source apportionment

Jeevan Lal Matawle · Shamsh Pervez · Manas Kanti Deb · Anjali Shrivastava · Suresh Tiwari

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Abstract USEPA's UNMIX, positive matrix factorization (PMF) and effective variance-chemical mass balance (EV-CMB) receptor models were applied to chemically speciated profiles of 125 indoor $PM_{2.5}$ measurements, sampled longitudinally during 2012–2013 in low-income group households of Central India which uses solid fuels for cooking practices. Three step source apportionment studies were carried out to generate more confident source characterization. Firstly, UNMIX6.0 extracted initial number of source factors, which were used to execute PMF5.0 to extract source-factor profiles in second step. Finally, factor analog locally derived source profiles were supplemented to EV-CMB8.2 with indoor receptor $PM_{2.5}$ chemical profile to evaluate source contribution estimates (SCEs). The results of combined use of three receptor models clearly describe that UNMIX and PMF are useful tool to extract types of source categories within small receptor dataset and EV-CMB can pick those locally derived source profiles for source apportionment which are analog to PMF-extracted source categories. The source apportionment results have also shown three fold higher relative contribution of solid fuel burning emissions to indoor $PM_{2.5}$ compared to those measurements reported for normal households with LPG stoves. The previously reported influential source marker species were found to be comparatively similar to those extracted from PMF fingerprint plots. The comparison between PMF and CMB SCEs results were also found to be qualitatively similar. The performance fit measures of all three receptor models were cross-verified and validated and support each other to gain confidence in source apportionment results.

Practical implications Total nineteen locally derived source profiles (included different indoor as well as outdoor sources) which consists thirty-two (elemental, ionic and thermally speciated carbon fractions) chemical species were applied to test their applicability in CMB model execution for source apportionment. The UNMIX and PMF results were supplemented to CMB solution to obtain accuracy in SCEs. The latest model parameters (factor fingerprint plot for PMF and MPIN matrix of EV-CMB) were used to evaluate source markers, selection of measured source profiles on executing EV-CMB and validation of source apportionment results.

Electronic supplementary material The online version of this article (doi:10.1007/s10653-016-9889-y) contains supplementary material, which is available to authorized users.

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Fourier transform infrared spectroscopy combined with single-drop micro-extraction for quantitative analysis of tungstate in biological samples

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ABSTRACT

This work demonstrates a simple, rapid and convenient method based on Fourier transform infrared (FTIR) spectroscopy combined with single-drop micro-extraction (SDME) and chemometrics for the analysis of tungstate. Nanogram quantities of tungstate using N^1-hydroxy-N^1, N^2-diphenylbenzamidine (HDPBA), were quantitatively extracted into chloroform at 4.0–6.0 M sulphuric acid medium by the SDME method. The method is fairly selective and almost all common ions including Mo(VI), Cr(VI) etc. do not interfere in the extraction. The tungstate formed an orange-red colored, 1:2 complex with HDPBA in chloroform. This complex was characterized by FTIR spectroscopy, and tungstate in it was determined. The factors affecting SDME were optimized for better extraction efficiency. The most steady and strongest asymmetric vibrational (υ_3) band at $840 \pm 2\,cm^{-1}$ was selected for the quantitative analysis of the tungstate–HDPBA complex. The calibration curves for the concentration range of 1.0–100.0 ng mL^{-1} were prepared with the help of the chemometric software TQ analyst using partial least squares (PLS) regression models. The limit of detection and limit of quantification of the method were found to be 3.0 ng mL^{-1} and 10.0 ng mL^{-1}, respectively. The standard deviation and relative standard deviation for the concentration 10 ng mL^{-1} for 10 replicate measurements were found to be 0.14 ng mL^{-1} and 1.3%, respectively. The method was applied to human blood and urine samples for quantification of tungstate.

1. Introduction

Tungsten (W) is reported to be an important rare element, having tremendous applications, notably as a catalyst in industries and also as an essential element in X-ray tubes and projectiles [1]. The existence of tungsten in the environment is mainly in the form of the tungstate ion, i.e., WO_4^{2-} in which it exhibits the +6 oxidation state [2]. Very recently many toxicological effects of tungstate have been observed [3]. The toxicity might be attributed to its hexavalent state. Tungstate toxicity leads to diseases like emphysema and pulmonary fibrosis [4]. Tungsten(VI) is chemically similar to molybdenum(VI), hence it interferes with the molybdenum metabolism in cells. It has been reported that the concentration of 5 μg kg^{-1} of tungstate can lead to the death of animal embryos [2].

The analysis of metals generally involves extraction processes for the enrichment of the metal from bulk matrix. There are various methods reported for the extraction of metals such as solid phase extraction (SPE) [5,6], liquid–liquid solvent extraction (LLSE) [7] and co-precipitation [8]. In addition, cloud point extraction (CPE) method has also been employed [9,10]. However, the major drawbacks in one or more of the above methods are the low separation efficiency, need of a high solvent volume, and the cumbersome process [11]. SPE is a solventless technique and an efficient method but it uses large amounts of eluents and takes longer extraction time. Conventional LLSE method of extraction requires a bulk amount of toxic solvents [12]. However, most of these methods suffer from a number of limitations such as low-metal recovery, high-blank values, lack of sensitivity, large interferences as well as stringent reaction conditions. To overcome these above mentioned drawbacks many developments have been reported in extraction methods. The miniaturization of extraction processes, i.e., liquid-phase micro-extraction, solid-phase micro-extraction (SPME), and the single-drop micro-extraction (SDME)

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Study of Solvent Effects on Hydrolysis of Mono-*m*-toluidine Phosphate

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Abstract: The study of solvent effects on the hydrolysis of mono-*m*-toluidine phosphate has been carried out in 1, 4 dioxane/water and DMSO/water binary systems at various compositions. The pseudo first order rate constants have been determined. The rate of reaction increases with increase in percentage of 1, 4 dioxane and DMSO from 10 to 50% (v/v) at different temperatures. The activation parameters ($\Delta H^{\neq}$, $\Delta G^{\neq}$, $\Delta S^{\neq}$) have been calculated. The results obtained have been explained on the basis of solute-solvent interaction, solvent of the transition state of the medium.

Keywords: Hydrolysis, Solvent effects, Mono-*m*-toluidine phosphate, Solvent-solute interaction, Activation parameters.

Introduction

Organophosphate esters are the derivatives of orthophosphoric acid. They have found a broad range of applications in the areas of industrial, agricultural and medicinal chemistry owing to their biological and physical properties, as well as their utility as synthetic intermediates[1-4]. Phosphate esters have a unique range of properties which are exploited in the production of specialised chemical processing aids for industry. Solvent effects play a key role in many chemical and physical processes in solutions[5]. The rate of an elementary chemical reaction may change by order of magnitude when the solvent is changed[6, 7]. A change in solvent from a polar solvent to a nonpolar solvent has been suggested to increase or decrease reaction rates depending on the type of reactions[8]. In homogeneous media, solvent effects on reactivity are explained in terms of the specific interactions between solvent and substrate molecules and between solvent and transition states[9].

Experimental

Mono-*m*-toluidine phosphate was synthesized by Cavalier method[10]. It involves the reaction of *m*-toluidine with phosphorylating agent phosphorus pentaoxide (P_2O_5) in 1:1 mole ratio. The crude product so obtained was recrystallized by barium hydroxide solution and glacial acetic acid to get pure sample. The confirmation of compound was done by comparing observed and calculated percentage of elements and by recording IR spectrum as shown below :

1. Elemental analysis (%); observed (calculated): C, 26.8 (26.1); H, 2.14 (2.51); N, 4.86 (4.35); P, 9.92 (9.61).
2. IR absorption spectra: The spectrum of mono-*m*-toluidine phosphate was recorded by FTIR. U (KBr) (cm^{-1}): 3100 (N-H); 3125 (O-H); 2945.30 (C-H); 1531.48 (C=C); 1235(P=O); 717.52 (P-N), 974.05 (C-N).

ASIAN JOURNAL OF CHEMISTRY

Sensitive Spectrophotometric Determination of Deltamethrin Using Leuco Malachite Green in Environmental Samples

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Keywords: Spectrophotometry, Deltamethrin, Leuco malachite green.

INTRODUCTION

Deltamethrin is a synthetic pyrethroid insecticide with molecular formula ($C_{22}H_{19}Br_2NO_3$). Solubility in water is < 0.1 mg/L at 25 °C. Relative molecular mass of the compound is 505.2 g/mol [1]. It is one of the most effective insecticides known and is not only widely used in veterinary products to control lice, flies and ticks on cattle, sheep and pigs but also in agricultural formulation to control several insect pests on fruits, vegetables and field crops [2], due to its persistence, residual activity and low toxicity to mammals [3]. However, deltamethrin has been found to be very toxic to terrestrial invertebrates, fish and other aquatic organism [4]. Because of its liphophilc characteristics it can be highly absorbed by the fish gills, which partially explains the high sensitivity of these mammals to deltamethrin exposure in concentration up to a thousand times lower than in mammals [5,6]. However, after exposure, a verity of reversible symptoms such as paraesthesia, irritation of the skin and mucosa, headache, dizziness and nousea are reported [7].

The aim of the present work is to develop a rapid, simple and sensitive analytical method for the determination of widely used deltamethrin insecticide at trace levels. Up to now, few analytical procedure have been reported for the determination of deltamethrin residues, including high-performance liquid chromatography (HPLC) [8-10], gas chromatography-mass spectroscopy (GCMS) [11], gas chromatography with electron capture detection (GC-μECD) [12,13], photochemical-spectro-fluorometric [6] and NMR [6].

EXPERIMENTAL

All spectral measurements were made by a systronic UV-visible spectrophotometer model – 104 with matched silica. A systronic pH meter model – 335 was used for pH measurements. A Remi C-854/4 clinical centrifuge force of 1850 g with permanent swing out rotors was used for centrifugation. All reagents used were of AnalaR grade and Double Distilled water was used throughout the experiment.

Deltamethrin [Isagro (Asia) Agrochemicals Pvt. Ltd.] A stock solution of 1 ppm deltamethrin is prepared in double distilled water. Working standard solution was prepared by appropriate dilution of stock. Sodium hydroxide (Loba Chemie, Mumbai) aqueous solution of 1 M concentration were prepared. The saturated solution of bromine in water was prepared. The solution was prepared daily. Formic acid solution was 90 %

ASIAN JOURNAL OF CHEMISTRY

Flotation-Dissolution Based Spectrophotometric Determination of Ethion

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[redacted]

Ethion [O,O,O,O-tetraethyl-S,S-methylene *bis*(phosphorodithioate)] belongs to the organophosphate insecticide class and from 1965 was registered for use in United States [1]. The first evolved insecticide, non-systemic insecticide as well as acaricide used on fruit trees, specially nut trees, grapes and citrus fruits [2]. This insecticide was developed for use on cotton and seed and forage crops as well as a broad range of fruits and vegetables against non-systemic insecticides. Bugs, aphids, mites, thrips, grasshoppers, maggots, larvae, suckers and soil-dweller insects on a broad scale of food, fiberous and decorative crops, fruits, vegetables and nuts can be eliminated [3]. Ethion is extensively to moderately poisionous by the oral path, which could result in influenza-like condition alongwith headache, malaise, weakness, loss of appetite and nausea [4]. Exposure to excessive levels of ethion can result nausea, sweating, loss of bladder, diarrhea and nervous system disorders [5]. On root cells of plants ethion can also result in a mitodepressive effect causing chromosomal abnormality toxicity, can also reduce their fertility, pathogenic resistivity, *etc.* [6].

There are several methods reported using some advance and sophisticated equipments such as infrared spectrophotometric method [7], gas chromatography method [4] and high performance liquid chromatography [8]. But all these equipments are expensive and also require regular maintenance, so an alternative method is required and here is a flotation-dissolution method for the determination of ethion is reported.

For all spectral analysis, Systronics UV-visible spectrophotometric model 104 with matched silica cells was used. pH meter model Thermofisher Orion star A211 was used for pH determination. For centrifugation Remi C-854/4 clinical centrifuge force of 1850 rpm with fixed swing out rotors was used.

Chemicals used were of Analytical Reagent grade. Demineralized water was used all over the experiment. Ethion (Swal Corporation Ltd., Mumbai) 1 mg mL^{-1} was prepared as stock solution. Ammonium molybdate A 0.05 mol L^{-1} was prepared in dilute (1.5 mol L^{-1}) sulfuric acid. Methylene blue 4×10^{-5} mol L^{-1} solution was prepared by dissolving 0.013 g of methylene blue in 100 mL of water. Solution of 0.10 mol L^{-1} oxalic acid was used.

Preparation of calibration graph: In 250 mL Erlenmeyer flask, 10 mL of aqueous solution consisting 0.5-16 μg of ethion was taken and 1 mL of 1.5 mol L^{-1} sulfuric acid was added in each concentration of solution and then ammonium molybdate solution 0.6 mL of 0.05 mol L^{-1} were added. Left for 20 min and then the solution was brought to room temperature. In order to eliminate excess of molybdate the mixture is treated with 0.5 mL volume of oxalic acid and the solution was placed into a 250 mL separating funnel. Add methylene blue solution

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Determination of Carbendazim in Environmental Samples with Iron(III) and 1,10-Phenanthroline as Reagents

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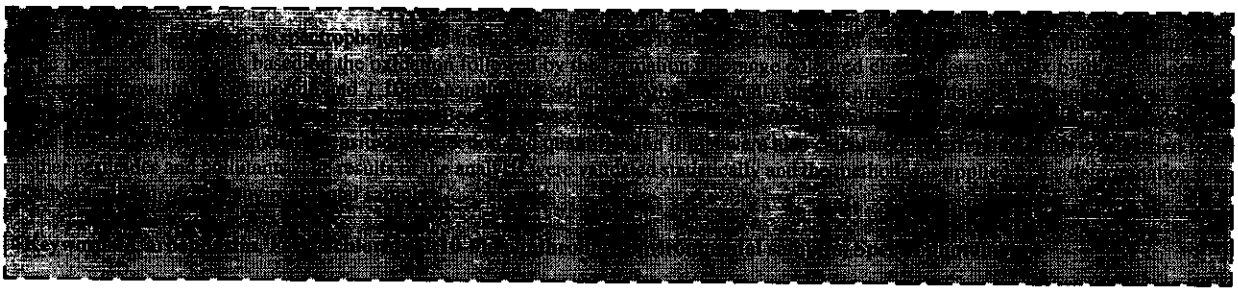

INTRODUCTION

In agriculture plant diseases are inhibited by means of chemical products (fungicides, bactericides *etc.*). Carbendazim (methyl-benzimidazole-2-yl-carbamate) (Fig. 1) is a commonly used fungicide. It belongs to the benzimidazole group of compounds [1,2]. A broad range of diseases on cereals, fruits, cotton, tobacco, turf, ornamentals and vegetables are control by carbendazim pesticide. It is also used in post-harvest food storage and as a seed pre-planting treatment [3,4].

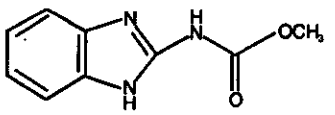

Fig. 1. Carbendazim (methyl-benzimidazole-2-yl-carbamate)

In soil and water carbendazim is quite stable and it is also reported to have an environmental half-life of up to 12 months. The soil persistence and the plant systemic nature of carbendazim can in turn lead to the contamination of water and plant products [5,6]. It can be treated as a dangerous substance. Its mutagenic and teratogenic effects on mammals have also been confirmed even when the substance was applied in a single and relatively small dose [1].

Different sophisticated techniques have been developed in the last few years for the detection of carbendazim such as adsorptive stripping voltammetry [7], liquid chromatography [8], gas chromatography-mass spectrometry [9], high performance liquid chromatography [10,11], infrared spectroscopy [12], fluorescence analysis [13,14], UV-visible spectrophotometric [3,15]. Some of these techniques suffer from poor sensitivity, analyses are limited to laboratory facilities and expensive due to its analytical cost and instability of colour or longer time required for full colour development. To overcome these drawbacks a rapid and sensitive method has been proposed for the determination of carbendazim. Spectrophotometry is considered the most convenient analytical technique because of its inherent simplicity, low cost and wide accessibility in most laboratories.

In the present study a simple, sensitive and cost effective method have been developed for the determination of carbendazim using ferric chloride followed by coupling with 1,10-phenanthroline reagent.

EXPERIMENTAL

All the spectral measurements were made by a systronic UV-visible spectrophotometer model-104 with 10 mm matched silica glass cell. pH meter model Thermofisher Orion star A211 was used for pH determination. A Remi C-854/4 clinical centrifuge force of 1850 g with permanent swing out rotors was used for centrifugation. Calibrated glassware were

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Low-Cost Paper Electrode Fabricated by Direct Writing with Silver Nanoparticle-Based Ink for Detection of Hydrogen Peroxide in Wastewater

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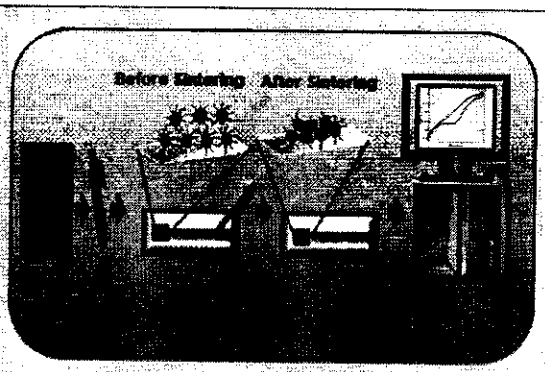
Supporting Information

ABSTRACT: A simple, low cost and user-friendly method for the fabrication of paper electrode (PE) using silver nanoparticles capped with octylamine (AgNPs-OA) is reported for detection of hydrogen peroxide (H_2O_2) in wastewater samples. The PE was prepared by direct writing onto the photo paper using a ball-point pen filled with nanoink (10 wt % of AgNPs-OA in chloroform). The prepared electrode was sintered at 100 °C for 1 h to make it conductive. The PE/AgNPs-OA was used as a working electrode in cyclic voltammetry (CV) for the detection of H_2O_2. The PE/AgNPs-OA exhibited a wide linear calibration range from 1.7 μM to 30 mM for the determination of H_2O_2 with a low limit of detection, 0.5 μM. The good recovery percentage (95.2–96.2%) and interference study for determination of H_2O_2 in wastewater samples demonstrated the selectivity of the method from the complex sample matrices. The PE/AgNPs-OA electrode is found to be economic, facile and user-friendly for multiple analyses (n = 60) of H_2O_2 in CV compared to other commercially available electrodes and custom-made modified electrodes.



Hydrogen peroxide is an oxidizing agent and has broad application in preparation of deodorants, bleaching agents, disinfectants, and also in sewage treatments. It is used as a bleaching agent in paper industry, disinfectants in hospitals and as sterilizers in food industries. The industrial wastes, hospitals, and domestic effluents containing H_2O_2 are main sources for contamination of natural water bodies. The introduction of H_2O_2 in human system through the drinking water may cause headache, nausea, dizziness, and vomiting. Inhalation may cause irritation in the nose, throat, and lungs. Therefore, the monitoring of H_2O_2 in wastewater samples is important to prevent the entry of this toxic chemical in to the environment.[1−3]

The analytical techniques such as spectrophotometry,[4] infrared spectroscopy (IR),[5] chemiluminescence,[6] fluorimetry,[7] and cyclic voltammetry (CV)[8,9] are commonly used for the determination of H_2O_2 in a variety of samples. Spectrophotometry, chemiluminescence, and fluorimetry are found to be simple and sensitive techniques. However, these techniques require a chromophore or fluorophore to form a complex with a target analyte which are sometimes not selective for detection of analyte from the sample solution. In CV, the detection of analyte occurs at the surface of electrode through the redox reaction. The detection of H_2O_2 has primarily been done by immobilization of enzymes on the electrode surface, although the stability of enzyme, storage and reproducibility are the main issues.[10] The electrode modification with different nanoparticles (NPs) such as gold (Au),[11] silver (Ag),[12] and platinum (Pt)[13] has drawn attention as alternative of enzyme immobilization on the electrode surface. The use of metal NPs modified electrodes in CV measurements showed better performance, selectivity, and sensitivity. The modification and pasting of electrodes or deposition of functionalized materials on the surface of electrodes require tedious, time-consuming, and complex process. The uniform coating of material on the surface of electrode is challenging and there are chances of breakage and leakage of materials from the surface of electrodes. Thus, gums and adhesives are being used along with the nanocomposites to prevent the rupturing of material from the modified electrode.[14,15] The disadvantages of modified electrodes are excluded by the fabrication of the functional materials on different substrates such as plastics,

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Direct-Writing of Paper Based Conductive Track using Silver Nano-ink for Electroanalytical Application

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ABSTRACT

We present a novel approach for the synthesis of silver nanoparticles capped with oleylamine (AgNPs/OLA) and its application in conductive ink for electroanalytical application. The synthesized OLA capped AgNPs was characterized with TEM, UV-Vis, EDX, FTIR and TGA to confirm the size, composition and surface modification of NPs. In this paper, we report conductive ink printing using a pen to achieve a best conductivity value of 0.11×10^5 Scm^{-1}. A 10 wt% AgNPs nano-ink solution was used for printing conductive electrodes (counter, reference and working) on-to photo paper and sintered at 150 °C for 1 h to achieve metallization. We demonstrated successful application of printed conductive electrodes in cyclic voltammetry (CV) measurement. To ensure the continuity of conductive pattern, we demonstrated the lighting of LED when conductive track was connected to a 9 V battery. This report shows that paper-based flexible electrodes are user-friendly, cost effective and useful for multiple analyses in CV compared to other printed electrodes.

1. Introduction

Conductive thin films have drawn attention due to their wide range of applications such as preparation of electronic circuits [1], fuel cells [2], photovoltaic cells [3], electrodes [4–6], solar devices [7], transistors [8], touch screens [9] and light emitting diodes [10]. Many new applications of thin films in flexible electronics are being developed like flexible batteries, flexible electrodes [11], foldable circuits [12] and flexible displays [13]. Flexible electronic materials can bring advantages of being compact as it can be folded, creased, repeated bended without undergoing degradation in functionality. These flexible electronic can be designed on substrates like glass, plastics and polymeric materials to achieve low cost electronic devices [14,15]. The disadvantages of using such substrates are degradation and damage of the electronic circuit during bending the circuit. Paper based electronics has also attracted significant interests due to easy accessibility, lightweight, low cost, biodegradable, recyclable and eco-friendly. Moreover it is inexpensive as compared to other plastic and polymeric substrates. Therefore, paper is found to be a better substrate for making flexible electronic circuits compared to polymeric materials [16–18].

Methods for deposition of conductive materials on the solid surface are lithography, stamping, chemical vapor deposition, sputtering, and spin coating [19]. These methods provide a smooth layer of conductive materials on the solid substrates. However, these methods require a dust free environment and controlled temperature that is very expensive to maintain. Solution based technique is a simple way to fabricate conductive thin films that require a preparation of NPs ink. In this perspective, inkjet printing is found as more popular method for fabricating the conductive materials due to its easy control by PC software and chosen for variety of substrates. However, the formulations of conducting materials for different substrates in inkjet printing is found to be very challenging and if the proper formulation of materials is not done, it may block the nozzles of the printer [20]. Direct pen writing method is another approach for drawing electronic circuit on solid substrates. The pen writing method is found to be very simple, rapid, low cost and user-friendly compared to other available methods for preparation of conductive thin films. Hence, roller ball pen is used for drawing thin film of NPs on paper substrate [21].

Next, the choice of conductive materials such as conducting polymers, carbon nanotubes, graphene and metal nanoparticles

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Onsite-detection of barium and nickel from river, pond and tap water samples using gold nanoparticles as a chemical sensor

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ABSTRACT

We report a simple, selective and sensitive colorimetric assay for onsite determination of Ni(II) and Ba(II) from river, pond and tap water samples using the localized surface plasmon resonance (LSPR) of malonate capped gold nanoparticles (AuNPs) as a chemical sensor. The method is based on the color change and red shift of LSPR absorption band in visible region that caused by the aggregation of NPs because of the coordination complex between Ba(II) and Ni(II) with carboxylate ions of malonate capped AuNPs. The determination of Ba(II) and NI(II) in a same sample was performed by masking one of the analyte at a time, EDTA was used to mask Ni(II) for detection of Ba(II) and dilute H_2SO_4 was used to mask the Ba(II) for detection of Ni(II). The linear range for quantitative determination of Ba(II) and NI(II) were found in the range of 15–500 and 10–500 ng mL^{-1} with a limit of detection of 5 and 3 ng mL^{-1}, respectively. The advantages of the AuNPs based chemical sensor is found to be simple, rapid and sensitive as well as it can be applied at the sample source for trace detection of Ba(II) and Ni(II) in various environmental samples.

1. Introduction

Barium (Ba) is an alkaline earth metal naturally present in soils, igneous, metamorphic and sedimentary rocks. The soluble form of barium sulphide (BaS) is very toxic to humans, animals and plants. The nature of barium [Ba(II)] is found similar to calcium [Ca(II)], and therefore, Ba(II) tends to concentrate in bones and teeth instead of Ca(II) which causes the weakness of teeth and bones [1,2]. The excess intake of Ba(II) through food and drinking water may causes diarrhea, nausea, blood pressure and difficulties in breathing, paralysis and sometimes even death [3].

Nickel (Ni) is a transition element present as small quantity in soil, water, plant and animal tissues. It is also an important essential micronutrient which is required for biological functions in human body and has affinity for binding with ribonucleic acid to play important role in pigmentation. The normal human plasma contains Ni(II) in the range of 12–85 μgL^{-1}. The main sources of Ni(II) are hydrogenation of oils, combustion of coal, diesel, tobacco smoke, chemicals and catalysts, It is also used in nickel plating, alloys, nickel-cadmium batteries and production of heat-resistant steel and cast iron because of its high strength, resistance and melting point [4–6]. The excess intake of Ni(II) by human causes dermatitis, pneumonia, lung and nose cancer [7,8]. Therefore, the monitoring of Ba(II) and Ni(II) in environmental samples is essential in order to take a preventive action to avoid the entering of these toxic substances into the human body.

There are several instrumental techniques such as spectrophotometry [5,9–12], atomic absorption spectrometry (AAS) [13–16], inductively coupled plasma-atomic emission spectrometry (ICP-AES) [17,18], inductively coupled plasma-mass spectrometry (ICP-MS) [19,20], capillary electrophoresis (CE) [21] and neuron activation analysis (NAA) [22]. AAS, ICP-MS, ICP-AES, CE and NAA are very expensive instruments and require a time consuming tedious process for the sample preparation prior to instrumental analysis. Colorimetric methods are found to be simple, economic and can be applied at the sample source for determination of metals.

In recent years, noble metal nanoparticles (NPs) such as silver (Ag), gold (Au) and copper (Cu) have been employed in analytical chemistry as chemical sensors or probes for detection of variety of analytes in environmental, food and biological samples [23–29]. This is performed through the exploitation of optical and electronic properties of noble metal NPs. The color of noble metal NPs are yellow for AgNPs, pink for AuNPs and red for CuNPs when the size of NPs in the range of 10–60 nm. The reason for specific color of these noble NPs are due to the localized surface plasmon resonance (LSPR) absorption band for Ag, Au and Cu which is found around 400 nm, 525 nm and 570 nm, respectively. LSPR is an oscillation of free electron in the conduction band of noble metal NPs when UV–visible range of electromagnetic wave of light interacts with its particle surface. The addition of very low concentration of target analyte to these noble NPs solution cause the color change of

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Enhancement of plasmonic resonance through an exchange reaction on the surface of silver nanoparticles: application to the highly selective detection of triazophos pesticide in food and vegetable samples†

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We report a simple and novel colorimetric assay for the highly selective detection of triazophos pesticide using the localized surface plasmon resonance (LSPR) of citrate capped silver nanoparticles (AgNPs) as a sensing probe. To the best of our knowledge, to date there is no report for the colorimetric detection of triazophos pesticide in food and vegetable samples using AgNPs as a colorimetric probe. The proposed method is based on the aggregation of AgNPs through a selective interaction of both sulfur and nitrogen moieties of triazophos with the NPs. The color change and red shift of the LSPR of AgNPs in the UV-visible region is due to the exchange of citrate capped ions with triazophos from the surface of NPs. Control experiments and theoretical investigations were also carried out to confirm the interactions and exchange reaction between AgNPs and triazophos pesticide. The calibration curve was found to be linear over the range of 10–300 ng mL^{-1} with a limit of detection (LOD) of 3 ng mL^{-1}. Good recovery percentage (92.4–96.0%) and RSD (2.4–3.6%) showed the selectivity with better precision for the determination of the target pesticide from complex sample matrices. The advantages of the proposed method are simple, rapid and highly selective detection of triazophos from food and vegetable samples.

Introduction

Triazophos is a broad-spectrum organophosphorus pesticide. Triazophos controls the growth of insects such aphids, bollworms, red spiders, fruit borers, leaf hoppers, cutworms and mites that destroy crops such as okra, cotton, maize, paddy, cauliflower, eggplant and citrus fruits. Triazophos is widely used over a variety of crops to increase productivity, and after use, the residues of the pesticide remain on surfaces, in ground water, and on fruits and vegetables.[1–3] The entry of this hazardous chemical substance into the human system through food and water causes adverse effects due to its bioaccumulation and toxic action on the nervous system. The pesticide inhibits the function of the acetylcholinesterase enzyme that is needed for neurotransmission and also suspected to have mutagenic, carcinogenic and endocrine disruptor effects. In addition, there are several side effects of this pesticide such as nausea, vomiting, diarrhea, headache, dizziness, lung edema and even death from respiratory or cardiac failure.[4–6] Therefore, a simple, rapid and sensitive analytical method is required to monitor the triazophos residues in food and vegetable samples in order to take preventive action against the entry of this toxic chemical substance in the human system.

Gas chromatography (GC) and high-performance liquid chromatography (HPLC) are commonly available analytical techniques for determination of triazophos in environmental and agricultural samples.[7–12] However, GC and HPLC techniques require a trained personnel, time consuming, expensive and tedious sample preparation procedure for analysis of pesticide prior to instrumental analysis. In addition, it requires pure solvents and gases to run the chromatographic separation of chemical species from the complex sample matrices which are found to be a costly. Cyclic voltammetric technique is also demonstrated for determination of triazophos using carbon nanotube modified electrode in variety of real samples. However, the surface modification of electrode with nanomaterial is found to be tedious and time consuming processes.[13–15] In addition, the immunoassay technique is reported for analysis of triazophos which require a specific enzyme for detection of particular pesticide.[16,17] UV-Vis spectrophotometry (colorimetry) is found to be a very simple and low

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Analytical Methods

PAPER

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Surfactant-based dispersive liquid–liquid microextraction for the determination of zinc in environmental water samples using flame atomic absorption spectrometry

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Zinc metal is an essential micronutrient which is required for different biological and physiological processes in humans, animals and plants. Here, a simple, rapid and sensitive method for the determination of zinc in environmental water samples using surfactant-assisted dispersive liquid–liquid micro-extraction (SA-DLLME) prior to flame atomic absorption spectrometry (FAAS) analysis has been reported. This method involved the formation of a zinc complex with 4-(2-pyridylazo) resorcinol (PAR) and subsequently SA-DLLME was applied to extract the Zn(II)–$(PAR)_2$·CPC complex into chloroform in the presence of a cationic surfactant. Optimum extraction of the complex was observed when the concentration of cetylpyridinium chloride (CPC) and PAR was 0.1% for both at pH 9.0 and with an extraction time of 10 min. The calibration curve was found to be linear over the range of 1.5–60 μg L^{-1} with a correlation of estimation (r^2) of 0.997. This optimized method has been successfully applied for the determination of zinc in environmental water (tap, river and well) samples.

Introduction

Among all the micronutrients, zinc is an essential trace mineral that people need to stay healthy.[1] The recommended dietary allowance (RDA) of zinc per day is 14 mg for men and 12 mg for women. The average concentrations of zinc found in surface water and drinking water are in the range of 0.02–0.05 mg L^{-1} and 0.01–0.1 mg L^{-1}, respectively. Carboxypeptidase A is a zinc metalloenzyme that breaks down peptide linkages present in proteins during their digestion. It plays a number of roles in many other biological functions such as cellular integrity, protein synthesis and metabolism of nucleic acids as well as in the development of the brain.[2–4] Deficiency of zinc in human beings may lead to several disorders such as delayed wound healing, retardation of growth, decrease in the immunological defense, skin lesions and infertility.[5] Therefore, the determination of zinc in water samples is quite necessary to know the amount of the element taken by an individual through water samples.

Several sophisticated analytical techniques have been reported for the determination of zinc in a variety of samples such as flame atomic absorption spectrometry (FAAS),[6,7] graphite furnace atomic absorption spectrometry (GF-AAS),[8,9] inductively coupled plasma-atomic emission spectrometry (ICP-AES),[10,11] inductively coupled plasma-mass spectrometry (ICP-MS),[12,13] X-ray fluorescence spectrometry (XRF)[14] and voltammetry.[15,16] However, GF-AAS, ICP-AES, ICP-MS and XRF are quite expensive techniques and skilled manpower for the operation of these instruments is needed. FAAS is a simple and readily available analytical instrument in many laboratories. The cost of the instrument is quite low as compared to the above mentioned instruments. It has been widely used for the determination of heavy metals due to its low cost, ease of operation, high sample throughput and good selectivity.

The main drawback of using the FAAS technique is its low sensitivity as compared to other sophisticated instruments such as GF-AAS, ICP-AES and XRF. The sensitivity of the FAAS technique can be improved by using separating and preconcentrating sample probes prior to instrumental analysis. Liquid–liquid extraction (LLE) is known to be a simple sample preparation method that can be used for the separation and preconcentration of trace metals from the aqueous phase to the organic phase. However, it is considered to be a time consuming, tedious and multistage operation method. At the same time, LLE also requires large amounts of toxic organic solvents[17,18] and exposure of hazardous organic solvents to the environment. The disadvantages of the LLE method can be removed by the use of single drop microextraction (SDME) and hollow fibre-liquid phase microextraction (HF-LPME) methods. SDME is a simple, inexpensive and fast sample preparation

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Impact of rare-earth metal oxide (Eu_2O_3) on the electrochemical properties of a polypyrrole/CuO polymeric composite for supercapacitor applications†

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A ternary composite of polypyrrole/copper oxide/europium oxide (PPY/CuO/Eu_2O_3), synthesized via a facile in situ chemical oxidative polymerization method, exhibits the maximum specific capacitance of 320 F g^{-1} at the current density of 1 A g^{-1}. Incorporation of the rare-earth metal oxide Eu_2O_3 in the PPY/CuO matrix can promote charge transportation in the resulting ternary nanocomposite by enhancing the porosity. The interconnected mesoporous networks reduce the internal resistance and the charge transfer resistance (R_{ct}) of the composite electrode material. Moreover, the incorporation of Eu_2O_3 in the PPY/CuO provides support to the fragile polymer backbone resulting in an excellent cycle stability and a markedly enhanced thermal stability. These together with the exhibition of an excellent coulombic efficiency demonstrates that incorporation of rare earth metal oxide can play a significant role in improving the performance of a polymeric composite opted as an electrode material for high-performance supercapacitor.

1. Introduction

Mounting demands in digital communication, electric vehicles, wearable electronics and their associated technologies and several other devices necessitating high power electrical energy have impelled substantial research investigations in electrochemical capacitors, popularly known as supercapacitors.[1,2] With growing demand for energy sources, supercapacitors are attracting great interest because of their high-power density, high storage capacity, fast charge/discharge rate, long cycle life, light weight, and environmental friendliness. This results in the combination of the advantages of the high-power dielectric capacitors and the high specific energy rechargeable batteries.[3,4] Based on the energy storage mechanisms and the involved electrode materials, supercapacitors have been broadly categorized into electrical double-layer capacitors (EDLCs) and pseudocapacitors. EDLCs involves the formation of double layers as a consequence of charge separation at the electrode/electrolyte interface. On the other hand, pseudocapacitors involve faradaic charge transfer between the electrode and the electrolyte and redox capacitive mechanisms resulting in 10–100 times higher specific capacitance value than the EDLCs.[3] A considerable amount of research has been devoted to develop advanced nanomaterial that could prove to be very efficient electrode material possessing high rate capability and enhanced capacity attributed to a dramatically shortened ion diffusion path.[5,6] Carbon material based EDLCs though provide a long cycle life (>10^5 cycles) but fail to exhibit a significant value of specific capacitance.[4] However, pseudocapacitors, employing metal oxides and conducting polymers (CPs) as an electrode material display much higher specific capacitance but lack long cycle life and mechanical stability.[6,7]

According to a recent study, M. Liu *et al.* reported core–shell reduced graphene oxide/MnO@carbon hollow nanospheres with a specific capacitance value of 270 F g^{-1} (at 1 A g^{-1}).[8] Similarly, S. Ye *et al.* reported the fabrication of 1D graphene/PPY nanotube with specific capacitance up to 253 F g^{-1}.[9] Furthermore, L. Miao *et al.* reported the fabrication of N, S-codoped ultramicroporous carbon nanoparticles with the maximum specific capacitance of 225 F g^{-1} at 2.0 A g^{-1}.[10] To overcome the limited specific capacitance value possessed by the electrodes, storing charge based on EDL mechanism, researchers worldwide are devoted to develop novel materials that would involve the faradic charge transfer mechanism. These materials from the pseudocapacitive origin are expected to possess high specific capacitance and the other requisite properties, which will make them appropriate for practical application in the high-performance supercapacitors.

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Impact of Parallelism on Multicore

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ABSTRACT
This paper shows the effect of parallelism in multicore architecture. Performance was evaluated on the basis of the execution time of matrix multiplication between sequential algorithm and parallel algorithm in multicore processors. To implement matrix multiplication algorithms C programming language with OpenMp Libraries was used under Linux environment.

General Terms
Parallel and distributed computing.

Keywords
Matrix Multiplication, Parallel Algorithm, OpenMp

1. INTRODUCTION
A Multicore processor is an Integrated Circuit in which more than one processor or core are included for performance improvement and Simultaneous processing of parallel jobs. Matrix multiplication is a well known mathematical term used in a linear algebra. Many other important matrix problems can be solved via matrix multiplication, e.g., finding the N th power, the inverse, the determinant and eigenvalues etc. We are living in the era of parallel computing where performance and efficiency are of fundamental importance [1]. OpenMp is used for parallelizing the sequential matrix multiplication. In rest of paper we have define some basic concept of OpenMP, Multicore Architecture and Matrix Multiplication Algorithms.

OPENMP
OpenMp is an API (Application Program Interface) that use multithreaded and shared memory parallelism. Openmp is basically divided into three parts Compiler directives, runtime library routines and environment variable. It is an open specification for multiprocessing OpenMp worked as a fork-join model where fork is master thread that use to create a team of parallel thread and join is used when the team of parallel threads complete their task they synchronize and terminate and left the master thread to execute sequential program. OpenMp visualize as parallel programming model on multicore architecture [3]

Multicore Architecture
A multicore places multiple processors on a single chip and each processor is called a core [2]. As we increase the capacity of chip placing multiple processors on a single chip became practical. These architectural designs are known as Chip Multiprocessors (CMPs), chip Multiprocessors are known as Multicore. A multi-core processor is a single with two or more independent processors. The instructions on multicore are ordinary CPU instructions, but the multiple processors can run multiple processes parallel at the same time by increasing the overall speed of the programs. Multicore span threads which divide the tasks between cores. It can execute multiple tasks at single time. Multicore is shared memory processor all processors shares the same memory. Multicores are becoming popular for both server and desktop processors. By the next decade, it is expected to have processors with hundreds of cores on a chip.

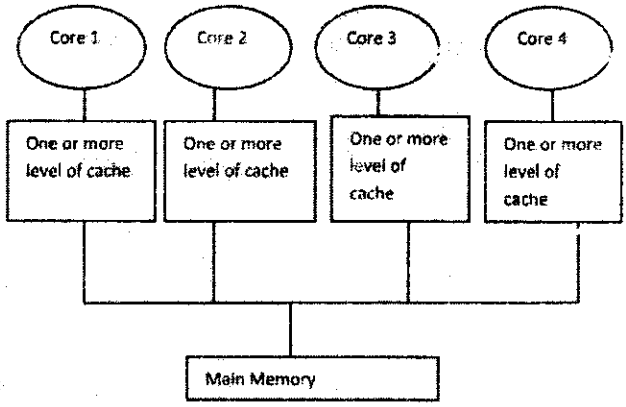

Fig 1. Multicore Architecture

2. MATRIX MULTIPLICATION
Matrix multiplication is a mathematical binary operation that takes input as pair of matrices, and gives output of another matrix.

2.1 Sequential matrix Multiplication
The sequential matrix multiplication is the fundamental basis for other matrix multiplication. Matrix multiplication is only possible when width of first matrix match with height of second matrix. The product of a X b matrix A with b X c matrix B is an a X c matrix C where element is defined as

$$C_{ij} = \sum_{k=1}^{b} a_{ik} b_{kj} \quad \text{where} \quad 0 \le i < a, 0 \le j < c$$

Sequential matrix multiplication requires a * b*c addition and same number of multiplication so, time complexity of multiplication of matrix using sequential algorithm is O (N^3)

2.2 Parallel Matrix Multiplication
In last few decades various approaches has been proposed for implementation of matrix multiplication on shared memory architecture. All parallel algorithms are based on conventional sequential matrix multiplication. For parallel matrix multiplication consider two nxn matrix A and matrix B. Partition the matrix in L blocks where (0<=i, j<root l) of size (n/root l) x (n/root l) each small matrix the n this small matrix mapped into root l X root l mesh of processors. The process initially stores Aij and Bij and compute Cij of result matrix. After computing the entire sub matrix, matrix A's block performed in each row and matrix B's performed in each coloum. Finally sub matrix multiplication and addition is performed. In parallel algorithm each element of matrix C is

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An Analytical Study on effect of Parallelism on Multicore

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Abstract— Parallel computing has been fast evolving research areain the last few decades. Parallel computing means simultaneous execution of the same task by dividing the task into subtasks, on multiple processors. This paper provides an overview of multicore architecture and shows the effect of parallelism in multicore. Performances was evaluated in a multicore on the basis of the run time of serial and parallel algorithms. To implement matrix multiplication algorithms C programming language with OpenMp Libraries was used under Linux and Windows environment..

Index Terms— **Matrix Multiplication, OpenMp. Parallel Algorithm.**

I. INTRODUCTION

A Multicore processor is an Integrated Circuit in which more than one processor or core are included for performance improvement and Simultaneous processing of parallel jobs. Matrix multiplication is a well known mathematical term in a linear algebra which is used for solving large computation problem. We are living in the era of parallel computing where performance and efficiency are of fundamental importance [1]. OpenMp is used for parallelizing the sequential matrix multiplication. In rest of paper we have define some basic concept of OpenMP, Multicore Architecture and Matrix Multiplication Algorithms.

A. OPENMP

OpenMp is an API (Application Program Interface) that use multithreaded and shared memory parallelism. Openmp is basically divided into three parts first one is compiler directives, second is runtime library routines and third as environment variable. This API is an open specification for multiprocessing. OpenMp worked as a fork-join model where fork is master thread that use to create a team of parallel thread and join is used when the team of parallel threads complete their task they synchronize and terminate and left the master thread to execute sequential program. OpenMp visualize as parallel programming model on multicore architecture [3].

B. Muticore Architecture

A multicore places multiple processors on a single chip and each processor is called a core [2]. As we increase the capacity of chip placing multiple processors on a single chip became practical. These architectural designs are known as Chip Multiprocessors (CMPs), chip Multiprocessors are known as Multicore. A multi-core processor is a logic circuit in which more than one processor is placed. In multicore multiple processors can execute parallel and increases performance. Multicore span threads which divide the tasks among cores. It can execute multiple tasks at single time. Multicore is shared memory processors, all processors shares the same memory. Multicores are becoming popular for both server and desktop processors. By the next decade, it is expected to have processors with hundreds of cores on a chip.

II. MATRIX MULTIPLICATION

Matrix multiplication is a mathematical binary operation that takes input as pair of matrices, and gives output of another matrix.

A. Sequential Matrix Multiplication

The sequential matrix multiplication is the fundamental basis for other matrix multiplication. Matrix multiplication between two matrices is possible when row sizeof first matrix match with column size of second matrix. The product of l X m matrix A with m X n matrix B is an l X n matrix C where element is defined as

$$C_{ij} = \sum_{m-1} a_{ik} b_{kj} \quad \text{where} \quad 0 \le i < a, 0 \le j < c$$

Sequential matrix multiplication requires l * m*n addition and same number of multiplication so, time complexity of multiplication of matrix using sequential algorithm is O (N^3)

B. Parallel Matrix Multiplication

In last few decades various approaches has been proposed for implementation of matrix multiplication on shared memory architecture All parallel algorithms are based on conventional sequential matrix multiplication. For parallel

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Perspective Study and Analysis of Parallel Architecture

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ABSTRACT
As technology has advanced, Parallel Computing and Architecture has emerged as a research area with the potential of providing satisfactory and faster result for real time applications. Parallel architecture is those that emphasize on parallel and concurrent computation among different processors. This paper presents a thorough survey of the parallel architecture and performance is analysed on the basis of the execution time of few parallel sorting algorithms in multicore processors .To implement these algorithms we have used C programming language with OpenMp Libraries under Linux environment.

General Terms
Parallel and distributed computing.

Keywords
Parallel Architecture:Openmp;Sorting;Bitonic Sorting

1. INTRODUCTION
Parallel processing means dividing a problem into sub problem and executing these sub problems simultaneously. Parallel architecture emphasize on parallel processing between operation in some way. Parallel computing makes use of concurrently running the processes that are belonging to larger computation, for this reason the divide-and-conquer approach is usually preferred over other techniques [1]. With the rapid development of last few decades the area of Parallel architectures have emerged as challenging task for discovering new architectures that can perform better. Basic objective of parallel architecture is improve the speed. The factors generally considered in developing a new architecture include the internal circuitry of processors or PEs(Processing Elements), number of PEs, arrangement of PEs and memory modules in an architecture, the communication mechanism among the PEs and between the PEs and memory modules, number of instruction and data streams, nature of memory connections with the PEs, nature and types of interconnection among the PEs, and program overlapping. The internal circuitry of PEs plays a vital role in designing parallel architecture. Some parallel architecture are designed with small number of PEs of complex internal circuitry to enhance the overall performance of the architecture. Other architectures, on the other hand, are designed with a substantial number of PEs of simple internal circuitry to achieve the desired performance. [2]

2. CLASSIFICATION OF PARALLEL ARCHITECTURE
Parallel computers are classified into different categories based on various factors such as: Flynn's classification, Fengs Classification, Handlers and Shores Classification, Classification based on granularity. Classification based on memory arrangement and communication among PEs. Classification based on interconnections among PEs and memory modules. Classification based on characteristic nature of PEs and Specific types of parallel architectures.

2.1 Flynn's classification
Flynn's classification scheme is based on multiplicity of instruction stream and data stream. Flynn's classification is introduced by Michel J Flynn in the year 1966. Generall, digital computer can be classified into four categories according to multiplicity of the instruction stream and data stream. SISD (Single Instruction Stream Single data Stream),SIMD (Single Instruction Stream Multiple data Stream),MISD (Multiple Instruction Stream Single data Stream),MIMD (Multiple Instruction Stream Multiple data Stream).SISD: - Most serial computers are SISD. Instruction are executed sequentially but may be overlapped during their execution phases. Most uniprocessor systems are pipelined. SISD computers may have more than one functional units, all the functional units are under the supervision of one control unit .SIMD:-In SIMD there are multiple processing elements supervised by the same control unit. All the processing units receive the same instructions and broadcast from the control unit but operates on different sets from distinct data stream. The shared memory subsystem may contain multiple modules. MISD: In this type of organization there are n processing units, each receiving distinct instruction over the same data stream and it derivates output of one processor became input of the next processor in the micropipeline (cascade of processors). This structure has received much less attention and has been challenged as impractical by some architecture .MIMD;-Multiprocessor system and multiple computers can be classified in these categories. Intrinsic MIMD architecture implies interaction among n-processors. All the memory streams are divide from the same data space and shared by all the processors. MIMD is the set of independent SISD uniprocessor systems. MIMD computer is tightly coupled in the degree of interaction among the processor is high otherwise we consider them as loosely coupled.

2.2 Fengs, Handlers and Shores Classification
Tse-yunFeng in 1972 has prposed a scheme based on serial versus parallel processing. Fengs classification is based on degree of parallelism. The maximum number of bits that can be processed within a unit time by a computer system is called maximum parallelism degree. Fengs classified the system into four types on the basis of sequential and parallel operations at bit and word levels as Word serial and bit serial, Word serial and bit parallel, Word parallel and bit serial finally word parallel and bit parallel.In 1977, Wolfgang Handler proposed an elaborate notation for expressing the pipelining and parallelism of computers. Handler's classification addresses the computer at three distinct levels: Processor control unit (PCU), Arithmetic logic unit (ALU) and • Bit-level circuit (BLC). Shores, in 1973 classified the computer on the basis of organization of the constituent elements in computer system .Six different kinds of machines

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Performance Analysis of Sorting Algorithms in Multicore Architeture

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Abstract As technology has advanced, Multicore Computing has emerged as a research area with the potential of providing satisfactory and faster result for real time applications. Multicore architecture is those that emphasize on more than one processors work together for Parallel Processing. Multicore is a logic circuit in which two or more processors are attached for performance enhancement and processes basic instruction that are needed by the system. This paper presents comparisons of few sorting algorithm on multicore architecture. Performances are analyzed on the basis of execution time of parallel sorting algorithms in multicore processors. To implement these algorithms we have used C programming language with OpenMp Libraries under Linux environment.

Index Terms **Bitonic Sort, Multicore, OpenMp, Sorting.**

I. INTRODUCTION

A Multicore processor is an Integrated Circuit in which "A Multi-core processor is typically a single processor which contains several cores on a chip". The cores are functional units made up of computation units and caches [7].A Multicore processor is an Integrated Circuit in which more than one processor or core are included for performance improvement and Simultaneous processing of parallel jobs. Moore's Law has been proven to be true overthe passage of time - the performance of microchips has been increasing at an exponential rate, doubling every two years. In most proposed multicore platforms, different cores share the common memory. The multiple cores inside the chip are not clocked at a higher frequency, but instead their capability to execute programs in parallel is what ultimately contributes to the overall performance making them more energy efficient and low power cores [6]. Multi-core processors could be implemented in many ways based on the application requirement. It could be implemented either as a group of heterogeneous cores or as a group of homogenous cores or a combination of both. In homogeneous core architecture, all the cores in the CPU are identical On the other hand heterogeneous cores consist of different core with different capabilities. A Sorting Algorithm is an algorithm that arranges the elements of a list in a certain order. The most-used orders are numerical order and lexicographical order. OpenMp is used for parallelizing the sequential matrix multiplication. In rest of paper we have define some basic concept of OpenMP, Multicore Architecture and Soting Algorithms.

A. OPENMP

OpenMp is an API (Application Program Interface) that use multithreaded and shared memory parallelism. Openmp is basically divided into three parts as Compiler directives, runtime library routines and environment variable. It is an open specification for multiprocessing. OpenMp worked as a fork-join model where fork is master thread that use to create a team of parallel thread and join is used when the team of parallel threads complete their task they synchronize and terminate and left the master thread to execute sequential program. OpenMp visualize as parallel programming model on multicore architecture [3] [4].Fork-join model of parallelism is provided in OpenMP, where the programmer specifies parallelism in code using OpenMP directives. The OpenMP directives are embedded in the code either as special comments in FORTRAN or as programs in Cand C++. Parallel regions and work sharing constructs enable the programmer to express parallelism at the level of structured blocks within the program, such as loops and program sections[5].

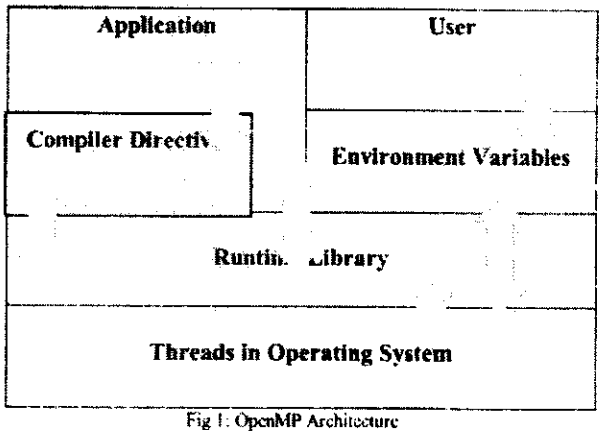

Fig 1: OpenMP Architecture

B. Multicore Architecture

A multicore places multiple processors on a single chip and each processor is called a core [2]. As we increase the capacity of chip placing multiple processors on a single chip became practical. These architectural designs are known as

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Evaluation of Mobility Model with MANET Routing Protocols

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ABSTRACT
MANET is class of an emerging technology of ad hoc networks. Ad hoc networks can be built around any wireless technology, including infrared, global positioning system (GPS), radio frequency (RF) and so on. Each node in a MANET is free to move freely in any direction, and therefore it will change its links to other devices frequently. Mobility model shows how the speed and direction of a node changed over the time according to given pattern of mobility. In this paper, various mobility model with routing protocols of ad hoc networks are studied.

General Terms
Ad hoc Network

Keywords
Manet, Routing protocols, RWPMM, RWMM, RDMM.

1. INTRODUCTION
During the last decades, there has been a rapidly increasing interest in communication technologies of wireless networks. Manet is one of the most popular wireless networks. MANET is a collection of communication nodes that wish to communicate with each other, but it has no fixed infrastructure and no predetermined topology of wireless links.

Even though a WSN is usually considered as an ad hoc network in which nodes are extended with sensing capability, a mobile WSN and a mobile ad hoc network (MANET) are basically different. Mobility in a MANET is often arbitrary, whereas mobility in a mobile WSN should be intentional. In other words, the movement of mobile sensors to conduct different missions can be controlled [2].

2. ROUTING PROTOCOLS
Routing is the process of transferring information from a source to a destination in an internetwork. At least one intermediate node within the internetwork is found during the transfer of information. Basically two activities are involved in the concept: determining optimal routing paths and transferring the packets through an internetwork. The transferring of packets via an internetwork is called as packet switching which is straight forward, and the path determination could be very complex.

According to routing strategy routing protocol can be classified as Table Driven Source Initiated and Hybrid.

Table 1. Comparison Of Protocols

Comparative Study of Basic Protocols		
Protocols	**Merits**	**Demerits**
Proactive	Predefine Routes are always available.	Use large portion of networks (Overhead is high).
Reactive	Overhead is low and use small portion of network capacity	Long Delay and excessive control traffic
Hybrid	Provide features of both Proactive and Reactive (Use full for Large Network)	Increase Complexity.

3. MOBILITY MODEL
Mobility models are used to simulate and calculate the performance of mobile wireless systems and the algorithms and protocols on the basis of them. [4] Two types of mobility models are used in the simulation of networks: Realistic and nonrealistic models. Realistic are the mobility patterns that are observed in real life systems. It is also known as group/traces model. They provide accurate information when they involve a large number of nodes and an appropriately lengthy observation time. Whereas, new network environments like ad hoc networks are not easily modeled if traces have not yet been created. In this type of application it is necessary to use nonrealistic models. Generally known as Random mobility models .These models attempt to realistically represent the behaviors of MNs without the use of traces [5]. In this, routing protocols from reactive, proactive as well as hybrid categories for comparison of performance of routing protocols is observed in non-realistic mobility model are used.

3.1 Classification of Mobility Model
Mobility models are classified from different aspects. In a popular classification, they are divided into two categories of Realistic and Nonrealistic (random), based on the similarity of node movement to its movement in real environment.

3.2 Realistic Mobility Model
Unlike Nonrealistic models, in realistic models some limitations are imposed on node movement. The restrictions may be due to environmental obstacles, such as buildings, or to the rules made for node movement such as moving in fixed pathways. The rules are made to make node movement more similar to real nodes. [6]

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Evaluation of Mobility Model with MANET Routing Protocols

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ABSTRACT
MANET is class of an emerging technology of ad hoc networks. Ad hoc networks can be built around any wireless technology, including infrared, global positioning system (GPS), radio frequency (RF) and so on. Each node in a MANET is free to move freely in any direction, and therefore it will change its links to other devices frequently. Mobility model shows how the speed and direction of a node changed over the time according to given pattern of mobility. In this paper, various mobility model with routing protocols of ad hoc networks are studied.

General Terms
Ad hoc Network

Keywords
Manet, Routing protocols, RWPMM, RWMM, RDMM.

1. INTRODUCTION
During the last decades, there has been a rapidly increasing interest in communication technologies of wireless networks. Manet is one of the most popular wireless networks. MANET is a collection of communication nodes that wish to communicate with each other, but it has no fixed infrastructure and no predetermined topology of wireless links.

Even though a WSN is usually considered as an ad hoc network in which nodes are extended with sensing capability, a mobile WSN and a mobile ad hoc network (MANET) are basically different. Mobility in a MANET is often arbitrary, whereas mobility in a mobile WSN should be intentional. In other words, the movement of mobile sensors to conduct different missions can be controlled [2].

2. ROUTING PROTOCOLS
Routing is the process of transferring information from a source to a destination in an internetwork. At least one intermediate node within the internetwork is found during the transfer of information. Basically two activities are involved in the concept: determining optimal routing paths and transferring the packets through an internetwork. The transferring of packets via an internetwork is called as packet switching which is straight forward, and the path determination could be very complex.

According to routing strategy routing protocol can be classified as Table Driven Source Initiated and Hybrid.

Table 1. Comparison Of Protocols

Comparative Study of Basic Protocols		
Protocols	**Merits**	**Demerits**
Proactive	Predefine Routes are always available.	Use large portion of networks (Overhead is high).
Reactive	Overhead is low and use small portion of network capacity	Long Delay and excessive control traffic
Hybrid	Provide features of both Proactive and Reactive (Use full for Large Network)	Increase Complexity.

3. MOBILITY MODEL
Mobility models are used to simulate and calculate the performance of mobile wireless systems and the algorithms and protocols on the basis of them. [4] Two types of mobility models are used in the simulation of networks: Realistic and nonrealistic models. Realistic are the mobility patterns that are observed in real life systems. It is also known as group/traces model. They provide accurate information when they involve a large number of nodes and an appropriately lengthy observation time. Whereas, new network environments like ad hoc networks are not easily modeled if traces have not yet been created. In this type of application it is necessary to use nonrealistic models. Generally known as Random mobility models .These models attempt to realistically represent the behaviors of MNs without the use of traces [5]. In this, routing protocols from reactive, proactive as well as hybrid categories for comparison of performance of routing protocols is observed in non-realistic mobility model are used.

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Simulation and Investigation on "Effect of Dependency in under Pipelining"

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ABSTRACT
Instruction level parallelism is the most common technique to achieve speedup and Pipelining is one of the techniques to achieve Instruction level parallelism. Pipelining is of 5 types – Scalar pipelining, Superscalar pipelining, Super pipelining, Under pipelining and Super Scalar Super pipelining. In pipelining technique more than one instruction can issue simultaneously into different functional unit. But, dependency is most common problem in pipelining. This paper shows the development of simulator using 'C' language to study the effect of dependency in under pipelining. This paper also calculates some pipelining parameters like CPI, IPC etc.

General Terms
Pipelining.

Keywords
Instruction Level Parallelism, Dependency, Pipelining, Simulation, CPI, IPC, MIPS

1. INTRODUCTION
In pipelining technique, instruction execution process is divided into number of stages called pipelining stage (Load, Decode, Fetch, Execute and Write), and each stage of instruction is executed by different functional unit (Load unit, Decode unit, Fetch Unit, Decoder and Write Unit) of processor[1-3]. Figure 1 shows 5 stage pipelining.

Pipelining is the technique in which instructions are executed into overlapped cascaded manner [4-5]. Pipelining are of 5 types – Scalar pipelining, Superscalar pipelining, Super pipelining, Under pipelining and Super Scalar Super pipelining. When instruction issue latency is more than 1 clock cycle then it comes under under-pipelining architecture [6]. Processor is utilized fully when 1 instruction is issued in each clock cycle, but because of various practical reasons instruction issue latency is more than one. When instruction issue latency is more than one, then the pipeline is underutilized and this pipeline is known as under-pipeline [7]. Under pipelining is shown in figure 2. In figure 2 x axis shows clock cycles and y axis shows number of instructions. There are 2 instructions i_1 and i_2 both instructions are getting processed parallel but first instruction i1 is loading in 1st clock cycle and second instruction i_2 is loading on 3rd clock cycle because this is under-pipelining architecture. First instruction i_1 is completing in 5th clock cycle and second instruction i_2 is completing on 7th clock cycle. So total number of clock cycle to complete 2 instructions is 7 clock cycles. Here instruction issue latency is 2 clock cycles. Following are the various practical reasons for instruction issues latency is being more than one clock cycle [8-9]-

- True data dependency
- Procedural dependency
- Resource Dependence
- Output dependency

True data dependency also called write read dependency means an instruction cannot be executed until all required operands are available [10]. Instructions having branch is called procedural dependent instruction, in which the instruction cannot be completely executed until the branch is executed [9]. Resource dependence means two or more than two instructions require same resource same time. Here resource means integer units (such as integer adder), floating point units, registers, memory areas etc [7]. Output dependency also called write after write dependency. Output dependency means two instructions write into same output variable simultaneously [11]. If dependency is not handled properly then incorrect result will be generated. There are various methods available to deal with dependency. One of the simple method is pipeline stalling. Pipeline stalling means giving time delay [12]. In the present work the effect of dependency in under pipelining is studied.

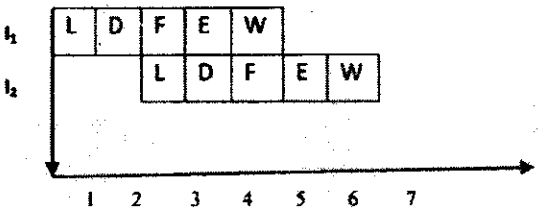

Fig. 2 Under-pipelining

2. EXPERIMENTAL METHOLOGY
This section describes the methodology used to study the effect of dependency in under pipelining. This paper considered mainly 2 conditions. First condition is current instruction is not dependent on any previous instruction and second condition is current instruction is dependent on previous instruction.

Now if current instruction is not dependent on any other previous instruction then loading of current instruction takes place on $(I[i-1]+2)^{th}$ clock cycle. Decoding takes place on $(L[i]+1)^{th}$ clock cycle. Fetching will be taken place on

$(D[i]+1)^{th}$. Execution cycle depends upon type of instruction. If current instruction is addition or subtraction then, execution stage is completed on $(F[i]+2)^{th}$ clock cycle If current instruction is multiplication or division then execution stage is completed on $(F[i]+3)^{th}$ clock cycle. If current instruction is

An Investigation of List Heuristic Scheduling Algorithms for Multiprocessor System

Sunita Kushwaha and Sanjay Kumar***

The problem of obtaining an optimal scheduling of dependent tasks in homogeneous multiprocessor system is well known as an NP-hard problem. Heuristic is the best way to solve this problem. In a homogeneous multiprocessor system, task execution time is independent of the machine to which it is assigned. Recent research in scheduling has shown that list scheduling algorithms usually obtain more efficient and less complex schedules than other known algorithms. In this paper, some basic list scheduling algorithms, namely, LPT, SPT, ECT and EST are compared on the basis of performance parameter Makespan in two different environments. In the first environment, all the processes arrive at 'zero' time instantly, while in the second environment, all the processes arrive randomly. Simulation results show that the makespan of LPT is better than other algorithms in both environments.

Keywords: LPT, SPT, ECT, EST, Makespan

ntroduction

major issue in the operation of parallel computing systems is that of scheduling, which an important problem in areas like manufacturing, process control, economics, and eration research, to name a few. To schedule is to simply allocate a set of tasks or s to resources such that the optimum performance is obtained (Ramamoorthy, 1972). hese tasks are not interdependent, the problem is known as task allocation. However, asks are dependent, then output of one task may become input to another task. In h cases, precedence relation among tasks is defined and Direct Acyclic Graph (DAG) drawn. In a parallel processor system, one would expect linear improvement with rease in the number of processors used. However, this is generally not the case due factors such as communication overhead, control overhead and precedence straints between tasks (Adams, 1974; and Chow and Kohler, 1979).

1 Heuristic Scheduling

uristic means searching or doing anything on the basis of one particular specific perty. Heuristic guarantees to find a near optimal solution in less than polynomial

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GEOSPATIAL TECHNOLOGY IN GEOMORPHIC ANALYSIS FOR ASSESSING WATERSHED CHARACTERIZATION AND PRIORITIZATION OF SON SUB-WATERSHED, CHHATTISGARH

S.K. NASIB AHAMED* AND ANUSUIYA BAGHEL**

ABSTRACT

Land and water resources are gradually depleting due to haphazard and unplanned growth of various anthropogenic activity. Now a days, the evolution of watershed and its prioritization has gained a confronting issue in all the natural resource management. Geomorphic analysis has been commonly used for watershed characterization and for evaluating the prioritization. In the present study, several morphometric parameters have been carried out in the Son sub-watershed with the help of Geospatial Technology. Morphometric parameters have revealed the topographical configuration and geological settings which helped to know that which area is prior to take action immediately. Using SRTM DEM data and topographical sheet hydrological unit have been delineated in Arc GIS environment. This study demonstrates the importance of geomorphic study as well as the geospatial technology to evaluate the watershed characterization and planning for prioritization.

Keywords: *Geospatial, Geomorphometry, prioritization, hydrology, SRTM DEM.*

Introduction

Morphometry is the measurement and mathematical analysis of the configuration of the earth's surface, shape, and dimension of its landforms (Clarke, 1966). Morphometric analysis provides quantitative descripti of the basin geometry to understand initial slope or inequalities in t

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Since March 2002

Development and Role of Micro Finance on The Renewal of Rural Poverty in India

Micro finance is an institution which provide easy and accessible loan to the poor sections of the society especially in rural areas. According to the Census of India 2011 around 30.9% population are below poverty line in rural areas as compare to 39.6% (2009-10) which means that poverty get reduced. In rural areas population growth rate is 12.3% in 2011-12 as compare to urban growth rate 31.8% in India. The Micro Finance Institutions (MFIs) plays a major role to reduce poverty in rural areas with the help of these MFIs through Self Help Group (SHGs). The main aim of this paper is to study the development and role of Micro finance on the renewal of rural poverty in India. With the development of new poverty alleviation programmes the government is in a position to remove poverty very fastly in rural as well as urban areas.

Pooja Devi Sinha* & Dr.A.K Pandey**

Introduction :

Micro finance plays a very important role to remove poverty in India. Micro finance refers to those financial institutions who give credit insurance, loans, payment services, money transfers etc. to the poor people. The main aim of the MFIs is to promote rural development and as an instrument of poverty alleviation programme and women empowerment. Micro finance divided into two parts SHG-Bank Linkage Programme and MFIs-Bank Linkage Programme. SHG(Self Help Group) are linked with banks the people in this groups connected with the several banks they take loans from the banks directly. MFIs like NGOs, Cooperative Societies etc these also linked with the banks for the benefit of poor people.

Villages are faced with problems related to poverty, illiteracy, lack of skills, healthcare etc. these are the problems that can't be tackled individually but can be better solved through group efforts. Today these groups known as SHg have become the vehicle of change for the poor and marginalized. These SHG connected with the banks and through these banks they receive very loans with a very ,own rate of interest to start a new business. Thousands of poor people in India are connected with these groups. The 9th five year plan of the govt. of India had given due recognition on the importance and relevance of the SHG method to implement development schemes of the grassroot level. Most SHGs are women's group with membership ranging between 10 to 20. SHG have well defined rules and by laws hold regular meetings and maintain records and savings and credit discipline.

During the past few years rural poverty continuous increase. While the govt. launch various anti-poverty programmes like IRDP, TRYSEM, DWCRA, SITRA resulting in the reduction of poverty levels.

Significantly growth of SHG-bank linkage programmes people collect loans through banks with the helpof these SHG. Micro finance through SHGs together with an element of additional financial support including technology infrastructure and marketing from the govt. can be a better alternatives to the existing methods of addressing rural poverty.

The year has seen many a positive turn to the microfinance sector, despite initial road blocks. Though the year started off on a disappointing note after the Microfinance (Regulation and Development) Bill, 2012 lapsed as the 15th Lok Sabha completed its term, it still culminated in the announcement of the Micro Units Development Refinance Agency (MUDRA) Bank by the Union Finance Minister in his budget speech in 2015. The primary objective of this bank is to "fund the un-funded", drawing parallels with the "banking the un-banked" model. The Government encourages the microfinance sector across institutional and operational functions to pursue MUDRA Bank's objective because it acknowledges that "small business units" play a significant role in GDP growth and employment. They recognize that this is a key delivery channel at the grass-roots level. The govrnment announce main financial inclusion and they are as follows-

MUDRA : MUDRA Bank proposes refinancing all Micro-finance Institutions that are in the business of lending to micro/small business entities, who are most commonly engaged in manufacturing, trading, and service activities and

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02

महासमुन्द जिले में मनरेगा कार्यक्रम का कियान्वयन-एक मूल्यांकन
(वित्त वर्ष 2009-10 से 2015-16 तक)

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•• नीलम अग्रवाल, ••• ए.के.पाण्डेय

सारांश- भारत सरकार ने बेरोजगारी पर सीधे प्रहार करने के लिए महात्मा गांधी राष्ट्रीय ग्रामीण रोजगार गांरटी कार्यक्रम (मनरेगा) प्रस्तुत किया, जिसे 23 अगस्त 2005 को पारित किया गया तथा 7 सितम्बर 2005 को इसकी अधिसूचना जारी की गई। यह देश के ग्रामीण क्षेत्रों में रोजगार का एक अधिकार आधारित कार्यक्रम है। जिसकी शुरूआत 2 फरवरी 2006 को आंध्रप्रदेश के अंनतपुर जिले के ग्राम बदलापल्ली से कि गई। इस कार्यक्रम के तहत देश के ग्रामीण क्षेत्रों में निवासरत प्रत्येक ग्रामीण परिवार, जिनके वयस्क सदस्य स्वेच्छा से अकुशल शारीरिक श्रम करना चाहते है, उन्हे एक वित्त वर्ष में कम से कम 100 दिनों का गांरटीशुदा मजदूरी रोजगार उपल्बध कराते हुए आजाविका सुरक्षा को बढ़ाना है। प्रस्तुत शोध अध्ययन छत्तीसगढ़ राज्य के महासमुन्द जिले का है, जहां मनरेगा कार्यक्रम को द्वितीय चरण में 1 अप्रैल 2007 को अधिसूचित किया गया था, जहां मनरेगा अधिनियम - 2005 में कही गई बातों को जमीनी स्तर पर लागू करने में असफल रहा और 100 दिनों का रोजगार मनरेगा कार्यक्रम तहत बहुत ही कम परिवारों को प्रदान किया गया है तथा औसत रोजगार दिवस की संख्या भी कम है। इसका मुख्य कारण मनरेगा कार्यक्रम के अंतर्गत निरन्तर कार्य का अभाव और प्रशासनिक अधिकारियों की उदासीनता रही है।

मुख्य शब्द- मनरेगा कार्यक्रम, रोजगार , कियान्वयन।

प्रस्तावना- किसी भी देश के आर्थिक विकास में रोजगार एक महत्वपूर्ण निर्धारक कारक होने के साथ-साथ सम्मानपूर्ण जीवन जीने के लिए प्रमुख आवश्यकता भी है। इसमें किसी भी तरह का संदेह नही है कि रोजगार का प्रश्न व्यक्ति के रोजी-रोटी से जुड़ा है। रोजगार के उपलब्ध संसाधन किसी भी देश के विकास को दर्शाते है वही रोजगार किसी व्यक्ति के सामाजिक-आर्थिक उत्थान का माध्यम भी है। रोजगार में लगे व्यक्तियों को जहां उससे आय प्राप्त होती है, इसके साथ ही वह व्यक्ति अपना समय अनावश्यक कार्यों में न लगाकर उत्पादक कार्यो में लगाता है जिससे उस व्यक्ति के व्यक्तिगत विकास के साथ - साथ देश का भी विकास होता है। बेरोजगारी व्यक्ति के मन में हीनभावना को

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03

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Analyses of Micro Finance in India (With Special Reference to Chhattisgarh State)

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Abstract- *Micro Finance emerging as a powerful institutions in our country. It plays a very crucial role to uplift the weaker sections of the society. It shows a tremendous increment in our country with the help of Self help groups (SHGs) - Bank Linkage Programme. SHGs programme has been successful in not only designing financial products meeting peculiar needs of the rural poor, but also in strengthening self employment of the poor and lending to their empowerment. The main objective of our study is to find out the impact of MFIs (Micro Finance Institutions) in different regions of the country in India and to know the impact of MFIs in the rate of savings and loan disbursement through different channels of micro finance.*

Introduction: MFIs mainly started after the year 1970s some micro finance institutions are ACCION is in America, SEWA Bank in 1973 in Gujarat and Grameen Bank in Bangladesh by Mohammad Yunus in the year 1983. So, we mainly concentrate in post 1970 era. Before MFIs the position of poor was very miserable the existing banking policies and procedures were not in a good position. They have to borrow money through the moneylenders. NABARD (National Bank for Agriculture and Rural Development) recommended that alternative policies, system and procedures should be put in use to save the poor from the clutches of moneylenders. Thus micro finance was introduced in banking sector.

Micro Finance refers to that financial institution who gives credit, insurance, loans, payment services, money transfers to the poor and low income household and their micro enterprises. Micro Finance may be defined as "Banking with service for the poor". Micro Finance as extending small loans to poor people for self employment project that generate income allowing them to care of themselves and their families. The main aim of MFIs is to promote rural development, as an effective instrument of poverty elevation and women empowerment. In India MFIs falls under two categories the financial and non-

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Measuring Fiscal Performance of Chhattisgarh in Post Reform Period

Ravindra Brahme, Sunil Kumeti and B.L. Sonekar

Introduction

In the literature of public finance a great deal of attention has been given to the Union Finance and State's finances are relatively neglected. It is well documented in the literature that there is a positive relationship between fiscal heath and economic development. Considering the importance of fiscal health at state level Tenth, Eleventh, Twelfth and Thirteenth finance commission's recommended the fiscal discipline indicators as a criterion for tax devaluation. (Dholakia, 2005) criticized the single indicators based fiscal discipline measure as a criterion for tax devaluation. Fourteenth finance commission has abolished fiscal discipline criterion for central transfer to the states, but it is still important to diagnose the fiscal health of the state.

After the launch of the fiscal reform process in 2005 in Chhattisgarh it is quite relevant to measure the progress of fiscal discipline in the State. Since the new State of Chhattisgarh was created on 1st November, 2000 and the first budget of the State for full financial year was made for 2001-02. The Government of Chhattisgarh adopted Financial Responsibility and Budget Management (FRBM) act in 2005 to restore viability to fiscal balance. This act required that the revenue deficit should be eliminated by 2008-09. Under this act government could continue to be able to issue bonds within limits, but only to finance capital expenditure which creates assets and would not be permitted to finance recurring (revenue) expenditure. Rules under FRBM act additionally require that the revenue deficit must come down by 0.5 percentage point of Gross State domestic product (GSDP) every year and the fiscal deficit must come down by 0.3 percentage point of GSDP every year and the revenue deficit and fiscal deficit in 2008-09 must be come down to 0 and 3 percent of GSDP respectively. The reform recommended by 12th finance commission, of avoiding the centre to the lending states and bringing market discipline to states' borrowing is therefore an important one (Rao and Sen, 2011). More than a decade after the launch of the reform process, it seems that significant attention is still not paid to the fiscal reforms at state levels (Vadra, 2010). Present paper reviews the fiscal discipline of the state after implementation of the FRBM act from the year 2005-06 to 2015-16. In this paper an attempts has been made

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to measure the fiscal reform process in Chhattisgarh. To form a view of the effectiveness of fiscal reform we have examined performance of some of the important fiscal variables in an inter-temporal context.

The paper is divided into four parts, Section one is introduction, Section two comments very briefly on the revenue and expenditure indicators of the state, Section three through lights on the deficit indicators of the state, where as the last section points out the concluding observation of the study. The paper identifies the areas of strength and weakness in the fiscal performance of the state during the period. It is observed that there is some variation within the limit of FRBM act over the period but more or less the fiscal indicators of the state is improved and most of indicators of fiscal discipline were under the target of FRBM act.

Receipts and Expenditure of Chhattisgarh

Ensuring the sustainability of public finance requires difficult choices on both sides of the budget while tax reform can help boosting potential growth through the removal of distortions, spending reforms have a key role to play in strengthen public service delivery (WEFS 2014). The OTR of state was 4052 Cr. In 2005-06 which grows considerable to 21558 Crores in 2015-16. Likewise ONTR is also increased from 1229 Crores in 2005-06 to 8625 Crores in 2015-16.

Table 1
Revenue Indicators of Chhattisgarh % Change Over Previous Years

Years	Own Tax Revenue	Own Non-Tax Revenue	Total Own Revenue	Central Tax Revenue	Central Grant	Total Central Revenue	Total Revenue
2005-06	25.58	-1.16	18.13	33.57	16.47	28.16	21.93
2006-07	24.52	18.04	23.01	27.56	67.50	39.33	29.58
2007-08	11.34	39.21	17.57	26.14	25.48	25.91	21.18
2008-09	17.37	8.99	15.15	5.52	18.31	10.04	12.86
2009-10	8.03	38.17	15.58	2.88	38.25	16.32	15.90
2010-11	26.41	26.03	26.30	23.84	23.49	23.68	25.15
2011-12	18.96	5.81	15.03	16.50	7.24	12.32	13.86
2012-13	21.68	13.73	19.49	14.19	-1.38	7.49	14.35
2013-14	10.03	10.51	10.16	9.18	0.33	5.69	8.39
2014-15	9.51	-4.44	5.85	6.13	90.17	37.64	18.35
2015-16 (R)*	37.25	76.94	46.65	93.87	38.15	63.00	55.05

Source: Economic Survey of Different Years, Directorate of Economics & Statistics, Chhattisgarh

Total revenue (Excluding borrowings) for 2005-06 was 8838.49 crores which is 58813.72 crores for 2015-16 shows significant increase over study period an percentage of GSDP the fiscal performance of state i.e. Own Tax Revenue and Total Tax Revenue have shown an upturned during the study period i.e. Tax-GSDP ratio also recorded an increase from 7.59 percent in 2005-06 to 8.57 percent in 2015-16. Graph 1 shows the revenue efforts of the

(5)

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छत्तीसगढ़ में खाद्य सुरक्षा एक विश्लेषणात्मक अध्ययन

• गीता नागवंशी
•• रविन्द्र कुमार ब्रम्हे

सारांश- *भारत सरकार द्वारा सभी के लिए खाद्य सुरक्षा सुनिश्चित करवाने की प्रमुख पांच योजनाएं हैं जिनमें सार्वजनिक वितरण प्रणाली, समेकित बाल विकास योजना (आंगनबाड़ी केन्द्र), मध्यान्ह भोजन योजना, राष्ट्रीय खाद्य सुरक्षा मिशन एवं महात्मा गांधी राष्ट्रीय ग्रामीण रोजगार योजना आदि हैं। छत्तीसगढ़ राज्य खाद्य सुरक्षा कानून पारित करने वाला देश का पहला राज्य है। इस अधिनियम में न केवल खाद्य सुरक्षा हेतु प्रावधान किए गए हैं, अपितु संतुलित आहार की दृष्टि से भोजन में प्रोटीन की मात्रा बढ़े इस उद्देश्य से पोषण सुरक्षा हेतु योजनाएं भी शामिल किए गए हैं। इस प्रणाली को पारदर्शी बनाने हेतु शत् प्रतिशत कम्प्यूटरीकृत कर दिया गया है। योजना आयोग ने छत्तीसगढ़ की सार्वजनिक वितरण प्रणाली को आदर्श मानकर देश के अन्य राज्यों में लागू करने की सिफारिश की है। देश में तमिलनाडु के बाद छत्तीसगढ़ का पीडीएस सबसे कारगर साबित हो रहा है। इसे एक मॉडल के रूप में लिया जा रहा है। छत्तीसगढ़ खाद्य विधेयक पारित होने के पश्चात् प्रदेश में 56 लाख परिवारों में से गरीब और जरूरतमंद 50 लाख परिवारों को भोजन का कानूनी अधिकार मिल गया।*

मुख्य शब्द- खाद्य सुरक्षा, सार्वजनिक वितरण प्रणाली।

1. **प्रस्तावना**- 1960-70 के दशक में हरित क्रांति की शुरूआत हुई समय के साथ यह अभियान बढ़ता रहा, लेकिन जिस अनुपात में जनसंख्या बढ़ी उसके हिसाब से हम अन्न तो उपजाए लेकिन उसकी सुरक्षा नहीं कर पा रहे हैं। इसका सीधा असर गरीबी रेखा से नीचे जीवन यापन करने वालो पर पड़ा। हरित क्रांति के बाद केन्द्रीय सरकार ने सार्वजनिक वितरण प्रणाली, अन्त्योदय अन्न योजना, अन्नपूर्णा योजना, काम के बदले अनाज योजना आदि योजनाएं लागू की। सार्वजनिक वितरण प्रणाली 1950 के दशक में प्रारंभ हुआ जिसका प्रमुख लक्ष्य गरीबों को सस्ते मूल्य पर खाद्यान्नों को वितरित करना है जिससे उन्हें खाद्यान्नों की बढ़ती हुई कीमतों के बोझ से बचाया जा सके। सार्वजनिक वितरण प्रणाली राज्य सरकारों की संयुक्त जिम्मेदारी के अधीन चलायी जाती है। राज्य के अन्दर आबन्टन, लक्षित परिवारों की पहचान करने, राशनकार्ड जारी करने और उचित दर दुकानों के कार्यकरण का पर्यवेक्षण करने सहित अन्य प्रचालनात्मकक जिम्मेदारियां राज्य सरकारों की होती है। फिलहाल सार्वजनिक विरतण प्रणाली के अधीन राज्यों/संघ

★ शोध छात्रा, रायपुर (छ.ग.)
★★ सहायक प्राध्यापक, अर्थशास्त्र अध्ययन शाला, पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर।

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Inter-District Disparities in I Development in Chhattisgarh

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ABSTRACT:

This research paper examines inter-district disparities in economic development in Chhattisgarh stateove to 2011-12. Using Principal Component Analysis (PCA) composite index of economic developn constructed for evaluating status of economic development among 16 districts of Chhattisgarh. This s ranked districts of Chhattisgarh at CIED has been Durg, Raipur and Korba and they has retained their ranking during both reference years at CIED. ED in Raipur, Dhamtari and Raigarh districts of Chh significantly over the period of a decade 2001-02 to 2011-12. On the other hand districts such as Dant Kanker and Jashpur were at bottom of CIED over the period of 2001-02 to 2011-12.

KEYWORDS: Economic development, Disparity, CIED, PCA

1. INTRODUCTION:

Economic development (ED) contributes significantly towards improving the socio-economic st individuals in any country. The process of economic development utilizes the productive resources i.e. resources for improvement in socio-economic development of a region during a specific period of time.

Disparities or inequalities in economic and social development have been acknowledged among India United Nations (UN) concept note on 'inequality' by Afonso et al. (2015)[2], disparities in economic viewed in two different approaches among economists. First approach considers economic disparity or of opportunities' which can further be understood from theories of social justice. Whereas the secon disparity means inequality in income opportunities or inequality in monetary and living standards of ind

Therefore according to Afonso et al. (2015), "Economic inequality refers to how economic variable individuals in a group, among groups in a population, or among countries. Development theory has larg inequalities in standards of living, such as inequalities in income/wealth, education, health, and discussion has boiled down to a debate between two perspectives:

the first is primarily concerned with the inequality of opportunities, such as unequal access to employm second with the inequality of outcomes in various material dimensions of human well-being, such educational attainment, health status and so on" [1].

This research paper examines the status of disparities in economic development among 16 districts of 2001-02 and 2011-12 through considering 6 indicators of economic development. These are agricultu urbanization (ROU), work participation rate (WPR), financial inclusion (FI), per capita electricity con and credit-deposit ratio (C-DR). Agricultural development has been evaluated through considering percentage of area cropped to total geographical area, cropping intensity, gross irrigated area as perce number of pumps / tube-wells energized per 1,000 hectares of gross cropped area, percentage of agricu population, average yield (ton/hectare) of paddy, gram, sugarcane, maize, livestock density per sq. Km.

Followings are the objectives of this study;

1. To examine inter-district disparities in ED in Chhattisgarh over the period of 2001-11
2. To suggest the measures to reduce disparities in ED in Chhattisgarh

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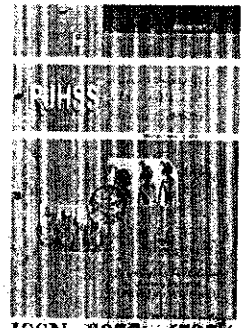

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Assessment of Priorities for "Access to Primary Facilities" and "Eradication of Social Evils" of Women after Joining Self Help Groups: In Context to Women Empowerment

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ABSTRACT:
The soul of India lives in Villages. Even though India got independence six decades ago yet the villages in India is still facing problem of underdevelopment. This underdevelopment is in form of social, cultural, infrastructure and economic backwardness. To elaborate these problems come in form of unemployment, illiteracy, population explosion due to lack of family planning steps, failure of agriculture in consecutive years, poorest health management infrastructure etc. Every individual in the village is being suffered from these issues, but the worst hit are the women and the children. Using SHG's as tool government is trying to eradicate the sufferings of rural women. Some of the evils that is targeted by SHG's are no presence of economic independence, no access of primary facilities to women and unorthodox social chain. In this research work an attempt has been made to study how self-help groups are enabling women empowerment. In this research work the two important pillars of women empowerment has been considered, first – after joining SHG which primary facilities the women opted for themselves and their family. Secondly – after joining SHG eradication of which social evils were their priority. Using Henry Garret Rank analysis it was deduced that first priority of access to primary facilities for female SHG members was preparation of ration/health card, while first priority of eradication of social evil for female SHG members was strict negation to work.

KEY WORDS: SHG, Women Empowerment, Henry Garret Rank Analysis

INTRODUCTION:
The soul of India lives in Villages. Even though India got independence six decades ago yet the villages in India is still facing problem of underdevelopment. This underdevelopment is in form of social, cultural, infrastructure and economic backwardness [1]. To elaborate these problems come in form of unemployment, illiteracy, population explosion due to lack of family planning steps, failure of agriculture in consecutive years, poorest health management infrastructure etc. Every individual in the village is being suffered from these issues, but the worst hit are the women and the children. The women are the worst hit because

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ग्रामीण भारत में महंगाई के कारण एवं [illegible] पर प्रभाव

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सरकार जब भी बजट प्रस्तुत करते हैं मंदी और महंगाई से आम लोगों को न केवल राहत देने की बात करते हैं, बल्कि आदमी का बोझ कम करने की बात भी करते हैं, लेकिन होता इसके विपरीत है। और यही कारण है कि आज भारत में महंगाई चर्चित मुद्दा बनी हुई है, जिसका प्रभाव न केवल गरीब वर्ग पर पड़ता है बल्कि इसका प्रभाव मध्यम एवं उच्च आय वर्ग के लोगों को भी प्रभावित करता है। किन्तु इस महंगाई का मार सबसे अधिक गरीब तबकों पर पड़ती है और यदि यह कहा जाय कि आज इन गरीबों को दो जून की रोटी जुटाना मुश्किल हो गया तो इसमें कोई अतिश्योक्ति नहीं होगी, किन्तु यह भी यच है कि सरकार इस महंगाई को रोकने में कोई कसर नहीं छोड़ी है, लेकिन महंगाई कम होने का नाम ले रही है। जिसके अनेक कारण हैं –

प्रमुख कारण

1. [illegible]

ग्रामीण क्षेत्रों में मनरेगा ;डछत्म्ळ।द्ध जैसे कार्यक्रमों के चलते गरीबी रेखा से नीचे रहने वाले परिवारों की आय में वृद्धि की गई है, जिसके चलते खाद्य पदार्थों की माँग बढ़ी है। वही इसकी तरफ खेती के रबके का उतना ही बने रहना और फसलों का पैदावार न बढ़ना भी महंगाई बढ़ने का एक कारण है यदि हम पिछले चार वर्षों के प्रमुख खाद्य फसलों के उत्पादन स्थिति से हमें पता चलता है कि वर्ष 2006–07 की तुलना में वर्ष 2010 में चावल, अनाज, तिलहन, गन्ना के उत्पादन में कमी देखी गयी है। जिसमें चावल के उत्पादन में [illegible] प्रतिशत, कमी आई इससे स्पष्ट होता है कि एक तरफ उत्पादन में कमी और दूसरी तरफ लोगों की बढ़ती माँग महंगाई को बढ़ाने में सहायक हुआ है।

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तालिका क्र.1

फसलें	2006–07	2007–08	2008–09	2009–10
चावल	93.4 (1.7)	96.7 (3.7)	99.2 (2.7)	80 (–19.6)
गेंहु	75.8 (9.2)	78.6 (3.7)	80.7 (2.7)	81.5 (1.0)
अनाज	203.1 (4.1)	216 (6.4)	219.9 (1.8)	197.6 (–10.1)
दालें	14.2 (5.9)	14.8 (4.2)	14.6 (–1.4)	15.1 (3.4)
जोड़ अनाज	217.3 (4.2)	230.8 (6.2)	234.6 (1.7)	212.7 (–9.3)
तिलहन	24.3 (–13.2)	29.8 (22.6)	27.7 (–7.1)	24 (–13.4)
गन्ना	355.2 (26.3)	348.2 (–2.0)	285 (–18.2)	259 (–9.1)

स्रोत – आर्थिक सर्वेक्षण 2009–10

2. वैश्वीकरण

आज वर्तमान में महंगाई का ठीकरा जिन आर्थिक घटकों के सिर फोड़ा जा रहा है उनमें सबसे अधिक वैश्विक महंगाई दर है। आज वैश्वीकरण के युग में यदि किसी एक देश की अर्थव्यवस्था प्रभावित होती है तो वह अन्य प्रदेशों की आर्थिक स्थिति में भी प्रभाव पड़ना स्वभाविक है जिसमें भारत भी एक देश है हालांकि भारत वर्तमान में खाद्यान्न का आयात नहीं कर रहा है किन्तु खाद्य तेल, दालें और खनिज तेल तो बड़ी मात्रा में आयात कर रहा है। अगर अन्तर्राष्ट्रीय बाजार में इनकी कीमतें बढ़ती है तो उसका असर भारत में बढ़ती महंगाई के रूप में पड़ेगा। यही कारण है कि अन्तर्राष्ट्रीय बाजार में जब भी पेट्रोल की कीमत बढ़ती है, उसका प्रभाव भारत में भी पड़ता है।

3. जनसंख्या वृद्धि

जनसंख्या वृद्धि भी एक प्रमुख कारण है जिसकी वर्तमान में बहुत ज़्यादा चर्चा नहीं हो रही है यह बहुत दुख की बात है जबकि पिछले दशकों में अधिक जनसंख्या को सारी समस्याओं का जड़ माना जाता था जिसमें महंगाई भी एक समस्या है चुंकि भारत में अब जनसंख्या मानव संसाधन बन चुकी है जिसकी देश के विकास में महत्वपूर्ण भूमिका होती है और यदि यह कहा जाय कि चीन की तरह भारत में भी जनसंख्या अर्थव्यवस्था टटे उत्पादन के कारण माँग और पूर्वि के बीच अंतराल बढ़ गया है यह भी देश के विकास में बा की ताकत बन चुके है तो इसमें कोई अतिश्योक्ति नहीं होगा। साथ ही इस सत्य को भी स्वीकारना होगा कि तेजी से बढ़ती हुई जनसंख्या में हुई वृद्धि कई बार विकास में बाधक सिद्ध होती है। आज विशाल जनसंख्या और ध घक का एक सूचक है।

4. मुनाफाखोरी

मुनाफाखोरी भी महंगाई के लिए एक प्रमुख कारण है। इस संदर्भ के योजना आयोग के सदस्य प्रो. अभिजीत सेन के मुताबिक पिछले दो साल से मानसून अच्छा रहा है उत्पादन में भी उतनी कमी नही आई है जितना खाद्य मुद्रा स्फीति में वृद्धि हुई अभी वर्तमान में मुद्रा स्फीति दर..... प्रतिशत है। हालाकि इस महंगाई के लिए मुनाफावसूली मुख्य रूप में जिम्मेदार है। साथ ही पहले जो शहरी इलाके के आस–पास सब्जी और दूध का उत्पादन व्यापक रूप से होता था वहां पर अब इन कार्यों के लिए जमीन उपलब्ध नहीं है क्योंकि उस जगह पर रियल स्टेट सेक्टर प्रापर्टी विकसित कर रहा है यह स्थिति शहरी इलाकों के खाद्य पदार्थों की महंगाई के लिए जिम्मेदार है और मुझे ऐसा लगता है ग्रामीण क्षेत्रों की अपेक्षा शहरी क्षेत्रों को महंगाई ने अधिक प्रभावित किया है।

5. आय

महंगाई में बढ़ोत्तरी के लिए लोगों की आय में हुई वृद्धि भी जिम्मेदार है। पिछले तीन साल में लोगों के वेतन मजदूरी में अच्छी खासी बढ़ोत्तरी हुई है। चाहे

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छत्तीसगढ़ में ग्रामीण गरीबी की स्थिति का एक विश्लेषणात्मक अध्ययन

(बलौदाबाजार जिले के सीमांत व लघु कृषक परिवारों के संदर्भ में)

• ओमप्रकाश बघेल
•• बी. एल. सोनेकर

सारांश– भारत एक कृषि प्रधान एवं गॉवों का देश है। गांवों की अधिकांश आबादी निम्न आय वर्ग की है, जिसमें भूमिहीन मजदूर, सीमांत एवं लघु कृषक, बंधुआ मजदूर एवं समाज के अन्य कमजोर वर्ग के व्यक्ति सम्मिलित है। जिनकी आर्थिक स्थिति इतनी दयनीय है कि वे जीवन की बुनियादी आवश्यकताओं जैसे–भोजन, कपड़ा, आवास, शिक्षा, स्वास्थ, स्वच्छ पेयजल आदि सुविधाओं की पूर्ति करने में भी असमर्थ होते हैं। देश में एक तिहाई जनसंख्या गांवों में निवास करती है जिनके जीवकों–पार्जन का मुख्य स्त्रोत कृषि है। देश में 79 प्रतिशत कृषक परिवार सीमांत एवं लघु कृषक है , जिनका जीवन स्तर केवल कृषिकार्य पर निर्भर है। परंतु ग्रामीण क्षेत्रों में जनसंख्या का दबाव अधिक होने के कारण सीमांत एवं लघु कृषकों को छिपी हुई बेरोजगारी का सामना करना पड़ता है, और कृषिकार्य पूरा हो जाने के बाद वे बेरोजगार हो जाते हैं। जिससे इन कृषक परिवारों में अशिक्षा, पलायन, भूखमरी एवं गरीबी जैसे समस्या उत्पन्न होती है,जो केवल व्यक्ति, समाज ही नही बल्कि देश के सामाजिक एवं आर्थिक विकास में अवरोध उत्पन्न करती है। इस प्रकार इन गंभीर समस्याओं के निदान के लिए ग्रामीण क्षेत्रों में शिक्षा एवं रोजगार का विकास करना, सीमांत एवं लघु कृषकों के लिए सिंचाई की उत्तम व्यवस्था करना, कुटीर एवं लघु उद्योग के विकास और स्वसहायता समूहों को बढ़ावा देना चाहिए। जिससे गरीबी एवं अन्य बहुआयामी जटिल समस्यओं को दूर किया जा सके।

मुख्य शब्द– गरीबी, बेरोजगारी एवं पलायन।

1. प्रस्तावना– वर्तमान में गरीबी न केवल भारत बल्कि वैश्विक स्तर पर एक जटिल एवं संवेदनशील बहुआयामी समस्या है। जो मानव जीवन के विकास में सबसे बड़ी चुनौती है। गांवों की अधिकांश आबादी निम्न आय वर्ग की है, जिसमें भूमिहीन मजदूर, सीमांत एवं लघु कृषक, बंधुआ मजदूर एवं समाज के अन्य कमजोर वर्ग के व्यक्ति सम्मिलित है। जिनकी आर्थिक स्थिति इतनी दयनीय है कि वे जीवन की बुनियादी आवश्यकताओं जैसे-भोजन, कपड़ा, आवास, शिक्षा, स्वास्थ, स्वच्छ पेयजल आदि सुविधाओं की पूर्ति करने में भी असमर्थ होते हैं। उस स्थिति को गरीबी कहते हैं। यह किसी परिवार की वह

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RESEARCH ARTICLE

Analysis of rate of investment, upcoming industrial units and associated new employment generation in Kabirdham District of Chhattisgarh State

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ABSTRACT:
Historically in rural India, agriculture was the only source of income for the locals. But as the infrastructure development took place locals found that there are lot more opportunities to earn their livelihood besides agriculture. The industrial revolution focused on development of manufacturing centres in the suburbs. The manufacturing centres were close to rural regions and hence attracted labour from the nearby villages. This alternate seasonal jobs brought slight decline in agricultural activities. The manufacturing sector was a silver lining for the rural population, however, the manufacturing sector itself was associated with management problems. Poor management of operations, lack of operational amenities such as 24 hours' electricity connection and easy availability of raw materials on manufacturing site were some of the factors responsible for shut down of some of the popular manufacturing units. This study focus on Kabirdham (Kawardha) district of state of Chhattisgarh, the district poses potential to get developed into a manufacturing cluster. But this potential is yet to be harnessed. This research work tries to find out how the employment scenario in the Kabirdham district is changing with time. The population of the district is increasing with large number of youth still unemployed. The study tries to shed light of the job creation aspects present in the district. The results of the research work indicate that the trend for new registration of industrial units is negative in the region. The research work further indicate that rate of employment generation is sluggish in the district and needs to be immediately rectified. The inflow of investment in the district is seventy-three lakhs per year only. The investment is less when there is need for generation of employment for a population which is eight lakhs in strength.

KEY WORDS: Employment, Industrial investment, Kabirdham.

1. Introduction

Historically in rural India, agriculture was the only source of income for the locals. But as the infrastructure development took place locals found that there are lot more opportunities to earn their livelihood besides agriculture [1]. The industrial revolution focused on development of manufacturing centres in the suburbs. The manufacturing centres were close to rural regions and hence attracted labour from the nearby villages. This alternate seasonal jobs brought slight decline in agricultural activities. In present time, the economy of rural India can be divided into two segments. First the agricultural sector and second is the non-agricultural sector [2]. The limited availability of the agricultural land leaves little scope for extension of agriculture. Due to this limited availability of agricultural land people in the rural region started searching for an alternate means of livelihood. This alternate means of livelihood came in form of working as manual labour in different industrial units for example cement manufacturing sector, mining, forestry, food parks etc.

This availability of means of livelihood provide rural people with a fixed source of income. This income was fixed but less than what they earn from agricultural practices [3]. The income from this job provided them instant cash and was risk free and on top of it, it had fixed working hours. Manufacturing sector brought a stability in livelihood earning of the rural people, who

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Problem of water stress in Indian Agriculture

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Abstract

Agriculture is an important sector which is fulfilling a huge demand for food in the world which is not possible without water; recently many researches show that soon we are going to face the problem of water stress. Since the nations stepped towards development the requirement as well as the usage has increased. If we don't look over this problem it will become a serious issue which will affect the human life on earth irrespective of the fact we are living in developed, developing or under developed economy. The fact which matters is, to assume the required quantity of water for domestic and agricultural purpose. The present research paper is a factually a discussion paper based on secondary data from national and international sources which discussed on the pattern of water uses & availability in the Indian economy as well as its water stress level in future. It is an attempt to know the water stress in Indian agriculture in coming years and a discussion on the problem as well as ways to solve the problem. The paper analyses current as well as future water stress problem in Indian agriculture along with the availability of fresh water and proper utilization of this resources which is becoming a serious future issue in Indian economy.

Keywords: Water stress, Agriculture, Indian economy,

Introduction-

Water, one of the important essential requirements of human life. If we look behind on the evolution of life on earth we find it is not possible without water and even we do not think about future of human life on earth without water. Water is essential for each and every human act for the living, whether it is production, consumption or other important works. But the problem arises, as we learnt in the economic phenomenon of scarcity that resources are limited and water is one of them because we have only few amount of fresh water chasing by billions of people on earth. Agriculture is an important sector which is fulfilling a huge demand for food in the world which is not possible without water; recently many researches show that soon we are going to face the problem of water stress. Since the nations stepped towards developments the requirement as well as the usage has increased. If we don't look over this problem it will become a serious issue which will affect the human life on earth irrespective of the fact we are living in developed, developing or under

developed economy. The fact which matters is, to assume the required quantity of water for domestic and agricultural purpose.

By 2050, agriculture will need to produce 60% more food globally, and 10% more in developing countries[1]. The World Bank has projected that the annual water demand will be 1050 BCM by 2025 of which 69% will be from agriculture uses, 20% from industrial uses, 5% from domestic uses and 6% from environment and others[2]. Agriculture, an important sector of Indian economy accounts for 14 per cent of the nations GDP about 11 percent of its exports. India has the second largest arable land base (159.7 million hectares) after US and largest gross irrigated area (88 million hectares) in the world. Rice, wheat, cotton, oilseed, jute, tea, sugarcane, milk and potatoes are the major agricultural commodities produced. More importantly, over 60 per cent of the country's population, comprising several million small farming households depends on agriculture as a principal income source and land continues to be the main assets for livelihood security[3]. The present paper is an attempt to know the water stress in Indian agriculture in coming year and a discussion on the problem as well as ways to solve the problem based on secondary data.

The paper is divided on five parts, section one is Introduction, section two is briefly discussing about the water stress level in the world, section three is focusing on the pattern of water usage in the context of agriculture, section four is focusing on Indian water stress level and its future availability to Indian agriculture and the last Section is concluding the discussion on observation & research study. The paper analyses current as well as future water stress problem in Indian agriculture along with the availability of fresh water and proper utilization of this resources which is becoming a serious future issue in Indian economy.

Water Stress in the World-

Water stress occurs when the demand for water exceeds the available amount during a certain period or when poor quality restricts its use. Water stress causes deterioration of fresh water resources in terms of quantity (aquifer over-exploitation. dry rivers, etc) and quality (eutrophication, organic matter pollution, saline intrusion, etc)[4]. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO) estimates, the total volume of water on earth is about 1.4 billion km^3, which is enough to cover the earth with a layer of 3 km depth. However, World's oceans cover about three-fourths of earth's surface while the fresh water constitutes a very small proportion of this enormous quantity available on the earth. It is only about 35 million km^3 or 2.5% of the total volume. Of these, about 24 million km^3 or 68.9% is in the form of ice and permanent snow cover in mountainous regions, the Antarctic and Arctic regions and another 29.9% is present as ground water (shallow and deep groundwater basins up to 2,000 meters). The rest 0.3% is

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SEARCH ARTICLE

छत्तीसगढ के जिलों की जनांकिकीय प्रवृतियां एवं आर्थिक विकास पर प्रभाव

डॉ अर्चना सेठी

सहायक प्राध्यापक, अर्थशास्त्र अध्ययनशाला, पं रविशंकर शुक्ल विश्वविद्यालय, रायपुर

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सारांश

आर्थिक विकास अनेक तत्वों से प्रभावित होता है जनसंख्या उनमें से प्रमुख तत्व है। किसी प्रदेश में जनसंख्या के वितरण में विभिन्नतायें पायी जाती है, जनसंख्या वितरण प्रारूप न सिर्फ मनुष्य के किसी क्षेत्र विषेश में निवास संबंधी अभिरूची एवं विरूची का द्योतक होता है, अपितु क्षेत्र में कार्यरत भौगोलिक कारणों के संश्लेषण का स्पश्ट प्रदर्शन भी होता है। क्षेत्रीय विकास के साथ जनसंख्या उस ओर आकर्शित होती है जहां औद्योगीकरण एवं नगरीकरण होता है। जनसंख्या के वितरण प्रतिरूप पर सामाजिक आर्थिक कारण लिंगानुपात जन्म दर मृत्यु दर एवं प्रवास प्रभाव डालते है। जलवायु, भैगोलिक स्थिति, उच्चावचन, फसलों की प्रकृति, मिट्टी की उर्वरता आदि भी जनसंख्या वितरण को प्रभावित करते है। लिंगानुपात से किसी क्षेत्र के विकास के स्तर का ज्ञान हो सकता है, अधिक विकसित देशों में लिंगानुपात अधिक होती है, तथा पिछड़े देशों में लिंगानुपात कम होती है।जनसंख्या घनत्व एवं आर्थिक विकास में कोई सीधा संबंध नहीं है। मैदानी क्षेत्र में जनसंख्या घनत्व अधिक एवं पहाडी तथा वन क्षेत्र में जनसंख्या घनत्व कम है।मैदानी क्षेत्र में औद्योगीकरण अधिक होना भी अधिक घनत्व का कारण है। जनगणना 2011 के अनुसार छत्तीसगढ की 76.76 प्रतिशत जनसंख्या ग्रामीण है जो कृषि कार्य में संलग्न है। है। जिसकी आधी लगभग महिला है। राज्य के विकास के लिए महिलाओं का विकास आवश्यक है। राज्य की 32 प्रतिशत जनसंख्या अनुसूचित जनजाति है राज्य के विकास के लिए उनका विकास प्रथम आवश्यकता है। जनगणना 2011 के अनुसार छत्तीसगढ की 76.76 प्रतिशत जनसंख्या ग्रामीण है जो कृषि कार्य में संलग्न है। राज्य के विकास के लिए कृषि का भी विकास अनिवार्य है। छत्तीसगढ की 70.28 प्रतिशत जनसंख्या साक्षर हैं। पुरुषों का 80.27 एवं महिलाओं का 60.24 जनसंख्या साक्षर है। पुरुष महिला साक्षरता अंतराल 20.03 प्रतिशत है विकास के लिए इस अंतराल को समाप्त करना अनिवार्य है।

शब्दकुंजी – लिंगानुपात ,जनसंख्या वृद्धिदर, जनसंख्या घनत्व

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Int. J. Ad. Social Sciences. 2017; 5(1):39-47.

135191 वर्ग कि मी में विस्तृत भारत की राज्य हैं। जिसका निर्माण 1 नवम्बर हुआ था।वर्तमान समय में छत्तीसगढ में है। रायपुर जिले का निर्माण 1954 में हुआ में बिलासपुर एवं 1जनवरी 1906 को दुर्ग ा। 15 अगस्त 1947 को सरगुजा बस्तर जिले का निर्माण हुआ। 26 जनवरी 1973 में व जिला अस्तित्व में आया। 25 मई1998 ोर चॉपा कोरबा कोरिया जशपुर जिले का आ। 6 जुलाई 1998 को महासमुंद कांकेर तरी दंतेवाडा जिला अस्तित्व में आया।11 को बीजापुर नारायणपुर जिला निर्मित 9 जिले बलरामपुर सूरजपुर बलौदाबाजार बालोद बेमेतरा सुकमा मुंगेली कोंडागांव जनवरी 2012 को निर्मित हुए। जनगणना अनुसार यहां की जनसंख्या 255, 40, 196 करोड) है। जिसमें से 1.28 करोड पुरुश एवं ड महिला है। यह भारत की जनसंख्या का % है। 2001 जनगणना में जनसंख्या 218 थी। दशकीय जनसंख्या वृद्धिदर 22% 1से 2001 के मध्य वृद्धिदर 18.06 था। घनत्व 2001 में 154 से बढकर 2011में क्ति प्रति वर्ग किमी हो गया। लिंगानुपात ला प्रति 1000 पुरुश है जो राज्यों में 5वां

का उददेय

सगढ के जिलों की जनांकिकीय प्रवृतियों का करना

सगढ के जिलों की जनांकिकीय प्रवृतियों का विकास पर प्रभाव का अध्ययन करना।

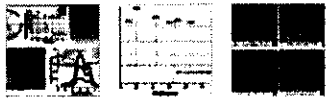
गढ के ग्रामीण क्षेत्रों में लिंगानुपात 1002 एवं क्षेत्र में 956 है। 0- 6 आयु वर्ग में लिंगानुपात जनगणना 2001 में 975 से जनगणना 2011 में 964 हो गया।-साक्षरता में जनगणना 2001में 64. 66% से बढकर जनगणना 2011 में 71.4 % हो गया। साक्षरता में छत्तीसगढ का स्थान भारत में 5वां है।

किसी प्रदेश में जनसंख्या के वितरण में विभिन्नतायें पायी जाती है, जनसंख्या वितरण प्रारूप न सिर्फ मनुश्य के किसी क्षेत्र विशेष में निवास संबंधी अभिरूची एवं विरूची का द्योतक होता है, अपितु क्षेत्र में कार्यरत भूगोलिक कारणों के संश्लेषण का स्पश्ट प्रदर्शन भी होता है। क्षेत्रीय विकास के साथ जनसंख्या उस ओर आकर्शित होती है जहां आद्योगीकरण एवं नगरीकरण होता है। जनसंख्या के वितरण प्रतिरूप पर सामाजिक आर्थिक कारण लिंगानुपात जन्म दर मृत्यु दर एवं प्रवास प्रभाव डालते है। जलवायु, भैगोलिक स्थिति, उच्चावचन, फसलों की प्रकृति, मिट्टी की उर्वरता आदि भी जनसंख्या वितरण को प्रभावित करते है। छ.ग. में वे जिलें अधिक सघन है जहां विकास अधिक हुआ है। ये जिले दुर्ग, राजनांदगांव, रायपुर, धमतरी, आदि हैं दक्षिण के जिले बस्तर, बीजापुर, नारायणपुर, दंतेवाड़ा आदि क्षेत्र में वनांचल दुर्गम यातायात नक्सल समस्या आदि के कारण स्त्री जनसंख्या का वितरण कम है।

छत्तीसगढ की जनसंख्या जनगणना 2011 में 2. 5 करोड थी ।जिसमें से रायपुर जिले की जनसंख्या सबसे ज्यादा 21.6 लाख थी बिलासपुर की जनसंख्या 19.6 लाख थी दुर्ग जिले की जनसंख्या 17.2 लाख थी जांजगीर चॉपा जिले की जनसंख्या 16.2 लाख थी नारायणपुर जिले में सबसे कम जनसंख्या 1.4 लाख बीजापुर 2.5 लाख दंतेवाडा 2.8 लाख है ।तालिका 1 रेखाचित्र 1।

Outline

Figures (12)



Journal of Alloys and Compounds
Volume 695, 25 February 2017, Pages 1956-1965

Diminution in photoluminescent intensity of SrS: Ce^{3+} phosphor due to increased milling time

Shubhra Mishra [a], Ayush Khare [a], Sanjay Tiwari [b], D.S. Kshatri [c]

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https://doi.org/10.1016/j.jallcom.2016.11.030

Highlights

- **SrS: Ce nanophosphor has been synthesized using solid state diffusion method.**

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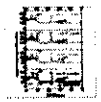

Materials Letters
Volume 183, 15 November 2016, Pages 191-196

SrS:Ce^{3+} thin films for electroluminescence device applications deposited by electron-beam evaporation deposition method

Shubhra Mishra [a], D.S. Kshatri [b] ✉, Ayush Khare [a], Sanjay Tiwari [c], Prabhat K. Dwivedi [d]

https://doi.org/10.1016/j.matlet.2016.07.097

Highlights

- SrS thin films at varied concentration of Ce^{3+} are being reported for the

(3)

486

Nanocrystalline SrS:Ce3+ systen

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LUMINESCENCE
The Journal of Biological and Chemical Luminescence

Volume 31, Issue 8
December 2016
Pages 1427-1432

Research article | Full Access

Nanocrystalline SrS:Ce^{3+} system for the generation of white light-emitting diodes

Shubhra Mishra, DS Kshatri, Ayush Khare, Sanjay Tiwari,

First published: 28 March 2016 | https://doi.org/10.1002/bio.3124 | Citations: 6

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Figures References Related Information

Abstract

Nanocrystalline SrS phosphors doped with Ce^{3+} ions at different concentrations (0.5–1

Published: 24 October 2016

Optical Properties of Rare Earth Doped SrS Phosphor: A Review

Ayush Khare ✉, Shubhra Mishra, D. S. Kshatri & Sanjay Tiwari

Journal of Electronic Materials **46**, 687–708 (2017) | Cite this article

Abstract

Rare earth (RE) doped SrS phosphor has attracted a lot of attention on a wide range of photo-, cathodo-, thermo-, and electroluminescent applications. Upon doping with different RE elements (e.g., Ce, Pr, Eu, Yb), the luminescence from SrS can be varied over the entire visible region by appropriately choosing the composition of the strontium sulfide host. The main applications include flat panel displays and SrS-based powder electroluminescence (EL) for back lights. Sulfide materials known for providing Eu^{2+} based red emission band and

Directional Fuzzy Edge Detection Based Modified Edge Regeneration System for Efficient JPEG Artifacts Reduction

Vikrant Singh Thakur[a], Kavita Thakur[b*] and Shubhrata Gupta[c]

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Abstract. Presently, the image and video compression are the most crucial and demanding requirements for the visual data communication due to the channel bandwidth and data storage limitations. Transform based coding using the Discrete Cosine Transform (DCT), is a popular technique for the image and video compression. However, at lower bit-rates, for the DCT based image compression, the reconstructed images suffer from several visual distortions. Edge regeneration is one of the most recent and important technique to suppress the visual distortions generated by DCT compression at lower bit-rates. This paper proposed an innovative modification of the edge regeneration technique by increasing its initial edge prediction capability under the presence of artifacts using directional fuzzy edge detection. The proposed JPEG artifacts reduction system addresses all the three types of artifacts, which are common in JPEG images: blocking, edges blurring, and aliasing. Furthermore, the proposed system enhances the quality of the JPEG compressed images via two stages. First, it removes blocking artifacts via boundary smoothing and guided filtering. Then, in the second stage, it reduces blurring and aliasing around the edges via proposed modified local edge regeneration based on directional fuzzy edge detection technique. A sound comparison of the proposed algorithm with other existing JPEG artifact removal algorithms has been also presented on the basis of the two important parameters, peak signal to noise ratio (PSNR) and mean square error (MSE). Performance evaluation illustrates that the proposed system provides maximum PSNR, minimum MSE, and hence leads to efficient JPEG artifact reduction as compared to the other state of the art algorithms.

Keywords: JPEG image artifacts removal, Blocking artifacts, Edge blurring, Edge regeneration, Directional fuzzy edge detection, DCT, PSNR, MSE.

Introduction

In present scenario image and video compression persists to be in high demand. The Block Discrete Cosine Transform (BDCT) (Ahmed *et al.*, 1974; Thakur *et al.*, 2014, 2015) is the most accepted and extensively used transform based lossy compression technique in image and video compression standards, owing to its optimum energy compaction property and easiness of implementation. The most important and widely accepted international image compression standard was developed by Joint Photographic Expert Group (JPEG) based on BDCT named as JPEG standard. For JPEG, one of the widely recognized limitation is that at low bit rates, compression process leaves discontinuities of intensities among adjacent blocks (named as blocking artifacts). JPEG can also lead to further visual artifacts such as degraded textures, blurring, and distortion of edges. Altogether, decreasing the bit rate will increase the severity and dominance of these visual artifacts. Over the past few decades, abundant algorithms have been proposed to enhance the visual quality of JPEG compressed images by attempting to remove the artifacts. These techniques generally fall into two broad categories: encoder-based methods and post-processing based methods.

The encoder based techniques work by making modifications to the encoder, such as transform-domain methods (Malvar and Staelin, 1989; Chen *et al.*, 2001; Xu *et al.*, 2006), interleaved block transform (Pearson and Whybray, 1984), interactive methods (Zakhor, 1992), lapped transform (Malvar, 1998), combined transform (Zhang *et al.*, 1993) or wavelet based filtering (Liew *et al.*, 2004). However, the drawback of this process is a deviation from the rules of JPEG standard.

Post-processing techniques basically improve the visual quality by removing artifacts via processing of the image after decoding. This process does not require any modifications to the available JPEG encoder or decoder, and can thus be used on existing JPEG images. Post-processing can generally be divided into spatial-domain techniques (Reeve and Lim, 1984; Ramamurthi and Gersho, 1986; Apostolopoulos and Jayant, 1999), DCT-domain techniques (Kasezawa, 1997; Choy *et al.*,

1997; Chen *et al.*, 2008), Projections onto Convex Sets (POCS) (Yang *et al.*, 1993; Paek *et al.*, 1998), and block-shift filtering (Sullivan and Baker, 1994; Zhai *et al.*, 2008, 2009).

The spatial domain techniques process the JPEG image based on some past knowledge and information about the original image, such as intensity smoothness or block boundaries of images. For instance, Reeve and Lim (1984) proposed a symmetric two-dimensional Gaussian spatial filtering method to reduce the blocking artifacts. Other methods of spatial-domain techniques based on gradients/thresholds and the histogram which first classify the blocks as either high frequency or low frequency, followed by filtering to remove artifacts are also reported in the literature (McDonnell *et al.*, 1994; Lynch *et al.*, 1995; Hu *et al.*, 1997; Lee *et al.*, 1998; Jiwu *et al.*, 1998; Apostolopoulos and Jayant, 1999).

In DCT-domain post-processing algorithms, blocking artifacts are reduced by direct alteration of DCT coefficients. For example, Jeon and Jeong (1998) proposed a post processing method to reduce discontinuities of pixel values over block boundaries by compensating for the loss of coefficients accuracies in the transform domain. Then Zeng (1999) proposed a DCT-domain method for blocking reduction by applying a zero-masking to the DCT coefficients of some shifted image blocks. However, a loss of edge information caused by the zero-masking scheme can be noticed in his method. More recently Chen *et al.* (2008) proposed an algorithm based on three filtering modes in terms of the activity across block boundaries. They considered the masking effect of the human visual system and integrated adaptive filtering into the deblocking process.

There are also some methods which use both spatial domain and DCT domain approaches. For instance, Singh *et al.* (2011) proposed an adaptive post-filtering algorithm to remove blocking artifacts. They classify the boundary regions between the blocks as smooth, non-smooth, or intermediate regions. Then, blocking artifacts in the smooth and non-smooth regions are removed by modifying selected DCT coefficients while an edge preserving smoothing filter is applied to the intermediate regions. In addition, there are typical post-processing iterative methods based on the theory of projection onto convex sets (POCS) (Yang *et al.*, 1993) and a maximum posterior probability approach (Stevenson, 1993). Reeve and Lim (1998) introduced a method based on the theory of POCS and proposed a post-processing technique to reduce blocking artifacts in JPEG images. The major drawback of this approach is the high computational complexity.

Block shift filtering is an adaptive filtering algorithm for reducing image artifacts (Zhai *et al.*, 2008, 2009). Some algorithms have been proposed which attempt to reduce blockiness by using a quad-tree (QT) decomposition and block-shift filtering (Sullivan and Baker, 1994; Szeliski and Shum, 1994; Rhee *et al.*, 2000; Banister and Fischer, 2001). Luo and Ward (2003) proposed an adaptive approach which reduced blocking artifacts in both the domains. For smooth regions, this method took advantage of the fact that the original pixels in the same block provide continuity. Zhai *et al.* (2008, 2009) proposed algorithms to preserve the image's details and reduce the effect of quantization noise. They integrated QT decomposition with the block shift filtering.

Although previous algorithms can effectively suppress blockiness, JPEG images suffer from more than just blocking. At low bit rates, the compressed image also suffers from blurring and aliasing artifacts around the edges. Some works have been done, where authors have taken deblocking further and shown attempts to pay off for degraded textures in the compressed image (Liew and Yan, 2004; Zhai *et al.*, 2008, 2009). Nevertheless, this method does not address blurring and aliasing around the edges.

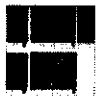
Recently Golestaneh *et al.* (2014) proposed a single technique to enhance the quality of the JPEG image via two stages. First, they removed blocking artifacts via boundary smoothing and guided filtering. Then, they reduced blurring and aliasing around the edges via a local edge regeneration stage. For detecting the strong edges they have used canny edge detection with Otsu's thresholding. The edge regeneration performance of this technique highly depends on the capability of initial edge detection via canny edge detector in the presence of blocking artifacts and blurring effects of image edges. The presence of artifacts actually creates strong imprecise conditions for the prediction and regeneration of original image edges. In this imprecise environment, any miss-classification of original image edge prediction leads to a reduction of artifacts reduction efficiency. This is the strong reason this technique have shown comparable performance as compared to previous JPEG artifact reduction techniques but lacks to provide higher artifacts reduction efficiency over all the bit-rates compression.

To provide a proficient solution to this problem, this paper proposed a directional fuzzy edge detection technique for efficient prediction of original image edges in the presence of blocking artifacts and edge blurring effects. The proposed fuzzy logic based initial edge prediction technique have the capability of precisely handle the imprecise conditions generated by the various JPEG artifacts. Furthermore, in the present paper, we have developed a complete system to efficiently enhance the visual quality of JPEG images. The developed system first removes blocking artifacts by using image smoothing (Luo and Ward, 2003) followed by guided filtering (He and Tang, 2010), and it then reduces blurring and aliasing artifacts around

Outline

Show full outline

Figures (3)



Materials Letters
Volume 198, 1 July 2017, Pages 101-105

Fabrication, characterization and electroluminescence studies of SrS: Ce^{3+} ACTFEL device

Shubhra Mishra [a], D.S. Kshatri [b], Ayush Khare [a], Sanjay Tiwari [c], Prabhat K. Dwivedi [d]

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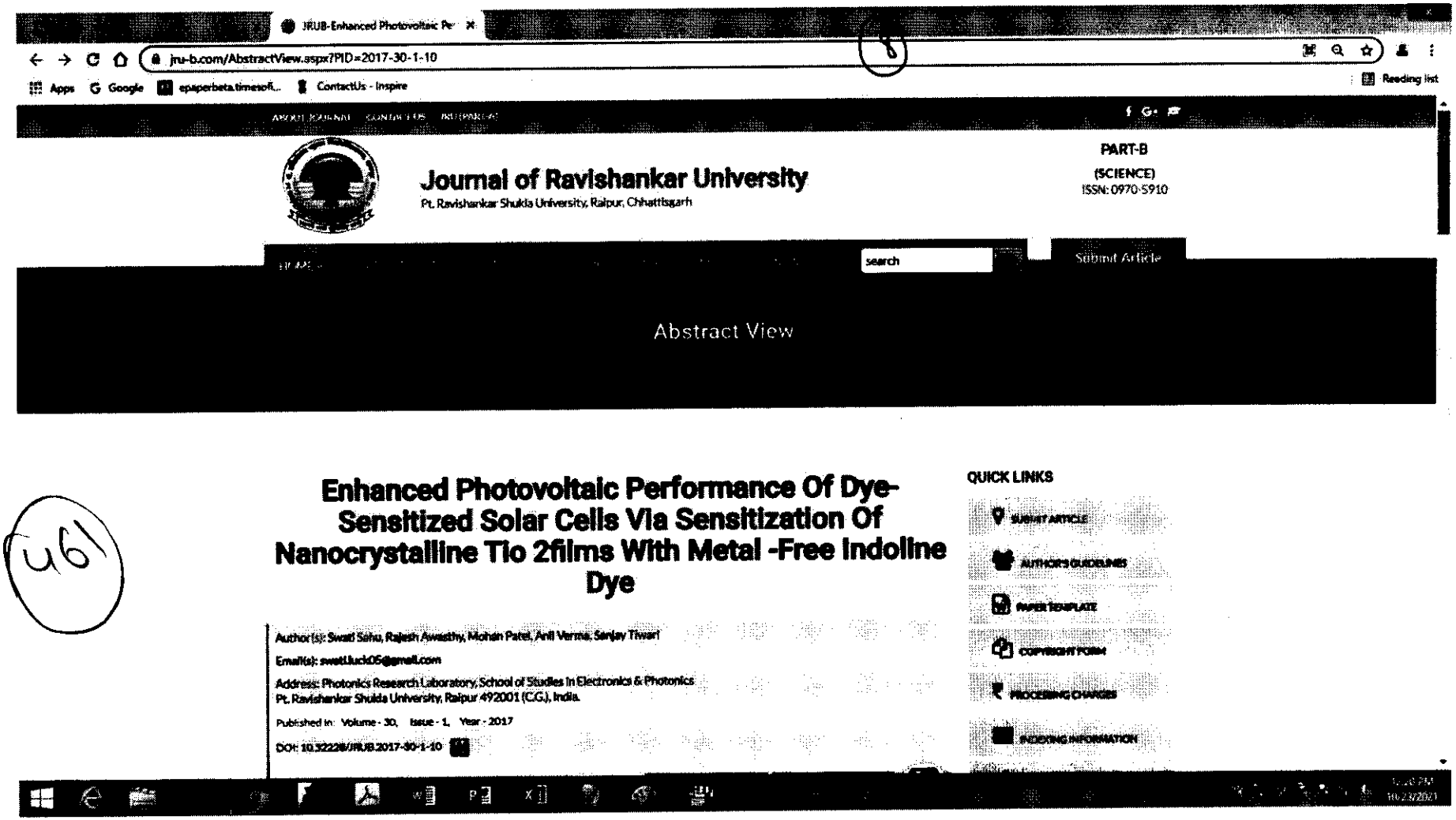
https://doi.org/10.1016/j.matlet.2017.04.013

Highlights

- **The ACTFEL devices based on SrS: Ce^{3+} thin films are fabricated by**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Volume 11, Issue 10
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Hybrid WPT-BDCT transform for high-quality image compression

Vikrant Singh Thakur, Shubhrata Gupta, Kavita Thakur

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Abstract

The image compression performance of transform coders highly depends on the energy compaction (EC) capability of transforms. The popular transforms such as discrete cosine transform (DCT) and discrete wavelet transform (DWT) provide decent EC: however, their

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A New Hybrid Post-Filtering Technique for Efficient JPEG Artifacts Reduction

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***Abstract*—The Joint Photographic Expert Group (JPEG) is the most popular lossy image compression standard owing to its simple structure and economical hardware implementation. However, at the low bitrate compressions, the JPEG standard suffers from the highly visible blocking artifacts, which is the primary reason behind its poor compression performance. In order to efficiently address this issue, this paper forwards a new hybrid post-filtering technique for the JPEG blocking artifacts reduction. The proposed hybrid technique is a proper fusion of iterative steering kernel regression-based filtering and the guided image filtering techniques. Numerous tests have been carried out to validate the blocking artifacts reduction capability of the proposed hybrid technique against the state-of-the-art techniques. The resultant findings confirm that the proposed hybrid technique offers a noteworthy reduction in the JPEG artifacts as compared to the available techniques.**

***Index Terms*— JPEG image artifact removal, blocking artifacts, steering kernel filtering, guided image filtering, PSNR.**

I. Introduction

The ultimate aim of the lossy image compression techniques is to represent the input image with the fewer bits as compared to the original image. Thus, the lossy techniques make a loss of information at the time of compression to facilitate the transmission of images over the band-limited channel. In the past, numerous international standards have been established to full-fill the good quality compression demand of images. Among, the existing standards, the most popular is the JPEG standard, which is a block-based coding technique that utilizes Discrete Cosine Transform (DCT) [1]-[4] for the energy compaction followed by the quantization and entropy coding. Usually, at the medium and the higher bitrate image compression, the JPEG standard provides good quality compression, but on the lower bitrates side, it often suffers from the strong blocking artifacts. Meanwhile, as the bitrate decreases further, the JPEG compression also demonstrates the other visual artifacts such as degraded textures, blurring, and distortion of the edges [5].
Therefore, numerous techniques have been developed in the past to enhance the visual quality of JPEG compressed images by the removal of the compression artifacts. The existing JPEG artifacts reduction techniques can be divided into two categories viz. (1) Encoder-based techniques, and (2) Post-processing

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based techniques. The encoder-based techniques rely on the modifications of the encoder structure, like transform domain techniques [8]-[10], interleaved block transforms [11], interactive methods [12], lapped transform [13], combined transform [14], or wavelet transform based filtering [15]. However, the major disadvantage of all these techniques is that they generate deviation from the rules of the JPEG standard. Conversely, the Post-processing techniques rely on the improvement of the visual quality of JPEG compressed images by removing the artifacts through the processing after JPEG decoding. Therefore, these techniques do not require modifications on the existing JPEG encoder or decoder, and hence can be directly utilized with the existing JPEG standard. The Post-processing can be sorted into four main categories such as (1) Spatial-domain techniques [16]-[23], (2) DCT-domain based techniques [24]-[29], (3) Projections onto Convex Sets (POCS) based techniques [30]-[34], and (4) the block-shift filtering techniques [35]-[44].

Recently in 2014, Golestaneh et al. proposed a technique to enhance the quality of the JPEG image via two stages [45]. First, they have removed the blocking artifacts using boundary smoothing and guided filtering. Subsequently, they have reduced aliasing and blurring across the edges using a local edge regeneration method. The result of this technique was comparable to the others, but its performance is not uniform for all types of test images over different bitrates.

Therefore, this paper presents a new hybrid post-filtering technique to achieve better JPEG artifacts reduction at low bitrates uniformly for different types of JPEG images. The proposed hybrid technique utilizes two level artifacts suppression strategy. In the first level iterative steering kernel regression-based filtering is utilized, and in the second stage guided image filtering technique is used for the efficient JPEG artifacts reduction.

The complete organization of this paper is as follows; Section 2 describes the basic details of the proposed hybrid post-filtering technique, Section 3, presents the results and discussions followed by Section 4, which presents the conclusion of this work.

II. Proposed Hybrid Post-Filtering Technique

The simple flow chart depiction of the proposed hybrid post-filtering technique is depicted in Fig. 1. The proposed hybrid technique accepts a JPEG compressed image as the input and then applies a two-stage blocking artifacts reduction strategy. The first stage is being designed to initially remove the blocking artifacts using iterative steering kernel-based filtering [46]. The second stage removes other visual artifacts using guided image filtering [47].

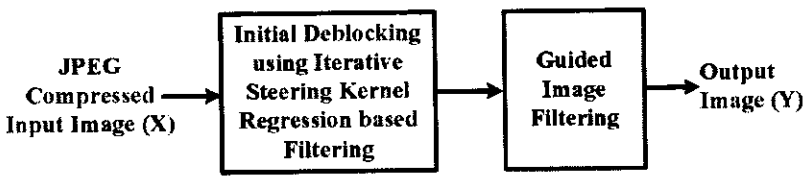

Figure 1. Flow chart of the proposed hybrid post-filtering technique

A. Iterative Steering Kernel Regression-based Filtering

The kernel regression-based filtering is the non-parametric estimation of the implicit model which is referred as the regression function [48]. In simple form, the 2-D kernel regression function can be defined as:

$$y_i = z(x_i) + \varepsilon_i; \qquad i = 1,2,\cdots P \tag{1}$$

Where, $Z(\cdot)$ is the regression function and $\varepsilon_i s$ is the independent and identical zero mean values, $x_i s$ are the data sample values and $y_i s$ are the measured data values. We can now simply provide a local level expansion of the above regression function as:

$$z(x_i) = z(x) + \{\nabla z(x)\}^T (x_i - x) + \frac{1}{2} vec^T \{Hz(x)\} vec\{(x_i - x)(x_i - x)^T\} + \cdots \tag{2}$$

Where, ∇ and H are the gradient and hessian (or also known as smoothing matrix) operators, and $vec(\cdot)$ is the vectorization operator. Further, considering the symmetry property of the Hessian matrix, (2) can be simply rewritten as,

$$z(x_i) = \beta_0 + \beta_1^T (x_i - x) + \beta_2^T vec\{(x_i - x)(x_i - x)^T\} + \cdots \tag{3}$$

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LAND USE AND AGRICULTURAL REGIONS OF BILASPUR DISTRICT – A SPATIO-TEMPORAL ANALYSIS.

Nagma Kausar Siddiqui and (Smt.) Uma Gole

ABSTRACT

Present paper is an attempt to analyze the spatio-temporal vaflations in respect to land use and agricultural regions of Bilaspur district for the past two decades (from the year 1990-91 to 2013-14). The study is based on secondary data collected from various Government offices of the district. Land use in literal terms means the parcels of land employed for different functions based on their quality and capacity. Whereas, agricultural region is an area which exhibits homogeneity in terms of agricultural land use, cropping pattern and combinations of crops.

Keywords *– Bilaspur District, Land use, Agricultural Regions, Spatio-Temporal.*

Introduction

In general terms land use means utilization of land and activities performed on it; thereby classifying it into different zones accordingly. Here, the land use is divided into six categories for study and analysis - Land not available for agriculture (land put to non-agricultural uses, barren and uncultivable land like mountains, river beds, etc), Other uncultivable land excluding fallow land (includes permanent pastures, grazing lands, area of miscellaneous tree crops and groves), land available for agriculture (the land which can be brought under cultivation but has not been cultivated successfully for more than past consecutive five years), fallow land (it is the land which is not under cultivation at the time of reporting but has been in the past, it divided into two subdivisions based on the time it has remained uncultivated; current fallow and old fallow), forest and net sown area (it is the actual area under crops sown at least once for the year of reporting). While, agricultural region is categorization of agricultural land according to the prominence of crop cultivated on it.

Sources of Data and Methodology

The analysis is based on secondary data collected from the Deputy Directorate of Agriculture and the Land Record Office, Bilaspur. The data for the land use and crop area has been taken for two time periods; first for the year 1990-91 and secondly for the year 2013-14. The obtained data for land use has been converted in per cent values for better understanding of the temporal variations and into three zones for cartographic purposes. For the calculation of crop combination regions Prof. S.M. Rafiullah's 'Maximum Positive Deviation Method' published in his article, 'A New approach to functional classification of towns' is employed. The formula used by Rafiullah is-

$$\delta = \frac{\Sigma D_p^2 - \Sigma D_n^2}{N^2}$$

Where, δ is deviation, D_p the positive difference and D_n the negative difference from the median value of the theoretical-curve valve of the combination and N is the number of functions in the combination. The cartographic representations of the obtained results have been done through the ARC GIS software.

The Study Area

Bilapur district is located in the north-western part of Chhattisgarh, its latitudinal extension

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Spatio-Temporal Variations in Agricultural Practices of Bilaspur District

Mrs. Uma Gole & Nagma Kausar Siddiqui

Abstract

Present paper is an attempt to analyze the Spatio-temporal variations in the agricultural development in Bilaspur District; through different measures Crop Concentration, Crop Diversification, Agricultural Efficiency and Carrying Capacity of Land. The data for spatial and temporal variations are taken for two time period (first is the average of three years data of 1990-91, 1991-92 and 1992-9; and the second time period is the average of year 2011-12, 2012-13 and 2013-14); from the secondary data collected from various Government offices of the district.

The main objective of this study is to outline the Spatio-Temporal variations or changes in agriculture of Bilaspur District through various measures and practices of Crop Concentration, Crop Diversification, Agricultural Efficiency and Carrying Capacity of Land.

Keywords:- Spatio-Temporal Variations., Crop Concentration, Crop Diversification, Agricultural Efficiency, Carrying Capacity of Land,

Introduction

Agriculture is the basic activity which not only provides food and job opportunity, but constantly keeps changing and improvising. Efforts for increase in productivity and efficiency of agriculture have been made since the dawn of Green Revolution in India. As the techniques involved in farming keep on changing so does the outcome. Present study is an attempt to analyze agricultural characteristics in the past two decades of Bilaspur district. The measures considered for the Spatio-temporal analysis are firstly, Crop Concentration; secondly Crop Diversification; thirdly Agricultural Efficiency; and lastly Carrying Capacity of Land. These measure will present the agricultural scenario for two time periods (first is the average of three years data of 1990-91, 1991-92 and 1992-9; and the second time period is the average of year 2011-12, 2012-13 and 2013-14).

Study Area

Bilaspur district is located in the North-Western part of Chhattisgarh, its latitudinal extent is from 21°47′N to 23°8′N while from 81°14′E to 83°15′E is the longitudinal extent. Major part of the district is drained by River Mahanadi and its tributaries Manjhari, Hasdeo, Leelagar, Arpa; whereas there are 122 canals, 116 ponds, 11031 tubewells and 6305 wells aiding in irrigation. The recorded average rainfall for the year 2014 was 13789.8 mm while the average temperature was 24.68°C. The soil of the district can broadly be divided into three types- Kanhar, Matasi and Dorsa while the mean sea level is 262 meter. Bilaspur district

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Two episodes of structural fractures and their stress field modeling in the Ordos Block, northern China

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ABSTRACT

The importance of the Ordos Block, which is surrounded by different Chinese continental blocks, is well documented, but the development of the structural fractures and the stress fields within the Late Mesozoic and Cenozoic eras in this stable block (dips of the Mesozoic and Cenozoic strata are less than 3°) have been poorly studied. In this paper, two dominant groups of structural fractures with NW to EW and NNE to ENE trends are identified through field measurements and imaging log observations. The maximum principal compressive stress magnitudes and stress trajectories are calculated employing 2D finite element models (2D-FEM). Based on the displacement fields, the rotation of the Ordos Block and comparisons between the measured and the calculated stresses, it can be deduced that there are two episodes of fracture formation in the Ordos Block. The calculated orientations of maximum compressive stress in the Late Mesozoic and the Cenozoic eras are found to be WNW and NE respectively, which imply that the NW to EW trending structural fractures were developed in a Late Mesozoic stress field whereas the NNE to ENE ones were developed in a Cenozoic stress field in the block. The change in stress fields may have resulted in the change in tectonic setting from the northwestward subduction of the Izanagi Plate in the Late Mesozoic to the collision between the Indian Plate and the Eurasian Plate in the Cenozoic. The change in the Mesozoic and Cenozoic stress fields is of great significance to the further fracture prediction in fractured reservoirs, basin analyses in the Ordos Basin and research on the geodynamics of the North China Craton.

1. Introduction

The Ordos Block is the main segment of the Western Block in the North China Craton, which is surrounded by the eastern North China Craton, the Central Asian Orogen, the Tarim Craton, the South China Craton and the Tibet Plate (Fan et al., 2003; Cheng et al., 2014; Sun et al., 2014) (Fig. 1). Owing to its unique location and seismic activities, the Ordos Block can provide valuable information about the interaction of multiple Chinese continental blocks and the tectonic evolution of the eastern and western China (Zhang et al., 1998; Cheng et al., 2014). Among the various models proposed to explore the movements of the Ordos Block during the Late Mesozoic–Cenozoic, one model suggested that the horizontal forces from the adjacent blocks were only a secondary component, whereas another model emphasized the importance of the lateral shearing and horizontal compression along the boundaries (e.g. Wang et al., 2014a). It is generally accepted that the movement of the Ordos Block was instigated by the interaction of the adjacent plates, which occurred either by the subduction of the Izanagi Plate in the eastern part of the block or by the collision between the Indian Plate and the Eurasian Plate in the southwestern part (e.g. Fan et al., 2003; Yuan et al., 2007). The tectonic interaction between the Ordos Block and its adjacent plates becomes the foundation of further research on structural fractures and stress fields in the Late Mesozoic and Cenozoic eras.

Even though the block was very stable in the Mesozoic–Cenozoic era (i.e. the dips of the Mesozoic and Cenozoic strata are less than 3°), structural fractures are well developed in the central Ordos Block. The formation mechanism of these fractures may be related to the rotation of the block, which was an important tectonic event in the Mesozoic and Cenozoic eras. On the basis of the paleomagnetic evidence, it is generally accepted that the Ordos Block rotated in an anticlockwise direction during the Late Mesozoic era after the amalgamation of the North China Craton and the South

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2 Dyke emplacement in the Narmada rift zone and implications for the evolution of the Deccan Traps

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Abstract: The Deccan Large Igneous Province of India is the product of fissure eruptions, and contains vast lava fields and dyke–sill networks. It is associated with several rift zones in peninsular India, which reflect pre-existing major weaknesses in the Indian lithosphere. In rift-zone eruptions, magma is normally transported to the surface through dykes. However, some injected dykes do not reach the surface but are arrested at depth in the rift zone due to mechanical heterogeneity and anisotropy, or insufficient magma pressure. In the present work, the effects of mechanical layering and regional tension on dyke emplacement in the Narmada rift zone are studied. The results indicate that the distribution of maximum principal tensile stresses was altered by mechanical layering and/or regional tension, which has led to variations in potential dyke propagation pathways. Studies on dyke evolution and emplacement in the Narmada rift zone indicate four evolutionary stages: stage I – arrival of a mantle plume and pre-volcanic extension; stage II – formation of shallow magma chambers; stage III – vertical dyke injection and fissure eruption; and stage IV – the 'blanket effect' and lateral dyke propagation.

Dykes are primarily extensional fractures that form perpendicular to the minimum principal compressive stress. Hence, mafic dyke swarms can be used to indicate the orientation of the regional horizontal maximum stress at the time of their formation (Ernst *et al.* 1995, 2001; Gudmundsson 2002; Hou *et al.* 2006, 2008, 2010; Ju *et al.* 2012, 2013*a*; Barnett & Gudmundsson 2014).

Many large igneous provinces, such as the Deccan Large Igneous Province (DLIP) of India, are products of fissure eruptions. These vast lava fields can be both extensive and complex, cropping out in dyke–sill networks (Elliot & Fleming 2004). Three major regional-scale dyke swarms that crop out in the DLIP are the approximately NEE–SWW-trending Narmada–Tapi dyke swarm, the weakly oriented Nasik–Pune dyke swarm and the approximately N–S-trending West Coast dyke swarm (Deshmukh & Sehgal 1988; Sheth 2005; Bondre *et al.* 2006; Ju *et al.* 2013*a*; Fig. 1). However, a detailed study by Misra *et al.* 2014 revealed that trends of the West Coast dyke swarm vary widely. The DLIP and the three above-mentioned major dyke swarms are associated with several rift zones of peninsular India, which reflect pre-existing major weaknesses in the Indian lithosphere. In rift-zone eruptions, magma is normally transported to the surface through dykes. However, most injected dykes do not reach the surface but remain blind beneath rift zones, primarily due to mechanical heterogeneity and anisotropy of the crust, particularly caused by layering (Gudmundsson & Loetveit 2005; Barnett & Gudmundsson 2014).

Dykes have been studied extensively using various approaches (Walker 1986; Lister & Kerr 1991; Mcleod & Tait 1999; Watanabe *et al.* 2002; Valentine & Krogh 2006; Ray *et al.* 2007; Hou *et al.* 2008; Ju *et al.* 2013*a*). Ray *et al.* (2007) calculated magmatic overpressure and source depth for dykes in the Nandurbar–Dhule region based on field and structural data. Ju *et al.* (2013*a*) studied the mechanics of mafic dyke swarms in the DLIP using numerical models. Comparatively less attention has been paid to dyke emplacement with reference to mechanical layering and regional tension. Therefore, in the present study, several numerical models

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Geochemistry and Petrogenesis of Felsic Meta-volcanic Rocks of Baghmara Formation, Sonakhan Greenstone Belt, Central India

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Abstract

The Neo-Archean Sonakhan Greenstone Belt (SGB) is located in the north-eastern fringes of the Bastar craton in Central India and is composed of greenschist to amphibolite facies meta-volcanic rocks and meta-sedimentary sequences. The felsic meta-volcanic rocks from SGB exhibit steep REE pattern (La/Yb = 66.86). The trace element geochemistry indicates negative Nb and Ti anomalies in the multi-element spider diagrams suggesting subduction related origin for this volcanic suite. It has been inferred that the felsic and mafic volcanic rocks are characterised by bimodal volcanism. The felsic magmatism in SGB might have been generated by the partial melting of the crustal portion, either due to the heat generated by the diapirism of mafic magma or by the heat generated during the subduction process.

Keywords: Archean Sonakhan Greenstone Belt, Bagmara formation, Suprasubduction zone, Bastar Craton, Central India.

Introduction

Convergent plate margins are the major sites of crustal growth and accretion. The mixing of subduction-related mafic magma and crust-derived felsic magma in active continental margins accounts one of the principal mechanisms of crustal generation and growth (Foley *et al.*, 2002; Rudnick and Gao, 2003, Taylor and McLennan, 1995). The addition of Juvenile crustal materials and the growth of continental crust are controlled by vertical and lateral accretions. The accretion of oceanic and trench materials onto the active continental margins cause the lateral and vertical growth and thickening of arc crust derived from the magmas derived by melting of mantle wedge fluxed with slab-dehydrated fluids (Santosh, 2013). The Neo-Archean greenstone terrains are characterized by tholeiite-komatiite magmas derived from plume magmatism and bimodal tholeiitic to calc-alkaline assemblage of basalt-andesite-dacite-rhyolite (BADR) derived from an island arc setting (Wyman *et al.*, 2002; Wang *et al.*, 2013, Wang *et al.*, 2008). Rhyolites constitute an integral component of BADR association in convergent margin setting. In subduction related environment, active continental margins are the important sites of rhyolitic magma generation (Eyuboglu *et al.*, 2013).

The present study primarily focusses on the preliminary geochemical and petrographic aspects of meta-rhyolites, nature of felsic magmatism and crustal evolution in SGB, which is located on the north-eastern fringes of Bastar craton.

Geological Setting

The Peninsular Indian Shield comprises several cratonic nuclei and records a long history of crustal evolution. The entire region is divided into two distinct crustal provinces, namely the southern crustal province and the northern crustal province, which are separated by the Central Indian Tectonic Zone (CITZ) (Radhakrishna and Naqvi, 1986; Yedekar *et al.*, 1990; Rogers and Santhosh, 2003; Santhosh *et al.*, 2009). The southern crustal province consists of Archean cratonic nuclei namely Dharwar, Bastar and Singhbhum cratons, whereas the northern crustal province consists of the Bundelkhand craton.

The Bastar craton of central India is bounded by the Central Indian Tectonic Zone (CITZ) to the north and the Eastern Ghats Mobile Belt to the south. The eastern and western boundaries are defined by two Phanerozoic rift systems, the Mahanadi rift, and Godavari rift respectively. The volcano-sedimentary sequence in the northeastern part of the

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(4) The model of fracture development in the faulted folds: The role of folding and faulting

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The model of fracture development in the faulted folds: the role of folding and faulting

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ABSTRACT

Tectonic fractures are otherwise known as joints or fissures. The density of tectonic fractures is governed by the lithology, layer thickness and structures. The distribution and density of tectonic fractures in the Kuqa Depression in the northern Tarim Basin of Northwest China are dominantly controlled by the regional faulted fold belt. Our purpose of this paper is to analyze how folding and faulting control the development of tectonic fractures, based on outcrop and logs of drill data. In the folded tight sandstone reservoirs in the Kuqa Depression, the extensional area, transition area and shortening area have been separated by two neutral lines, which control the distribution and density of tectonic fractures in the buckle folds. From the twelve sites of field measurements, six logs of drill core data and analysis of the micro-texture of tectonic fractures, it can be deduced that the fracture development in the sub-salt faulted fold belt is related to the neutral lines and related faults. The high-density tensile fractures in the vicinity of fold hinges are more developed than in the limbs of the fold. Folding is thus the first level of control over the general pattern of fracture distribution. The fractures in the hanging wall of the thrust faults are more developed than those in the footwall. Further more, the fractures in the hinge zone and steeply tilted limbs of folds close to thrust faults are more developed than the gently tilted limbs which are far from faulting. This suggests that faulting is a secondary control over the development of local fractures within the faulted fold belt. The development of fractures related to faulted folds in the Kuqa Depression can be also divided into three episodes: pre-folding, syn-folding and post-folding, which are identified by field observation.

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GEODYNAMICS

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Mechanism of Paleo-Mesoproterozoic rifts related to breakup of Columbia supercontinent: a paleostress field modeling

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Highlights

- Numerical modeling of breakup between the NCC and Indian Craton is performed.
- Mechanism of Zhongtiao aulacogen and initial breakup of Columbia are revealed.
- Coupling of mantle plume and plate tectonic forces contributes to the mechanism.

Abstract

The Paleo-Mesoproterozoic Zhongtiao aulacogen in the North China craton and Cuddapah basin in the Indian craton, have both been interpreted as intra-continental rift formed by a mantle plume that led to the breakup of Columbia supercontinent, but the mechanism has not been completely deciphered. In this paper, the mechanism of the Zhongtiao aulacogen and Cuddapah basin related to initial breakup of Columbia has been evaluated with 2D elastic finite element

3.4.5

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भुम पुटूल कोया पंडुम

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प्रस्तुत शोधपत्र में बस्तर के आदिम जनजातियों द्वारा मनाई जाने वाली प्रमुख धार्मिक पर्व, उदार प्रकृति के प्रति सदैव कृतज्ञ रही है,इनकी संस्कृति में प्रकृति के उपादानों के लिए कृतज्ञता ज्ञापन, नयी फसल आने पर उसे ग्रहण करने के पूर्व पर्व मनाकर किया जाता है। इसे "कोडता तिहाना"(नवा खानी) कहते हैं। बीज बोने के पूर्व धरती माता से याचना करते हैं,माटी पुजा का पर्व मनाते हैं। विधिपूर्वक पूजा अर्चना कर नाचते–गाते माटी के प्रति श्रद्धा प्रकट करते हैं, आदिम जनजातियाँ पर्व त्यौहारों को बहुत महत्व देते हैं, हर फसल में पर्व का अयोजन किया करते हैं, ये समुदाय का तीन पर्व मुख्य रूप से बनाते हैं। नवाखानी, माटी तिहार, आँगुस, ये जहाँ पर हो उस पर्व में अपनी पूवर्जों के स्थान पर जावे है। इस आलेक में जयमती कश्यप ने बस्तर संभाग के पर्वो का विस्तृत चर्चा की है।

प्रस्तावना

बस्तर के आदिम जनजातियाँ प्रकृति की पूजा करते हैं। ये अपने भाव को प्रकट करने के लिए तिहार पर्व मनाते है इसे गोंडी बोली में भुम पुटूल बनेया पंडुम अर्थात आदिम जनजातियों के तीज–त्यौहार कहते है। बस्तर की जनजातियाँ प्रमुख रूप से तीन पर्व मनाते है, सम्पूर्ण बस्तर संभाग के आदिवासी अलग–अलग तिथियों में अपने त्यौहार मनाते है, इसके पीछे कारण यह है कि एक गांव के लोग दूसरे गांव के त्यौहार में शामिल होते है माटी पूजा, नयी खानी, आमुस आदि। समुदाय हर पर्व को समुह में मनाते है, ऐसा ही माटी पूजा को पर्व के रूप में मनाते थें। आदिम जनजातियों का प्राण माटी बसता था। उनका जीवन पुरी तरह माटी पर निर्भर होता था, इस लिए वे माटी को प्राण से अधिक महत्व दिया करते थें, और वे माटी की अंनत सत्ता से पूर्णतः प्रभावित थी। प्रभावित ही नहीं, अपितु यह माटी की उपदेयता के आगे श्रद्धा से नतमस्तक होकर, माटी पूजा कर उसके प्रति आंतरिक कृतज्ञता का भाव प्रकट करते थें। बस्तर संभाग के अलग अलग क्षेत्रों में अपना विधि पूर्वक पूजा करते थें, जैसे दक्षिण बस्तर में जोगरदई से संचालन किया करते थे, पश्चिम में मेन कोडुम, उत्तर में देव लाउड़ गध्य बस्तर में माटी देव गुडी से पूजा विधिविधा होता था। ये पूजा लगातर तीन दिन होता था। शताब्दियों से यहां निवास करने वाली

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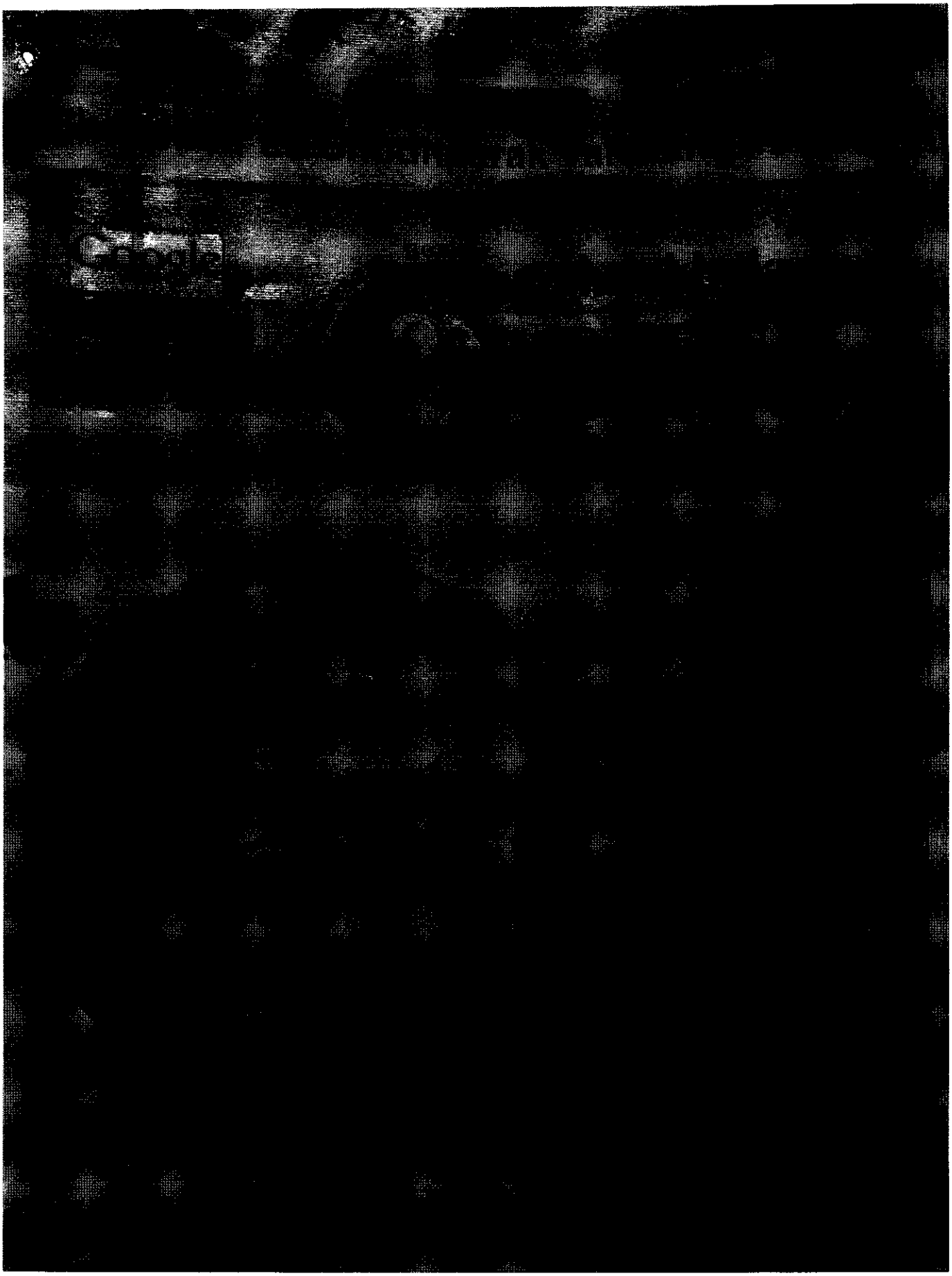

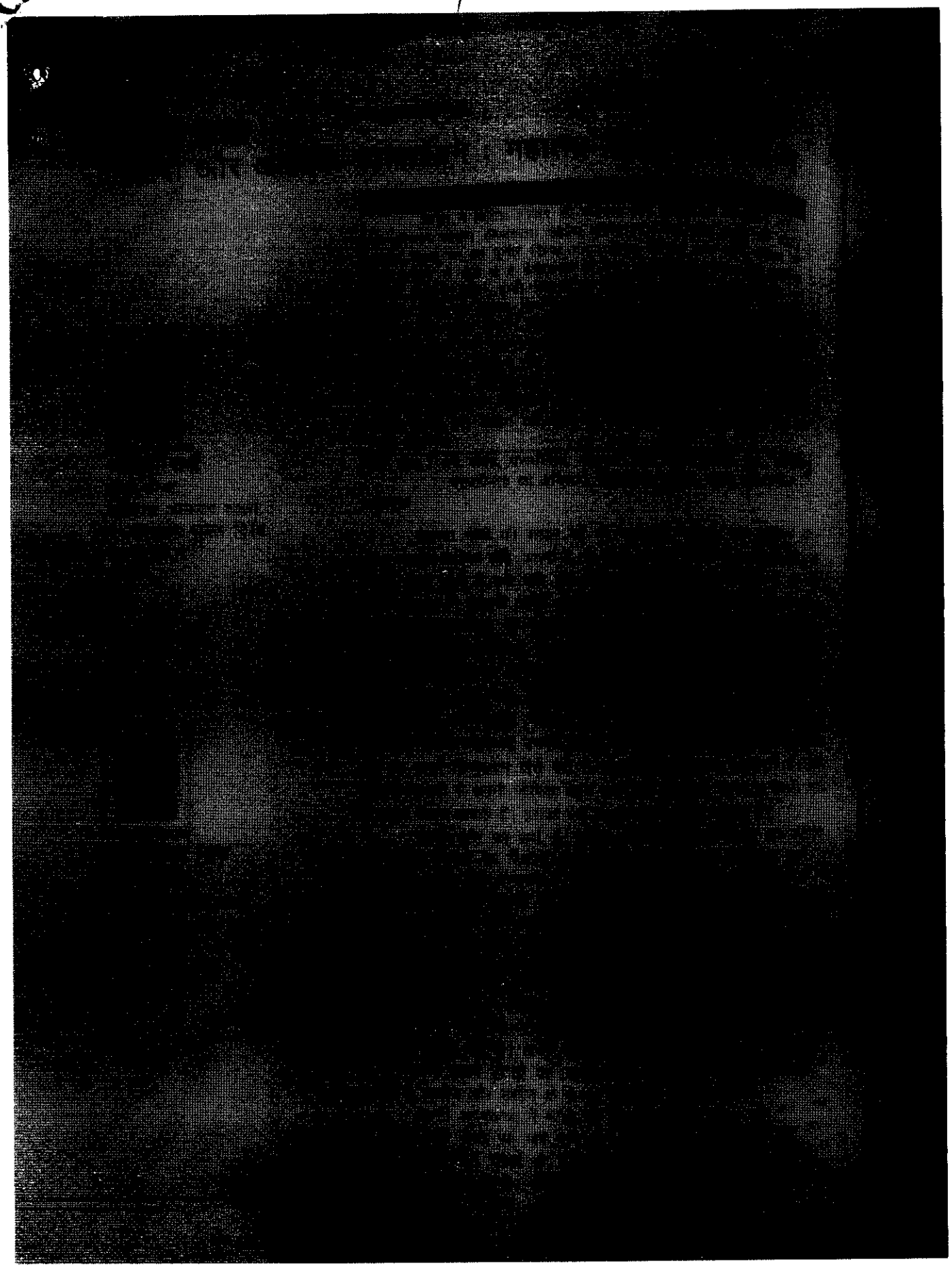

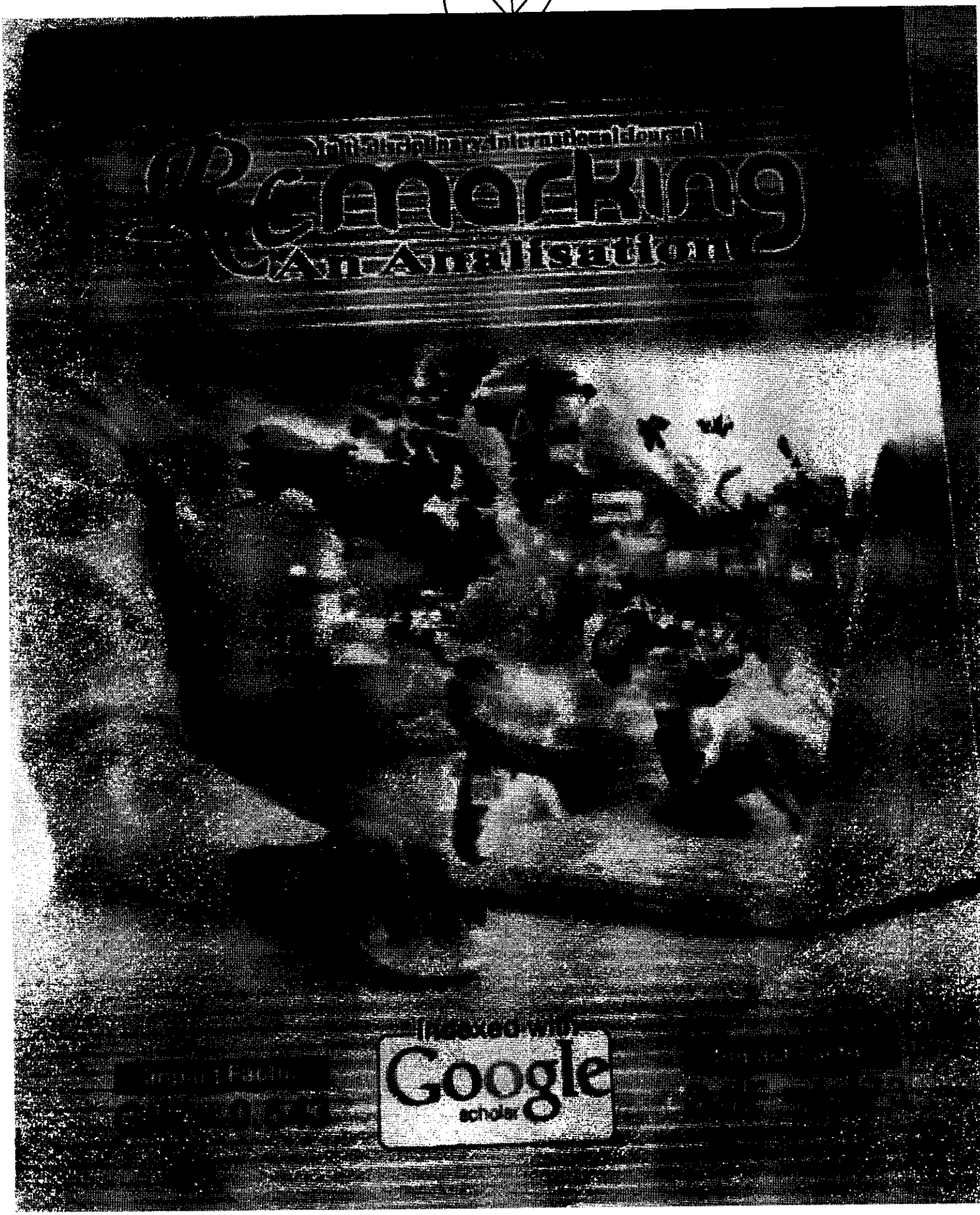
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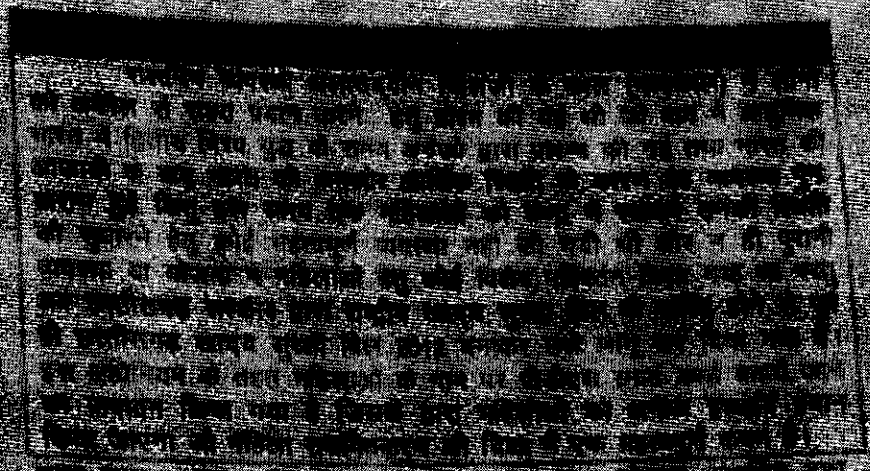

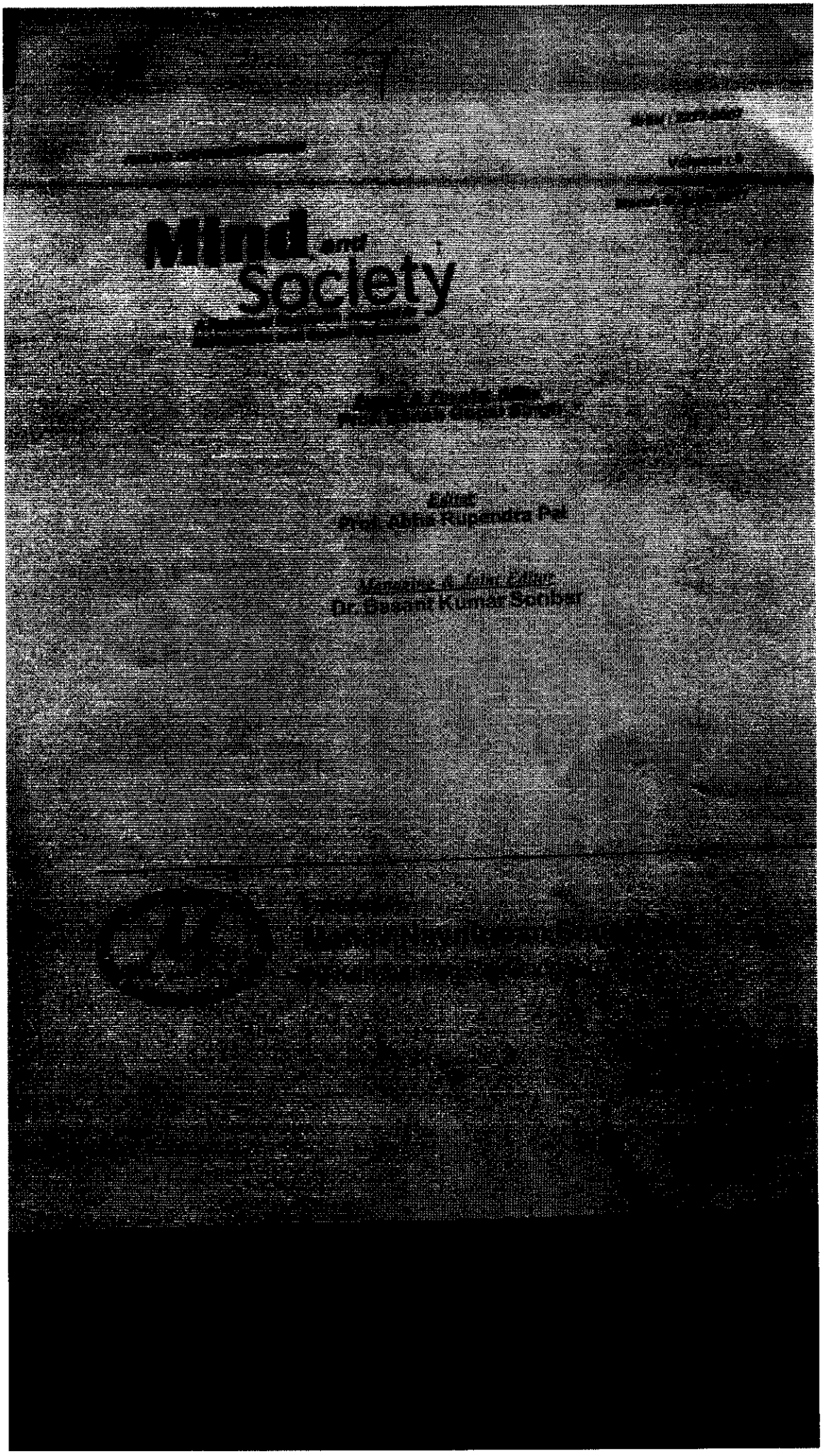
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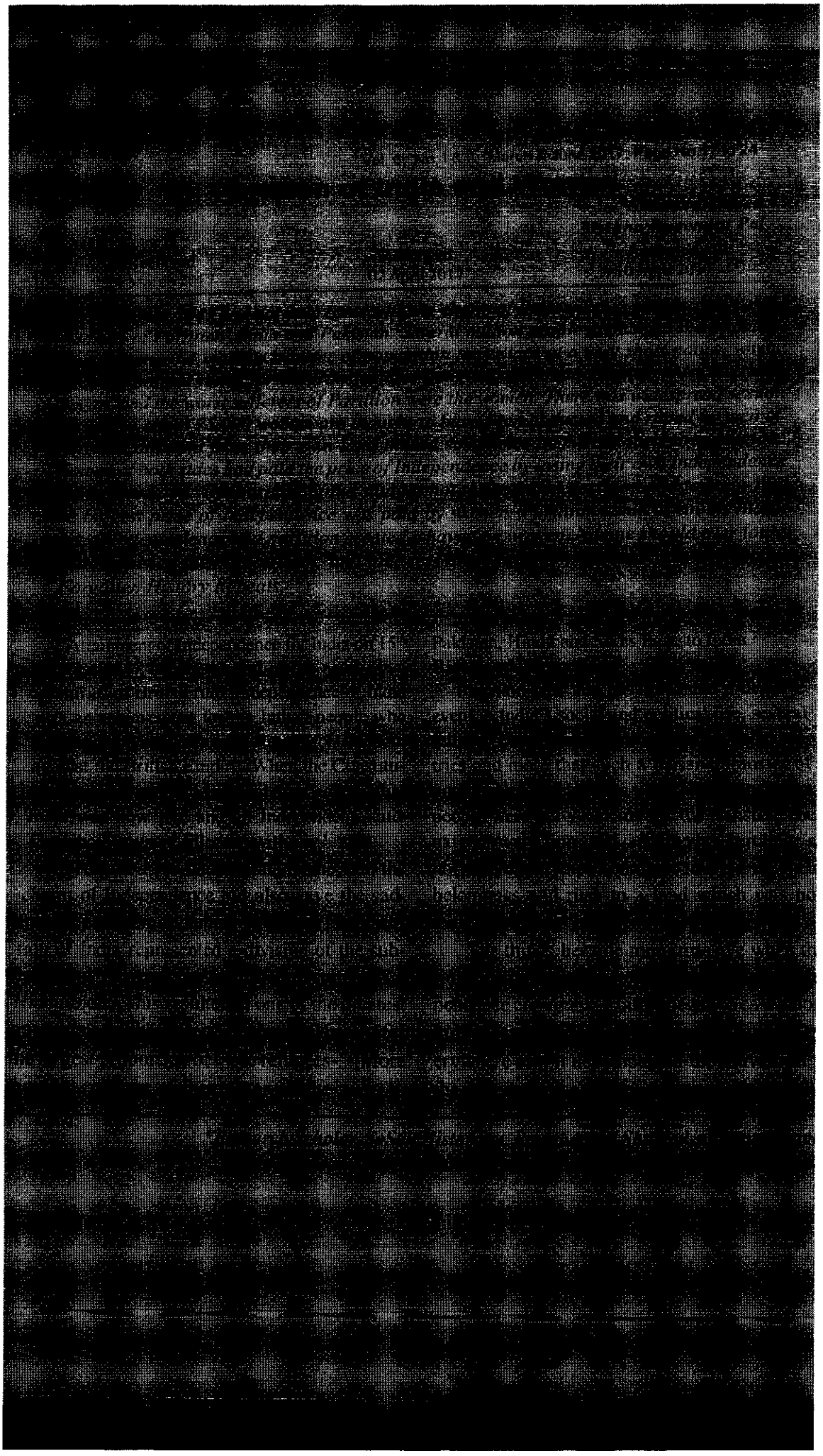

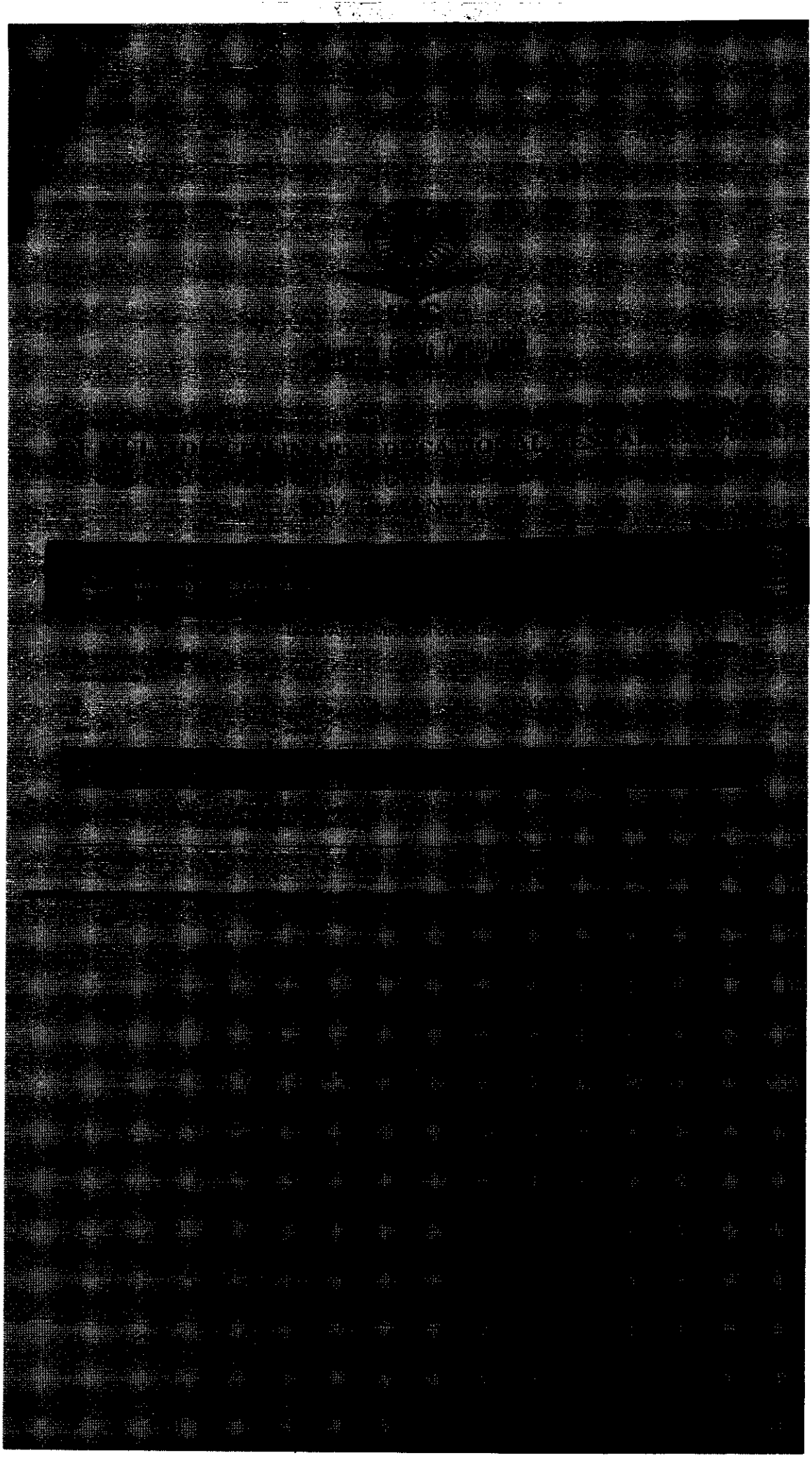

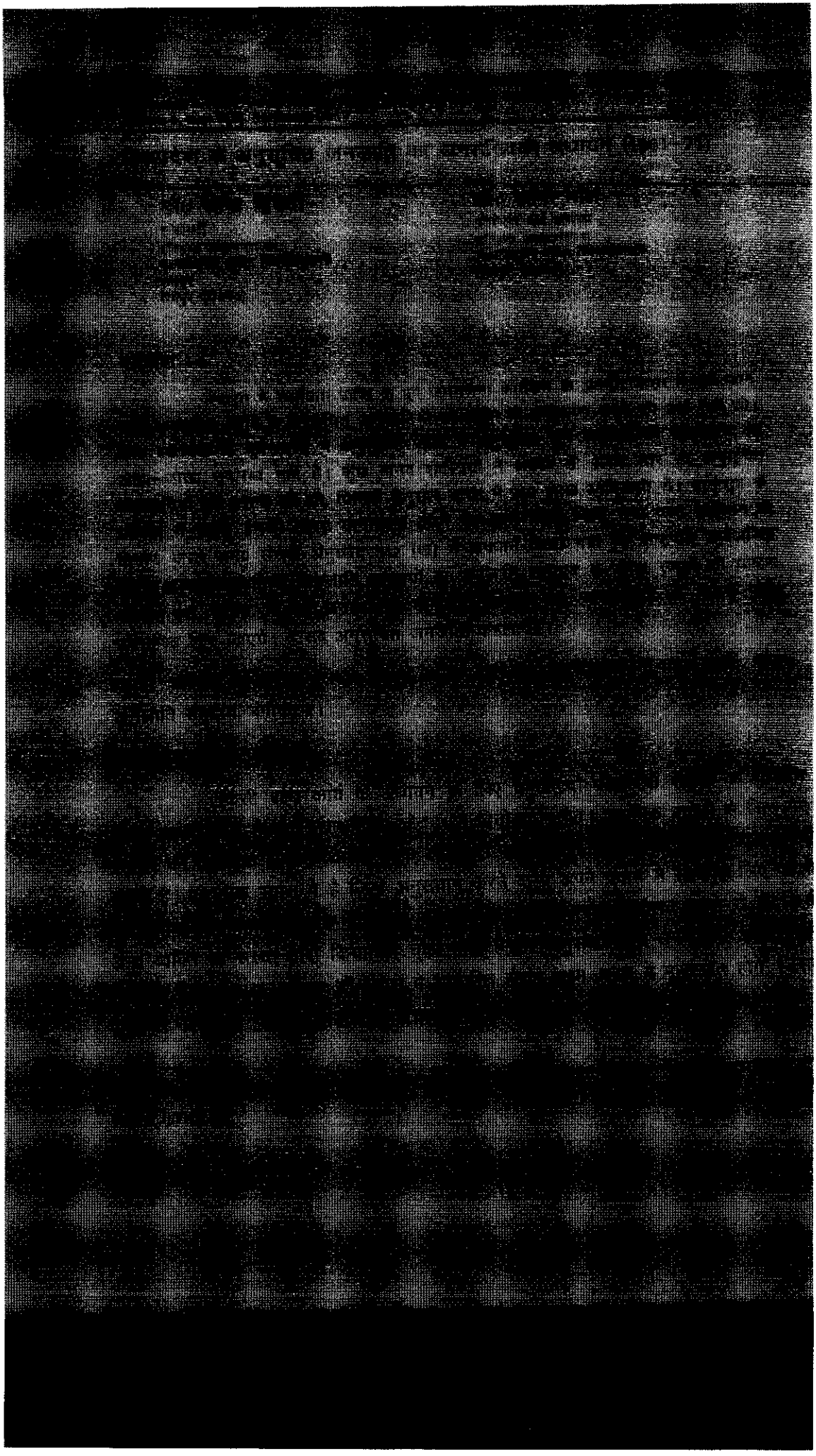

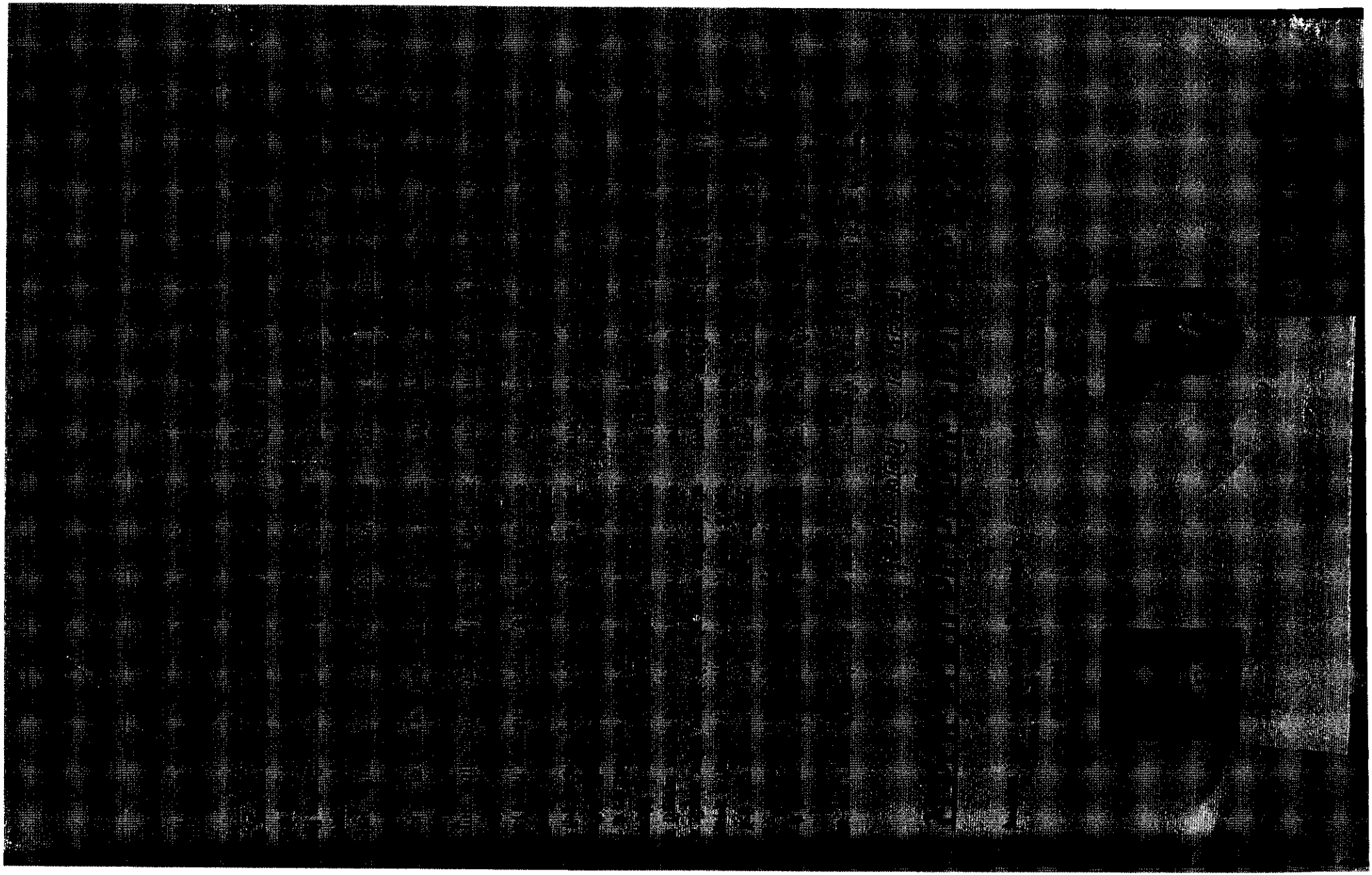

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बैगा आदिवासियों का सामाजिक, आर्थिक एवं सांस्कृतिक जीवन

(अमरकंटक के विशेष सन्दर्भ में)

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मानव समाज एक प्रगतिशील समाज है, जिसके सामाजिक — सांस्कृतिक और आर्थिक जीवन का निरंतर उद्विकास होते आया है। विकास की यह निरंतरता, समाज के हर वर्ग में आयी, परन्तु उसकी गति में भिन्नता समाहित रही। बैगा आदिवासी के सन्दर्भ में यदि कहा जाये तो उनका पूरा जीवन प्रकृती पर निर्भर है, और उसी के अनुरूप इनकी परम्परायें ,विश्वास व अर्थव्यवस्था भी बदलती रही है। एकाकी जीवन व्यतीत करने वाले बैगा धीरे धीरे रूप से बदलाव अमरकंटक अंचल में भी देखा गया। जब समाज और समाज के सम्पर्क में आने लगे और अपनी विधा से सभ्य समाज को परिचित कराया। जनजाति अथवा ग्राम्य जीवन पर हो तब संस्कृति पर इतिहास लेखन हो ,और वह भी आम जन, मौखिक स्रोतों की अनिवार्यता और बढ़ जाती है यद्यपि अमरकंटक अंचल विशेष पर द्वितीयक स्रोतों के रूप में लेखो का अध्ययन किया गया लेकिन प्रत्यक्ष अवलोकनों और अनौपचारिक साक्षात्कार द्वारा ही इनके विषय में जानकारी इकट्ठी की गयी हैं। अध्यनों परान्त पाया गया कि बैगा समाज ने आज भी सभ्यता को उस रूप में स्वीकार नहीं किया कि उनका पलायन अपनी संस्कृति व समाज से हो जाये। वह अपनी निष्ठा ,ईमानदारी व स्वच्छंदता को एक परम्परागत धरोहर के स्वरूप में संजोये हुए है।

सभ्य समाज से दूर, आज भी ऐसे समुदाय है जो सभ्यता के प्रभावों से खुद को दूर रखकर ,बिना किसी भौतिकवादी आडम्बरों के जंगल और पहाड़ों में अपना जीवन बसर करते है। उनका जीवन प्राचीन परम्पराओं से घिरा हुआ है। उनकी परम्परायें ,विश्वास व आस्था अन्य समाज से भिन्न है।[1] बैगा ऐसे ही समाज का प्रतिनिधित्व करते है जो, उस आदिम गंध से महकते वनफूलों की तरह है, जो अपनी अनोखी जीवनशैली को जीता हुआ ,आधुनिकता से दूर बसता है।[2] सम्पूर्ण भारत मे सर्वाधिक बैगा म.प्र. के दक्षिण पश्चिम में निवास करते है। ये मैकल पर्वत श्रेणियों की गहन कंदराओं ,घाटियों व नर्मदा नदी के किनारे —किनारे ही निवास करते है, इसीलिए डिंडोरी जिला और बिलासपुर जिले के बीच का भाग "बैगाचक "कहलाता है। बैगा अपनी पुरानी परम्पराओं को प्रतिबिंबित करते है। इनकी उत्पत्ति के बारे में तो कोई ठोस प्रमाण नहीं मिलता है , और न ही लिखित इतिहास मिलता है। अर्थात् केवल इनके पूर्वजों द्वारा कही गई पौराणिक गाथाओं से ही मालूम होता है की, इनकी उत्पत्ति कैसे हुई । बैगा खुद को जंगल का राजा तथा सृष्टि का निर्माता बताते है। रसेल और हीरालाल के अनुसार ,"सर्वप्रथम भगवान ने नागा बैगा और नागा बैगनी को ,वे जंगल में रहते थे। कुछ समय बाद उनके दो पुत्र हुए ,उन्होंने अपनी —अपनी बहनों से विवाह कर ली, जिससे मनुष्य जाति की उत्पत्ति, इन दोनों युगलो से हुई। पहले युगल से बैगा व दूसरे युगल से गोंड की उत्पत्ति हुई।"[3] बैगा आदिवासियों की जीवनशैली पर जंगल का प्रभाव रहा है।

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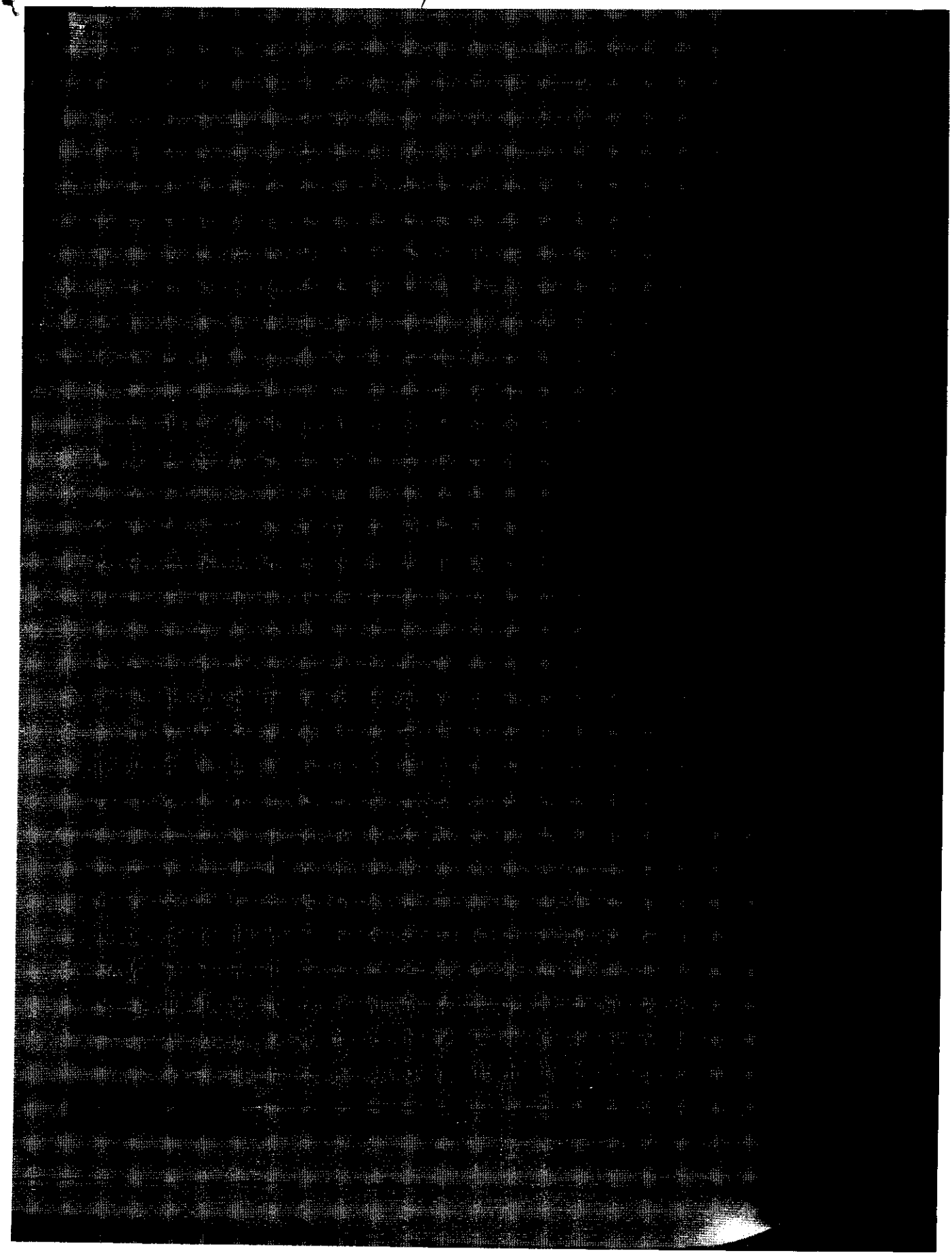

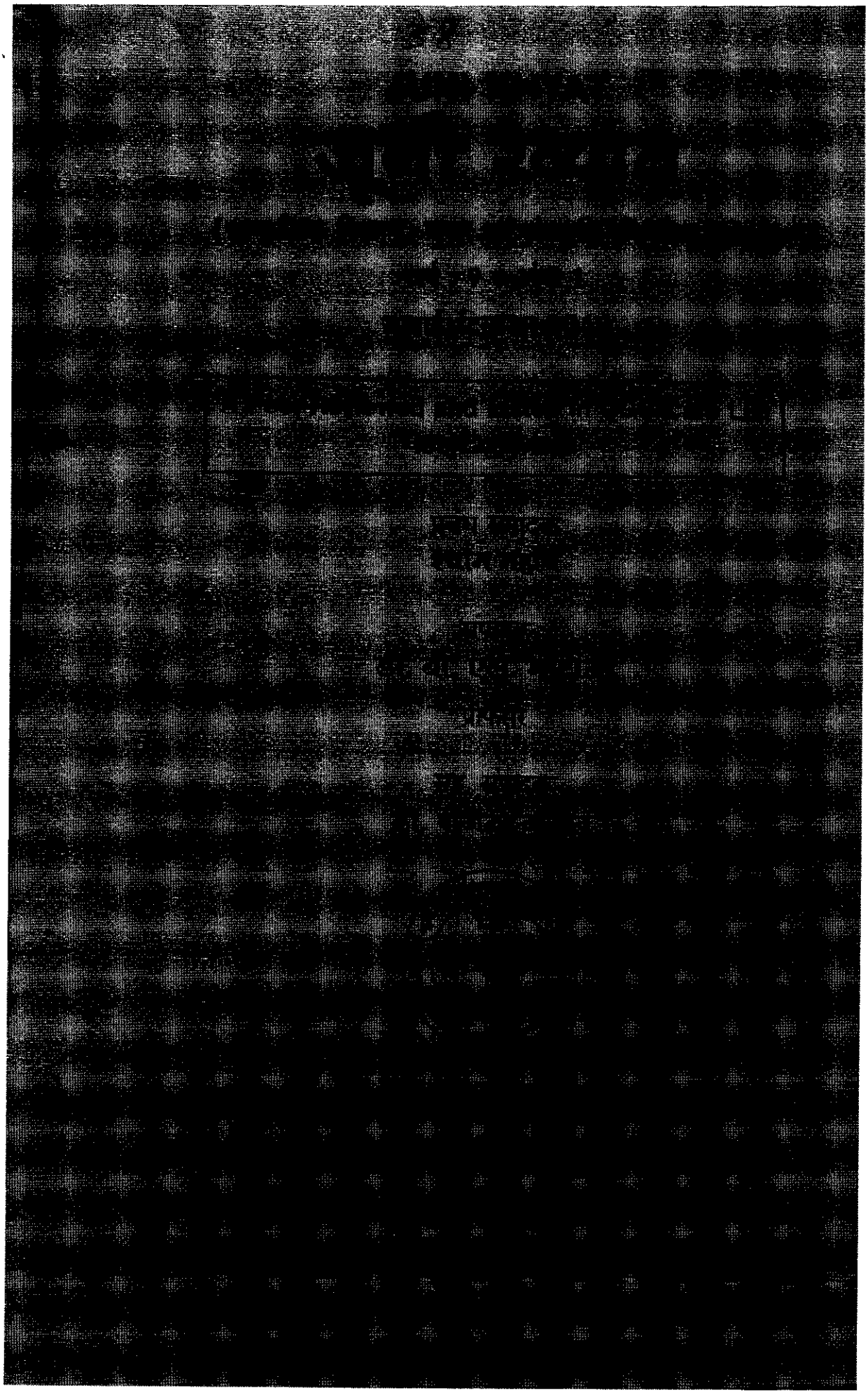

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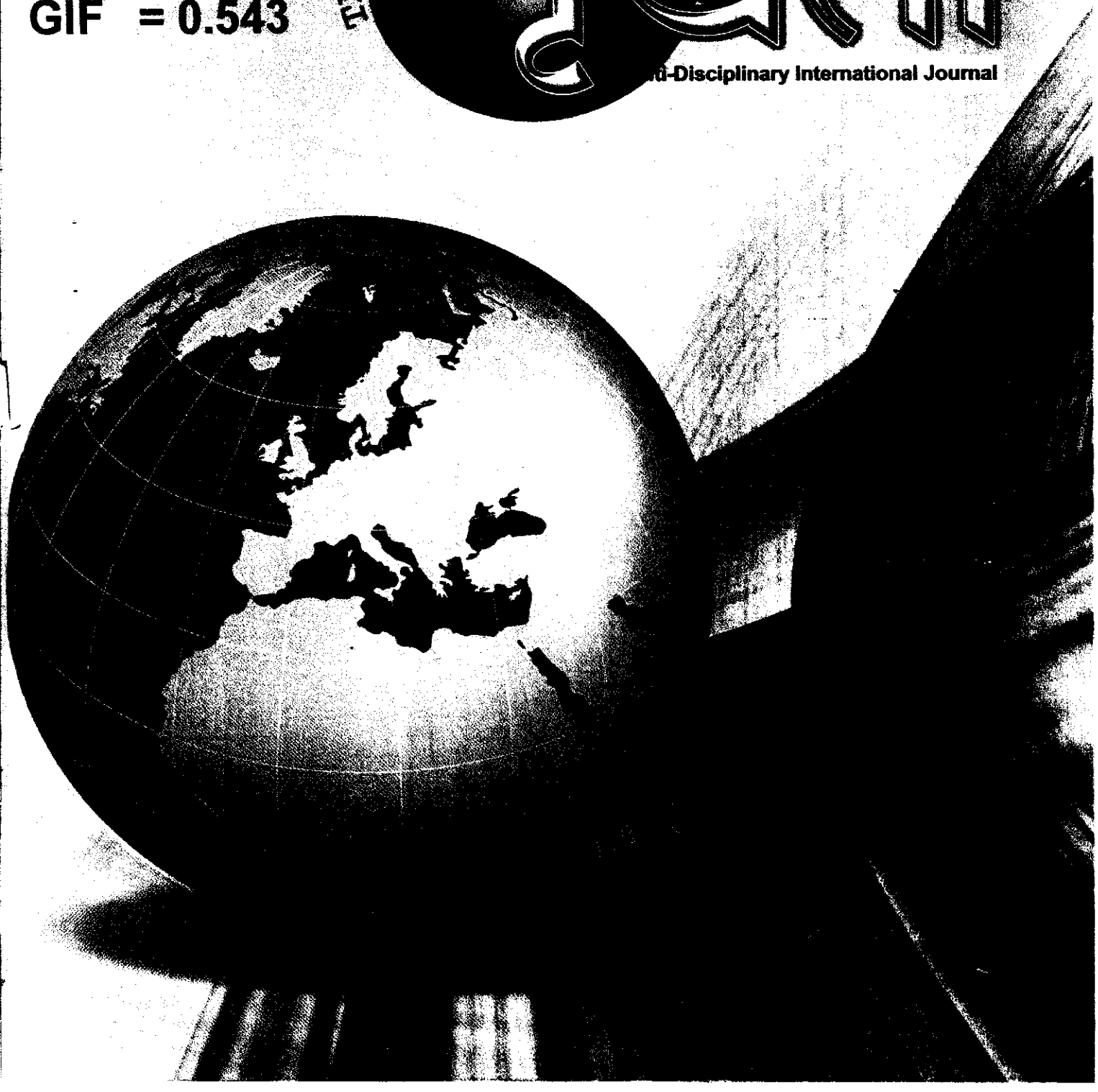

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1859 ई. का बस्तर का कोई विद्रोह

सारांश

बस्तर एक आदिवासी बाहुल्य अंचल रहा है। यहां के आदिवासियों में धार्मिक विश्वास और आस्था का आधार है प्रकृति।यहां की प्राकृतिक परिस्थितियां वनों के सर्वथा अनुकूल है। बस्तर का लगभग 57 प्रतिशत भाग वनों से आच्छादित है। वन बस्तर के सौंदर्य है, जीवन है, संस्कृति है वस्तुतः वन बस्तर के प्राणतंत्र है। यहां के वनवासियों का समग्र जीवन वनों की गोद में ही तो गुजरता है। जन्म से लेकर मरण तक वृक्षों की हर सांस इनके साथ रहती है। बस्तर के आदिवासी अपने देवी–देवता का स्थान वृक्षों में ही पाते है। इनके प्रति असीम श्रद्धा वनवासियों के मन में रहती हैं तथा वृक्षों को वे नहीं काटतें है।

मुख्य शब्द : यजुर्वेद, अथर्ववेद, पद्मपुराण, मत्स्यपुराण, वराहपुराण, स्कन्दपुराण, दत्तक निषेध,कोई, मांझी, बंजारा, सिरोंचा।

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रायपुर, छ.ग.

प्रस्तावना

बस्तर छत्तीसगढ़ राज्य का एक आदिवासी बाहुल्य अंचल रहा है। यहां के लोग अपने देवी – देवता का स्थान वृक्षों में ही पाते है। इनके प्रति असीम श्रद्धा वनवासियों के मन में रहती है तथा वृक्षों को वे नहीं काटते है। बस्तर के वनों में साल वृक्षों की अधिकता के कारण "बस्तर को साल वनों की द्वीप" कहा जाता है। बस्तर को 1854 ई. में लार्ड डलहौजी ने नागपुर के अधीन होने के कारण अपने आंग्ल नियंत्रण में ले लिया तथा उनकी दृष्टि बस्तर के वनों पर पड़ी। वहां के साल वृक्ष की लकड़ी का उपयोग भारत भर में रेल लाईन बिछाने के उद्देश्य से वनों की कटाई कराने का आदेश दिया गया, जिसका बस्तर के आदिवासी समूह "कोई" ने विरोध किया। 1859 ई. में यह क्षेत्र "कोई आंदोलन" से प्रभावित रहा। ठेकेदारों व अंग्रेजी सरकार के लोगों को बस्तर के कोई आदिवासियों ने मार भगाया तथा बस्तर के साल वृक्ष को काटने नहीं दिये, कई लोग इस विद्रोह में मारे गए। खराब स्थिति को देखकर सिरोंचा के डिप्टी कमिश्नर सी.ग्लासफर्ड को तुंरत ही दक्षिण बस्तर आकर विद्रोहियों से समझौता करना पड़ा तथा अपना आदेश वापस लेना पड़ा। इसमें कोई आदिवासियों की पूरी तरह जीत हुई।

उद्देश्य

1. बस्तर के आदिवासी सरल व शांत प्रवृत्ति के होते है लेकिन उनके जीवन व प्रकृति के खिलाफ शासकीय नीतियां होने पर समयानुसार वे विरोध भी कियें है जिनका अध्ययन इस शोध पत्र में किया गया है।
2. कोई आदिवासी प्रकृति की रक्षा के प्रति बहुत ही सजग व जागरूक है जो कि प्रेरणाप्रद है।
3. अपने जीवन की चिंता न करते हुए वे आदिवासी अपने फरसा, भाले, कुल्हाड़ी, तीर कमान आदि से ही अंग्रेजी सेना व ठेकेदारों के बंदूको से लोहा लिए है। अपने अधिकारों की लड़ाई औपनिवेशिक शासक अंग्रेजों के विरूद्ध लड़ी है जिनका अध्ययन इसमें किया गया है।
4. इस आदिवासी विद्रोह को भारत के किसी विद्रोह में शामिल नहीं किया गया है जबकि यह विद्रोह भारत में वन सुरक्षा संबंधी पहला विद्रोह है जिनका अध्ययन आवश्यक है।
5. कोई विद्रोह के कारण एवं परिणाम को जान सकेंगे ।

इससे विद्रोह से पता चलता है कि कोई आदिवासी जीवन, प्रकृति, क्षेत्र, व देश के प्रति बहुत ही जागरूक रहे है जिनका अध्ययन आवश्यक है जिन्हे इस शोध पत्र में प्रस्तुत किया जा रहा है ।

पर्यावरण हमारे चारों ओर स्थित वह घेरा या वातावरण है जिसका हम प्रत्यक्ष या अप्रत्यक्ष रूप में उपभोग करतें है। इसके अंतर्गत प्रकृति जन्य सभी तत्व आकाश, जल, अग्नि, ऋतु, पर्वत, नदियां, वृक्ष, वनस्पति, जीव–जन्तु, ग्रह, नक्षत्र, दिशाएं एक तरह से अखिल ब्रम्हाण्ड ही सम्मिलित हो जाता हैं। पर्यावरण चेतना से हमारा अभिप्राय प्रकृति के इन तत्वों के महत्व को समझना, इनका सही

उपयोग करना, इनकी सुरक्षा व संवर्धन के प्रयास करना है। इस तरह प्रकृति और मानव एक–दूसरे के पूरक है। प्राचीन काल में प्रकृति की पूजा का विधान था और वेदमंत्रों द्वारा देवताओं को प्राकृतिक शक्तियों के रूप मे प्रस्तुत करते हुए व्याख्या की गई है। यजुर्वेद में "वृक्षाणां पतये नमः" कहकर वृक्षों की रक्षा करने वालों के लिये सत्कार प्रकट किया गया है। अथर्ववेद में अनेक सूक्त वनस्पतियों को समर्पित है और इन अरण्यों के बल पर ही यह संस्कृति पल्लवित और पुष्पित होती है। वृक्षों में देवत्व की भावना का विकसित रूप पद्मपुराण में मिलता है। पद्मपुराण के अनुसार कोलाहल नामक युद्ध में दानवों से पराजित देवताओं ने प्राणरक्षा के लिये वृक्षों की शरण ली थी। तभी से वृक्षों में देवताओं के निवास के कारण वृक्षों का संरक्षण तथा पूजन, पुण्य माना गया है।[1]

वृक्ष पर्यावरण संतुलन में महत्वपूर्ण भूमिका निभाते है। मत्स्य पुराण में वृक्षोंपासना तथा वृक्ष महोत्सव पर विचार प्रकट किया गया है।[2] वराह पुराण में बताया गया है कि वृक्षारोपण करना किसी अन्य दान से कम नही है, अपितु यह भूमिदान और गोदान के समान है।[3] पुराणाचार्यों ने पादपरोपण के महत्व को दुखनिवृत्ति और सुख समृद्धि से जोडते हुए जनता को वृक्ष लगाने के लिये प्रेरित किया है कि जो व्यक्ति एक पीपल, एक नीम या बरगद, दो नींबू या पांच आम के वृक्ष लगाता है, वह कभी भी कष्ट को प्राप्त नहीं करता।[4]

वृक्ष मानव समाज को अग्निहोत्र के ईंधन देते है, पथिकों को छाया और विश्राम, पक्षियों को निवास तथा प्राणियों को औषधियां प्रदान करते है।[5] स्कन्दपुराण के अनुसार घर में तुलसी पादपरोपण से समस्त दरिद्रता विनिष्ट हो जाती है।[6] इस प्रकार पेड पौधों और वनस्पतियों का महत्व प्राचीन काल से ही स्वीकार्य रहा है।

भारत की जनसंख्या का एक बड़ा हिस्सा आदिवासियों का है। छत्तीसगढ़ के बस्तर की जनजातियों का भारतीय स्वतंत्रता संग्राम में महत्वपूर्ण योगदान रहा है। स्वतंत्रता के पूर्व बस्तर छत्तीसगढ़ प्रभाग (मध्यप्रांत) की एक प्रमुख रियासत थी। यह रियासत छत्तीसगढ़ के सभी 14 रियासतों में सबसे बडी थी, जिसकी राजधानी जगदलपुर थी।[7] यह रियासत 17°46 से 20°14 उत्तरी अक्षांश और 80°45 से 82°1' पूर्वी देशांश के मध्य 13062 वर्ग मील क्षेत्र में विद्यमान था।[8] रियासत की लंबाई उत्तर से दक्षिण 180 मील तथा चौडाई पूर्व से पश्चिम तक 125 मील थी।[9]

बस्तर एक आदिवासी बाहुल्य अंचल रहा है। यहां के आदिवासियों में धार्मिक विश्वास और आस्था का आधार है प्रकृति। यहां की प्राकृतिक परिस्थितियां वनों के सर्वथा अनुकूल है। बस्तर का लगभग 57 प्रतिशत भाग वनों से आच्छादित है। वन बस्तर के सौंदर्य है, जीवन है, संस्कृति है वस्तुतः वन बस्तर के प्राणतंत्र है। यहां के वनवासियों का समग्र जीवन वनों की गोद में ही तो गुजरता है। जन्म से लेकर मरण तक वृक्षों की हर सांस इनके साथ रहती है। बस्तर के आदिवासी अपने देवी–देवता का स्थान वृक्षों में ही पाते है। इनके प्रति असीम श्रद्धा वनवासियों के मन में रहती हैं तथा वृक्षो को वे नहीं काटतें है।[10]

बस्तर के वनों मे मुख्यतः साल, सागौन, बीजा, साजा, धावडा, महुआ, तेंदु, हर्रा, आंवला, इमली, खैर तथा बांस आदि के वृक्ष पायें जाते है। यहां के वनों में साल वृक्षों की अधिकता के कारण "बस्तर को साल वनों का द्वीप" कहा जाता है। साल की लकड़ी का उपयोग इमारती लकड़ी, रेल के डिब्बे, स्लीपर, ट्रक ट्राली तथा समुद्री जहाज आदि बनाने में किया जाता है।[11] बस्तर की सागौन लकड़ी की मांग संपूर्ण भारत में सर्वाधिक होती है। इस लकड़ी से निर्मित सामानों में एक विशेष प्रकार का सौंदर्य आ जाता है।[12]

बस्तर के आदिवासी ऊपर से शांत एव सरल प्रकृति के है, किंतु वे अत्यंत संवेदनशील प्रजाति रही है। जहां उनकी अस्मिता को ठेस लगी और उनका शोषण व अत्याचार चरम सीमा पर पहुची, तो उन्होने विद्रोह भी किये है। बस्तर के राजघराने का संबंध ब्रिटिश शासन से 1854 ई. में हुआ, जब नागपुर राज्य को लार्ड डलहौजी ने दत्तक निषेध नीति के अंतर्गत हड़प लिया। नागपुर के साथ – साथ छत्तीसगढ़ व बस्तर भी तत्काल प्रभाव से आंग्ल– नियंत्रण में आ गया।[13] अब ईस्ट इंडिया कंपनी शासन काल में बस्तर के वनों पर अंग्रजों की गिद्ध दृष्टि पड़ी। वनों की कटाई एवं वन्य जीवों का शिकार का उपक्रम शुरू हुआ। बस्तर गौरों का शिकार गाह बन गया। भारत भर में रेल लाइनें बिछाई जा रही थी तथा बस्तर में जिस गुणवत्ता के साल के जंगल थें, वे अन्यत्र कहीं उपलब्ध नहीं थें। अंग्रेजो ने अपने तात्कालिक और दूरगामी हितों की पूर्ति के लिये बस्तर में ठेंकेदारी प्रथा को बढ़ावा दिया। बस्तर की अकूत और उत्कृष्ट वन संपदा अंग्रेजो की नजरों में कीमती हरा सोना था। उन्हें बस्तर के वनों की कीमत बूझते देर नहीं लगी। वे मद्रास के रास्ते से यूरोपीय बाजार में भेजने का सपना देखने लगें। कंपनी सरकार ने औपनिवेशिक हितों की दृष्टि से बस्तर में राज–काज को नये सांचे में ढालना चाहा।[14]

सन् 1859 ई. में बस्तर में दूसरे राज्यों से ठेकेदारों को बुलाकर वनों की कटाई हेतु आरा मशीनें लगवा दी गई। "अंग्रेजों ने बस्तर रियासत के राजा भैरमदेव और दीवान दलगंजन सिंह की उपेक्षा करते हुए वनों की कटाई का ठेका हैदाराबाद के ठेकेदार हरिदास–भगवानदास को दिया। हरिदास के सिर्फ नाम में हरि था, मानवता उसमें नाम मात्र का भी नहीं था। वह बहुत क्रूर और जालिम व्यक्ति था। वह काटी गयी लकड़ी का मूल्य भी नहीं चुकाता था। उन्हें न तो यहां के आदिवासियों के सरोकारो से मतलब था और न ही उसे लूट के दामों में यहां से सस्तें मजदूर, अपने राज्य मे उपलब्ध हो सकते थें। उनकी निगाह में कोई आदिवासी इंसान नहीं थें, उसके लिये कटाई के कार्य में लगे मजदूर निजि सम्पत्ति थे"।[15]

ब्रिटिश सरकार उसके खिलाफ की गई शिकायतों को अनसूनी करती थी। लोग उसकी गलत नीतियों से पीड़ित थें, तथा उनका हर प्रकार से शोषण होता रहा।[16]

यह कितने आश्चर्य की बात थी कि जिनका जीवन जंगल है, वे नहीं जानते थे कि यहां के वनों की कटाई किस लिये हो रही है जिनके घर जंगल में है, वे नहीं जानते कि उन्हें उजड़ जाने के आदेश किस लिये दिये गयें। सबसे महत्वपूर्ण बात तो यह थी कि जंगल बस्तर का और लाभार्थी हैदराबाद क़ा निजाम ? यह सब बस्तरवासियों को रास नहीं आया, कुछ ही महीनों में

बस्तर अशांत हो गया। स्थान –स्थान पर आदिवासी लामबंद होने लगे। आंदोलन की आंच दक्षिण बस्तर में अपेक्षाकृत ज्यादा महसूस की गई। इस आंदोलन में मुख्य संगठनकर्ता नेताओं में भोपालपट्टनम के जमींदार राम भोई, भेज्जी के जमींदार जुम्मा राजू तथा जुग्गा राजू, फुतकेल के जमींदार नागुल दोरा तथा कुन्या दोरा आदि थें।[17]

दक्षिण बस्तर के आदिवासियों की चिंता स्वाभाविक थी जो पर्यावरण के प्रति उनकी समझ से निकली थी। वे अब सोचने लगे कि जंगल नही रहेगा तो घर किधर होगा, वनोपज व शिकार कहां से मिलेगी और जीवन–यापन कैसे चलेगा। अपने जंगल खो देने की अहसास ने उन्हें एकजुट कर दिया।

दक्षिण बस्तर के भोपालपट्टनम, भेज्जी, कोतापल्ली व फुतकेल के जमींदारियों में रहने वाले आदिवासियों को "कोई" कहा जाता था जिन्हे आज हम दोर्ला तथा दण्डामी माडिया कहते है।[18] अतः उनके द्वारा किये गयें विद्रोह "कोई विद्रोह" के नाम से जाना गया। जंगल में लकडी की कटाई का काम जैसे ही गति पकड़ी दक्षिण बस्तर के आदिवासियों ने सन् 1859 ई. में मांझी प्रमुखों से मिलकर यह सामूहिक निर्णय लिये कि "अब बस्तर से साल का वृक्ष कोई भी व्यक्ति नहीं काट सकेगा।" अपने इस निर्णय की सूचना उन्होनें बस्तर के राजा, अंग्रेज अधिकारियों तथा हैदराबाद के ठेकेदारों को दे दी गई। धीरे–धीरे यह विद्रोह की भावना संपूर्ण दक्षिण बस्तर में फैल गया। ब्रिटिश सरकार ने इसे अपनी प्रभुसत्ता को चुनौती मानी और उसने लकड़ी कटाई करने वाले मजदूरों के साथ बंदूकधारी सिपाही भेजे। कोई आदिवासी भी अब हथियार का जवाब हथियार से देने के लिये तैयार थें। उनका नारा था– "एक साल वृक्ष के पीछे एक व्यक्ति का सिर"।[19]

अगली सुबह खबर फैली कि आरा मशीन चलाने वालों के साथ हथियार बंद सिपाही लगायें गयें है। तो स्वतः स्फूर्त आक्रोश ने जन्म लिया। बंदूक के साये में आरा मशीनों की घरघराहट जैसे ही आंरभ हुई, कोई आदिवासी अनियंत्रित हो गए। हजारो सिर कुर्बानी देने के लिये तत्पर हो गए। वे सभी तरफ से तीर–कमान, भाले–फरसे और मशाल लेकर जंगल की ओर दौड़े। नंगी छातियों ने अंग्रेजी सेना व ठेकेदारों को खुली चुनौती दे दी कि चाहे जितने कारतूस फूंक दो, अब रहेंगे तो हम और हमारे जंगल या फिर कुर्बानी ही सही। ठेकेदारों के तरफ से रायफलें गरजी, तो कोई आदिवासियों ने उनका सामना तीर – कमान व भाले फरसे से वीरता के साथ प्रत्युत्तर दिया। युद्ध शस्त्रों से ही नहीं, हौसलों से भी लड़े जाते है यह कोई आदिवासियों ने दिखला दी । आरा चलाने वाले कारीगरों के सिरों को कोईयों ने काट डाले, लकडी के टालों को आग के हवाले कर दिये गयें। एकदम से दहशत व्याप्त हो गयी। ठेकेदार स्तब्ध रह गया तथा उन्हें भूमिगत हो जाना पड़ा।[20]

लेकिन चिंतलनार के पास बंजारे लोग अभी भी हैदराबाद के निजाम के ठेकेदारों तक साल–सागौन के लकडी पहुचा रहें थें। आदिवासियों के नाजायज शोषण में बंजारो की कई सौ वर्षो से भूमिका रही है। नमक, गुड़, और कुछ रंग बिरंगे सौंदर्य उत्पादों के एवज में कीमती वनोंपज धड़ल्ले से बस्तर रियासत के बाहर ले जाया जाता था। ऐसी स्थिति में दक्षिण बस्तर के आदिवासियों का सारा आक्रोश बंजारा लोगों के खिलाफ हो गया था। दोर्ला तथा दंडामी माडिया दलों ने बंजारा लोगो के कारवां को जगह – जगह लूटा। बापीराजू के नेतत्व में उन्होंने एक कारवां से 2500/– रूपये लूटे। अनेक जगहों पर विद्रोहियों ने बंजारों के अनाज की कोठियों को लूटा तथा बैलगाड़ियों को छिना। इस विद्रोह में अनेक ठेकेदार, कारीगर तथा बंजारे मारे गए।[21]

इस समय स्थिति इतनी खराब हो गई कि सिंरोचा के डिप्टी कमिश्नर सी. ग्लासफर्ड को 1859 ई. में ही तुरन्त सेना लेकर दक्षिण बस्तर आना पड़ा। हालात का जायजा लेने के बाद उसने प्रमुख विद्रोही नेताओं से समझौता किया। उसने अपनी हार मानकर, बस्तर में लकड़ी ठेकेदारी की प्रथा को समाप्त किया तथा बस्तर से हैदराबाद के ठेकेदारों व उनके लोगों तथा सिपाहियों को हटा लिया। उसने आदिवासियों तथा अंग्रेज सिपाहियों के बीच निर्मित होने वाली युद्ध की स्थिति को टाल दिया। अपने पूर्व के आदेश को निरस्त किया तथा दक्षिण बस्तर में पुनः शांति बहाली हुई।[22]

निष्कर्ष

इस विद्रोह से पता चलता है कि अंग्रेज अधिकारी सी. ग्लासफर्ड की चिंता बढ़ गई थी। बस्तर के कोई आदिवासी समूह उन्हें ऐसी चुनौतियां उत्पन्न कर रहे थें जो अन्यत्र नहीं मिली। कोई आदिवासियों की राजनीतिक समझ बेमिसाल थी। कागज पर शासक चाहे जो हो लेकिन जगदलपुर के प्रति ही राज्य की हर आदिम प्रजाति की प्रतिबद्धता रहीं। कोई आदिवासी भी सामंती व्यवस्था के अंतर्गत शासित थें और वे राजा की प्रभुसत्ता स्वीकार करते हुए अपने प्रमुख अर्थात् मांझियों के अधीन थे।

अंग्रेज अधिकारियों को यह समझ आ गया था कि प्रतिरोध आगे बढ़ने से बेहतर है कि जंगल कटाई का कार्य बस्तर रियासत के माध्यम से ही करवाया जायें। अतः बस्तर से ब्रिटिश सेना लौटा दी गई तथा निजाम के आदमियों को दिये गये सभी ठेके निरस्त कर दिये गयें। अंग्रेजों के लिये यह कदम भले ही रणनीति का हिस्सा रहा हो, "कोई आंदोलन" ने अपनी सफलता का इतिहास लिख दिया। इस विद्रोह के सभी नेताओं ने एकता स्थापित कर बहादूरी से लड़ाई लड़ी और अपने लक्ष्य को प्राप्त किया अर्थात् जीत हासिल कियें।

बस्तर के वनों को समय से पूर्व कटने से बचाने का यह "कोई विद्रोह" बस्तर का ही नहीं वरन् छत्तीसगढ़ तथा भारत का अनोखा विद्रोह था। इस विद्रोह के पीछे आदिवासियों की आद्विक मानसिकता का परिचय मिलता है। साल वृक्ष की रक्षा हेतु सभ्य समाज से दूर कहे जाने वाले आदिवासियों ने जो संघर्ष किया है, वह उनके पर्यावरण जागृति को दर्शाता है। इस तरह की जागृति और चौकन्नापन्न आज की पीढी में दिखाई नहीं देता है। यह विद्रोह आज के शिक्षित समाज के लिये एक प्रेरणा है। इस विद्रोह में आदिवासियों की वैचारिक दृढ़ता के दर्शन होते है। सही मायनों यह "भारत का पहला पर्यावरण सुरक्षा आंदोलन" था। अपने शाल वनों की रक्षा हेतु कोई आदिवासियों ने जो आहुतियां दी, वे बस्तर के इतिहास में अमर रहेगी। 1859 ई. का कोई विद्रोह बस्तर का पहला विद्रोह था, जिसमें अंग्रेजों ने अपनी हार मानी

तथा उन्हें विद्रोहियों के साथ समझौता करना पड़ा। इसमें बस्तर के कोई आदिवासियों ने अपने लक्ष्य और उद्देश्य को प्राप्त करने में सफल रहें।

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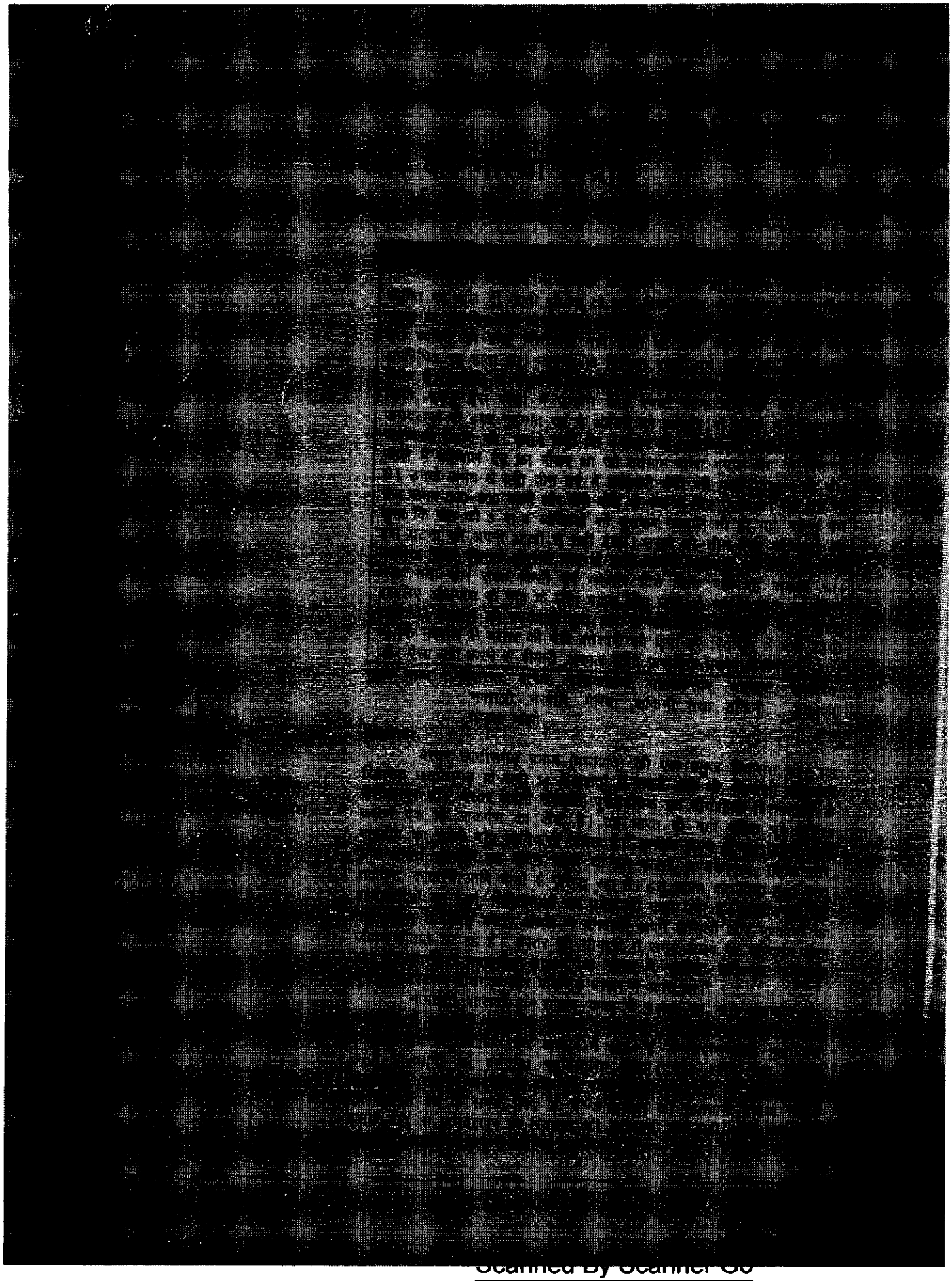

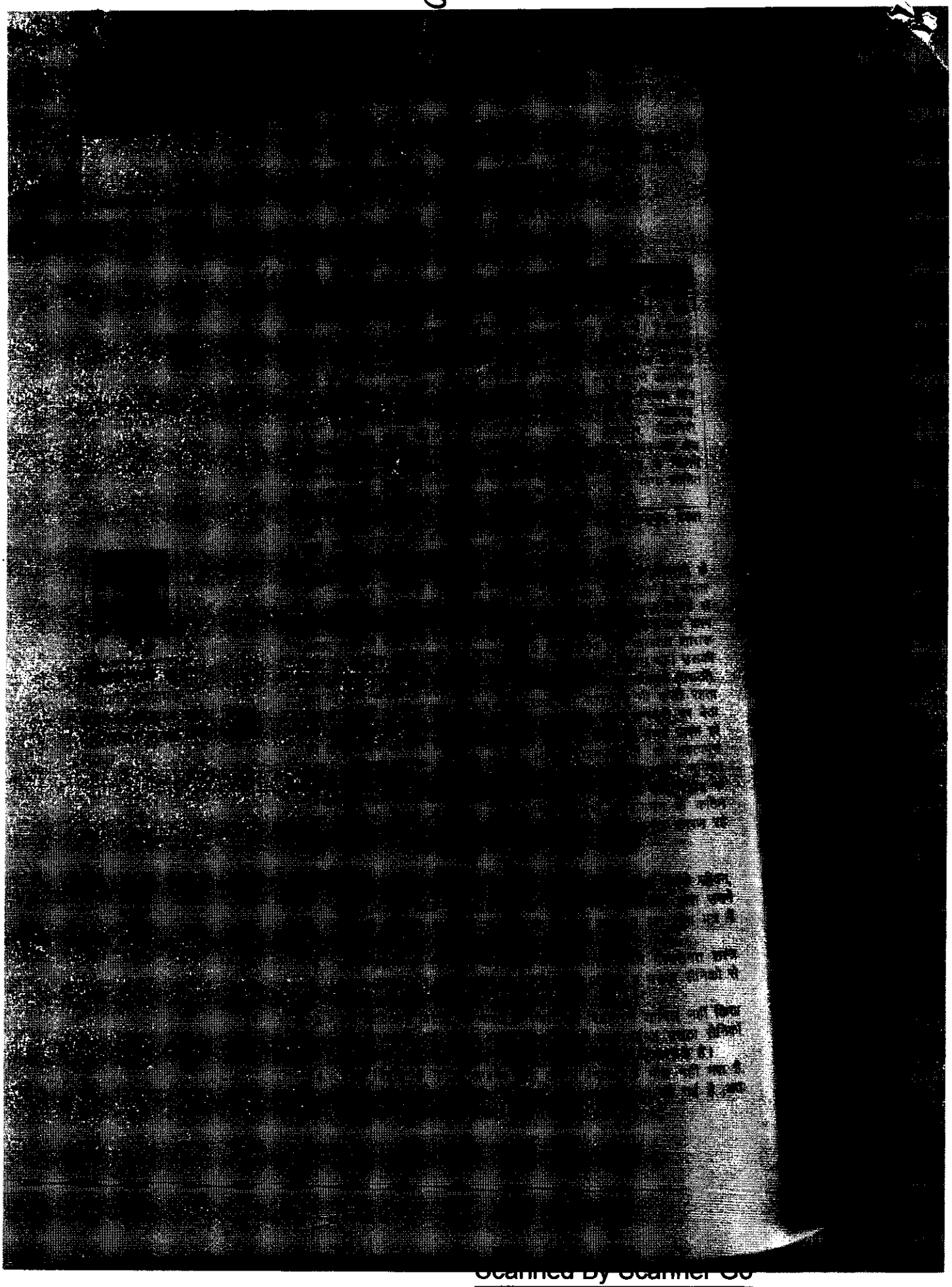

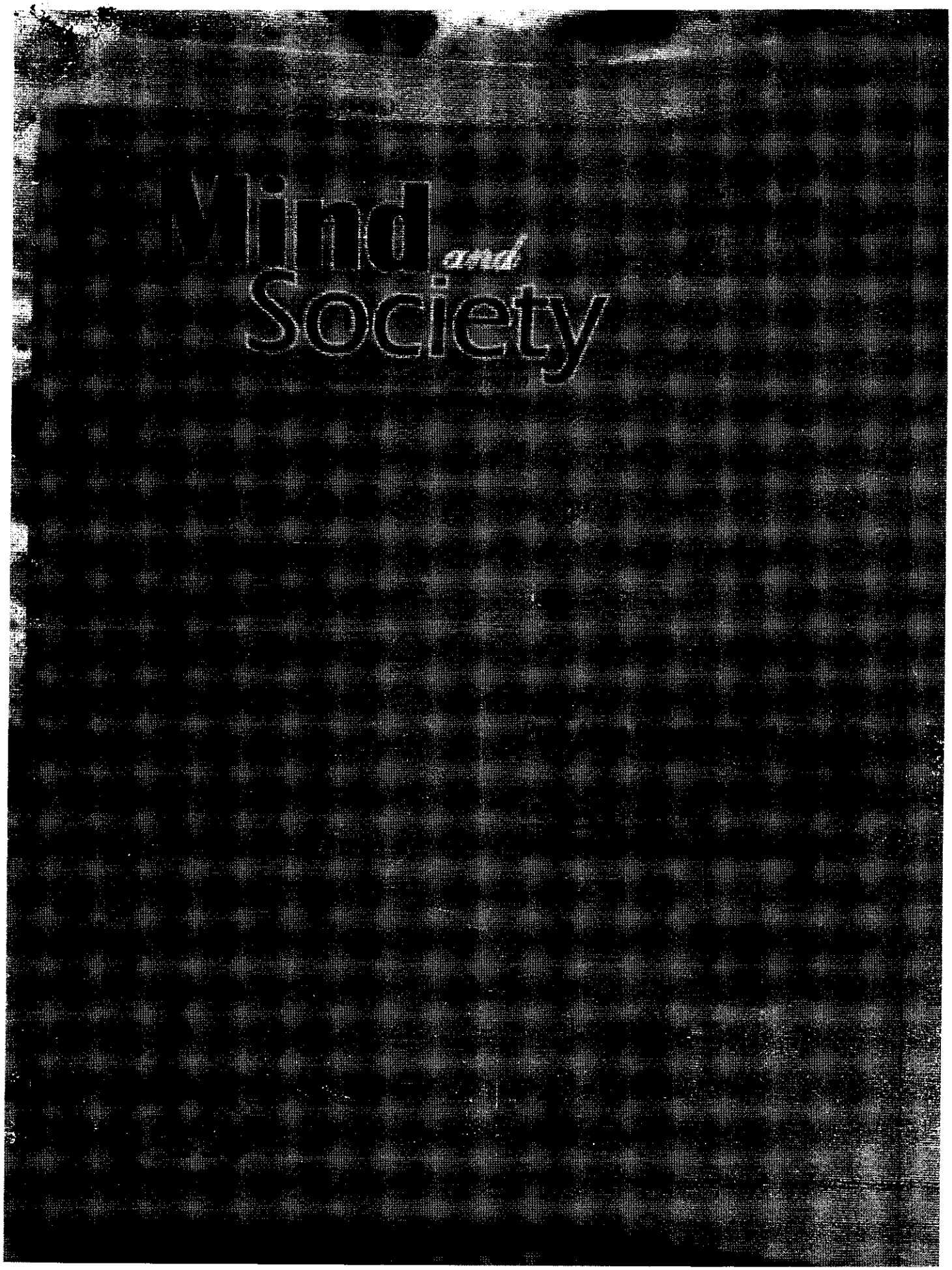
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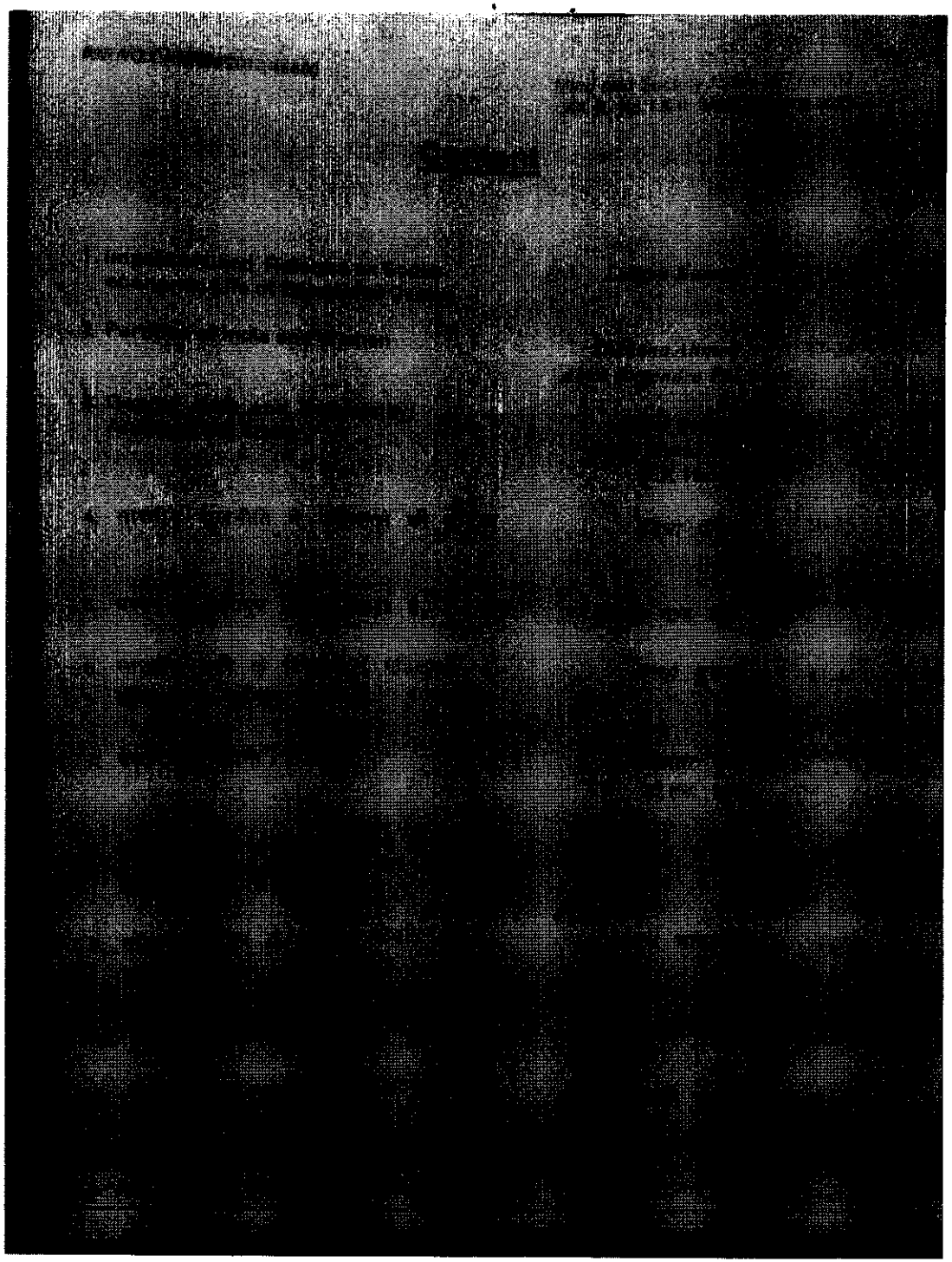
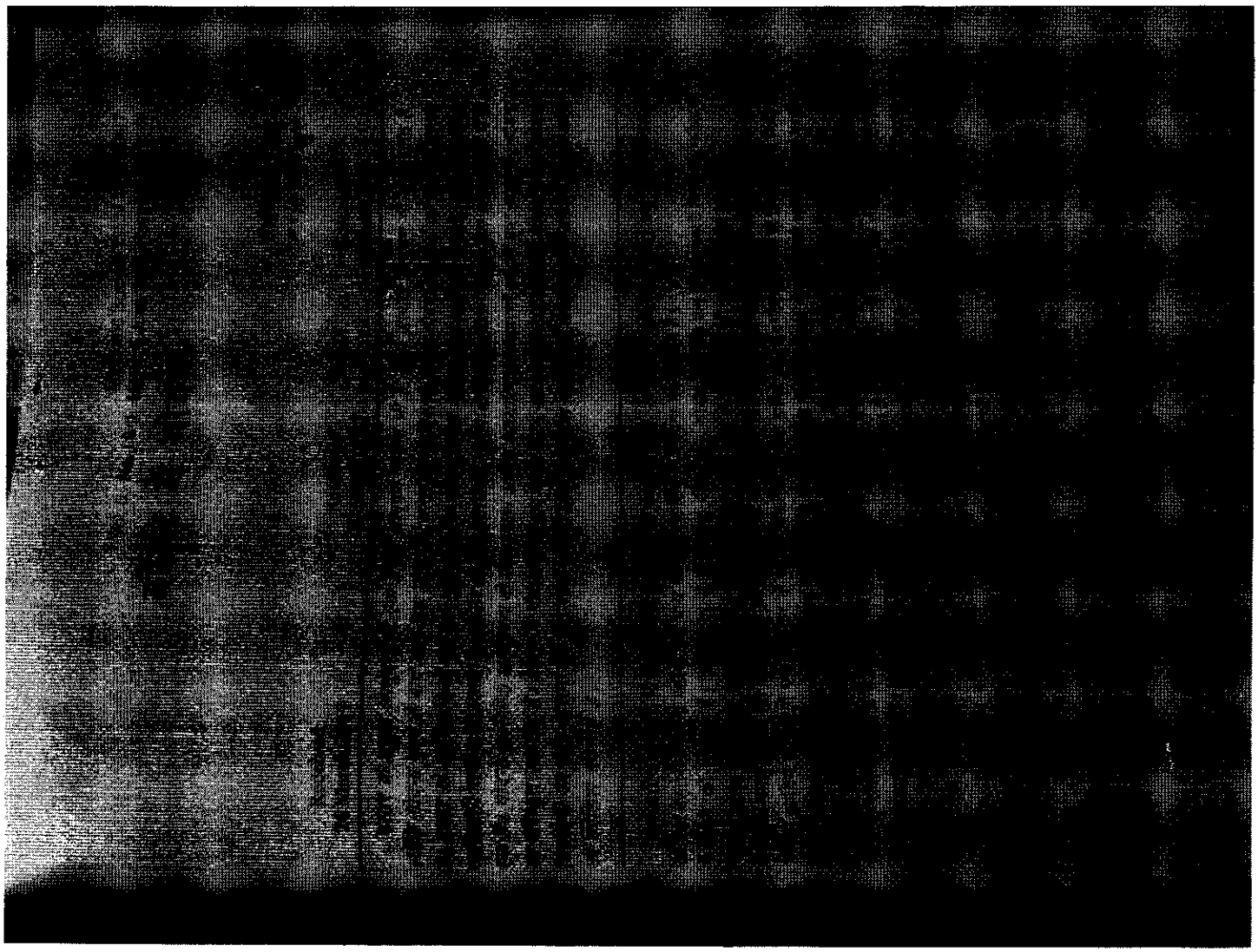
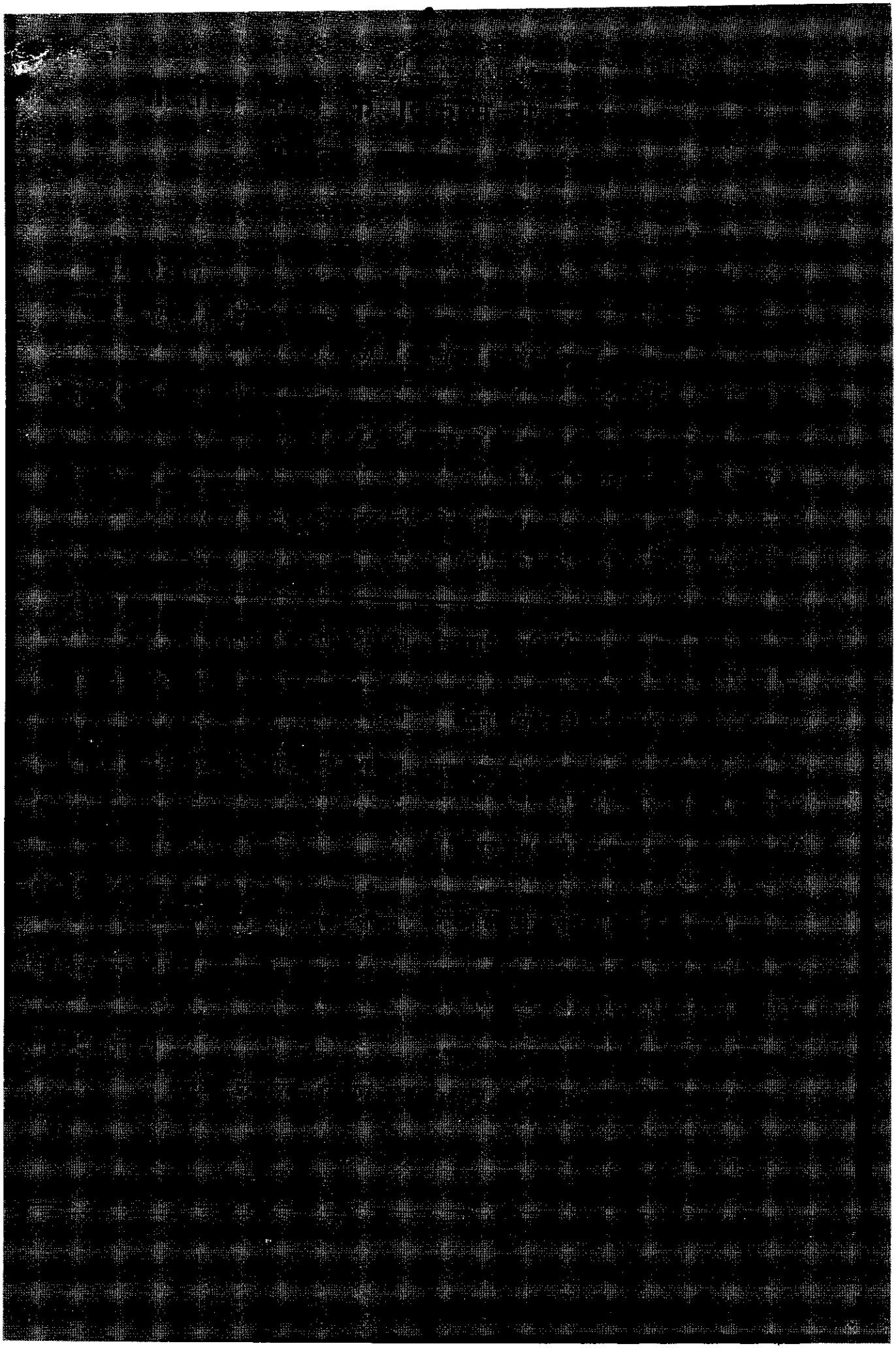






Are the rights of the prisoners guaranteed to them enforced in an effective manner?

Dr.Priya Rao

Asst. Prof Law

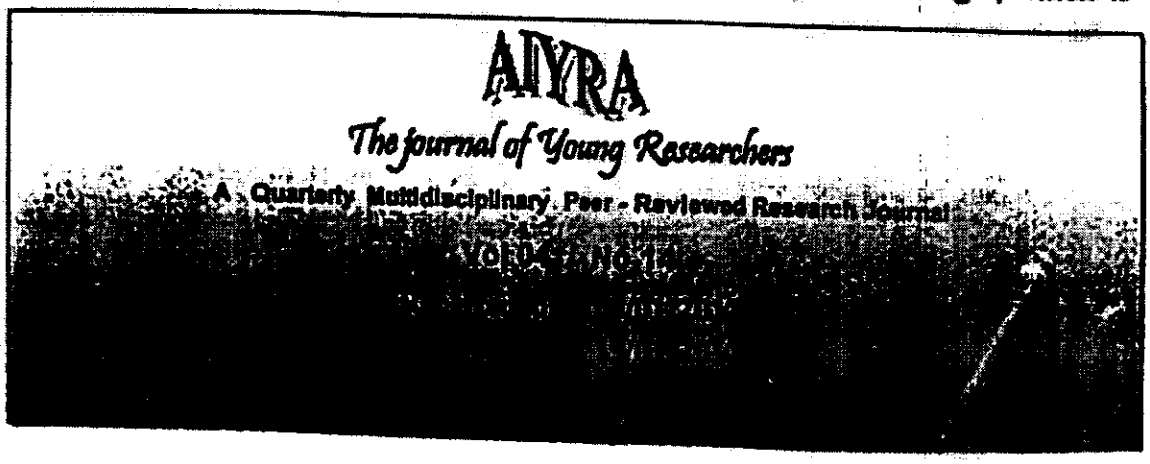
Pt.Ravishankar shukla University Raipur

Human beings are born equal in dignity and rights. These are moral claims which are inalienable and inherent in all individuals by virtue of their humanity alone, irrespective of caste, colour, creed, and place of birth, sex, cultural difference or any other consideration.

It is the human life that necessitates human rights. Being in civilized society organized with law and a system as such, it is essential to ensure for every citizen a reasonably dignified life. Even if the person is confined or imprisoned because of his wrong, he is entitled to their rights unaffected by the punishment for wrongs, simply because if a person under trial, his rights cannot be discarded as a whole.

In India, eighty percent of the inmates in the jails are under trials. The major problems faced by these inmates are not only of not getting a trial but that of not being granted bail, inhuman treatment in jails, facing poor conditions, lack of proper medical treatment, etc. There are various statutes such as the Prisoners Act, 1894; the Model Manual Prison India, etc. and various precedents which have been laid down in landmark cases which provide for the rights which these prisoners are entitled to.

It is established that conviction for a crime does not reduce the person into a non-person, so he is entitled to all the rights, which are generally available to the non-prisoner. On the other hand, it cannot be denied that he is not entitled for any absolute right, which is



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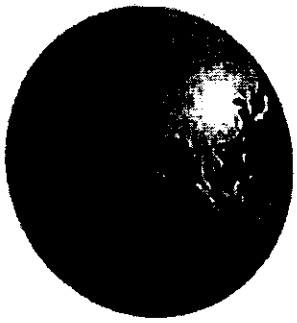
DISSOLUTION OF MARRIAGE IN HINDU LAW



New Age Researchers

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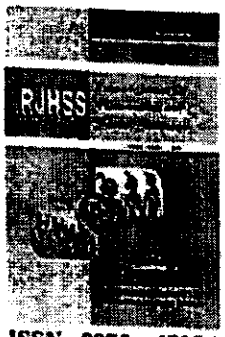
INTRODUCTION:

The wives are ready to face challenges in life. They are keen to become self-dependent. The spirit of forced tolerance of yesteryears is waning away. They are prepared to live separately rather than to stay united while unhappy. The traditional concept of marriage has greatly changed now and Hindu marriage today has assumed more or less the nature of a contract for the mutual benefit of the parties concerned, duly aided by various legal provisions and reforms.

HISTORY:

Marriage, variously defined as an institution, the bedrock of procreation and family life, a gamble, a life sentence or a heaven-programmed union between two people, is an ideal medium to gauge value shifts in society. Arranged marriages, not surprisingly, remain the most preferred option for most couples, but not arranged in the traditional sense. They are becoming flexible, adaptable, open-minded affairs, based on contemporary, practical and realistic factors. Match-making has come a long way from being the emotionally and socially loaded event



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Constitutional Perspective of Indian Environmental Laws

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ABSTRACT:
The conservation of the environment formed an ardent article of faith, reflected in the daily lives of the people and also enshrined in myth folklore, art, culture and religion. In Hindu theology forests, trees and wildlife protection held a place of special reference.

KEY WORDS: Constitutional Perspective, Indian Environmental Laws

INTRODUCTION:
In the ancient India, protection and cleaning up of environment was the essence of the Vedic culture. The conservation of the environment formed an ardent article of faith, reflected in the daily lives of the people and also enshrined in myth folklore, art, culture and religion. In Hindu theology forests, trees and wildlife protection held a place of special reference.

The Environment Protection Act 1986 defines environment as "environment includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro organism and property."

Besides the physical and biological aspect, the "environment" embraces the social, economic, cultural, religious, and several other aspects as well. The environment, thus, is an amalgamation of various factors surroundings an organism that interact not only with the organism but also among themselves. It means the aggregation of all the external conditions and influences affecting life and development of organs of human beings, animals and plants.

The Constitution has acted as a *'grund norm'* for all the other legislations in India and the case of Environmental Laws is not distinguishable. In the Constitution of India, as it stood on 26.1.1950, there was no specific provision for environmental protection except for few Articles which indirectly covered some environmental aspects.[1] The laws of the land were lacking greenery and the legal scenario was environmentally barren. It was only four years after the Stockholm Conference of 1972 that the State and the citizens were provided with directives to protect the environment of the nation.[2] As development and pollution went hand in hand, the snivel to protect the environment inflated but the courts found it difficult to restrict the polluters as the Directive Principles were unenforceable in the Courts of Law. Thus, at times the polluters, at times the courts and at times both were able to exonerate themselves, the former from their liabili and the later from their duty.

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Information Seeking Behavior of Managers in digital environment: A C... Study of Durgapur Steel Plant, India

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Dr. (Mrs.) Maya Verma

Professor SoS in Library & Information Science Pt. Ravishankar Shukla University, Raipur (C.G.)

Abstract: The paper presents the results of a survey of the information seeking behaviour of Man... digital environment: A Case Study of Durgapur Steel Plant, India. The purpose of the survey ... explore the use of information technology by the Managers for seeking information and to know ... access resources. For the desired information, a well structured questionnaire was circulated among ... managers of the plant for collecting data. Collected data were analyzed with the help of SPSS ... The response shows that the managers are well aware about the internet and the information ... internet and they are using it for their desired information, though they access it for general inform... like reading newspaper over internet. Various awareness programs can be programmed for making ... more aware about the technical sources and their availability by the organization.

Keywords: Electronic information resources, Durgapur Steel Plant, Managers.

Introduction

Knowledge and information are vital for corpor development and growth. In the modern ... the types of information and the media which present them have become manifold and multifaceted. ... increase in information on the Web has affected information seeking behavior.

Updating knowledge is very much needed for professionals. If the professionals, especially ... persons who are in administrative level are not up to date with the latest developments in their respe... field, the organization will not be able to achieve heights. To keep their officials up to date, most ... organizations have their own library with dedicated stocks of books and journals related to ... specialization.

About Durgapur Steel Plant (DSP)

Durgapur steel plant was set up in the late fifties with an initial production capacity of 1 MTPA (million ton per annum) crude steel which was progressively increased to 1.8 MTPA during the last modernization in tandem with the prime objective of achieving higher level of product... improvement in productivity and quality, conservation of energy, reduction of cost of production ... minimization of environmental pollution.

DSP is currently implementing its Modernization & Expansion Plan (Phase-I) with main objectives:

- Conversion of available ingots into value added rolled products.
- Near 100% concept production with phasing out of top pouring ingot- Blooming Mill route
- Sustenance/De-bottlenecking of existing facilities to overcome present constraints
- Capacity of the plant will increase in hot metal of 2.40 MTPA, Crude Steel at 2.20 MTPA and ... Saleable Steel at 2.12 MTPA

Durgapur Steel Plant(DSP)is one of the integrated steel plants of Steel Authority of India Limited, was established in year..1955 located in Durgapur, in the eastern Indian state of West Bengal. It was set up with the help of UK. Keeping in view about the need and demand for latest information and developments by the Employee's in steel plants around the globe, the library was established in year 1960. The central library is located in Human Resource Development building.

Objective of the study:

Without any objective there is no meaning of conducting any research. The study has the following objectives to ascertain the information seeking behavior of Managers in the digital environment:

1. To determine the information seeking behavior of the managers of Durgapur Steel Plant in the electronic platform.
2. To identify the preferred method of information search by the managers.
3. To ascertain the frequency of using electronic resources by them.
4. To identify the most preferred type of electronic resources.
5. To determine the problems faced by them while accessing and using e-resources.
6. To suggest measures to improve the current scenario.

Research population and methodology

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RESEARCH ARTICLE

Library Management in Digital Era: A Study with Special Reference to Selected University Libraries of Chhattisgarh

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ABSTRACT:
The advent of IT has made a clear and persistent impact in almost the area of library services. The paper highlights the management of selected University libraries of Chhattisgarh. It describes the information sources, services and facilities preferred and satisfaction level of the services given to library users and the library environment's quick changes to new generation of libraries.

KEY WORDS: Digital, Management, Library, University, Chhattisgarh

INTRODUCTION:

Existence of books in human life is older than the invention of paper and printing. Storage of knowledge acquired by observations was preserved on Clay's tablets, strips, leather and copper sheets. From the beginning at the end of the mediaeval era, library was used personal property. It means that individuals had a monopoly on it. The invention and spread of printing technology and the rise of democratic ideologies increased the use of the libraries in modern era. At the end of 19th century books became necessary sources of information in 20th century, not only books but Microfilms, cassettes, videos, computers, etc. were also used for spreading the knowledge.

Since last few years due to the impact of ICT, libraries change drastically. Now customized information packages, electronic books, own e-repository, library management systems, etc. part of modern libraries. The application of ICT is widespread in many discipline.[Wasik (2004), Dollah, W.A.K.W.(2006)] wrote that the dynamic nature of the Internet creates an ever-changing information environment and transforms the way information is delivered and accessed. Since a great number of users connect to the Internet [Penka (2003), Dollah, W.A.K.W.(2006)], their expectation of immediate access to information and knowledge resources steadily increases.

The concept of the traditional library is changing in terms of the forms of documents, services, organization of resources, method of information retrieval from the available resources. Now many Universities of India have started the digitization of their valuable resources. The Universities libraries are acquiring various types of digital resources and providing links to open access sites for their users.

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Library Management in Digital Era: A Study with Special Reference to Selected University Libraries of Chhattisgarh

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Abstract

The advent of IT has made a clear and persistent impact in almost the area of library services. The paper highlights the management of selected University libraries of Chhattisgarh. It describes the information sources, services and facilities preferred and satisfaction level of the services given to library users and the library environment's quick changes to new generation of libraries.

Top

Keywords

Digital, Management, Library, University, Chhattisgarh.

Top

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USE OF SOCIAL NETWORKING SITES (SNSS) BY THE FACULTY MEMBERS OF PRS UNIVERSITY, RAIPUR: A STUDY

Sunil Kumar Satpathy*, S. R. Kashyap**

INTRODUCTION

Right now, in fact most, social networking sites have rapidly become popular among all sections of people and have been a biggest part of everyday life. Numerous social networking sites such as Facebook, MySpace, Flickr, WhatsApp, Twitter etc. are now freely available to the average Internet user. Boyd and Ellison (2008) defined social networking sites as "web-based services" that allow users to create a profile, link with their acquaintances and be able to view and interact with their friends' connections. According to Alexa et al (2007), SNSs had become the most heavily used websites, and they were ranked as one of the top sites visited globally. These sites have become an integral part of the daily personal, social and business lives of many people.

Social networking as its name implies is the networking of people for keeping social relationship with each other. It refers to a process of relation building among group of people having common interest or likeness. The main purpose is to connect people to share messages, views, ideas on various issues such as recreational, political, social, academic or any issues relevant to life. Every social networking sites have some advantages and some limitations. Also the cases of misuse of social networking sites are more. But with the passage of time and inclination of users towards social networking sites, these have been experimented in libraries to reach their long tail users and to make involve them in the various library activities. Although use of social networking sites by libraries till date are mostly limited to provide alert services or library notices, there is more scope of their use in libraries. The present study is an attempt to study the use of social networking sites by the faculty members of Pt. Ravishankar Shukla University of Raipur, Chhattisgarh, India.

ABOUT PRSU, RAIPUR (C.G)

Pt. Ravishankar Shukla University, established in 1964 at Raipur (present capital of Chhattisgarh state of India) is the Chhattisgarh's largest and oldest institution of higher education and named after the first chief minister of erstwhile Madhya Pradesh state of India. The University has a sprawling campus spreading in 207 acres of land. There are Twenty-Nine teaching departments in the University. Besides a variety of self financed courses have been initiated in some departments. The total number of employees is 700, who provide the administrative support at different levels.

About 5000 students enrolled for variety of courses offered by the departments who are steered under the guidance of more than 100 faculty members. Also the university has about 700 non faculty staff to provide administrative support at different level. There are 180 educational institutions affiliated to the University which are situated in entire central and southern part of Chhattisgarh. The various departments along with number of faculty members are tabulated below.

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Use of Social Networking Sites among Undergraduate Students of Arts and Commerce Colleges, Raipur, Chhattisgarh

Harish Kumar Sahu*

Abstract

In this present era, the use of social networking sites among college students in India has significantly increased and it certainly has far reaching impacts on the academic and other activities. The purpose of the study is to investigate the use of social networking sites among the undergraduate students of nine Arts and Commerce Colleges of Raipur in CG. Structured questionnaires were used to collect the data from a representative sample of 105 students who were selected via random sampling techniques. The collected data was analyzed using different statistical methods. The result indicates that all undergraduate students are aware of social networking sites. They are using at least one form of social networking website to interact with friends and connect to their classmates for online study and also to discuss academic issues, watch movies and share multimedia contents. Facebook and Whats-app are the commonly used social networking sites among the students and they use them for friendly communication. There are benefits of using social networking sites as well as dangers associated with social networking sites which are discussed in this paper. It was recommended that college authorities should organize seminars to draw the attention of students on the good and bad aspects of social networking sites etc.

Keywords: *Social networking sites, Social media, Social networking.*

1. Introduction

In this modern era Social Media enable users to generate interpersonal connections based on common grounds. Social networking sites (SNS), such as Friendster, LinkedIn, MySpace, Facebook, Orkut, Flixter, Twitter, Whats-app, My Life, YouTube, Wikipedia set up personal communities, allow users to make comments on the profiles of their friends and send private messages. So SNS are being used regularly by millions of people. Because of this, the impact of SNS is increased. It is a modern communication channel through which people are connected to share with others experiences, ideas, messages, pictures and information of interest. In the modern age social networking sites are boon for the internet users. Many Marketing companies, Organizations, etc. are using Social Networking Sites to promote their products and services. Social networking sites are web-based services that allow individuals to construct a public or semi-public profile within a bounded system.

The social networking is a platform to build social relations or social networks among people who like to share activities, backgrounds, interests of real-life. According to the Computing Dictionary (2011): "Social networking site on any website is designed to allow multiple users to publish content of them. The information may be on any subject and may be for consumption by friends, mates, employers, employees just to mention a few."

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ग्रन्थालय विज्ञान

खण्ड 47, वर्ष 2016

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सम्पादक : डॉ. एस.पी. सूद

उप सम्पादक : उमेश शर्मा

[illegible]

सूचना विज्ञान संस्थान

विषय सूची

आधुनिक युग में ग्रंथों की सुरक्षा, परिरक्षण एवं संरक्षण

(Safety, Preservation and Conservation of Books in Modern Era)

डॉ. [illegible] कुमार [illegible]*

[illegible]**

[ग्रंथालय में संगृहीत सामग्री के उपयोग के साथ-साथ उसकी सुरक्षा प्रत्येक ग्रंथालय कर्मचारी का प्रथम दायित्व होता है। इसी प्रकाश में इसका महत्वपूर्ण है। इसमें क्षति के कारण, सुरक्षा एवं संरक्षण का वर्णन किया गया है।]

1. प्रस्तावना (Introduction)

ग्रंथों में भी मानव की भाँति शरीर एवं आत्मा दोनों ही होते हैं। जिस सामग्री से ग्रंथ का निर्माण हुआ है वह उसका शरीर है तथा उसमें निहित विचार उसकी आत्मा। निरन्तर उपयोग से ग्रंथों को क्षति पहुँचती है, उनकी जिल्द टूट जाती है, उनके पृष्ठ फट जाते हैं और अन्त में वे इतनी अधिक विक्षत हो जाती है कि उनका उपयोग नहीं किया जा सकता है। डॉ. एस. आर. रंगनाथन के पुस्तकालय विज्ञान के प्रथम सूत्र के अनुसार ग्रंथ उपयोग के लिए हैं अतः ग्रंथालयी का कर्तव्य है कि वह उनकी सुरक्षा का प्रबन्ध करे, उन्हें क्षति से बचाए तथा क्षतिग्रस्त ग्रंथों की समय पर मरम्मत करवाए ताकि वे पाठकों के लिए निरन्तर उपयोगी बनी रह सकें।

[illegible] ने अपने ग्रन्थ "द केयर एण्ड रिपेयर ऑफ बुक्स" में लिखा है कि "ग्रंथ बच्चों के समान है। एक प्रकार से प्रारम्भिक जीवनी में प्राप्त पोषण के प्रति उत्तर में एवं दूसरे वातावरण तथा वंश परम्परा के उत्तर में .... यदि बालक की भाँति इनका पोषण माता-पिता एवं मित्रों के साथ प्रेम एवं सहानुभूति पूर्ण होगा तो ग्रंथ का प्रारम्भिक जीवन सुखी, जिससे उनका [illegible] दूर हो जायगा।"

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** सहायक प्राध्यापक, ग्रंथालय एवं सूचना विज्ञान अध्ययन शाला, पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर (छ.ग.)

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Internet Facility at Pt. Ravishankar Shukla University Library: A Users' Survey

Harish Kumar Sahu *

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Abstract

The Present study attempt to assess the use of Internet, its service and resources in Pt. Ravishankar Shukla University Library. A elicit opinions from the users of Internet. The responses were gathered from 60 users of the service (30 teachers and 15 research scholars and 15 Students of Science, Social Science and Arts faculties). The results of the survey provided information in various aspects of Internet use in the library , as frequency of Internet use , purpose for which the Internet is used , use of Internet services and search engines , benefits from Internet use. On the basis of results of the survey, some suggestions have been given which, the author hope, will provide a basis for making the service more beneficial to the academic community of the university.

Keywords: Internet use, user survey

Introduction

Information technology has brought a fundamental change in the structure and functioning of libraries. They are resorting to fast means of communication such as computer , on-line searching , CD-ROM and computer networks to cope with the tremendous increase in the information and increasing demands of the users. Internet is such a phenomenon as has revolutionized the whole concept of libraries. The university libraries as centers of information services have reacted fast to embrace new information technologies and provided Internet access to the users , to put the whole worlds information at their disposal.

Developments in Pt. Ravishankar Shukla University Library: Pt. Ravishankar Shukla University Library - A semi computerized library, unmatched to any other library of this region , so for its

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सारांश :

इंदिरा कला, संगीत विश्वविद्यालय खैरागढ़, संगीत एवं कलाओं के लिए सम्पूर्ण देश में एक विशिष्ट स्थान रखता है, यहाँ भारतीय शास्त्रीय संगीत, नृत्य, लोक संगीत, दृश्य कला से संबंधित – चित्रकला, ग्राफिक्स, नाट्य से संबंधित ग्रंथों का संग्रह है। ऑडियो विजुअल सामग्री का उत्तम संग्रह एवं नये उपकरणों के माध्यम से संबंधित सामग्री का श्रवण एवं प्रदर्शन छात्र–छात्राओं एवं शोधकर्ताओं को प्राप्त होता है।

शब्द कुंजी : ग्रंथालय, संगीत, नृत्य कला, मूर्तिकला, चित्रकला, वर्गीकरण, सूचीकरण, संदर्भ सेवा, पाण्डुलिपि, संदर्भ ग्रंथ ।

RESEARCH PAPER

36

JOURNAL OF RAVISHANKAR UNIVERSITY (PART-A) : A BIBLIOMETRIC STUDY

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ABSTRACT

The Present Study Analysis of 88 contributions and 139 contributores of the Journal of Ravishankar Shukla University (Part A), Published in 1988 – 2015, studies based on authorship pattern, Year wise Distribution of Degree of Collabration, subject wise Dsanbution, Types of Cited Documents and Degree of Collabration. This study show That Majority of the articles contributed by author which appeared under subject Economics12(13.63%) and Library & Informatson Scienee 3 (3.40%) Maximum number of the refereces 221(21.66) produced in 2014-15.The Highest contributation is 4 articles (2.87%) of Anushuiya Baghel.

Keywords: ***Bibliometrics, Journal of Ravishankar Shukla University (Part- A), Articles, Authorship Pattern, References & Degree of Collaboration.***

1. INTRODUCTION

Journal of Ravishankar Shukla University (Part A) is well known Publication in the field of Arts, Social Science humanities and management. Published by Pt. Ravishankar Shukla University, Raipur ,Chhattisgarh, India. It was started in 1988. The first managing editor of this journals was Dr. S Guha & the present editor in chief is Dr.V. N. Dube, SOS in Literature & Language and Editor Dr.Bashir Hashan & Dr.Ravindra Brahme From SOS in Pschology & Economics Pt. Ravishankar Shukla University, Raipur. The purpose of this journal publish any aspect of research both Basic & applied, emanating from any branches of arts ,social sciences, humanities and management. the term Bibliometrics was first used by Alan Pritchard in 1996 , Bibliometrics study is stastical analysis of books and journals its Measure of different aspect of books and articls.

2. SCOPE & LIMITATIONS

The scope of the present study is Pt. Ravishankar Shukla University, Raipur, Chhattisgarh. It published Original articles from arts, social sciences, humanities and management. The major limitation of the Study are Vol.1 to Vol.19 – 21 of Journal of Ravishankar University from years 1988 to 2015 it is Annual journal.

3. METHODOLOGY

This bibliometrics methods based on Statistical analysis with differentt aspect of books & articles such as authorship pattern, Distribution of articles, Page length, citation and degree of Collabration etc. it is a new & important research methods of library & Information Science.

4. OBJECTIVES

The main objective of this Study are

- To know the Year wise Distribution of articles
- To study Authorship Pattern
- To know Page length of the Article
- To Study Subject Wise Distribution of Article
- To find out Year wise distribution of references
- To Study Types of Cited Documents
- To know Ranking of Author
- To Study Degree of Collabration

5. DATA ANALYSIS AND INTERPRETATION

Table 1: Year wise Distribution of articles

S No.	Year	Volume	Articles	%
1	1988	1	8	9.09
2	1989	2	7	7.95
3	1990	3	8	9.09
4	1991 – 92	4 -5	8	9.09
5	1993 – 94	6 -7	10	11.36

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Short Communication Open Access

A New Candidate of Catalase Appears during the Germination after Priming in Naturally Aged Neem (*Azadirachta indica*) Seeds

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Abstract

Loss of Neem (*Azadirachta indica*) seeds viability remarkably occurs with natural storages and related to decreased seed germination. We investigated that osmopriming induces hydrogen peroxide during germination that could be signaling molecule for germination improvement. A new catalase isozyme appeared during post-priming germination. The results show a high coordination between hydrogen peroxide and catalase and H_2O_2 may play a role in regulation of new catalase isozyme expression during post-priming germination of aged neem seeds.

Keywords: Seed priming; Germination; Catalase; Hydrogen peroxide; Isozyme

Introduction

Ageing accompanies diverse deleterious changes in cells that accumulate over the time that eventually leads to death. Seeds too lose viability with the progress of time. Seed viability is a complicated trait under the control of genetic, developmental, and environmental factors [1,2]. Often these factors interact with each other and produce deleterious effects during the process of seed maturation and harvest. Seed moisture and storage temperature play a significant role and confer varying length of seed viability. Concisely, we come across wide variability in seed viability, within and among seed lots and species that attributed to the interactions of above mentioned factors.

In recent years, increasing evidencehave been accumulated suggesting a functional significance for reactive oxygen species in seed aging and germination [3,4]. Reactive Oxygen Species (ROS) are metabolites of molecular oxygen (O_2) that have higher reactivity than O_2. ROS can include unstable oxygen radicals, such as superoxide radical ($O_2^{\bullet-}$) and hydroxyl radical ($OH^{\bullet}$), and non-radical molecules, like hydrogen peroxide (H_2O_2). Thus, all organisms living in an aerobic environment are exposed to ROS on a continual basis. Up to 2% of the oxygen utilized is converted into these deleterious agents and related reactive ROS, mostly, but not exclusively, within mitochondria. An enzymatic dismutation step must firstly take place to produce more stable H_2O_2 derivative from the $O_2^{\bullet-}$. H_2O_2 often travel across the cell membrane and is required for a viable long-range cell-to-cell signal [5]. Additional reactive $OH^{\bullet}$ can be formed from $O_2^{\bullet-}$ and H_2O_2 through Fe-catalyzed Haber-Weiss reaction that may cause lipid peroxidation [6]. The concentration of ROS is tightly controlled by ROS-scavenging pathways that metabolize ROS. However, an imbalance in generation and metabolism of ROS leads to a variety of physiological challenges by disrupting redox homeostasis of the cell, which is collectively known as "oxidative stress". Plant possesses an efficient antioxidative defense that protects the cell from oxidative damage. To minimize and/or to protect against the toxic effects of these damaging ROS, cells have evolved highly regulated enzymatic and non-enzymatic mechanisms to keep a balance between ROS production and destruction in order to maintain cellular redox homeostasis. These protective systems are composed of low molecular and enzymatic scavengers, such as superoxide dismutase (SOD), catalase (CAT) and enzymes of the Halliwell Asada pathway: ascorbate peroxidase (APX), dehydro ascorbate reductase (DHAR) and glutathione reductase (GR), connected with antioxidant compounds: ascorbate and glutathione [7]. SOD is a key enzyme in the regulation of the amount of superoxide radicals and peroxides. The removal of H_2O_2 through CAT as well as a series of reactions is known as an ascorbate glutathione cycle in which ascorbate and glutathione participate in a cyclic transfer of reducing equivalents resulting in the reduction of H_2O_2 to H_2O using electrons derived form nicotinamide adenine dinucleotide phosphate (NADPH) [8]. The cooperative activities of these enzymes and high levels of the low molecular antioxidants may increase the resistance to oxidative injury and minimize cell damage.

Additionally, increased level of ROS, including H_2O_2 [9,10], $O_2^{\bullet-}$ [11,12], and hydroxyl radicals [10], as well as reactive nitrogen species have been reported to play positive role during seed germination in plant species of varied taxonomic backgrounds. Seed priming affects germination rate, seed vigor, and seedling development. It has been shown that seed priming with water or solutions of various substances positively affects traits of seeds and seedlings [13,14]. Many research groups evaluated the ROS and detoxifying enzyme activity during seed priming and germination [15,16]. Bailly et al. proposed that an oxidative window for germination restricts the occurrence of cellular germination related events to a defined range of ROS level [17].

Previously research found that Neem (*Azadirachta indica*) seeds lose their viability during natural ageing [18,19]. The seed priming improved germination to a limited extent [20]. The aims of this work are to examine H_2O_2 metabolism during ageing and its post-priming germination.

Materials and Methods

Seed collection and extraction

Mature, ripe yellow fruits of *Azadirachta indica* (Neem) were collected manually from the trees growing on the campus of Pt. Ravishankar Shukla University, Raipur, (21°14'14" N latitude and

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DECOLORIZATION OF KRAFT LIGNIN BY LIGNINOLYTIC BACTERIAL ISOLATES FROM TIMBER SOILS OF RAIPUR, CHHATTISGARH

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ABSTRACT

Black liquor, the dark brown color of the effluent generated in the process of wood chips digestion, contains kraft lignin which is a toxic liquid and it contaminates the aquatic ecosystems. The proper disposal of this black liquor has gained momentum in the last five years across the world. Two bacterial strains TSB2 and TSB5 were isolated from soil. After isolation and purification of the bacterial isolates, they were tested for the decolorization of kraft lignin (KL) using sterile mineral salt medium (MSM) containing KL 600 mg l^{-1} (designated here after L-MSM) and supplemented with 1.0% glucose and 0.3% peptone (w/v) and incubated for six days under aerobic conditions at 30 °C and 120 rpm. Samples were withdrawn periodically at 1-day intervals for six days and analysed for pH and reduction of color. It was observed that TSB2 and TSB5 reduced color by 50% after 3rd and 1st day of incubation respectively.

Key words- *Decolorization, Kraft lignin, LigninolyticBacteria, Timber Soil,*

I. INTRODUCTION

The pulp and paper mill is a major industrial sector utilizing wood and non-wood materials and water during manufacturing process [1]. Pulp manufacturing involve two main processes i.e. kraft pulping and bleaching. Kraft lignin is polymer by product of this process. In the kraft pulping process, wood chips are cooked in the solution of sodium hydroxide and sodium sulfide at elevated temperature and pressure. Under these conditions the semisolid pulp is collected and washed. At this point the pulp is dark brown in color and known as black liquor [2]. The black liquor contains lignins, cellulose, phenolics, resins, fatty acids and tannins [3]. Discharge of untreated effluent from the pulp and paper industry caused serious pollution and loss of aesthetic beauty in the environment. They also increase the amount of toxic substance significantly in the water causing death to the zooplankton and fish [4].

Although several chemical and physical methods are available for lignin depolymerization. Thermochemical method is cost effective, energy consuming and harmful to environment hence the researchers have focused on environmental friendly technologies for the depolymerization. Therefore the degradation can be advantageouslydirected by applying selective and more effective ligninolytic microbes and enzymes[5].

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DIVERSITY OF MEDICINAL PLANTS IN PT. RAVISHANKAR SHUKLA UNIVERSITY CAMPUS, RAIPUR, CHHATTISGARH, INDIA.

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ABSTRACT

Chhattisgarh is known as rich herbal diversity state in India because variety of plants is being found here. Different parts of these plants like root, shoot, stem, leaves. flowers, bud, etc. are used to cure many diseases .Current research work is a useful account on medicinal plants in Pt. R.S.U. campus Raipur, Chhattisgarh. Medicinal plant diversity survey was carried out in the period from august 2013 to march 2014 in Pt. R.S.U. campus, Raipur, Chhattisgarh. After the field survey, observed medicinal plants were identified and their medicinal uses were searched from available literature. Total 184 medicinal plants species were identified which belong to 68 families. Out of 184 medicinal plants 56 were trees, 36 shrubs and 92 were herbaceous species. It was also noted that Pt. Ravishankar Shukla University campus is rich in plants of Fabaceae family that is 23 plants and the Euphorbiaceae family is the second largest plant family of this campus, of which 14 plants were reported.

KEYWORD: - Field survey, Medicinal plants, Pt.R.S.U. Campus, Raipur, Diversity.

INTRODUCTION

India is rich in medicinal plants diversity, and the traditional system is still practiced in almost all parts of the country. Charak - samhita (1000 B.C.) is the earliest detailed written account on Indian medicine. It records the use of over 340 drugs of plant origin (Nema et al., 2007). Most of these continue to be gathered from wild plants to meet the demand of the medical profession.

Plants are the source of food, fodder, fuel, construction material, health care material and medicines. They are used in pharmaceuticals, neutraceuticals and cosmetic industries. Plants are also used as food supplements. Plants contribute to modern medicine as source of direct or indirect therapeutic agents (Kadir et.al., 1998). Lifestyle and eating habits alteration among the people makes the herbal medicine as an alternative or complimentary therapeutic measure. Nearly 70% of world population (mainly in the developing countries) relies entirely on such traditional medical therapies as their primary form of health care. (Sumner et al., 2000)

It is reported that approx one third of prescribed drugs are of plant origin. Aspirin which is analgesic was originally derived from species of Salix & spire & some of the most valuable anticancer agents such as paclitaxel & vinblastin are derived solely from plant sources (Lewis et al., 2003).

Chhattisgarh is rich in plant biodiversity and provides habitat to a significant number of medicinal plants (Patel et al., 2012). Raipur is the capital of Chhattisgarh state where Pt. Ravishankar Shukla University is situated. The area of University campus is around 277acres. Environment of the area is quite pleasant. University campus is containing diversity of vegetation. Various botanical gardens are present in the different departments of the university. Diversity of medicinal plants are present in these botanical gardens. Aim of the present study was to carry out a regular survey in the botanical gardens of various departments and university campus for documenting the medicinal plant distribution in the University campus.

MATERIALS AND METHODS

The study was conducted in the Pt.R.S.U. Campus, Raipur, Chhattisgarh. The campus was regularly visited for collection of medicinal plants. Plants or plant parts were freshly collected and their digital photographs were taken. From the collected plants a herbarium of medicinal plants was prepared in the laboratory and their identification was done by the following literature

1. Medicinal plants of India and Pakistan by J. F. Dastur (1962)
2. Ethanobotanical uses of wild medicinal plants by Guddi and Gujjar Tribes of Himachal Pradesh by V. Guleria (2009)
3. Review on Indian medicinal plants by A. K. Gupta (2004-2011)
4. Medicinal plants by S. G. Joshi (2000)
5. Ayurvedic plants 1st edition by P. Kulkarni (2004)

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Effects of radiation emanating from base transceiver station and mobile phone on sleep, circadian rhythm and cognition in humans – a review

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The electromagnetic fields (EMF) are ubiquitous. The base transceiver station (BTS) and mobile phones (MPs) contribute to the generation of EMF around their locations and are regarded as important sources of non-ionizing radiations. The use of mobile phone has increased dramatically in recent years so also the skepticism regarding its effects. In this review, we have made an attempt to scan the key research papers those aimed at elucidating the effects of EMF starting from extreme low frequency (ELF) to radio frequency (RF) through low frequency (LF). We have selected papers that dealt with the effects of radiations emanating from the BTS and MPs on human sleep, circadian rhythm, and cognition. Mostly, we have concentrated on papers published in the last 15 years. We came across conflicting reports. The findings reported in many papers suggest that the exposure to EMF has potentiality to compromise parameters related to sleep quality; in contrast, there are several reports those have given a clean sheet to the EMF exposure. The effects of EMF on circadian rhythms also remain inconclusive. The EMF exposure while did not produce any effect on circadian rhythm of heart rate and blood chemistry, it modulated the rhythms in cortisol and melatonin characterized by a decline in their 24-h circulating levels. The effects of exposure to EMF on cognitive parameters, like performance and memory, are also equivocal. The existing contradictory findings could be attributed to inter-individual variability in tolerance, gender-, and age-dependent differences in response, latitudinal differences in efficacy, variability among employed methodologies and differences in specific absorption rate, frequency of the mobile phone usage, and interaction of EMF with other physiological and environmental factors, among others. The future research should be carried out with added focus on elucidating the modulatory effects of these factors to put an end to the existing controversies on the biological effects of low/RF EMF radiations.

Keywords: electromagnetic field (EMF); non-ionizing radiation; base transceiver station (BTS); mobile phone (MP); sleep; circadian rhythm; cognition; melatonin; specific absorption rate

Introduction

The electromagnetic fields (EMF) are ubiquitous in the environment that we live in. We are exposed to both natural and man-made EMF almost continuously in our day-to-day life. The EMF is a combination of both electric and magnetic fields. According to the WHO Regional Office for Europe in 1999, the "Electric fields are created by differences

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Exploring the Spider fauna of Gomarda Wildlife Sanctuary, Chhattisgarh, India

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Abstract

The aim of the current survey was to explore the spider fauna of Gomarda Wildlife Sanctuary, with geographical location 21°25'36.41" N 83° 9'46.92" E, spreads over an area of 277. 82 sq. km. located about 12 km. away from Sarangarh, Raigarh district of Chhattisgarh, India. This survey was the first approach to prepare checklist of GWS. 120 species representing 49 genera under 16 families, 16 specimens were identified till genera. Families indicating excessive member of species are Thomisidae (24 species under 9 genus) followed by Araneidae (22 species under 8 genus), while family Gnaphosidae indicates highest number of genera (10 genera). The least diversity of species was recorded in Agelenidae, Clubionidae, Eresidae, Filistatidae, Hersiliidae, Nephilidae, Uloboridae.

Keyword: Spider, Gomarda Wildlife Sanctuary, Raigarh, Araneae, Chhattisgarh.

Introduction

Uniqueness attracts attention; spiders are eye-catching because of their fascinating biology. Spider represents class Arachnida under Phylum Arthropoda. The member of class Arachnida were commonly characterized by two body sections, the cephalothorax having 8 segmented legs and the abdomen, absence of chewing mouthparts, antennae and wings. Spiders are also inimitable as they possess spinneret which produces silk but several of them can't whirl the web, they may use the silk to construct sac, nest and mostly to envelop the prey. They participate in the food chain by regulating the population of insects. Furthermore, Spiders are a vital food source for some animals such as amphibians, birds, small reptiles etc. Globally 44906 described species of spiders were catalogued[1]. Sebastian and Peter documented 1520 species of spiders representing 377 genera under 60 families[2]. Keshwani *et. al.* catalogued 1685 species of spiders represent 438 genera under 60 families from India[3].

Gajbe studied spiders from protected areas of central India and illustrated 13 species from Indravati Tiger Reserve, Chhattisgarh[4]. Ramakrishna *et. al.* reported 16 species from Kanha National Park, 27 species from Pench National Park and 29 species from Rani Durgawati Wildlife Sanctuary[5]. Gajbe depicted 32 species of spiders from Panchmarhi Biosphere reserve[6]. Shailendra *et. al.* illustrated 44 species of spiders belongs to 12 families from Rajghat, Barwani (Madhya Pradesh)[7]. Chandra *et. al.* documented 154 species of spiders from Narmada River Basin, Madhya Pradesh[8]. Patil has listed 214 species of spiders belongs to 68 genera and 22 families from state Madhya Pradesh and Chhattisgarh[9]. Sachin *et. al.* documented 23 species belongs 12 genera under 7 families from Rani Veerangana Durgawati wildlife Sanctuary, Damoh[10]. Ekka and Kujur documented 118 species of spiders from Ram Jharna, Raigarh district, Chhattisgarh[11].

The present study was carried out in Gomarda Wildlife Sanctuary, Chhattisgarh, India. State Government established the Gomarda Wildlife Sanctuary in the year 1972. It is approximately 12 km. away from town Sarangarh, Raigarh district of Chhattisgarh. The GWS covers an area of 277. 82 sq. km. The forest vegetation, in the sampling area is tropical dry deciduous, dominated by *Terminalia tomentosa, Shorea robusta, Madhuca indica, Buchnania lanzan etc.* The temperature ranges between 29.5 - 49°C in summer and 8 - 25 °C in winter. The state is covered mostly by moist and deciduous forests. The varied climatic, edaphic and geographical conditions of central India have covered the way for establishing its floral wealth[12]. Forest vegetation may be an imperative factor for existence of spider fauna

Materials and Methods

Study Area: The current study was performed from April 2013 to March 2014 at Gomarda Wildlife Sanctuary with Geographical location *21°25'36.41"N 83° 9'46.92"E.* spreads over an area of 277. 82 sq. km. The temperature ranges between 29.5 - 49 °C in summer and 8 - 25 °C in winter. The forest vegetation, in the sampling area is tropical dry deciduous, dominated by *Terminalia tomentosa, Shorea robusta, Madhuca indica, Buchnania lanzan etc.* Forest vegetation may be an imperative factor for existence of spider fauna.

Sample Collection: Sampling protocols for spiders were followed by Sorensen *et. al.* Six methods like Pitfall Trapping,

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Fish poisonous plants used by Oraon Tribes of North-East Chhattisgarh, India

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Abstract

A survey for documentation of Fish poisonous plants used by the Oraon Tribes in north-east Chhattisgarh has been conducted during August 2014 to July 2015. Ethnobotanical information was gathered through individual interviews and observations among the Oraon tribals. Chhattisgarh state is mainly inhabited by different tribal communities and livelihood of these tribal peoples depend mainly upon the land, agriculture, hunting, fishing, the collection of food product, bamboo work and labour of any kind. Fishing is an alternative occupation of the Oraon tribals and other folk of the area. They use their indigenous knowledge about plants for catching fish easily. In the present paper, 45 different species of fish poisonous plants used by the tribals of Chhattisgarh were highlighted. Use of 10 of these species –Barleria prionitis, Elephantopus scaber, Gloriosa superba, Haldina cordifolia, Nyctanthes-arbour-tristis, Lepidagathis cristata, Hygrophila spinosa, Plumbago zeylanica, Ventilago denticulate, Sphaeranthus indicus as fish poison has not been reported so far in the literature. The study suggested that, documenting the medicinal plants and associated indigenous knowledge can be used for conservation and sustainable use of Fish poisonous plants in the area and for validation of these plants for further study.

Keywords: Fish poisonous plants, Oraon tribe, Chhattisgarh, India.

Introduction

Chhattisgarh, the 26th state in central India is (17 to 23.7 degrees north latitude and 80.40 to 83.38 east longitude) abounds in hilly regions and plains. The culture of the people of the state is associated to the forest since they share a deep emotional attachment with the 'jangal'. This is especially true for forest-based tribal communities. Around 44% of the Eastern Highlands forests of the state are covered by deciduous forests. The state is also declared as the herbal state. The major tribes of this region are – Gond, Kanwar, Oraon, Halba, Bhatra Korwa, Baiga, Nagesia, Kol etc.

According to the 2011 census, the total population of Chhattisgarh is found to be 25,545,198 of which female and male population are 12,712,303 and 12,832,895 respectively. Out of these total population 7822902 are scheduled tribes in which male and female are 3873191and 3949711 respectively. The total population of Oraon tribes is 748789 in which 373065 and female are 375724.

Jashpur district (22° 17' - 23° 15' N and 83° 30' - 84° 24' E), the present study area, is situated in the north-eastern corner of the state. The length and breadth of this district are about 150 km (north-south) and 85 km (east-west). Its total area is 6,205 km². Geographically the district is divided into two parts, the northern Upper Ghat and the southern Nichghat. Upper Ghat is mostly covered with dense forests and mountains, while Nichghat is generally flat but also has many big mountains. The total population of the district is 852,043 (Census 2011).

The land reflects the lifestyle of tribal people. The main occupations of tribes are agriculture, hunting, the collection of forest products etc.; fishing is an alternative source of income. They collect fish for food and also for sale in weekly markets. The main occupation of the Oraon tribes of the state is fishing. Tribals of the state use indigenous knowledge about plants for stupefying fish or as fish poison to obtain a large amount of fish.

Ethnobotanists from different parts of the country have documented plant species employed as fish poison[1-4]. Scrutiny of the literature revealed that no work has been done on this aspect in Chhattisgarh state.

Materials and Methods

Data Collection: During the field survey of the state carried out extensive field studies August 2014 to July 2015 in more tribal rich area of Chhattisgarh which is north-east corner of this state. In this corner 2 district –Jashpur and Raigarh were covered. For the present study, surveys was conducted in 2 districts and from each district 2 blocks were selected, from each blocks again 2 villages were selected for study. During the course of the study regular field visits were carried out in the study area. Selection of area was based on tribal population or tribal richness. During field work all 08 tribal rich villages were covered.

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Research Paper

Histopathology of the liver of Indin Murrel *Channa punctatus* (Bloch) exposed to Phenolic Effluents

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Abstract: *The aim of this study was to examine the histological changes in the liver of fish Channa punctatus (Bloch) for a short term (8day) and long term (30 days) exposure in response to the Phenolic Industrial effluents of Bhilai Steel plant. Fishes were exposed in different concentration (low .01% .015% .02, .025%) and (high concentration 10% 20% 30%) of Phenolic effluent. Tissu sections of the liver were stained with haematoxyline-eosin and changes in the tissues were examined using light microscope. No histopathological changes were found in control, although no lesions were observed in response to short term exposure to both low and high concentration of toxicants, however remarkable changes in liver structure were observed in response to long term exposure .These included nuclear and cytoplasmic degeneration, leucocytic infiltration, vascular congestion hemorrhage. The degree of damage depended on the concentration of effluents and period of exposure.*

Keywords: Histopathology, Liver, Phenol, Effluents, *Channa punctatus*.

Introduction

Indiscriminate discharge of such compounds that contain mixtures of heavy metals, such as herbicide, pesticides, detergents, phenols etc. in water bodies, have harmful effects on the fish population and other forms of aquatic life found in that area[1,2,3]. The result was the generation of large amounts of waste going straight in to the environment seriously damaging its natural processes. The consequences were deleterious, giving birth to three major types of contaminations of our precious natural resources- air, water and soil.

Water is a universal solvent is an essential for life on earth. Hence, discharge of various toxic chemicals and substances into water makes life difficult, If discharged directly in to the environment are responsible for various acute and chronic diseases, such as skin burns and rashes, bone abnormalities, lung and digestive system disorders in aquatic and surrounding land fauna[4].

The Bhilai Steel Plant is the largest integrated steel plant, a unit of Steel Authority of India Ltd. and a public sector undertaking was conceived under aegis of Indo-USSR Treaty in the 2nd Five year plan in 1959. The plant is located at the central position of India, Besides the major marketable product which is good quality steel, it also produces important by products, such as, Coal tar, Naphthalene and Benzol. Left this it also produce large amount of waste water streams, generated from the cooling of the coke oven gas and the processing of ammonia, tar, naphthalene, phenol, and light oil. If they are directly dumped into the river it carries harmful effects on the water bodies.

Phenols are hydroxy-derivatives of aromatic hydrocarbons and are formed during the decomposition of organic materials under natural conditions. They are an important constituent of coal tar. The major portion of the phenol Present in the environment is of anthropogenic origin. Production and use of phenol and its products (wood, iron and steel industry),

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SOME ETHNOMEDICINALLY IMPORTANT AND RARE PLANTS OF NORTH-EAST CHHATTISGARH INDIA

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ABSTRACT

Chhattisgarh is situated in central eastern part of the India. The north-east part of Chhattisgarh state are covered with dense forest and hills. Jashpur and Surguja districts are situated in North-East corner of the state. Both districts are popular for their ultimate tribal culture. Surguja District is situated in the northern part of Chhattisgarh. It lies between 23°37'25" to 24°6'17" north latitude and 81°34'40" to 84°4'40" east longitude.The north-south corner of the state is Jashpur district, lies between 22° 17' and 23°15' North latitude and 83° 30' and 84° 24' East longitude. A large number of plant species have been collected which are used by the tribals and the villagers for treatment of various ailments. The survey was carried out with the cooperation of tribal vaidyas and villagers. The present paper deals with 25 plant species which are used by them ethnomedicinally, collected plants are very important and rare in this area. Ethnomedicinally important plants are: Argyreia speciosa Sweet., Bulbophyllum leopardinum Lindl., Chlorophytumarundinaceum Bark., Clerodendrumindicum (L)Ktze, Dellenia pentagyna Roxb., Erycibe paniculata Roxb.,Flemingia withtiana Grah., Gossypium hirsutum L., Loranthus ligustrinus Wall., Lygodium flexuosum Sw., Mucuna imbricata DC., Nyctanthus arbour-tristis L., Ochna pumila Buch-Ham.exD.Don., O.squarrosa L., Porana paniculata Roxb., Premna herbacea Roxb., Pueraria tuberose DC.,Saccolabium papillosum Lindl. etc.

Keywords: Ethnomedicine, Traditional Knowledge, Rare Plants, North-East Chhattisgarh.

I. INTRODUCTION

Chhattisgarh is situated in central eastern part of the India. The north-east part of Chhattisgarh state are covered with dense forest and hills. Jashpur and Surguja districts are situated in North-East corner of the state. Both districts are popular for their ultimate tribal culture. Surguja District is situated in the northern part of Chhattisgarh. It lies between 23°37'25" to 24°6'17" north latitude and 81°34'40" to 84°4'40" east longitude.The north-south corner of the state is Jashpur district, lies between 22° 17' and 23°15' North latitude and 83° 30' and 84° 24' East longitude. A large number of plant species have been collected which are used by the tribals and the villagers for treatment of various ailments. The survey was carried out with the cooperation of tribal vaidyas and villagers. The present paper deals with 25 plant species which are used by them ethnomedicinally, collected plants are very important and rare in this area.

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SPATIAL DIVERSITY OF SPIDERS OF ROSE GARDEN, RAIGARH, CHHATTISGARH, INDIA

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ABSTRACT

Chhattisgarh is endured with rich flora and fauna.Diversity of spider fauna had been documented from Indravati Tiger Reserve (Jagdalpur) and research projects in Raipur district is ongoing by ZSI (Zoological Survey of India), Raigarh area of Chhattisgarh state is still untouched, and there is no single information available on documentation of spider diversity. Hence, present study was carried out in Rose Garden, located at (21^0 54'N - 21.9^0 N / $83^0$24' E-83.4^0E) Raigarh city, Chhattisgarh, India. Arachnids are an essential poorly studied group of arthropods that play a major role in the regulation of other invertebrate populations in most ecosystems. Spiders represent the second trophic level of consumers in food webs and take part in herbivore and detritivore food webs.As spiders make use of extensive variety of niches, to collect samples, sampling has to be done in all habitats of study area. During this study sweep netting, aerial hand collection, vegetation beating, ground hand collection, litter sampling were used as collection techniques. After collection samples were preserved in 70% alcohol. Identification of spiders was done according to their morphology, and their reported characteristics as given in literatures. Total 20 species of spiders belonging to 13 genera distributed in 6 families were reported from study sites of Raigarh city, some of the species identified as.Araneaemitifica, Cyclosa bifida, Xysticusminutusetc. From this preliminary study it is concluded that, Raigarh is rich in diversity of spider fauna. Databases of present study will provide documentation for further research work in Raigarh, Chhattisgarh, India.

Keywords: Arachnida, Chhattisgarh, Ecosystem, Raigarh, Spider fauna

I INTRODUCTION

Spider attracts attention,because of their fascinating biology.They represent class Arachnida under Phylum Arthropoda. They arewidespread and abundant group in nature (Wilder, 2011) also found on all type of terrestrial habitats (Warui, 2004). They participate in maintaining biological balance of nature by regulating population of insects in agricultural as well as in natural ecosystem (Wise 1993). They can also be used as biological indicators to evaluate the fitness of an ecosystem because they can be easily acknowledged and are differentially responsive to

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Traditional medicament used by Kamar tribes of Chhattisgarh, India

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ABSTRACT

Chhattisgarh, the 26th State of India is situated between 17 to 23.7 degrees north latitude and 8.40 to 83.38 east longitude. Chhattisgarh abounds in hilly regions and plains. Chhattisgarh is known for its unique culture. The culture of the people of Chhattisgarh is linked to the forests and the people share an intense emotional bond with the 'jangal'. This is especially true of forest based and tribal communities. Kamar is one of the five identified primitive tribes(Hill Korwa, Birhor, Baiga, Kamar and Abujhmaria) of C.G. According to census -2006 the population of Kamar tribe is 23033, They are found in the districts of Raipur, Dhamtari & Mahasamund in present Chhattisgarh State. They are totally dependent on the jungle. Kamar tribes are used wild plants in the treatment of all types of disease on the basis of their ancestors knowledge and their own practices. The present paper deals with 37 plant species used by the Kamar tribes of C.G. for the treatment in different ailments. These species are wild, less known and rare in this area. These species like *Arisaema tortuosum* (Wall.) Schott. "Saanp ka Anda", *Argyreia speciosa Sweet* "Hathi ladang", *Abrus precatorius* L. "Goonj", *Abelmoschus moschatus* Medic. "Jangli bhindi", *Anthocephalus indicus* A. Rich "Kadam", *Bauhinia vahlii* Wt. & Arn. "Orra", *Butea monosperma* Lamk. "Palash, *Bombax ceiba* L. "Semal", *Bulbophyllum leopardinum* Lindle. "Pathar kela", *Cissampelos pareira* L. "Parhi", *Cosmostigma racemosum* Wight. "Chota konga", *Careya arborea* Roxb. "Kumbhi", *Cordia dichotama* Forst. "Lasodi", *Celastrus paniculata* Willd. "Kujur", *Centella asiatica* L. "Brahmi", *Clitoria ternatea* L. "Aparajita", *Curculigo orchioides* Gaertn. "Kalimusli", *Desmodium gangeticum* DC. "Galfula", *Diospyros melanoxylon* Roxb. "Tendu", *Erycibe paniculata* Roxb. "Kari", *Elephantopus scaber* L. "Minjur chundi", *Ficus cunia* Ham. ex. Roxb. "Podai", *Guizotia abyssynica* Cass. "Magha", *Holarrhena antidysenterica* Wall. "Korya", *Jatropha curcas* L. "Bagarandi" etc.

Keywords:- Ethnomedicinal plants, healthcare, Kamar, Primitive tribe, Chhattisgarh

Introduction

The culture of the people of Chhattisgarh is linked to the forests and the people share an intense emotional bond with the 'jangal'. This is especially true of forest based and tribal communities. Major festivals, religious practices, social events, traditional customs of child birth, totems and the systems of indigenous medicine and nutrition are based on forest produce. Kamar tribe is one of the 74 primitive tribe found in India. Kamar is one of the five identified primitive tribes(Hill Korwa, Birhor, Baiga, Kamar and Abujhmaria) of C.G. According to census - 2006 the population of Kamar tribe is 23033, They are found in the districts of Raipur, Dhamtari & Mahasamund in present Chhattisgarh State. They are totally dependent on the jungle. Language of this tribe is Kamar. Kamars are circumscribed tribe living in the forest of south eastern part of Raipur District. Today the Kamars earn their lively

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Wild Edible plants Used by Tribals of North-east Chhattisgarh (Part-I), India

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Abstract

The present study was carried out in North – East Chhattisgarh to document the diversity, indigenous uses and availability status of wild edible plants. The tribes of this region are dependent up to a large extent on wild resources for their food and other daily needs. The region is rich in wild edible plant resources. A total of 80 species belonging to 65 genera and 40 families were documented from the study area. Out of the recorded species 29were herbs, 11 shrubs, 25 trees and the rest 15 were climbers. Among the documented plants, 15 were abundant, 44 common and 21 uncommon to this area. Plant parts such as leaves, shoots, young twigs, roots, rhizomes, tubers, flowers, fruits, seeds, etc. are used for food by the tribal people. The study will be helpful in developing a comprehensive data base on wild plant resources, strengthening the food security in area and in conserving the traditional knowledge for the prosperity of the remote areas.

Keywords: Wild edible plants, Tribes, Chhattisgarh, India.

Introduction

Chhattisgarh state is situated at 80°15' to 84°24' E longitude and 17°46' to 24° 5' N latitude. The state is flourished with hilly regions and plains. The annual rainfall is 60 inches in average. The major crop grown in the state is rice. Chhattisgarh is known as herbal state because state has very rich flora and fauna. The total forests area of the state is about 44%. The state is well known in the whole country for its Sal forests. Teak, Bamboo, Saja, Sarai, Haldi etc. are also found in abundance in addition to Sal. Tribal people totally depend on the forest for their food and other purposes.

The present study is covered north- east region of Chhattisgarh. Jashpur district is situated at the north-eastern corner of the state between 22° 17′ to 23° 15′ N latitude and 83° 30′ to 84° 24′ E longitude. The total length (north-south) and breadth (east-west) of this district is about 150 km and 85 km respectively. It occupies a total area of 6,205 square km and its population is 852,043 (Census, 2011). Geographically the district is divided into two parts – the northern Upper Ghat and the southern Nichghat. Upper Ghat, a hilly belt, is covered with dense forests and mountains, however; Nichghat is generally flat but also has many big mountains.

Tribes of Chhattisgarh contribute around one-third of the total population of the state which is about 10 percent of the tribes in India. Scheduled castes (SCs) and scheduled tribes (STs) together represent more than 50 percent of the state's population. The population of SC and ST was 11.6% and 31.76% during 2001 census, which has been now changed to 12.8% and 30.62% (Census, 2011) of the state total population respectively. Gond, Kanwar, Oraon, Khairwar, Bhatra, Korwa, Hill-Korwa, Birhor, Nagesia, Kol etc. tribes are found in this region.

The major occupation of tribal people is agriculture, although forest and their products are also essential livelihood of tribals and folk people, meeting their multifarious requirements like food, medicine, fibres etc. Food requirement is fulfilled mainly through agriculture, but they also collect roots, tubers, leaves, flowers and fruits from the forest as supplementary foods.

Ethnobotanically the state is not well studied, only notable published works are there[1-13]. These publications cover only medicinal aspects, or a few other ethnobotanical aspects However, the detailed information on food plants is lacking. The present paper deals with wild plant species which they collect and consume for edible purpose.

Materials and Methods

Ethnobotanical survey has been carried out in several villages or tribal pockets of the north-east Chhattisgarh during August 2012 to September 2014. First-hand information on food plants was collected from experienced tribals. There were a long list of plants but here only 80 plants are listed. The plants are listed alphabetically by botanical name, followed by local name, family, consumable part, tribes using the plants, lifeform. Uses of plants as food are given in brief, wherever the plants are consumed by specific tribes. Photographs have taken on the spot. The specimens have been deposited in Govt. Navin College, Balrampur, Surguja District, Chhattisgarh.

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Enhancement of Extracellular fructosyltransferase Production by *Aspergillus stallus* Through Batch Fermentation

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Fructooligosaccharides are now well known for their prebiotic properties. Moreover, they lower cholesterol levels, phospholipids and triglycerides in the blood, as well as the diastolic blood pressure. Their synthesis is now commonly accomplished by microbial fructosyltransferase (Ftase) enzyme which has gained parallel importance in food market. The present study intends to maximize the Ftase production of *A. stallus* by amending the nutritional, physical and cultivation conditions of the mold. The investigation of effect of physical parameters like incubation period, pH and temperature revealed the optimum conditions to be day 4 at pH 6.00 and 30°C incubation temperature . Sucrose was the best utilized carbon source for Ftase production at 5 % concentration and supported 36.05±0.10 IU/ml of enzyme .Beef extract was optimally utilized at 2% as nitrogen source enhancing Ftase production to 36.05 ± 0.10 IU/ml. The study of additives revealed 123.33% increase in Ftase production due to $MgSO_4$. The introduction of shaking conditions increased the Ftase production to 68.73 ± 0.10 IU/ml.The total enhancement of Ftase production was 201.44%.

Keywords: Fructooligosaccharides,, fructosyltransferase, batch fermentation and cultural amendments.

Fructooligosaccharides are now well established as excellent prebiotics in health market after receiving Gras status from FDA[1] .Naturally, their occurance in trace amounts is prominently found in onion, garlic, rye, wheat, tomatoes and animal products as honey[2]. However, another potential source is synthesis of FOS by employing microbial FTases which has been successfully attempted in past by many researchers[3-5].

Microbial Ftases synthesize FOS utilising sucrose as a sole substrate. The Ftase is classified as β-fructofuranosidases (EC 3.2.1.26).The transferase activity on sucrose is demonstrated only under high sucrose concentration[6-7].

The enzyme reaction mechanism in *A pullulans* [8] was elaborated as follows

Sucrose (G-F) + Sucrose (G-F) → Glu-fru-fru (GF_2) + Glu (released) step- 1

1-Kestose (GF_2) + Sucrose (G-F)n→Glu-fru-fru-fru (GF_3) + Glu (released) step-2

Nystose (GF_3) + Sucrose (G-F)n→Glu-fru-fru-fru-fru (GF_4) + Glu (released) step-2

(1^F-fructofuranosylnystose)

The prebiotic properties of FOS are attracting immense attraction[9]. Moreover, the health benefits registered include lower cholesterol levels, phospholipids and triglycerides in the blood, as well as the diastolic blood pressure[3,10-11].

The experimental strategy for maximum synthesis of FOS has been varying from worker to worker. Rajoka and Yasmeen used gamma irradiation for strain improvement whereas some

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A STUDY ON SALIVARY α-AMYLASE ACTIVITY AS A MARKER OF STRESS

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ABSTRACT : "Stress" in living beings are like playmate stuff. In wide way stress can be defined as one of the attribute to our modern life style, which leads us to either ways of motivation or depression. However, a potent non invasive biochemical marker to measure the intensity of stress is yet to be established. Recently saliva has been suggested as a source of biochemical marker for several physiological and behavioural functions. The secretion of salivary glands is regulated by sympathetic nervous system through activation of the sympatho-adreno-medullary (SAM) axis. This axis is directly associated with acute stress and secretion of salivary á amylase which varies with respect to the intensity of experiencing stress. Therefore, salivary amylase is being considered as a good biomarker for acute stress level in human beings. In the present study, stress level and salivary amylase activity was measured among 81 participants comprising students from Ph.D. (26), M.phil. (25) and M.Sc. (30). The level of the salivary amylase was found to be 83.96 U/ml, 102.66 U/ml and 90.86 U/ml for Ph.D., M.Phil. and M.Sc. respectively. Whereas the subjective average stress level of these classes of students was recorded 75.96, 72.88 and 80.03 for Ph.D., M.Phil. and M.Sc. respectively. Although statistical tools did not detect any significant difference in stress score, comparison of enzyme activity among these students revealed that level of salivary amylase activity of M.Phil students is significantly higher than other two classes of students. A higher level of salivary amylase activity among M.Phil students may be attributable to their higher stress level. A higher amylase activity among these students also suggests that students of short term courses in higher studies are more stressful than other courses. Further, analysis of data also revealed a heightened positive correlation between stress score and amylase activity suggesting salivary amylase activity as an important biochemical marker for estimation of stress.

Key words : Stress, Salivary α amylase, sympatho-adreno-medullary.

INTRODUCTION

"Stress" is the most frequently used term in 24/7 society of modern world with a great variations in the intensity on human populations. Experiencing stress of the human being may be Eustress or Distress depending upon its stimulus either as a positive or negative stimulant (Yamaguchi *et al,* 2004). Limited amount of stress is motivating, energising and protective for us whereas excess stress can lead to severe illness (Girdano, 2001), such as clinical depression, AIDS, cancer (Cohen *et al,* 2007) and coronary heart disease (Steptoe and Kivimäki, 2012).Hence marking of a biochemical for noninvasive assessment of stress is one of the priority area of research among scientists. Several studies have reported a marked variation in salivary biomarkers like salivary cortisol (sC), salivary alpha-amylase (sAA), salivary chromogranin A (sCgA) during different stress conditions (Filaire *et al,* 2009; Hellhammer *et al,* 2009; Wagner *et al,* 2010). However, stress being a multi-faceted phenomenon (Nater and Rohleder, 2009) a definite biochemical variable for noninvasive quantitative estimation of stress is yet to be established.

In humans, sAA levels have been found to increase in response to both physiological and psychological stress (Bosch *et al,* 1996; Chatterton *et al,* 1996; Nater *et al,* 2005; Stegeren *et al,* 2006). The hypothalamus-pituitary-adrenal (HPA) axis and the sympatho-adrenal medullary (SAM) axis are the two most important biological systems which are activated by stress (Wolf *et al,* 2008). The activation of HPA axis leads to secretion of cortisol hormone. Whereas, activation of the SAM axis results in the release of catecholamine and secretion of salivary amylase (Wolf *et al,* 2008) with a great variation of time lag for increase in the level of these variables. The change in serum norepinephrine levels due to stress is late by 20–30 minute, whereas, salivary alpha amylase level changes within one or few minutes in response to stress (Skosnik *et al,* 2000). Further during psychological stress salivary alpha amylase shows more sensitive and quick response than cortisol (Yamaguchi *et al,* 2004) enabling this variable as a brilliant index for psychological stress.

Among students, it is unequivocal that higher stress is the major impediment for their academic performance. Although limited amount of stress, when it works as 'Eustress', may be helpful to augment their academic

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Circadian clock, cell cycle, and breast cancer: an updated review

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ABSTRACT

Some key elements are common to two fundamental periodic regulatory processes; the circadian cycle and the cell cycle. Underlying mechanisms of coordination between the two processes are critical for proper cellular functioning and physiology. Disruption in the mechanisms of one process may affect the role of other that may direct critical physiological changes and may cause severe diseases like cancer, etc. More or less persuasive evidences evolve from the breast cancer research. In this mini review, we highlighted the molecular coordination's of the elements of circadian cycle and the cell cycle and their altered expressions associated with the genesis and progression of breast cancer.

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KEYWORDS
Breast cancer; cell cycle; circadian cycle

1. Introduction

All underlying mechanisms of the individual cells are directly or indirectly influenced by two important regulatory processes; the cell cycle and the circadian cycle (Masri et al. 2013; Feillet et al. 2015). Essential elements of these two regulatory processes interact with each other (Panda et al. 2002; Gerard & Goldbeter 2012). The interaction may occur at the transcription level or at the translational level (Gerard & Goldbeter 2012). Strong evidences regarding the interaction of elements of both the cycles emerged from bacteria (Goto & Johnson 1995; Mori et al. 1996; Mori & Johnson 2001; Yang et al. 2010a), mammals (Matsuo et al. 2003; Nagoshi et al. 2004), and from other experimental models such as zebrafish (Tamai et al. 2012; Peyric et al. 2013). Recent studies carried out through single live cell imaging with contemporary computational methods emphasized that coupling between these two regulatory processes harmonize the cell cycle (Bieler et al. 2014; Feillet et al. 2014) that is essential for the proper cellular functioning. It has been reported that disruption in the expression levels of elements of one regulatory process may affect the functioning of elements of other process that may lead to altered physiology and behavior (Bjarnason & Jordan 2000; Nagoshi et al. 2004; Welsh et al. 2004).

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Circadian Rhythm in Energy Expenditure in Cancer In- and Out-Patients: A Comparative Study

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Abstract. Unlike normal humans, an alteration in circadian pattern in energy expenditure (EE) has been observed in cancer patients. In the current cross sectional study we examined rhythm characteristics of EE in cancer in- (n = 30) and out-patients (n = 26), and healthy controls (n = 30). EE was assessed non-invasively using an electronic device - the Actical, programmed with data sampling epoch of 60 seconds. All patients and control subjects wore instrument on their non-dominant hand for 3-4 consecutive days. Cosinor rhythmometry was used to determine the rhythm characteristics, such as 24-h average/Mesor, amplitude, and peak/acrophase of EE. Circadian and rhythm quotients were derived from the rhythm characteristics. Two-way ANOVA was employed to determine the effects of factors, 'group' and 'gender' on rhythm characteristics. A significant circadian rhythm in EE was validated in all groups. However, rhythm detection ratio, at 12 h period, was found to be low in both cancer in- and out-patients as compared to controls. Factor 'group' produced significant effect on 24-h average, amplitude, acrophase, rhythm quotient and circadian quotient of EE rhythm. However, effects of factor 'gender' and interaction of both factors was significant on circadian quotient only. At the group level, rhythm characteristics, namely 24-h average, amplitude, and circadian quotient of three groups varied from each other significantly in the following order: in-patient < out-patient < control. In conclusion, EE rhythm deteriorated in both in- and out-patients as compared to control subjects, although the deterioration was more pronounced in cancer in-patients. We suggest that further extensive investigation involving larger sample should be carried out to validate the above findings.

Keywords: Cancer . in-patients . out-patients . circadian rhythm . energy expenditure

Introduction

Energy balance in healthy individuals is synchronized by the circadian clock (Turek *et al.*, 2005). Diurnal pattern of energy expenditure (EE) exists in normal individuals (Swinamer *et al.*, 2004) and is not affected by the different meal timing schedules (Consoli *et al.*, 1981). It has been reported that in humans energy metabolic pathways and rate limiting enzymes for energy producing mechanisms, such as glycogenesis and glycogenolysis are controlled by the circadian clocks that synchronize the energy balance of an individual (Doi et *al.*, 2010; Dallmann *et al.*, 2012).

In disease conditions, like cancer the energy balance has been found to be desynchronized that is characterized by multifaceted factors, such as type and stage of the cancer, symptoms raised from the treatment or alteration in the activity pattern due to disease severity (Keller, 1993; Gibney *et al.*, 1997). Earlier, numerous studies reported reduced or elevated energy expenditure in cancer patients and highlighted that these conditions may be the consequence of reduced energy intake or an increased energy output or both (Warnold *et al.*, 1978; Keller, 1993; Falconer *et al.*, 1994; Nara-ashizawa *et al.*, 2001; Lundholm *et al.*, 2004). These reports are also supported by the findings in tumor bearing animal models (Oudart *et al.*, 1999). Further, it has been reported that the energy expenditure differs among the individuals that is facilitated by many factors, such as gender and age has a significant effect on the status of energy expenditure (EE) (Ferraro *et al.*, 1992). Studies have reported higher energy expenditure levels in males as compared to females (Ferraro *et al.*, 1992; Morio *et al.*, 1997). Ferraro *et al.* (1992) have reported 5-10% higher 24-h energy expenditure in men as compared to women.

As we know that all most all physiological, molecular, metabolic and behavioral processes are controlled by the circadian clocks. Likewise, it has been reported that energy balance is also under the control of these conserved clocks (Turek *et al.*, 2005; Taj *et al.*, 2013; Sultan *et al.*, 2014). Nonetheless there are very few reports on the pattern of energy expenditure rhythm in humans and in animal models particularly related to clinical populations (Ichikawa and Fujita, 1987; Ichikawa *et*

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Combined Toxicity and Bioconcentration of Fluoride and Arsenic in African Catfish *Clarias gariepinus* (Burchell, 1822)

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Abstract— *Laboratory experiments were performed to examine the combined toxic effects of two important aquatic contaminants viz., arsenic and fluoride on African catfish, Clarias gariepinus. Additionally, the bio concentration factors (BCFs) of the two contaminants in tissues and blood of catfish were also determined. The LC_{50} for sodium fluoride and arsenic trioxide were determined to be 619.3 mg L^{-1}, 30.3 mg L^{-1}, respectively. Erratic swimming movements with hyperactivity, loss of equilibrium, augmented air gulping and decreased food consumption were observed in the experimental groups. In co-exposure groups of arsenic and fluoride, the concentration of fluoride in fish tissues increased with increasing water fluoride concentration in the test aquaria with significant differences ($P<0.01$) between different groups. Also significant differences ($P<0.05$) in tissue concentrations of arsenic between groups were observed in response to different concentrations of water arsenic. However, the differences in blood fluoride and arsenic concentrations were not significantly dissimilar ($P>0.05$) among the exposure groups. Arsenic was observed to exceedingly bioaccumulate and biomagnify in the tissues. Perhaps due to the complex formation of arsenic and fluoride the bio concentration of arsenic in tissues was observed to decrease with increasing water fluoride concentration and vice-versa. The study concludes that fluoride may interfere with the bio-concentration of arsenic.*

Keywords— Arsenic, Bio-concentration factor, Combined toxicity, Fluoride, LC_{50}.

I. INTRODUCTION

Fluoride and arsenic are two stern drinking water contaminants recognized worldwide [1] with natural sources contributing to the bulk of their environmental load. Fluoride is found in freshwater at concentrations less than 1.0 mg L^{-1}; however, its natural concentrations may exceed even 50.0 mg L^{-1} [2]. While lower concentrations, viz., <1.0 mg L^{-1} according to Bureau of Indian standards and 1.5mg L^{-1} according to World Health Organization are beneficial, higher concentrations may lead to various health problems [1]. Fluoride causes fluorosis, a slow degenerative disease affecting teeth and bone tissues. It also induces neurological defects, infertility, mental retardation, depression of thyroid activity [3, 4, 5, 6, 7] and persistently bioaccumulates in aquatic animals continuously exposed to the contaminated medium [8, 9, 10].In India, 19 out of 35 states and union territories have ground water highly contaminated with fluoride [11].

A heavy metal, arsenic is more toxic than fluoride at the same dose and exposure duration [1]. Symptoms of toxicity during short term exposures in humans include vomiting, abdominal pain, encephalopathy, and watery bloody diarrhea. Long-term exposure may result in thickened pigmented skin, abdominal pain, diarrhea, heart disease, numbness, and cancer. Globally, arsenic toxicity is mostly prevalent in West Bengal (India), Nepal, and Bangladesh [12, 13] with contaminated drinking water being the most common source. A higher concentration of arsenic is lethal to many organisms in the aquatic environment [14, 15] inducing the synthesis of stress related proteins [16] and alterations in B and T cell functions [17] in the fish body. Like other heavy metals, it is non degradable and considered hazardous to aquatic ecosystem due to its environmental persistence and tendency for bioaccumulation [18, 19, 20]. Donohue and Abernathy [21] reported that total arsenic (μg g^{-1} dry weight), in marine fish, shellfish, and freshwater fish tissues ranged between 0.19 to 65, 0.2 to 125.9, and 0.007 to 1.46, respectively.

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Research Article

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Limitation of Improvement in Germination by Osmopriming of Differentially Aged Non-Orthodox Neem (*Azadirachta indica*) Seeds

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Abstract

This work involves physiological and biochemical features of seed ageing gauged from seed viability and vigour over the period of storage. Both conventional storage (natural ageing) and controlled deterioration (accelerated ageing) are resulted in loss of germination capacity and vigour as well as poor seedling establishment. Present findings indicate that both natural and accelerated ageing sustain similar pattern, except their mortality curve. In natural ageing, prior to entering sigmoidal type decline a period of relative stability exists; whereas in accelerated aging, such relative stability is absent. It is also observed that rate- controlling process of ageing (natural ageing slow whereas accelerated ageing fast) was dependent upon moisture content and temperature. These physical factors have negative linear correlation with seed viability. Membrane integrity and lipid peroxidation are associated with seed ageing, however peroxidation does not hold exact with accelerated ageing. Additionally, these aged seeds were exposed to osmopriming (controlled hydration) resulted in improved germination characterized by faster and uniform germination. For the first time, it was strongly established that osmopriming significantly improves the seed germination (about 12-17%) until a critical level (up to 50% germination) during the ageing and thereafter priming does not support the process of improvement of germination. Such improvement prediction is important for physiologists and seed technologists to recruitment the degree of priming.

Keywords: Natural ageing; Accelerated ageing; Osmopriming; Germination improvement; *Azadirachta indica*; Membrane integrity; Lipid peroxidation

Abbreviations: PEG: Polyethylene Glycol; MC: Moisture Content; TTC: Tri-phenyl Tetrazolium Chloride; LSMC: Lowest Safe Moisture Contents; MDA: Malondialdehyde; TBARS: Thiobarbituric Acid-Reactive Substances; BHT, Butylated Hydroxy Toluene; DM: Dry Mass; FW: Fresh Weight

Introduction

The importance of tropical tree species is wildly recognized. Many tropical trees propagate through seeds. It is a matter of concern, when the seeds of some of the tropical trees have low to very low storage longevity. These seeds generally display intermediate or recalcitrant storage behavior. Unlike orthodox, seeds [intermediate or recalcitrant] shed at very high moisture contents do not survive below critical moisture content (depend upon drying rate and condition). Intermediate seeds survive drying and/or moderate low moisture content, but are often injured by low temperature. This is attributed to their sensitivity to desiccation and/or low temperatures. Storage of such seeds results in loss of seed viability under natural condition by way of decline in the moisture content. These seeds are to be conserved (stored) for sake of reforestation as well as *ex situ* conservation as forest genetic resources. Neem (*Azadirachta indica*), is a valuable and economically important tropical tree species. The seeds of *Azadirachta indica* have been characterized as having intermediate storage longevity. They lose viability within 3 months after harvesting [1,2]. Loss of germinability occurs during dry storage over the time. According to Heydecker et al. [3] seed ageing exhibits deteriorative changes that lead to decreased viability, poor germinability and weak seedling establishment. Besides natural ageing (NA), accelerated ageing (AA) under high temperature and high humidity have a great potential for understanding the mechanism of ageing and associated deterioration processes of seed [4]. The process of deterioration under accelerated ageing conditions is considered fundamentally similar to those under normal condition but not so far verified. However, the major difference is that the rate of deterioration is much faster during accelerated ageing. A number of studies have been carried out in the past to analyze the physiological and biochemical changes associated with accelerated ageing in different seeds [5-7]. Membrane integrity is important marker to determine seed longevity. It is most probable site of biochemical and biophysical changes. Membrane chemical stability is determined by degree of peroxidation of membrane lipids leading to irreversible gel phase domains and loss of membrane function. During last few decades, several priming treatment established to improve germination time, rate, homogeneity and synchrony of aged seeds. Osmopriming is a pre-sowing treatment that exposes seeds to such osmoticum that allows partial hydration but prevent germination [8]. During priming water uptake is controlled by the lowering of the water potential of pre-treated solution with an inert osmoticum. Such primed seeds tend to have an improved seed performance indicated by better germination rate and uniformity [9]. Polyethylene glycol-6000 is often used as the osmopriming reagent [10]. If the seeds are not used immediately after treatment, then they must be dried back to lowest safe moisture contents (LSMC) at which they can be stored without deterioration. Present work depicts ageing dynamics in both natural and accelerated aged seeds. It is not known whether mechanisms of seed ageing are alike under accelerated ageing and natural ageing. Neem seeds behave as intermediate storage longevity. That gives the opportunity to execute

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Monitoring of rest-activity rhythm in cancer patients paves the way for the adoption of patient-specific chronotherapeutic approach

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ABSTRACT

The status and phases of the circadian timing system (CTS) can be ascertained through measuring several biological functions. Of those measurements, rest-activity rhythm is considered as a reliable circadian biomarker to evaluate the function of CTS among oncology population. Its amenable non-invasive monitoring over longitudinal time scale makes it more appropriate and convenient. Its use as reference rhythm for timing the medications is widely accepted in cancer and sleep clinics. Current mini review highlights the present knowledge on different actigraphy devices used for the measurement of circadian rest-activity rhythm. Further, this review presents recent data dealing with the status of circadian rest-activity rhythm in cancer patients and discusses its association with health-related patients' quality of life. Application of this concept supports that the interventions with abilities to reverse CTS dysfunction in cancer patients might prolong their survival with improved and acceptable level of health-related quality of life.

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KEYWORDS
Actigraphy; cancer; rest-activity rhythm; quality of life

1. Introduction

Clinical oncologists with especial interest in chronotherapy study many biological variables, such as melatonin (Jung-Hynes et al. 2010), cortisol (Sephton et al. 2000), blood cell counts (Manfredini et al. 1994), body temperature (Cajochen et al. 2005), and rest-activity (Lévi et al. 2014) along either transverse or longitudinal time scale in cancer patients. The selection of variable/s of interest rests on a few important criteria, namely (1) it should be a reliable marker of the circadian timing system (CTS) of the target subjects/patients; (2) it should be noninvasive; and (3) it should be amenable for multiple hassle free sampling over a longitudinal time scale. Of the various candidate biological variables, rest-activity has been considered as the most suitable non-invasive and robust marker for the evaluation of human CTS (Mormont et al. 2000). Rest-activity in humans follows light–dark cycles with marked activity during the photo phase and less or no activity during the scoto phase of the naturally

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Spatial mapping of spiders (Araneae) in the Gomarda Wildlife Sanctuary, Chhattisgarh,India

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ABSTRACT

The present study deals with the assessment of spider diversity and composition among different habitats in Gomarda wildlife sanctuary, established by government of State Chhattisgarh, India in 1972. The GWS covers an area of 277.82 sq.km.The spiders were sampled by using six different collection techniques as they utilize extensive variety of niches. Each habitat supported distinct/discrete spider assemblages that reflect major differences in structural complexity of vegetation. Collected Specimen were Identified, belonging to 16 families, 49 genera and 105 species, 15 spiders were identified till genera. Overall the most abundant families were Araneidae (18.41%) followed by Oxyopidae (14.45%), Lycosidae (14.63%) and Thomisidae (13.89%). The highest species richness was found in Forest (120 species), while the lowest species richness was in cropland sites (38 species). Simpson's index differ significantly among the three habitats types, however Margalef species richness and Shannons - Weiner index were significantly higher for Natural forest than other two habitats.

Keywords: Araneae, Diversity,Gomarda wildlife Sanctuary, India, Spatial Mapping

I. INTRODUCTION

Rapid declining of diversity and complexity of living organism, causing alarming threat to life supporting systems on earth [1]. Approximately 44% of the geographical area of state Chhattisgarh is covered with tropical forest has strong potential for carbon sequestration. However, increased anthropogenic activities, introduction of alien species have led to degradation of forests in last few decades. According to the report published by Forest Survey of India (FSI) on state forests of India, a net loss of 189 km^2 of forests occurred between year 2005 and 2011 in Chhattisgarh. During this period vast area (3.5 - 5%) of dense forests is converted into open and degraded forests.The pace of land use and land cover is very high in the dry tropical forest ecosystems of State Chhattisgarh,India. There is a dire requirement to evolve sustainable land use practicesfor conserving biodiversity, carbon sequestration, enhancing productivity, and improving bio-geochemical cycles. Increased devastation of natural habitats reinforces necessity to analyze patterns of biodiversity and their spatial and temporal variations, to encourage the purpose of conservation and management decisions [2]

Spiders are often been mystified with insects but in reality they belong to the class Arachnida, order Araneae. Spiders are a group of megadiverse arthropods, including approximately 3935Genera and 44906 described species of spiders worldwide [3].catalogued 1685 species of spiders representing 438 genera under 60 families from India.Spiders inhabit extensive variety of both spatial and temporal niches [4]. They are eye catching and

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ORIGINAL ARTICLE

Worsening of rest-activity circadian rhythm and quality of life in female breast cancer patients along progression of chemotherapy cycles

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ABSTRACT

Chemotherapy and its associated side effects can induce the disruption of circadian rest-activity rhythm and may have negative consequences on health-related quality of life (HRQoL) of cancer patients. In the current study, repeated-measures cross-sectional design was implemented to determine the status of circadian rest-activity rhythm and to assess the HRQoL of newly diagnosed female breast cancer patients those were planned to receive six cycles of chemotherapy. Rest activity and HRQoL were assessed in twenty-five patients during chemotherapy cycles 1st (C1), 3rd (C3), and 6th (C6) immediately after they reported to the outdoor ward of the Regional Cancer Center, Pt. J.N. M. Medical College, Dr. B.R. Ambedkar Memorial Hospital, Raipur, India. Wrist actigraphs for consecutive spans of 3–4 days were used to record the rest-activity rhythm, and its parameters were computed with the help of Cosinor Rhythmometry. Quality of life (QoL) parameters were assessed using EORTC QLQ-C30 and QLQ-BR23. Results revealed that average scores of all rhythm parameters, such as MESOR, amplitude, acrophase, rhythm quotient, circadian quotient, peak activity, dichotomy index, and autocorrelation coefficient; and all functional scales of QLQ-C30, such as physical, role, emotional, cognitive, and social, and global quality of life statistically significantly decreased with the increasing number of chemotherapy cycles (C1 to C3 and C6). Scores of symptom scales of QLQ-C30, such as fatigue, pain, dyspnoea, insomnia, appetite loss, and diarrhea increased significantly from C1 to C6. Among the QLQ-BR23 scales, scores of sexual functioning, sexual enjoyment, breast symptoms, and arm symptoms significantly decreased, whereas scores of systemic therapy side effects, and upset by hair loss significantly increased across the chemotherapy cycles. We conclude that rest-activity rhythm disrupted and HRQoL of breast cancer patients worsened along the increasing number of chemotherapy cycles. We suggest that along with the treatment protocol, level of disruption of these parameters should be assessed and managed with the proper interventions that prominently include timing of the chemotherapy administration. The latter is pivotal for maintenance of these parameters, which are likely to enhance the physiological ability of patients for better treatment responses and may improve the overall QoL and survival of the patients.

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KEYWORDS
Breast cancer; chemotherapy cycle; quality of life; rest-activity rhythm

Introduction

The master clock, suprachiasmatic nuclei (SCN), controls and coordinates the tissue-specific peripheral oscillators via humoral and neural mechanisms (Haus, 2009) and generates nearly 24-h physiological and behavioral events, including rest-activity rhythm (Dibner et al., 2010; Hastings et al., 2003; Van Someren et al., 2007). Rest-activity rhythm has been used as a marker of the endogenous circadian clock function in isolation studies (Aschoff, 1965, 1994; Wever, 1975), phase-shift studies (Duffy et al., 1996; Honma et al., 1995; Kronauer et al., 1982), psychiatry (Teicher et al., 1993; Wehr et al., 1983), and in oncological studies (Ancoli-Israel et al., 2006; Lévi et al., 2014; Mormont et al., 2000; Ortiz-Tudela et al., 2014, 2016; Parganiha et al., 2014). In numerous oncological studies, it has been unequivocally demonstrated that cancer patients exhibit disrupted 24-h rest-activity pattern (Lévi et al., 2014; Parganiha et al., 2014; Taj et al., 2013) and the level of disruption worsens during chemotherapy infusions (Lévi et al., 2010; Roscoe et al., 2002; Savard et al., 2009). Likewise, breast cancer patients also confront the similar drift (Ancoli-

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Original Article

छत्तीसगढ़ी वाक्य–संरचनाओं का विश्लेषण

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शोध संक्षेप :

शब्दों का ऐसा तारतम्य जिसका शाब्दिक अर्थ निकलता हो, वाक्य कहते हैं। वाक्य सार्थक शब्दों का व्यवस्थित रूप हैं। यदि शब्द भाषा की प्रारंभिक अवस्था है, तो वाक्य उसकी अंतिम इकाई है। वाक्य वह सार्थक संरचना है, जिसके माध्यम से लेखक लिखकर तथा वक्ता बोलकर अपने भाव या विचार पाठक या श्रोता पर प्रकट करता है। वाक्य की उपयोगिता व्याकरण में तो है ही, सर्वसाधारण के दैनिक जीवन में भी कम नही है। मानव मात्र की भावनाओं, आकांक्षाओं और विचारधाराओं का प्रतीक वाक्य ही है। आचार्य विश्वनाथ ने इसीलिए यश की वृद्धि करने वाले काव्य की अनिवार्य शर्त रसात्मक वाक्य को माना है।

'वाक्यं रसात्मकं काव्यम्'

प्रस्तावना :

यदि वक्ता या लेखक अपन बात श्रोता या पाठक के हृदय तक पहुँचाना चाहता है, तो यह नितांत आवश्यक है कि वाक्य जहाँ अर्थपूर्ण हो, वहाँ भावपूर्ण भी हो। बिना अर्थ के वाक्य को कोई भी व्यक्ति समझने में असमर्थ होगा इसी प्रकार यदि कोई वाक्य भावशून्य होगा, तो उसका प्रभाव भी श्रोता तथा पाठक पर न पड़ सकेगा। अर्थ की सहायता से ही व्यक्ति भावों की गहराई तक पहुँचने का प्रयास कर सकता है।

पद समूहौ वाक्यामर्थ परिसमाप्तौ

पदों का समूह वाक्य होता है, जिसमें अर्थ अच्छी प्रकार समाप्त हो। भाषाविज्ञान के अंतर्गत वाक्य में प्रयुक्त विभिन्न पदों के परस्पर संबंध काविचार किया जाता है अतः वाक्य का स्वरूप, वाक्य की रचना, वाक्य के आवश्यक तत्व वाक्य का विभाजन, वाक्य के निकटस्थ अवयव, वाक्य में परिवर्तन, परिवर्तन के कारण और दिशाओ आदि संबंध में विस्तार से अध्ययन किया जाता है।

पदविज्ञान और वाक्यविज्ञान में अतंर यह है कि पद विज्ञान में पदों की रचना का विवेचन होता है। अतः उसमें पद विभाजन (संज्ञा, क्रिया, विशेषण आदि), कारक, विभक्ति, वचन, लिंग, काल, पुरूष आदि के बोधक शब्द किस प्रकार बनते हैं, इस पर विचार किया जाता है, वाक्य विज्ञान उससे अगली कोटि है। इसमें पूवोक्त विधि से बने हुए बदों का कहाँ, किस प्रकार प्रयोग होता है, पदों को किस प्रकार रखना या रजाना चाहिए, उनको विभिन्न प्रकार से अर्थ में किस प्रकार अर्थ में परिवर्तन होता है, आदि विषयो का विवेचन है। ध्वनि निर्मापक तत्व हैं। जैसे– ईट, वस्त्र आदि, वाक्य वह रूप है, जो वास्तविक रूप में प्रयोग होता है, जैसे – मकान, सिले वस्त्र आदि पद ईट है तो वाक्य मकान या भवन।

RNI - MAPHIN/2002/7941

...ष्ठ के कथा-साहित्य के अंतर्गत बाजारीकरण

..., मनीषा कुलश्रेष्ठ के कथा-साहित्य की वस्तु को केन्द्र में रखकर बाजारीकरण पर ... आज के युग की सच्चाई भी यही है कि बाजार तक चलकर उपभोक्ता को जाने की ... है, वरन् बाजार और कंपनियाँ उसका दरवाज़ा या कॉलबेल बजा रही हैं। यह समय ... अधिक जोखिमभरा है, उससे अधिक चकाचौंध और विज्ञापन की चमक-दमक ... कौन सा असल है और कौन सा नकल, इसकी परख संभव नहीं रह गई है। फैशन के युग ... नहीं, वरन् चलन किस बात का है, इस पर जोर दिया जाता है। मनीषा कुलश्रेष्ठ ने अपने ...-ताना, शिल्प और दृश्य वही लिए हैं, जो आज की मॉल संस्कृति के व्यवहार और चलन ... कोई हो, वह समाज को संदेश देता है। मनीषाजी ने भी यही संदेश दिया है कि अच्छी ... आपके पास है, किन्तु आप एक पारखी खरीददार हैं, यह आपको सिद्ध करना है।

सत्यभामा मिश्रा* एवं डॉ.मधुलता बारा**

... एक गाँव में तब्दील हो गया है। इस ... है, बस खरीदने के लिए खरीदार ... और परिवेश में बाज़ारीकरण इस तरह से ... और उपभोक्ता के बीच का फर्क भूल ... में मनुष्य वस्तुओं का उपभोग करता था, ... दौर में वह स्वयं एक 'प्रोडक्ट' बन गया है। ...भास किया जाता था, अब मनुष्य और वस्तु ... गया है। हमारा जीवन आडंबरपूर्ण हो गया ... है कि, "उपभोक्तावाद तर्कहीनता, बाह्याडंबर ... का पर्याय है, जबकि उपभोग की पुरानी आधुनिक ... यथार्थ सुरक्षित थे।"[1] स्पष्ट है कि छलना के ... ज़िंदगी का चरम लक्ष्य है। सुख और शांति ... से बाहर हो गए हैं। छलना ने जीवन के प्रत्येक ... छलनी कर दिया है।

...यी बाज़ारवाद का चित्रण मनीषा कुलश्रेष्ठ ने ... 'लटीकर' में करते हुए लिखा है कि, "दीवारों के ... पर्दों, टेबल, नैपकिन्स पर भी मशरूम, टमाटर, ... मिर्च के चित्र बने थे। भूख जगाते चित्र 'मुस्कान ... नहीं, पिज्जा के साथ मुस्कान सर्व करते हैं', इस ... अभ्यास में दोहराते हुए उसने अपना चेहरा काउंटर ... वॉशबेसिन के आईने में देखा और चेहरे पर जमती ... खुशगवार सी मुस्कान चुन ली।"[2] उत्तर आधुनिक ... को इस तरह सजा-सँवार कर प्रस्तुत किया जाता ... आपको ज़रूरत न हो तो भी आपको ज़रूरत का ... जाए और आप मनोवैज्ञानिक रूप से विवश होकर ... करने लगें। जैसे रेस्तरां की दीवार से लेकर हर जगह ऐसे चित्र बनाए जाते हैं, ऐसा माहौल बनाया जाता है कि भूख न होने पर भी भूख का अनुभव होने लगता है। वहाँ उपस्थित कर्मचारी आपको विशिष्ट होने का अनुभव कराते हैं। वे हर बात पर मुस्कुराते हैं, ग्राहक चाहे कितनी भी अभद्रता कर ले। मुस्कुरा कर खाना नहीं परोसा जाता, खाने के साथ मुस्कुराहट परोसी जाती है। यही है आयातित उत्तर आधुनिकता जिसमें दाल-रोटी का स्थान पिज्जा, बर्गर ने ले लिया है। मुस्कुराहट अब स्वाभाविक भावना न होकर एक व्यावसायिक उपकरण मात्र है। लेखिका शुद्ध व्यवसाय के इस प्रपंच का आगे बखान इसी कहानी में करते हुए लिखती है कि- "वो लोग खुश होकर गए थे मगर उसकी इस असावधानी से कस्टमर को हुई परेशानी और खलल का मुआवज़ा भरेगा यह रेस्तरां। यही तो सही व्यवसायिक तरीका है। असावधानी और खलल के बावजूद दुबारा आएँगे। ओढ़ी हुई मुस्कानों और व्यवसायिक सौजन्यता के चलते।"[3] यही तो है व्यवसायिक चतुरता। पिज्जा सर्व करते हुए कस्टमर की पैंट पर गिर जाता है, जिससे उनके आनंद में व्यवधान पैदा हो जाता है। वेटर उन्हें दोबारा फिर से पिज्जा सर्व करता है और देर होने पर या गलती से पिज्जा खराब होकर गिर जाने के कारण दो आइसक्रीम भी फ्री देता है। इस तरह से ग्राहक तो खुश होकर जाते हैं, वे दुबारा भी रेस्तरां आएँगे, क्योंकि यहाँ उन्हें तथाकथित उत्तर आधुनिक 'मज़ा' आया है। परंतु फ्री की आइसक्रीम और खराब हुए पिज्जा का खामियाजा तो वेटर को ही भरना है। संभव है कि हम एक ऐसे बाज़ारवाद के समय में जी रहे हैं, जहाँ हर चीज़ कृत्रिम है। अगर कुछ वास्तविक है तो मुनाफा, फायदा चाहे वह जैसे हासिल किया जाए।

कृत्रिमता :

उत्तर आधुनिकता से उपजी इस कृत्रिमता ने हमारे बाहरी

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Impact of Service Quality on Customer Loyalty- A Study on Telecom Sector in India

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Abstract: *The objective of this paper is to identify the impact of service quality on customer relationship management and customer loyalty in the Indian telecom sector. Service quality has been considered as independent variable whereas customer relationship management and customer loyalty were considered as dependent variable. Five antecedents of service quality have been considered in this study viz. empathy, assurance, responsiveness, tangibility and reliability based on SRVQUAL model of Persuraman et al (1988). A survey-based exploratory and causal research design was used. A 29 items instrument was generated comprising of 18 items for the four antecedents of independent variables on the basis of the work of Persuraman et al (1988), 6 items for customer relationship management on the basis of the work of Sin, Tse and Yim (2005) and 5 items for customer loyalty on the basis of the work of Harsandaldeep Kaur and Harmeen Soch (2012). The data was collected from 262 customers using mobile service of various telecom operators of India through structured questionnaires distributed online. Exploratory factor analysis was conducted to check the validity and Cronbach's coefficient alpha was used to determine the reliability of the instrument. Multiple regression analysis was used to determine the causal relationship between both the independent & dependent variables. Results depicted that the service quality has significant and positive impact on customer relationship management and customer loyalty. Out of the four antecedents of service quality, tangibility and assurance has significant and positive impact on customer relationship management, while tangibility has a significant impact on customer loyalty. The study suggests that the service providers should put their endeavor to upgrade the technology and serve the customers with modern equipments. Besides, the staff should try to please the customers by their neat appearance.*

Keywords: *Service Quality, Customer Loyalty, CRM, Empathy, Assurance, Responsiveness, Tangibility, Reliability.*

I. Introduction

There is wider scope and potential of growth of the services in the developing country like India. The Indian telecommunication sector is the second largest in the world after China. In this Scenario, if service providers would not put their endeavor in differentiating them from competitors, customers are more prone to switch to other competitor at almost zero cost. Services are deeds, processes and performances (Zeithaml and Bitner, 2003). Broadly speaking, "services are economic activities that creates value and provide benefits for customers at specific times and places as a result of bringing about a desired change in or behalf of the recipient of the services" (Christopher Lovelock, 1983).

Success of a service provider depends on the high quality relationship with customers (Panda, 2003) which determines customer satisfaction and loyalty (Jones, 2002 as cited by Lymperopoulos et al., (2006). For service marketing, service quality is an essential plank. (Kushwah and Bhargava, 2014). Building long term relationship becomes a necessity today due to fierce competition in the market and hence customer loyalty is a growing concern of today. Indian Telecom industry has undergone a transformation change in past decade especially after the concept of privatization and strongly felt the need of customer loyalty. This need was felt due to availability of enormous number of market players in India. This stiff competition has compelled the service provider to compete in the market and to differentiate themselves on the basis of a factor other than price. Hence, this very concept of service quality has arises and gained attention. Better service quality provides competitive advantage to the organization. Any service organization can differentiate itself by providing high quality service.

Hence, this study is an attempt to analyze the impact of service quality on customer relationship management and loyalty and attract the attention of practitioners towards betterment of service quality to reduce the customer attrition, and to give suggestions to improve the service quality. The results of the study helps to determine the aspect of service quality (empathy, reliability, assurance, tangibility and responsiveness) to be

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Introspection into Green Credence: Theory or Reality

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Customers are the king of the markets. The success of any company depends upon the patronage it develops with the king of the market. In today's parlance the king has become conscious about environmental sustainability and is favoring those companies which are environmentally responsible and are ready to forego their profits to minimize environmental degradation. Banarjee et. al (1995) opined that historically the green initiatives undertaken by companies was a short term plan to exploit the potential related with green consciousness of customers which was converted into a long term plan due to advent of green customers. The role reversal from customer to green customer has made it compulsory for companies to actively divert their strategies to become a green company in practice and not in theory. Further Florian et al (2007) while discussing his rational choice model highlighted that customers favor those companies which are environmentally responsible and are ready to sacrifice profits to reduce stress on the environment. Buying process is summarization of consumer decisions in hierarchal order shaped by need recognition, search for information, evaluation of alternatives and purchase decision. Mainieri (1997) highlighted that awareness about environmental impacts of products and services influences the buying process and converts simple buying into green buying. The researchers conducted an empirical study by collecting data from 1000 customers residing in Raipur city to analyze the following issues by using structural equation modeling:

(a) Customers perception regarding the green initiatives undertaken by companies,

(b) Impact of green initiatives on patronage of customers,

(c) Impact of Green Patronage on buying behaviour of customers.

The findings of the study highlighted that the green perception of customers helps in formation of green reputation of companies which develop green patronage. Further the green perception of customers shapes the green buying behaviour of customers.

Keywords— *Green Customers, Green Reputation, Green initiatives.*

INTRODUCTION

Change is an all pervasive factor whose presence can be seen, felt and experienced in almost all phenomenon of life. The effects of change can be understood by analyzing the development process of a country. Economic development triggered by extensive usage of technology has been the story of almost all countries of the world. Technological up gradation has played a vital role in development of human civilization all over the world. In the present scenario technology has changed the psychology of human race and revolutionized their thought process with regards to products and services they demand, use and dispose. Companies all over the world are investing their time and efforts in discovery and invention of new technologies which can better translate the needs and want of customers into products and services

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Employee Well-Being, Life Satisfaction and the need for Work-Life balance

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Abstract

The purpose of this paper is to comprehensively study the developing concept of employee well being, their satisfaction and the balance between work and life of employee.. The paper reviews the concept of work life balance in both Indian and global context and analyses the practices of Indian Corporate related to work life balance. The researchers have tried to understand and explain the concept of employee wellbeing and its relationship with their job satisfaction and work life balance which enables the corporate to derive benefits related with higher retention and productivity ratios. Authors have done descriptive research while analyzing the data gathered through secondary sources and discussed their viewpoints. The key findings highlight that employees are an asset to an organization and the organizations which help their employees to achieve greater work life balance have more satisfied employees. This is a fairly original paper which discusses concept and practices related with work life balance.

Keywords: Employee Satisfaction, Work Life Balance, Employee Well Being, Flexi Timings, Compressed Work Hours and Tele Computing.

Introduction

Well-Being and Life satisfaction of an employee, as a concept has gained popularity and has become strategically important for the organizations globally in recent times. Just like the monetary benefits offered by the organization, the *work-life balance programs* have also become a desirable parameter for job seekers. Gone are the days when big organizations were able to attract talent on basis of its name and impressive legends of leaders who were

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Investigating Green Credence of Indian Hotels: A Study

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Abstract
Purpose: *The purpose of this paper is to comprehensively study the developing concept of Green Hotels and customers perception of green hotels. The paper reviews the concept of green hotels and identifies different variables related with green services and practices at selected hotels in India to identify customer's perception.*
Design/methodology/approach: *Authors have done descriptive research while analyzing the data gathered through secondary and primary sources and discussed their viewpoints.*
Findings: *The key findings highlight that customers concern for several factors in green hotels such as conservation of electricity & water, waste management programs, recycling & reuse, price etc and they don't mind paying extra for green services availed.*
Originality/value: *This is a fairly original paper which discusses the concept of green hotels and customers perception towards green Hotels.*
Keywords: *Green Hotels, Customers Perception, Reduce, Reuse, Recycle.*
Paper type: *Case study and viewpoint*

I. Introduction

Man is a rational being. The effects of rationality of man can be seen and felt in almost all disciplines of life. Man has understood the needs of the society and has accordingly developed concepts and practices that were most suitable for the sustenance and development of all stakeholders. Initially the natural resources available to mankind were utilized by man in the name of development and its consequences were seen in the form of alterations in the environment which was characterized by severe natural calamities. Munier (2005) indicated that the ambitious economic goals of mankind has put excessive pressure on natural resources which has caused irreversible damage to natural environment in terms of depletion of forest cover, contamination of natural environment and alterations in the form of climatic changes. The rational behavior of man made it essential for human race to think in terms of sustainability. The concept of sustainability undertakes the development of practices which will ensure the maintenance of ecological balance by minimizing the depletion of environmental resources by its cautious uses. However United Nations World Commission on Environment and Development (1987) in its publication "Our Common Future" propounded the most used definition of sustainable development which states that *"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* The concept of sustainable development has been translated in practice across various fields.

Business houses all over the globe have engaged themselves in understanding and implementing practices which will enable them to part of the futuristic vision of sustainable development. Esty & Simmons (2011) highlighted that business houses can contribute towards sustainable by conducting business in manners that will ensure cautious usage of natural resources and reduction of pollution of environment. The initial concept of sustainable development progressed in theory when the companies highlighted themselves as green companies by using the elements of promotion mix. In the latter stages the companies understood that theoretical practice and only promotion will not make them sustainable companies they need to make investments in alterations of procurement, processing and delivery process in order to make themselves sustainable companies. Jonker & De Witte (2006) opined that the singular economic goal of profit must be correlated with people and planet in order to make a more operational goal covering the three important parameter of development "Profit, people and planet". The operational feasibility of three P principles can be seen in hospitality and tourism industry in India. The hospitality industry in India have understood the negative impact of certain practices related with unreasonable usage and pollution of natural resources and are taking conscious efforts to develop sustainable practices by using better green technology, following governmental norms and investing in employee and customer education to reduce stress on the environment. Sharma and Kukreja (2013) highlighted that the Indian Hospitality industry contributes around 2.2 percent of India's GDP. The Industry is expected to reach INR 230 billion growing at a compound growth rate of 12.2 percent. Further Joseph (2016) studied the employment-generation potential of hotels and highlighted that World Travel & Tourism Council (WTTC), indicates that India's travel and tourism sector is expected to be the second-largest employer in the world, employing approximately 50 lakhs people, directly or indirectly by 2019. In the above backdrop the researchers felt it essential to understand the sustainable practices of hotel industry which is

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Patients' Perception of Service Quality of Select Private Hospitals in Chhattisgarh

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ABSTRACT

Health sector in India is growing at an accelerated speed to cater to the health care needs of the increasing population. There is huge network of public as well as private hospitals in the country providing wide variety of health care services. Being intangible in nature hospital services are difficult to measure. During hospitalization patients have certain expectation on their part from hospitals which they compare with actual service delivery and formulate perception. The quality of services is measured to calculate the difference between perception and expectation. But it is very difficult to measure as patient's expectation and perception may vary based on their service encounter at the time of service delivery in hospitals. In this paper the researchers have sampled 100 patients regarding the service quality of select private hospitals in Chhattisgarh administering modified version of SERVQUAL scale. The findings of the study reveals that patients expectation exceeds their perception about service quality in select private hospitals.

Keywords: Perception, Expectation, Hospital Services, SERVQUAL, Service Quality

1. INTRODUCTION

Customer is the king of market. It was the dream that founding fathers of consumerism movement aspired to achieve through active participation of both buyers and sellers in the market. Academicians, researchers and practitioners of marketing have tried to test the foundations of this principle through empirical analysis and case studies from time to time. The review of buyer's behaviour highlights that the growing awareness of buyers over the years has strongly contributed for the enrichment of markets. The practice like "Caveat Emptor" in market still demands better understanding from the buyers so that they can be safeguarded against the malpractices prevalent in markets. On the other hand the seller in the market has a manifold responsibility of providing better quality goods to customers at reasonable price to generate customer satisfaction which will help them retain customers .and increase their market generated revenue. Quality is an abstract term which is therefore difficult to comprehend for buyers with limited knowledge and thus is correlated with prices in Indian markets.

Further the service market is a combination of diverse services which are different and unique in nature. There are some services that are choice driven and customers are happy to avail them from time to time but there are certain services like hospital provided health services which are preferably avoided by customers. Berry and Bendapudi, (2007) indicated that Health care is a rare service that people need but do not necessarily want. Still health sector in India is progressing at an accelerated speed. Ramchandra and Rajlakshmi (2009) compared the growth of hospital services on a time series and highlighted that Indian health sector has taken a swing from public sector to private sector as an effect of LPG policy which led to opening of largest number of private hospitals in India. Furthermore these private hospitals account for 80% of revenue generation in the health care sector in India and public sector has restricted to small percent of 20%. (Price water house Cooper, 2007). This anomaly highlights the fact that Indian hospital sector is providing high range services but whether these services are extended to customers of lower income groups which formulate the maximum strata of Indian population is yet to be analyzed. In addition the problem of analysis of quality is difficult for services in comparison of products as services lack

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Customers Intention to Switch towards Mobile Number Portability in Chhattisgarh-A Study

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Abstract

This study is an attempt to assess the customers intention to switch towards Mobile Number Portability in selected district of Chhattisgarh. The respondents have been sampled purposively from the different district of Chhattisgarh. The exploratory factor analysis was performed over the data using SPSS 21sotware to identify different factors that cause intention to switch among customers. The findings revealed three factors responsible for switching intention namely 'intention to switch in future, ' reasons formulating intention to switch, ' 'intention to switch due to offer and improper response.'

Top

Keywords

Mobile Number Portability, Intention to Switch, Service Provider, TRAI, Pre Paid Connection, Post Paid Connection.

Top

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Go Green Initiatives of Customers: An Introspection of Myths or Reality

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Abstract

***Purpose**: Business enterprises in India and across the world who were historically engaged in profit maximization only are now diverging their practices towards the principle of "win-win" in the market. These enterprises are developing sustainable practices which are empowering customers, enterprises, environment and society to become more accountable to each other while managing the interest and benefits of all related parties. Kotler et.al (2013) mentioned that such ideas are floating which shrinks the gap between the development and execution in the market by interaction of customers and enterprises. Customers are favoring enterprises which are more environmentally and socially responsible on one hand and enterprises are framing strategies to educate and provide customers services which are more environmentally and socially responsible on the other hand.*

The present paper tries to study the customer mind set with respect to green initiatives that the customers are willing to take in response of the green practices undertaken by companies and policies framed by the customer. The paper tries to understand and evaluate the behaviour behavior of a green customer in the market. Business Dictionary (2015) defined green customer as a customer who is conscious about the issues and obligations related to environment and supports all environmental causes to the extent of switching loyalty from one product or supplier to another even on the cost of paying higher prices. Cambridge Dictionary (2015) further simplified the definition of green customer by highlighting that green customers tend to buy products and services which are produced by using environmental friendly ways and means.

A host of studies have been conducted in India and abroad to understand the practices followed by Green customers. Straughan and Roberts (1999) indicated that customers are aware of environmental friendly products and are changing their attitude with respect to their usefulness and are ready to pay higher cost to acquire and use such products. Saxena et al. (2010) opined that the companies are changing their production process and making it more environment friendly due to the positive response and attitude of customers in the market.

***Design/methodology/approach:** Researchers have conducted descriptive study empirically to identify buying behavior of green customer while analyzing the data gathered from sampled respondents in the city of Raipur, Chhattisgarh.*

***Findings:** The findings of the study indicate that belief and involvement of green customers have an impact on purchase intention for green products. Purchase intention for green products is dependent on availability of time, availability of product and availability of information of green products and services. Green purchase intention influences the green purchase behavior which is represented by preference for the product, willingness to pay higher prices and determination to buy green products. Further the research also indicated that support of green values by customers is based on their intrinsic choice and there is lesser impact of government policy and promotion of companies on their buying behavior.*

***Key Words**: Green Customer, Green Purchase Intention, Green Purchase Behavior, Green values*

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Mapping Relationship between Employee Performance and Emotional Intelligence : A Study

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Abstract

The aim of this paper is to analyse how the distinguished components of the constructs of emotional intelligence, namely emotional awareness, self motivation, self awareness and self regulation, constitute the emotional intelligence of the employees and ultimately affect their performance. For this purpose data had been collected from the employees of different branches of the State Bank of India in Raipur city. Data thus collected was analysed through regression using SPSS. It was found from the study that there is a direct linkage between employee's performance and emotional intelligence.

Key words: Emotional Intelligence, Emotional Awareness, Self Motivation, Self Awareness and Self Regulation

Introduction

Human capital is the most important asset of an organization. The conceptual growth of personnel management to human resource management and human resource management to Human resource development highlights the importance, that is, being placed by academicians and practitioners worldwide on Human Recourses. The Emotional Intelligence which shapes the knowledge, skill and ability of the employees working in an organization is being treated as an important fundamental element by HR managers. Change is the fundamental phenomenon of organizations. The reactions and actions of employees towards the ever changing internal and external environment of organization is shaped by emotional intelligence. Singh (2001) stated that emotional quotient of employees help in determining their reactions towards job elements as well as their formal and informal association in the groups with which they interact during their work life. Further Reuven et al. (2007) indicated that the managers must include the analysis of emotional intelligence in the selection process so that it can be analysed, that which employees can perform better in teams. Researches around the world has given a clear understanding regarding the fact that emotional intelligence determines the interpersonal relationships of employees in organizations therefore organizations must organize training and development programme to improve emotional quotient. Wall (2008) indicated that technical expertise shaped by intelligence quotient can determine the work efficiency of an individual but the emotional intelligence of an individual shapes the relationship of an individual

Adaptively Secure Strong Designated Signature

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Abstract. Almost all the available strong designated verifier signature (SDVS) schemes are either insecure or inefficient for practical implementation. Hence, an efficient and secure SDVS algorithm is desired. In this paper, we propose an efficient strong designated verifier signature on identity-based setting, we call it ID-SDVS scheme. The proposed scheme is strong existentially unforgeable against adaptive chosen message and adaptive chosen identity attack under standard assumptions, the hardness of the decisional and computational Bilinear Diffie-Hellman Problem (BDHP). Though the unverifiability by a non-designated verifier and the strongness are essential security properties of a SDVS, the proofs for these properties are not provided in most of the literature on SDVS we reviewed. We provide the proofs of unverifiability and of strongness of the proposed scheme. Moreover, we show that the proposed scheme is significantly more efficient in the view of computation and operation time than the existing similar schemes.

Keywords: Strong designated verifier signature · Identity-based cryptography · Bilinear Diffie-Hellman problem · Provable security

1 Introduction

Digital signature is a widely accepted tool for authentication in cryptography. The general definition of digital signature in public key cryptography allows any user in public to verify the authentication of the signature. However, in many situations, like proposal of construction bidding, licensing software, electronic voting etc., the signers may desire to sign a document for a particular receiver with control over the verification of their signatures. In these applications, the signed message may include crucial information between the signer and the verifier.

For such scenarios, Chaum et al. [3] introduced the undeniable signature which allows a signer to have a control over the signature with the property that verification of a signature requires the participation of the signer. But a practical issue with such a signature is that the signer's presence for verification requires the signer to be online all the time. To overcome this complication, Jakobsson et al. [7] proposed the concept of designated verifier signature (DVS),

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AN INVENTORY MODEL FOR NON-INSTANTANEOUS DETERIORATING ITEMS WITH QUADRATIC DEMAND RATE AND SHORTAGES UNDER TRADE CREDIT POLICY

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Abstract In this paper, we propose an appropriate inventory model for non-instantaneous deteriorating items over quadratic demand rate with permissible delay in payments and time dependent deterioration rate. In this model, the completely backlogged shortages are allowed. In several existing results, the authors discussed that the deterioration rate is constant in each cycle. However, the deterioration rate of items are not constant in real world applications. Motivated by this fact, we consider that the items are deteriorated with respect to time. To minimize the total relevant inventory cost, we prove some useful theorems to illustrate the optimal solutions by finding an optimal cycle time with the necessary and enough conditions for the existence and uniqueness of the optimal solutions. Finally, we discuss the numerical instance and sensitivity of the proposed model.

Keywords Inventory model, complete backlogging, time dependent deterioration rate, quadratic demand, non-instantaneous deterioration, permissible delay in payment.

MSC(2010) 90B05.

1. Introduction

Management is on the strand of being a huge success in understanding how industrial firm's success depends on the interaction among the flows of information, auxiliary equipment, wealth, manpower and main appliance. In response to such an aptitude and looking for ways of reducing costs and increasing profits, companies have to focus on the strong management of supply chains to gain ground their emulative benefits. The oldest and first known inventory model is an Economic Order Quantity (EOQ) model developed by Harris [11] in 1915. In that model, Harris [11] considered a constant demand rate, but intangibility, demand rate is not constant.

In 1977 Donaldson [4], first added the linear type demand in the EOQ inventory model. Subsequently, linear demand was replaced with positive demand in 1986 by Goyal [9], a negative demand is discussed in 1995 by Hariga [13], exponentially nonlinear demand was discussed in 1994 by Hariga and Benkherouf [12] and then for ramp type demand in 1995 by Hill [14]. In 2003, Khanra and Chaudhari [16], developed an inventory model for quadratic demand rate. Ghosh and Chaudhuri [7]

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A DETERMINISTIC INVENTORY MODEL FOR NON-INSTANTANEOUS DETERIORATING ITEMS WITH RAMP-TYPE DEMAND RATE AND SHORTAGES UNDER PERMISSIBLE DELAY IN PAYMENTS

VANDANA - B.K. SHARMA

In this paper, we have proposed an inventory model for non-instantaneous deteriorating items, having Ramp-type demand rate with a time dependent holding cost. In addition, the shortage is allowed, which is partially backlogged. In the genuine business sector, for getting more profit one of the best tools is the trade credit or delay in payments. Furthermore, in our model we have considered as the credit-period is offered by the suppliers to retailers for settling the account. Presented model serves in minimizing the total inventory cost by finding an optimal solution. Some useful lemmas and algorithms have been discussed to illustrate the optimal solution. Several numerical examples are given to test and verify the theoretical results. Finally, the conclusion of the proposed model is discussed.

1. Introduction

The best known inventory model is the classical square-root Economic Order Quantity (EOQ) model developed by F. Harris [9] in 1915. In 1977 Donaldson [5] was the first scientist, included a linear demand in the EOQ model rather

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AMS 2010 Subject Classification: 90B05

Keywords: inventory model, partial backlogging, Ramp-type demand, non-instantaneous deterioration, permissible delay in payment, time dependent holding cost

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AN ID-BASED KEY-EXPOSURE FREE CHAMELEON HASHING UNDER SCHNORR SIGNATURE

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Abstract. An ID-based key exposure free chameleon hashing scheme under the Schnorr signature system is proposed in this paper. Gao et al [5] first proposed chameleon hashing based on schnorr signature. This scheme inherited the qualities of Schnorr scheme [7], but our proposed scheme used in schnorr scheme quality and our design based on ID-based system in chameleon hashing, because the owner of a public key does not necessarily need to retrieve the associated secret key. And I have been implementing the algorithm in Mathematica 7.0 and here are provided the steps of the algorithm and discusses the security and efficiency.

Keywords: Schnorr signature; Chameleon hashing; Chameleon signature; ID-based cryptography; Key exposure scheme.

2010 AMS Subject Classification: 94A60.

1. Introduction

The concept of chameleon hashing first introduced by Krawczyk and Rabin [6], which was based on well established hash-and-sign paradigm, where a chameleon hash function is used to compute the cryptographic message digest. A chameleon hash function is a trapdoor one-way hash function, which prevents everyone except the holder of the trapdoor information from

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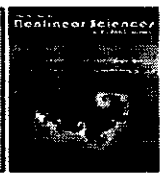

Approximation of a common minimum-norm fixed point of a finite family of σ-asymptotically quasi-nonexpansive mappings with applications

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Abstract

In this paper, we use the iterative method proposed by Zegeye and Shahzad [H. Zegeye, N. Shahzed, Fixed Point Theory Appl., **2013** (2013), 12 pages] which converges strongly to the common minimum-norm fixed point of a finite family of σ-asymptotically quasi-nonexpansive mappings. As consequence, convergence results to a common minimum-norm fixed point of a finite family of asymptotically nonexpansive mappings is proved. Our result generalize and improve a recent result of Zegeye and Shahzad [H. Zegeye, N. Shahzed, Fixed Point Theory Appl., **2013** (2013), 12 pages]. In the sequel, we apply our main result to find solution of minimizer of a continuously Frechet-differentiable convex functional which has the minimum norm in Hilbert spaces.

Keywords: Asymptotically quasi-nonexpansive mappings, asymptotically nonexpansive mappings, nonexpansive mappings, minimum-norm fixed point, strong convergence.
2010 MSC: 47H09, 54H25, 47J25, 65J15.

1. Introduction

Unless otherwise mentioned, throughout this paper, let H denote a real Hilbert space with inner product $\langle \cdot, \cdot \rangle$ and induced norm $\| \cdot \|$. Let K be a nonempty closed convex subset of H, $T : K \to K$ be a mapping

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A New Iteration Scheme For Approximating Fixed Points of Nonexpansive Mappings

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Abstract. In this paper, we introduce a new three-step iteration scheme and establish convergence results for approximation of fixed points of nonexpansive mappings in the framework of Banach space. Further, we show that the new iteration process is faster than a number of existing iteration processes. To support the claim, we consider a numerical example and approximated the fixed point numerically by computer using Matlab.

1. Introduction

Let E be a uniformly convex Banach space, C be a nonempty closed convex subset of E. Throughout this paper, $\mathbb{N}$ denotes the set of all positive integers and $F(T) := \{x : Tx = x\}$. A mapping $T: C \to C$ is said to be nonexpansive if $\|Tx - Ty\| \leq \|x - y\|$ for all $x, y \in C$ and for all $n \in \mathbb{N}$. For arbitrary chosen $x_1 \in C$, construct a sequence $\{x_n\}$, where x_n is defined iteratively for each positive integer $n \geq 1$ by:

$$x_{n+1} = Tx_n, \tag{1}$$

$$x_{n+1} = (1 - \alpha_n)x_n + \alpha_n Tx_n, \tag{2}$$

$$\left.\begin{aligned} x_{n+1} &= (1 - \alpha_n)x_n + \alpha_n Ty_n, \\ y_n &= (1 - \beta_n)x_n + \beta_n Tx_n. \end{aligned}\right\} \tag{3}$$

The sequences $\{x_n\}$ generated by (1), (2) and (3) are called Picard, Mann [8] and Ishikawa [5] iteration sequences respectively.

In 1955, Krasnoselskii [7] showed that the Picard iteration scheme (1) for a nonexpansive mapping T may fail to converge to fixed point of T even if T has a unique fixed point, but the Mann sequence (2) for $\alpha_n = \frac{1}{2}$, $\forall n \geq 1$ converges strongly to the fixed point of T.

Mann and Ishikawa iteration methods have been studied by several authors for approximation fixed points of nonexpansive mapping, see, e.g., [6, 11, 13–15].

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STRONG CONVERGENCE OF FINITE FAMILY OF PSEUDOCONTRACTIVE MAPPINGS BY A NEW IMPLICIT ITERATION

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ABSTRACT. In this paper, we propose Mann-Kirk type implicit iteration for a finite family of pseudocontractive mappings, and prove strong convergence of proposed iteration to a common fixed point in Banach spaces. The results in the paper extend and generalize well known corresponding results.

KEYWORDS : Mann iteration; Kirk iteration; implicit iteration; pseudocontractive mapping; common fixed point.
AMS Subject Classification: 47H09,47H10.

1. INTRODUCTION

Let E be a real Banach space, K be a closed convex subset of E and let J denote the normalized duality pairing from E into 2^{E^*} given by

$$Jx = \{f \in E^* : \langle x, f\rangle = \|x\|\,\|f\|, \|x\| = \|f\|\}, \quad \forall x \in E,$$

where E^* denotes the dual space of E and $\langle \cdot, \cdot \rangle$ denotes the generalized duality pairing. We shall denote elements in Jx by $j(x)$ and define $Fix(T) = \{x \in E : Tx = x\}$ to be the fixed point set of a mapping T. When $\{x_n\}$ is a sequence in E, then $x_n \longrightarrow x$ ($x_n \rightharpoonup x$) will denote strong (weak) convergence of the sequence $\{x_n\}$ to x.

Let T be a mapping with domain $D(T)$ and range $R(T)$ in E. Then T is called

- Nonexpansive, if for any $x, y \in D(T)$

$$\|Tx - Ty\| \leq \|x - y\|.$$

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MULTIPLIERS FOR MODIFIED WEIGHTED NORLUND MEANS FOR CONJUGATE SERIES OF A FOURIER SERIES

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A new iterative scheme for numerical reckoning fixed points of Suzuki's generalized nonexpansive mappings

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ABSTRACT

In this paper, we propose a new iterative algorithm to approximate fixed point of Suzuki's generalized nonexpansive mappings. We establish some weak and strong convergence theorems in a uniformly convex Banach space. We also provide examples to illustrate the convergence behavior of the proposed algorithm.

1. Introduction

Last five decades have witnessed an explosive growth in the fixed point theory for nonexpansive mappings. Let C be a nonempty closed convex subset of a Banach space X. A mapping $T: C \to C$ is said to be nonexpansive if $\|Tx - Ty\| \leq \|x - y\|$ for all $x, y \in C$. It is called quasi-nonexpansive if $F(T) \neq \emptyset$ and $\|Tx - p\| \leq \|x - p\|$ for all $x \in C$, $p \in F(T)$, where $F(T)$ is the set of fixed points of T i.e., $F(T) = \{x \in C : Tx = x\}$. It is easy to see that every nonexpansive mappings with a fixed point is quasi-nonexpansive mapping. It is well known that if X is uniformly convex and C is a closed, bounded and convex subset of X, then $F(T)$ is nonempty for a nonexpansive mapping.

Once the existence of a fixed point of mapping is established, an algorithm to calculate the value of the fixed is desirable. Banach contraction principle states that fixed point of a contraction mapping can be obtained by successive iteration (Picard iteration), where the sequence $\{x_n\}$ is generated from an arbitrary $x_1 \in C$, by the following method:

$$x_{n+1} = Tx_n, \quad n \geq 1. \tag{1.1}$$

Unlike contraction mapping, successive iteration for a nonexpansive mapping need not converge to a fixed point. One of the earliest result for approximation of fixed point of nonexpansive mapping was established by Krasnosel'skii [9], he showed that if X is a uniformly convex Banach space, and T is a nonexpansive selfmap of X then successive iteration of the function $(\frac{I+T}{2})$ converges to a fixed point of T.

During the years which have been elapsed since this result, a number of iteration processes have been developed to approximate fixed point of nonexpansive mappings. Mann's iteration scheme [10] has been extensively used to approximate fixed point of nonexpansive mappings. In this iteration scheme the sequence $\{x_n\}$ is generated from an arbitrary $x_1 \in C$ in the following

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Topical Analgesic Nanolipid Vesicles Formulation of Capsaicinoids Extract of *Bhut Jolokia* (*Capsicum chinense Jacq*): Pharmacodynamic Evaluation in Rat Models and Acceptability studies in Human Volunteers

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Abstract: Capsicum fruit is used for treating skeletomuscular disorders as a counter-irritant analgesic around the globe. But its concentration-dependent irritation and concomitant withdrawal of therapy by the patients hampers its therapeutic usefulness. In the present study, a novel nanolipid approach based on elastic phospholipid vesicles was employed to encapsulate a semipurified extract of *Bhut Jolokia* for topical drug delivery application. The working hypothesis was that encapsulation of irritant extract into nanolipid vesicles may prevent the initial rejection of formulation and the elastic vesicles may facilitate deeper skin penetration over a shorter time period. Surface response methodology was adopted to study the effect of selected independent formulation variables on dependent variables like vesicle size and entrapment efficacy. The prepared formulations were characterized for various physicochemical parameters. The efficacy of the newly developed nonolipid vesicle formulation loaded with semipurified extract of *Bhut Jolokia* was tested on carrageenan and formaldehyde-induced inflammation as well as freunds induced arthritis model. The novel formulations were tested on human volunteers in a Phase I clinical trial and were found to be acceptable. The study indicates that this strategy holds immense potential for topical delivery of the bioactive from *Bhut Jolokia* and can pave the way for its clinical applications.

Keyword: Analgesic, arthritis, *Bhut Jolokia*, nanolipid vesicles, topical.

1. INTRODUCTION

Long-term adverse effects of the molecules obtained by chemical synthesis have enforced the researchers to explore molecules from herbal sources. But at the same time, researchers working on herbal pharmaceutics have long concluded that the application of a polyherbal and semipurified extract of the crude drug without isolating the marker compound shows much better effect. This concept is well practiced in Ayurveda too.

Capsicum is an important medicinal plant used for treating skeletomuscular disorders as a counterirritant analgesic not only in India but also around the world [1]. In India, five varieties of capsicum are mainly cultivated and these include *Capsicum annum, Capsicum baccatum, Capsicum chinense, Capsicum frutescens* and *Capsicum pubescens*. Some of the species of capsicum are indigenous to specific regions, which may be due to large agroclimatic variation [2].

One of the Indian capsicum varieties, *Bhut Jolokia*, has been recognized as the world's hottest capsicum. Bosland and Boral (2007) reported the taxonomic position of *Bhut Jolokia* based on molecular marker study using random amplified polymorphic DNA. They placed *Bhut Jolokia* in a taxonomic position in between *Capsicum chinense* and *Capsicum frutescens* and clustering it closer to *Capsicum Chinese*. It was concluded that there was the possibility of genetic introgression from *Capsicum frutescens* into *Bhut Jolokia* species (*Capsicum chinense*) [3]. In North India, *Bhut Jolokia* is used for various health ailments, but only a few are documented as for the treatment of gastritis, arthritis, muscle pain and chronic indigestion [4]. *Bhut Jolokia* is a semi-perennial plant and produces elongated fruits around 5

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ORIGINAL ARTICLE

Understanding the Role of Response Surface Methodology in Development of Quercetin Loaded Phytocomplex for Wound Healing

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Abstract

Aim: It has been proved that optimized quercetin-loaded phytocomplex (QLP) system using response surface methodology occupied the desired characteristic for wound healing. **Materials and Methods:** The phytocomplex was prepared using complexation method. Quercetin and phosphatidylcholine were mixed by adding 20 mL of dichloromethane. The whole solution was refluxed for 2 h by maintaining the temperature below 60°C. The resulting solution was evaporated to 2-3 mL, and 10 mL of n-hexane was mixed with continuous stirring to form complex. **Results and Discussion:** According to entrapment efficiency (EE), drug release (DR), and percentage yield (PY) of phytocomplex concentration of quercetin (100 mg) and phospholipids (100 mg) were in optimum quantity. Physical characteristic were evaluated through *in vitro* characterization of phytocomplex including the EE, DR, and PY the resulting values of 82.10%, 61.96%, and 76.36% were found to be standard characterized values respectively. **Conclusion:** Optimized QLP will provide us an innovative platform as a novel addition to achieve high therapeutic efficacy on wound space.

Key words: Box-Behnken design, optimization, phytocomplex, quercetin

INTRODUCTION

Wound may be defined as a disturbance in the cellular and anatomic continuity of tissue. Wound can be classified accordingly various insult to the skin and its tissue including physical, chemical, thermal, microbial, or immunological insult. The process of wound healing covers the various cellular and biochemical mechanism leading to re-establishment of structural and functional integrity in injured tissues.[1] Wound-healing agents derived from plants need to be identified and formulated for the effective management of wounds. Various herbal products have been used in management and treatment of wounds over the years. Bioflavonoid and its glycosides playing an important role in wound healing without any side effect, i.e., Rutin, quercetin, etc. Quercetin phytoconstituents is bioflavonoid polyphenolic compound having potential of anti-inflammatory and antioxidant activity.[2] Quercetin has been extensively used as a therapeutic agent, and it has been incorporated in some novel additions for the treatment of different disease, i.e., skin disease, cardiovascular disease, and carcinoma.

In spite of better characteristic quercetin containing certain limitation of low lipophilicity of drugs, which leads to low bioavailability and therefore high concentration are required in designing of novel formulation.[3] Effective wound healing can be achieved by designing various factor dependent optimized formulations. These formulations possess the potential of therapeutic agent, textural properties and integrity of the formulation, drug pharmacokinetic profile, and drug retention efficacy at the site of application.[4] For better and effective delivery of formulations, it needs to be optimized using experimental design technique. Recently, lipoidal formulations are being extensively explored for the topical drug delivery due to its distinctive phospholipid complex. Phytocomplex containing phospholipids composition in its complex structure which resemble similar to the lipid cell membrane of the human body. In addition, lipophilic and

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RJPT

REVIEW ARTICLE

Rheumatoid Arthritis: An Autoimmune Disease Prevalent in Females

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ABSTRACT:
Rheumatoid arthritis (RA) is a chronic autoimmune inflammatory disorder. Females are highly affected by the ill effect of arthritis due to misbalancing of sex hormone. Macrophages, T cells and B cells infiltrate the synovium that lines the joints, while the synovial fluid is dominated by neutrophils. Chronic inflammation leads to destruction of joint cartilage and bone. Several research findings indicate the involvement of sex hormones in RA. B cells and T cells promotes pathogenesis of arthritis. Marked pathogenesis of arthritis is dominant in female compared to male. Active involvement of T cells and B cells produces proinflammatory cytokines observed.

KEYWORDS: Rheumatoid Arthritis, sex hormones, B Cells, T Cells, cytokines

INTRODUCTION:
Rheumatoid arthritis (RA) is a chronic autoimmune inflammatory disorder that primarily affects multiple joints, occurring in 0.5–1.0% of the world's population. Rheumatoid arthritis (RA) is more common in women than in men[1]. The peak incidence in females coincides with menopause when the ovarian production of sex hormones drops markedly. While in men it occurs at 60–70 years of age coinciding with the fall of biologically active testosterone. Macrophages, T cells and B cells infiltrate the synovium that lines the joints, while the synovial fluid is dominated by neutrophils. Chronic inflammation leads to destruction of joint cartilage and bone. Several findings indicate the involvement of sex hormones in RA[3]. For example, the female to male incidence ratio is 4–5:1 before 50 years of age, and 2:1 for patients with a later onset, and the peak incidence in women coincides with menopause. It has been shown that estrogens can affect the disease course of RA in humans, and in animal models. B cells are not merely antibody-producing cells, but they might also participate in the disease process by producing cytokines and effectively presenting antigen to specific T cells[4].

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Pathophysiology of rheumatoid arthritis:
Variations in immune balance oddly results in high cell death or increased cellular proliferation leading to a pathological disease such as RA. Among various proinflammatory cytokines, TNF-α and IL-6 have been proven to play critical roles in the development of RA. Proved as biological agents that antagonize TNF-α and IL-6 are highly effective in treatments for RA[5].

It is thought that the synovial hyperplasia is mediated, by inflammatory cells these are T-cells, B-cells, macrophage, neutrophils and macrophage like synoviocytes, which upon activation produce proinflammatory cytokines such as IL-1, TNF-α and IL-6 as represented in Figure 1. These cytokines are speculated to stimulate the overgrowth of Fibroblast like Synoviocytes (FLS) to form a synovial tissue mass called a pannus, which invades bone and cartilage via the production of matrix degrading enzymes from (FLS) and articular chondrocytes[6].

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An Review on Swine flu

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Abstract

Swine flu has been a dangerous effect in the world and globe. Swine flu is the viral infection disease caused by swine influenz The World Health Organization (WHO) is closely monitoring cases of swine flu globally to see whether this virus develops into pandemic. Because it's a new virus. The swine flu spread by direct

contact with pigs but, H1N1 virus is a new swine flu virus and it contains the genetic material of swine, bird and human influenz Swine flu can fabricate an integer of symptoms in human being. Swine flu virus infected patients graph increases day by day. M treatment and control of swine flu infection by using of antiviral drugs. Antiviral drugs effective against H1N1 virus include: osel and zamanavir. The intensity of this disorder can be lowered by diagnosing and taking proper treatments.

Keywords

WHO, virus, treatment, influenza.

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REVIEW ARTICLE

Factorial Design and a Practical Approach for Gastro-Retentive Drug Delivery System

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ABSTRACT:

Over the years, different formulation technologies intended for gastro retentive dosage delivery were investigated and patented. Oral drug administration has been the predominant route for drug delivery. During the past two decades, numerous oral delivery systems have been developed to act as drug reservoirs from which the active substance can be released over a defined period of time at a predetermined and controlled rate. From a pharmacokinetic point of view, the ideal sustained and controlled release dosage form should be comparable with an intravenous infusion, which supplies continuously the amount of drug needed to maintain constant plasma levels once the steady state is reached. Although some important applications, including oral administration of peptide and protein drugs, can be used to prepare colonic drug delivery systems, targeting drugs to the colon by the oral route. This review article clearly explains the advantages, limitations and need of gastro-retentive drug delivery system. It also covers the various criteria for drugs suitable and not suitable for such delivery. Also, the different types of gastro retentive delivery systems are described with suitable examples.

KEYWORDS: GRDDS, factorial design, Oral delivery, floating system.

INTRODUCTION:

Oral delivery of drugs is the most preferred administration route due to ease of administration. Drug bioavailability of pharmaceutical oral dosage forms is influenced by various factors. One important factor is the gastric residence time (GRT) of these dosage forms. [1, 2] It has been estimated that about 40–70% of all new drug candidates merging from drug discovery programs exhibit low solubility in water, resulting in poor oral bioavailability due to insufficient dissolution along the gastrointestinal (GI) tract [3]. Absorption of drug from gastrointestinal tract (GI) is a complex procedure and is subjected to many variables. [4] These variables make the in-vitro performance of the drug delivery systems uncertain. [5]

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The need for gastro retentive dosage forms (GRDFs) has led to extensive efforts in both academia and industry towards the development of such effective drug delivery systems. [6] Prolonging the gastric residence of a dosage form may be of therapeutic value. The process and ability to prolong and control the emptying time is a valuable asset for dosage forms, which reside in the stomach for a longer period of time than the available conventional dosage forms [7] these physiological problems have been overcome by several drug delivery systems, by investigating the prolonged gastric retention time. [8, 9] The basic idea behind the development of such a system is to maintain a constant level of drug in the blood plasma in spite of the fact that the drug does not undergo disintegration.

Several approaches have been proposed to retain the dosage forms in the stomach. These approaches used for the formulation of gastro retentive systems are

Article

Significance of Jobs Plot in Cyclodextrin Complexation

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Abstract

Jobs plot or continuous variation method is used to estimate the stoichiometry in cyclodextrin complexation. Cyclodextrin complexation is well known as widely acceptable technique for improving the poor physicchemical properties of BCS class II and class IV drugs. The stoichiometry of the inclusion complex is given by the number of guest and host molecules present in the supramolecular complex/inclusion system. The most common stoichiometry is 1:1, implying the inclusion of a single guest molecule. Now-a-days jobs plot is replaced by phase-solubility study. Jobs plot deals with spectral methods mainly for molecular modelling study of drugs and bioactives.

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The effects of Sahaja Yog practice and pranadharna practice on dynamic balance ability

Bharati Rajak and Dr. Rajeev Choudhary

Abstract

Objective: To objective of the study was to find out the effects of Sahaja Yog meditation practice and Pranadharna practice on dynamic balance ability.

Method: Ninety female students were selected form Pt. Ravishankar Shukla University, Raipur, who were aged from 17 to 25 years. They were divided into three groups randomly i. e two experimental groups and one control group each consisting of thirty subjects. The first experimental group practiced Sahaja Yog meditation and the second one practiced Pranadharna. Pre- test and post- test randomized group design was used for this study. The experimental treatments were conducted for six weeks. Dynamic balance ability was measured by Gymnastics balance beam test and was calculated in Points. Analysis of Co-variance was employed to analyze the data. The level of significance was set at 0.05.

Results & Conclusion: A significant difference was found between the Sahaja Yog group and Pranadharna group; Sahaja Yog group and control group related to effect of these on dynamic balance ability. On the other hand, there was no significant difference between the Pranadharna group and control group on dynamic balance ability.

Keywords: Sahaja Yog meditation practice, Pranadharna practice and dynamic balance ability

1. Introduction

The concept of Sahaja Yog was given by Shri Mata Ji Nirmala Devi in the year 1970. (Choudhary, 2011) [2]. Sahaja Yog is a type of "Kundalini Yog" and it describes very simple technique to activate the potential of individual by a simple meditative activity. Sahaja Yog showed positive effects in the management of various disorders such as Bronchial asthma and Hypertension. (Chugh, 1987 and 1997) [3, 4]. Sahaja Yog is related with the body and mind. It is aimed at the spirit. "Saha" means with and "Ja" means union. The word "Yog" means union or technique or ability. Sahaja Yog believes that every individual is born with the potential of united with the Divine. This potential is activated by Sahaja Yog. (Baijnath, 2003) [1]. Balance may be defined as any one's body's ability to maintain the centre of gravity above the base of support. It can be such that it is the ability not to fall over. (Hrysomallis, 2007) [5]. In the subject 'Biomechanics', balance is the ability to maintain line of gravity of the body above the base of support. (Shumway-cook A, Anson D, Haller, S, 1988) [8].

1.1 Objective of the study

The objective of the study was to find out the effects of Sahaja Yog meditation practice and Pranadharna practice on dynamic balance ability.

2. Methods

2.1 Subjects: Ninety subjects were selected for the purpose of the study who were aged from 17 to 25 years. They were divided into three groups randomly consisting of two experimental groups and one control group with thirty subjects in each group.

2.2 Variables: Two experimental treatments of the study i.e. Sahaja Yog and Pranadharna were selected as independent variables and on the other hand dynamic balance was selected as dependent variable.

2.3 Design: Pre- test and post- test randomized group design was used for this study. Sahaja Yog meditation was conducted for the first experimental group and the other experimental group practiced Pranadharna. The duration of the experimental treatments was for 6 weeks.

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Estimation of Weight Lifters Performance on the Basis of Balance Abilities and Anaerobic Power: Delimited to 56 Kilogram Weight Category

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Abstract
The objective of the study was to establish regression equation for predicting Dependent Variable (weight lifter performance belonging to 56 kilogram weight category) on the basis of Independent Variables (static balance, dynamic balance and anaerobic power). The subjects for this study were selected from Different Universities. A total of 15 male weight lifters belonging to 56 kilogram weight category from Inter University were selected. Keeping in the mind about specific purpose of the study, the following variables were considered: 1) Balance Abilities (Static & Dynamic) and 2) Anaerobic Power For predicting Dependent Variable (weight lifter performance belonging to 56 kilogram weight category) on the basis of Independent Variables (static balance, dynamic balance and anaerobic power), Multiple Regression Analysis was used and one regression model was established. Established regression model is: Weight Lifters performance (56 kilogram)= -42.85 + .567 * Anaerobic Power.

Keyword
Static Balance, Dynamic Balance and Anaerobic Power

1. INTRODUCTION

Weight lifting is one of the oldest and the easiest method of testing physical strength of individuals. The more weight one could lift, the more powerful he was considered. At present lifters are grouped into different categories as per their body weights. The participant lifters are required to lift a weighted bar by two different methods and techniques, the snatch and clean and jerk. The participants are allowed maximum of three attempts in each type of lift. The winners are declared on the basis of total weight lifted in both styles. If weights lifted by two participants are equal then the lifter with lower body weight is declared as winner (Kumar, M., 1993).

Balance ability is the most important trait for any sportsmen. In handball also it has great significance. Lee, B., (2010) described balance ability as a foundation of all movements. All the movements originate from the balance ability. In any sports, players loose centre of gravity and try to regain it to maintain the balance. During play this is performed several times.There is a continuous requirement for increasing anaerobic capacity to be defined and measured independently of anaerobic power. The peak rate of energy produced via anaerobic metabolism (anaerobic power) is difficult to measure directly and is therefore deduced from the peak power output measured during brief (<30s) sprint-type exercise bouts. Nevertheless, coaches and scientists are interested not only in the peak power output that can be instantly generated but also in the total amount of energy that can be produced via the anaerobic energy systems (i.e., anaerobic capacity). (Tanner, R. K. & Gore, C. J., 2013).

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INTERNATIONAL JOURNAL OF PHYSICAL EDUCATION AND APPLIED EXERCISE SCIENCES

Construction of Skill Test in Kabaddi

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Abstract

The objective of the study was to construct skill test in Kabaddi. For the purpose of the study, 100 male Kabaddi players were selected as the subjects for the study. Age of the subjects was ranging from [illegible] to 28 years. For the present study were test items selected Toe touch, Hand touch, Right grip strength, Left grip strength, Leg strength, Back strength, Footwork and Drag & [illegible]. To construct skill test in [illegible] was used. Level of significance was set at .05 level to test the hypothesis. In the present study, [illegible] adequacy was found mediocre. In the present study BTS ([illegible] Test of Sphericity) was found significant (p=.000). This shows that correlation matrix is not an identity matrix. This means there are some relationships between the variables. Therefore factor analysis is appropriate. First component is named as "Kabaddi performance related strength." Second component is named as "Skill related performance of kabaddi players." Third component is named as "Fitness and skill related performance of kabaddi players." Forth component is ignored by the researcher since, this component has only one variable.

Keywords

Toe touch, Hand touch, Right grip strength etc.

1. INTRODUCTION

Kabaddi is defined as the team contact sport that originated in South Asia as well as Indo-Iranian society. The word "Kabaddi" is originally derived from a Hindi word which means "holding your breath". Kabaddi is the National game of Iran and Bangladesh and the State game of Punjab, Tamil Nadu, and Andhra Pradesh. The International version of Kabaddi consists of two teams of 7 members each that occupies opposite halves of the field of size 13m × 10m (for men) and 12m × 10m (for women). Each team has five supplementary players held in reserve. Kabaddi is played with two halves and a 5 minutes halftime break during which the side is exchanged by the teams. Kabaddi is a recreational sports activity that is often played in underwear. The two teams occupy the opposite halves of a field. The attacking side sends a "raider" who, on a single breath enters the opponent's half of the field with continuous chanting "Kabaddi-Kabaddi-Kabaddi" in order to ensure that player is not chanting by taking another breath. Raider has to touch any player on opposite side and return back to his court. The player who is touched is out. The opposite team will try to hold the raider and stop him from returning to his court. Now another team will get a chance to send a player into opponent's court (Bhargava, G.C., 1975).

1.1. Objectives of the Study

The objective of the study was to construct skill test in Kabaddi.

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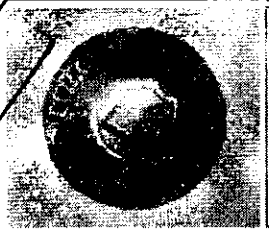

A Comparative Study of Problem Solving Ability Between Tribal and Non Tribal Sportspersons

KEYWORDS: Problem solving ability, sportsperson, tribal, non tribal

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ABSTRACT *In the present study, problem solving ability was compared among university sportspersons on the basis of their tribal non-tribal belongingness. To conduct the study, 50 tribal sportspersons (Ave. age 24.09 years) and 50 non tribal sportspersons (Ave. age 25.18 yrs) were selected as sample. The sample comprises of sportspersons of both the sexes. The criteria for selection of sample was participation in inter university sports competition in any sporting discipline. Hindi version of problem solving ability scale prepared by Sharmila and Naga Subramani (2011) was used to assess problem solving ability of tribal and non tribal sportspersons. Results indicated that problem solving ability of non tribal sportspersons was found to be significantly superior as compared to tribal sportspersons. It was concluded tribal non-tribal belongingness do affect the problem solving ability of sportsperson.*

Introduction

A problem refers to a obstacle which hinders an individual's goal. When individual encounter frustration in achieving his/her desired goals it is due to a problem. Problem solving aids an individual or a group individually or collectively to adjust to environmental stressors successfully. It is a learnable ability. Everybody in their day-to-day life are confronted with obstacles which they try to negate with problem solving skills. Like any other human activity, a sportsperson also comes across variety of problems on and off the field. It may be in the form of technique, tactics, environmental issues, conflict with team member etc. A sportspersons needs to solve these problems efficiently so that his /her performances do not get affected. Majority of the problems can be solved with the help of simple actions or procedure but some problems require special cognitive, technical and psychological abilities to find a correct solution (Guisen, 2008)[1]. According to Volkamer (2009)[2] sporting success comes from eliminating problems. Hence problem solving ability can be considered as psycho-cognitive variable that enables an athlete to take right decision at right time to solve the problem in shortest time.

Our society comprise of individual's coming from all race, caste and culture. In India, sportspersons also comes from to various race, ethnicity and caste. The participation of tribal sportspersons in Indian sports is quite a bit and number of studies in the past have made in order to comparative assess the psychological, physiological, skill related difference in tribal and non tribal sportspersons taking part in various sports. In this relation so many researchers namely Thakur (2012)[3], Patil (2013)[4], Dhamne and Salvi (2013)[5], Ghosh and Majumdar (2013)[6], Diwan, S. (2014)[7], Baro (2014)[8], Karkare (2015)[9] studied psycho-social, physiological and skill related differences in tribal and non tribal sportspersons. Surprisingly problem solving ability of sportsperson has not been assessed for, hence the present study was planned to assess problem solving ability of inter-university tribal and non tribal sportspersons.

Hypothesis

It was hypothesized that problem solving ability of inter university sportspersons will differ significantly on the basis of their tribal, non tribal belongingness.

METHOD:

To test the abovementioned hypothesis following methodological steps were taken.

Sample :

To conduct the study, 50 tribal sportspersons (Ave. age 24.09 years) and 50 non tribal sportspersons (Ave. age 25.18 yrs) were selected as sample. The sample comprises of sportspersons of both the sexes. The criteria for selection of sample was participation in inter university sports competition in any sporting discipline. The sample was selected using purposive sampling technique.

Tools :

Problem Solving Ability Scale :

To assess problem solving ability of selected subjects, Hindi version of Problem Solving Ability Scale prepared by Sharmila and Naga Subramani (2011) was used. This test consists of 40 statements. The equal length Spearman-Brown reliability coefficient of this scale was found to be 0.825 while it has fair construct validity.

Procedure :

50 tribal and 50 non tribal sportspersons were selected from inter university sports competition for various sports. Prior consent was obtained from each subject that their participation in this study is voluntary. Problem solving ability scale prepared by Sharmila and Naga Subramani (2011) were administered to each subject in a laboratory like condition and convenience of the subjects. Scoring of responses given by the subjects was done according to author's manual. After scoring, data were tabulated according to their respective groups. 't' test was used to find out differences among these two groups. Results are presented in table 1.

RESULTS

Table No. 1

Comparison of Problem Solving Ability between Tribal and Non-Tribal Sportspersons

Variable	Tribal Sportspersons (N=50)		Non-Tribal Sportspersons (N=50)		t	Level of Significance
	M	S.D.	M	S.D.		
Problem Solving Ability	104.72	[illegible]	111.44	12.80	2.67	.01

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RESEARCH ARTICLE

GROWTH PATTERN AND NUTRITIONAL STATUS OF ADOLESCENT GIRLS OF CHHATTISGARH

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Body Mass Index (BMI).

ABSTRACT

Background: There are about 1.2 billion adolescents, a fifth of the world's population, and their numbers are increasing. In India the statistics shows that the adolescent population is 8.3 crores, so this large population needs special attention as this period of growth is very important and crucial span of life. Proper nutrition of children belonging to this group is essential so that optimum growth can take place, hence the present study was undertaken to assess nutritional status of adolescent girls.
Materials and Methods: Present paper aims at assessing the nutritional status of adolescent girls of Raipur district of Chhattisgarh. 1000 adolescents girls aged between 12 and 18 years were selected from various schools of Raipur district (Chhattisgarh). Anthropometric measurements including weight, height were taken following standard techniques. Body Mass Index (BMI) was calculated using international BMI cut-off point for children and adolescence from 12 to 18 years of age.
Results: Results revealed that girls of 12 years had highest (37.8%) prevalence of under nutrition. The overall prevalence of under nutrition was (64.7%). Body weight and height of the girls of present study were compared with reference data of NCHS (National Centre for health Statistics 1987), ICMR (Indian Council Medical Research 2010), CDC (Centers for Disease Control and Prevention 2007-2010) and M.Mitra (2002) which shows that the mean of the present study was lower than NCHS (1987), ICMR(2010) and CDC (2007-2010) and higher than M.Mitra (2002).
Conclusion: It was concluded that the school going girls of Raipur district were suffering from very high rate of undernutrition. Nutritional intervention programme should be planned to enhance nutritional status of adolescent girls.

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INTRODUCTION

The term "Adolescence" literally means "to emerge" or "achieve identity". Its origin is from a Latin word "Adolescere" meaning, "to grow, to mature". It is a significant phase of transition from childhood to adulthood. A universally accepted definition of the concept of adolescence has not yet been established, but WHO has defined it in terms of age spanning between 10 to 19 years. Adolescence is one of the important stages because of its transitional nature to attain the highest biologically growth potential to attain adulthood. It is the period of physical, psychological and social maturity from childhood to adulthood. In India, adolescent girls (11-18 years) constitute nearly 16.75 % (Registrar General and Census Commissioner, India, 2001) of the total female population of 49.6514 crores which is approx. 8.3 crores. Adolescence is a significant period for mental, emotional and psychological development. Adolescence represents a window of opportunity to prepare for healthy adult life. In the developing countries scarcity of information regarding nutritional status of adolescents has been noticed. It has been observed that anthropometric data in these age groups are not interpreted in context of nutrition (De On is 1996). Human physical growth is a dynamically changeable and inherently vital phenomenon. Growth of children and youth has been recommended as one of the best indices of health and nutritional status of a community (WHO, 1978). Nutritional status is one of the strongest indicators of the standard of living in developing world (Nube *et al.*, 2003). Undernutrition among children and adolescents is a

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REVIEW OF RESEARCH

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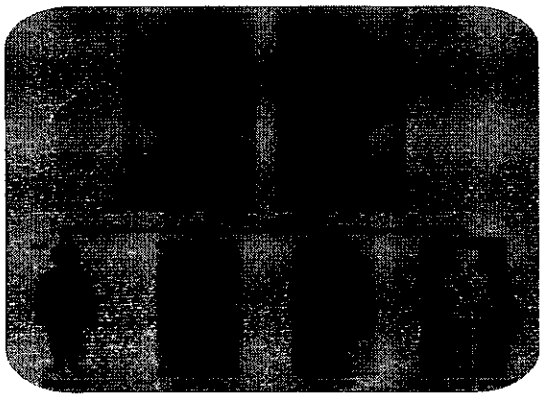
DIFFERENCE IN THE CHARACTERISTICS OF CARDIO-RESPIRATORY FUNCTIONS IN PHYSICAL ACTIVITY PARTAKERS WITH SICKLE CELL TRAIT CARRIER



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ABSTRACT:

The cardio-respiratory fitness of sickle cell trait (SCT) individual is deviated than the apparently healthy individuals. Many studies have been conducted on consequences of SCT, but it is not yet precisely known the effect of regular participation in physical activity. To see the cardio-respiratory efficiency of SCT physically active individual total 1000 school going students were examined. Out of them 109 students were diagnosed as SCT carrier. Their pulmonary and cardiovascular efficiency were assessed with the help of respiratory rate (RR), heart rate (HR), peak expiratory flow rate (PEFR), hemoglobin (Hb) and 12 minutes run and walk test. In addition, maximum oxygen capacity (VO2 max) was calculated as per formula prescribed by Cooper's test. Descriptive statistics, and comparative statistics "t" test was used to analyzed the data. Result of the present study showed insignificant difference in HR ($p>0.05$), PFER ($p>0.05$). The RR and Hb of control individual showed significantly ($p<0.05$) better efficiency. In contrast, the aerobic capacity (12 min run and walk) and VO_{2max} of SCT showed significantly ($p<0.05$) higher capacity than that of apparently healthy subjects. In conclusion, regular participation in moderate physical activity may reduce the consequences of SCT and may enhance the quality of life including healthy subjects. It is recommended to conduct more study on large sample to draw robust conclusions.

KEYWORDS: *sickle cell trait, physical activity, respiratory rate, heart rate, peak expiratory flow rate, hemoglobin, 12 minutes run and walk, maximum oxygen capacity.*

INTRODUCTION

The oxygen delivering capacity to the active muscle cells of sickle cell trait individual is reduced. Sickle cell trait usually is not a disease conditions, as it has very mild deviations of hemoglobin. The oxygen-carrying capacity is determined by the concentration of hemoglobin in the blood, which affects the binding of oxygen in red blood cells. Sports persons do not experience any serious complications during physical activity. Any serious conditions such as morbidity or mortality in SCT may be the results of unsystematic training activity. The SCT individuals, physicians, and sports coaches should be aware of the potential risk or complications involved in SCT (ACSM, 2003). Regular and systematic moderate physical activity benefits the body in many ways. Those with sickle cell trait might find some added benefits such as longevity and fewer complications. Similar effects may be found in patients with sickle cell disease (ACSM, 2003).

In Chhattisgarh, the presence of sickle cell trait is diagnosed. Extensive clinical and basic science research

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Prediction of Right Winger Performance in Handball on the Basis of Selected Co-ordinative Abilities

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Abstract
The objective of the study was to establish regression equation for predicting Dependent Variable (Right Winger Performance in Handball) on the basis of Independent Variables (selected Coordinative Abilities). A total of 10 University level male Handball Players who played Right Winger position were selected from different Universities in India. Five selected coordinative abilities were i.e. 1. Reaction Ability (RA), 2.Orientation Ability (OA), 3.Differentiation Ability (DA), 4. Balance Ability (BA), 5. Rhythm Ability (RA). To establish Dependent Variable (Right Winger Performance in Handball) on the basis of Independent Variables (Selected Coordinative Abilities), Multiple Regression Analysis was used and one regression model was established. Established regression model is: Right Winger's performance = 6.960 + 1.454 X Differentiation Ability.

Keywords
Coordinative Abilities

1. INTRODUCTION

According to the nature of handball game which requires speed, agility, coordination etc as fitness components to perform well, reaction time plays a vital role depending upon the reflexes of the player against a stimulus. Reaction time literally means to respond against a particular stimulus as soon as possible in a shorter duration of time. (Kamlesh, M.L., 2011). Coordinative abilities comprises of both i. e. motor fitness (enable one to increase his/her ability to perfect his/her skill) & motor ability (ability of proficiency in different sports). Sportsperson can use his or her psychobiological capacities up to maximum extent only in the presence of adequately developed coordinative abilities. Coordinative abilities are improved through physical exercise especially by general & specific exercises. (Kumar, R., 2011)

According to Blume (1978) German sports scientist, the concept of agility can be changed by the concept of coordinative abilities and these coordinative abilities influences the performance in different games and sports. (Uppal, A.K. 2001)

2. OBJECTIVE OF THE STUDY

To establish regression equation for predicting Dependent Variable (Right Winger Performance in Handball) on the basis of Independent Variables (selected Coordinative Abilities).

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Research Article

Comparative study of Ventilatory Functions of Cotton Mill Workers, Mumbai, India

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Abstract

Background & objectives: The present observational study was carried out in cotton mill workers of Mumbai to compare the pulmonary functions with those of apparently healthy population and to find out the effect of duration of exposure to the working environment. **Materials & Methods:** The study group comprised of 150 cotton mill workers and 150 workers of hospital staff, all males, in age group of 25-60 years. Socio-demographic characteristics and occupational history was noted in predesigned questionnaire performa for both groups. Respiratory functions namely FEV1, FVC, FEV1/FVC & PEFR were recorded by using portable and electronic instrument pneumotachometer, results were analysed by using difference of means. **Results:** The pulmonary functions were found to be significantly lower in cotton mill workers as compared to hospital staff and pulmonary functions were correlated negatively with duration of exposure to the cotton dust. **Conclusion:** In spite of modernization and recent technical evolution the working conditions and occupational environment has still a long way to go as per as the safety of cotton mill workers of Mumbai city is concerned.

Key words: Cotton mill workers, Spirometry, Ventilatory functions

Introduction

At the time of industrial evolution, then rulers (Britishers) gave priority to set up cotton industries at Mumbai, India so in the earlier periods of last century nearly 1/3 [rd] of the working population was employed in textile industries [1]. Many studies abroad noticed the high prevalence of cotton related respiratory diseases in cotton mill workers (CMW) although the reported incidence in India was found to be very low as compared to other countries [2,3]. In current era cotton industries in India, particularly Mumbai are going through difficult phase with most of them being closed down. Those which are still running, are grossly neglected and the workers continue to work on same old machines thereby increasing the risk of developing the diseases due to inhalation of cotton dust of working environment affecting pulmonary functions [4].

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This study was undertaken to know the current status of the pulmonary functions of the workers in textile industries of Mumbai and to compare those with the un-exposed population of Mumbai and also to correlate the effect of duration of chronic exposure with lung functions.

Materials and Methods

The present cross-sectional study was conducted in five cotton mills in Mumbai with prior permission of safety managers of respective cotton mills. A predesigned semi-structured performa and plan was submitted to the ethical committee and same was used as study tool. A study group of 150 cotton mill workers and control

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Academic Sports Scholars

EFFECT OF REGULAR YOGIC PRACTICES ON PROBLEM SOLVING ABILITY OF ADOLESCENT BOYS

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ABSTRACT

The objective of the present study was to find out the efficacy of 12 weeks yoga program on problem solving ability of adolescent school boys. To conduct the study, 50 adolescent boys (Ave. age 17.42 yrs) were selected from senior secondary schools operational in and around Raipur Chhattisgarh. Random sampling was used in the present study. The selected subjects participated in 12 week yoga program of selected yoga practices. Hindi version of problem solving ability scale prepared by Sharmila and Naga Subramani (2011) was used to collect data on problem solving ability. The data was collected before the commencement of study period and after the completion of 12 weeks yoga program. The results reveal significant impact of yoga program on problem solving ability of adolescent boys. It was concluded that 12 weeks of yoga program was found useful in enhancing problem solving ability of adolescent boys. The results are discussed in the light of global perspective of yoga practices.

KEYWORDS : *Elite, Sub-elite, Problem solving ability.*

INTRODUCTION

Higher order cognitive processes consists of working memory, reasoning and cognitive flexibility. It enables a person to make conscious effort to solve problems. The goal directed problem solving is part of executive functions of our brain (Logue and Gould, 2014)[1]. One of the factors that is integral part of brain's executive function is problem solving skills. Problem solving involves new techniques and strategies to achieve desired results (Thornton, 1998)[2]. It is believed that ability to solve problems makes it easier for an individual to different circumstance in life. According to D'Zurilla et al. (2007)[3] good problem solving ability makes individual self confident with higher level of self esteem which enables a person to achieve their desired goals in life.

It has also been observed that ancient Indian practice like yoga is useful in enhancing the memory, concentration and overall functioning of brain. Regularly practice of yoga has been found to be beneficial for attention span, remote memory, processing ability, verbal retention also (Chattha et al. 2008[4]; Prakash et al., 2010[5]). The efficacy of yoga has also been shown in improving spatial information, verbal memory, time taken for planning an action, execution time of certain cognitive task and some cognitive processes (Manjunath and Telles, 2001[6], Manjunath and Telles, 2004[7], Sarang and

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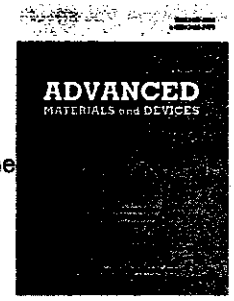

Studies on the Luminescence Properties of $CaZrO_3:Eu^{3+}$ Phosphors Prepared by the Solid State Reaction Method

Ishwar Prasad Sahu, D.P. Bisen, R.K. Tamrakar, K.V.R. Murthy, M. Mohapatra

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Photoluminescence and mechanoluminescence investigation of bluish-green afterglow $SrMgAl_{10}O_{17}:Ce^{3+}$ phosphor

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Abstract In the present paper, we report the luminescence properties of bluish-green afterglow $SrMgAl_{10}O_{17}:Ce^{3+}$ phosphors prepared by combustion synthesis using urea as fuel. The phase purity, morphology and photoluminescence (PL) properties of discussed phosphor were characterized by X-ray diffraction, field emission scanning electron microscopy and PL spectra. Under ultraviolet excitation at 340 nm, the emission spectra exhibited two emission bands at 390 and 450 nm. Phosphorescence decay analysis of synthesized phosphor indicates bluish-green emission at 510 nm, which may be due to the presence of oxygen vacancies around Ce^{3+} ions. Mechanoluminescence (ML) of gamma irradiated $SrMgAl_{10}O_{17}:Ce^{3+}$ samples with changing concentration of Ce were studied. The total ML intensity increases linearly with gamma dose up to 1770 Gy and results suggest that the phosphor $SrMgAl_{10}O_{17}:Ce^{3+}$ may be suitable for ML dosimetry of gamma radiation.

1 Introduction

Ce-doped crystalline compounds have received great interest owing to the rare-earth (RE) luminescence properties. Ce^{3+} containing solids are now applied in several applications such as phosphors for cathodoluminescence [1, 2], scintillators [3–5] and for the detection of X-rays, γ-rays, or neutrons [6–10] and tunable solid-state lasers [11–16]. The host material taken in the present work is $SrMgAl_{10}O_{17}$ (SAM). The crystal structure of SAM belongs to hexagonal crystal system, of β-alumina-type with space group $P6_3/mmc$. The structure of SAM consists of spinel blocks and intermediate layers [17–19] allowing various substitutions and therefore is interested as phosphor host. The luminescent properties of SAM:Eu^{2+} [20–23] and SAM:Mn^{2+} [24, 25] had been investigated extensively, due to their potential application for plasma display panels (PDP) [26] and long lasting phosphors [27]. Among all the rare earth ions, Ce^{3+} is vitally important due to its typical dipole allowed *5d–4f* transition. Since the crystal field and covalence can influence the location of *5d* orbitals and to a lesser extent the *4f* levels, the luminescence spectra of Ce^{3+} can be tuned from ultraviolet to red regions depending on the host lattices [28, 29] Currently there are very few reports available on the photoluminescence of Ce doped alkaline earth hexa aluminates, which gave motivation to choose Ce ions as dopant for $SrMgAl_{10}O_{17}$ host. Long afterglow phosphor is a type of energy storage material, which can absorb both UV and visible light from sunlight and gradually release the energy in the dark at a certain wavelength. In strontium aluminate based system, six phase of strontium aluminate doped with Eu^{2+} ions that yield afterglow have been reported namely $SrAl_2O_4$, $Sr_4Al_6O_{11}$, $SrAl_4O_7$, $Sr_4Al_{14}O_{25}$, $SrAl_{12}O_{19}$ and $Sr_3Al_2O_6$. In this paper PL properties of $SrMgAl_{10}O_{17}:Ce^{3+}$ was reported to find its possibility as a blue emitting phosphor and the afterglow property has been investigated for the first time by us. One of the most unique crystal properties is the emission of light when it undergoes fracture which is called Fracto-mechanoluminescence (FML). FML has a great deal of potential to understand the following facts and devices: (1) earthquake and mine failure [30, 31], (2) earthquake lights [32], (3) dynamics and mechanics of fracture [33], (4) design of damage sensors [34], (5) design

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Fracto- mechanoluminescence and thermoluminescence properties of orange-red emitting Eu^{3+} doped $Ca_2Al_2SiO_7$ phosphors

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ABSTRACT

The suitability of nano-structured $Ca_2Al_2SiO_7:Eu^{3+}$ phosphors for thermoluminescence and mechanoluminescence dosimeter were investigated. Europium doped di-calcium di-aluminum silicate phosphor was synthesised by the combustion assisted method and annealed at 1100 °C for 4 h in reducing and oxidizing environments. The prepared $Ca_2Al_2SiO_7:Eu^{3+}$ phosphor was characterized by X-ray diffractometer (XRD), transmission electron microscopy (TEM), scanning electron microscopy (SEM) with energy dispersive x-ray spectroscopy (EDX), photoluminescence (PL) and decay characteristics. The phase structure of sintered phosphor has akermanite type which belongs to the tetragonal crystallography; this structure is a member of the melilite group and forms a layered compound. The chemical composition of the sintered $Ca_2Al_2SiO_7:Eu^{3+}$ phosphor was confirmed by EDX spectra. Mechanoluminescence (ML) and thermoluminescence (TL) studies revealed that the ML and TL intensity increases with activator concentration. Optimum ML was observed for the sample having 2 mol% of Eu ions. The TL intensity of $Ca_2Al_2SiO_7:Eu^{3+}$ was recorded for different exposure times of γ -irradiation and it was observed that TL intensity is maximum for γ dose of 1770 Gy. The PL spectra indicated that $Ca_2Al_2SiO_7:Eu^{3+}$ could be excited effectively by near ultraviolet (NUV) light and exhibited bright orange-red emission with excellent colour stability. CIE colour coordinates of the prepared $Ca_2Al_2SiO_7:Eu^{3+}$ phosphor was found suitable as orange-red light emitting phosphor with a CIE value of (x = 0.6142, y = 0.3849) and correlated colour temperature (CCT) is 1250 K. Therefore, it is considered to be a new promising orange-red emitting phosphor for white light emitting diode (LED) application.

1. Introduction

Phosphors are widely used for emissive displays. However, all currently used phosphors still need considerable improvement, such as higher efficiency, lower current saturation and better chromaticity [1]. Oxide phosphors (including silicates phosphors) are more chemically stable than sulfide phosphors under high Coulomb loading. Metal silicates have been widely reported as promising host materials for rare earth and transition metal ions with excellent luminescence properties in the green, blue and red spectral regions [2]. From the manufacturing point of view calcium silicate phosphor would be ideal, because both calcium and silica are abundant and relatively inexpensive [3]. Silicates are also efficient luminescent materials, mainly because of their rigid and stable crystal structures [4,5]. Despite of their excellent host matrix properties, the silicates are not completely free of lattice defects, which causes a drastical decrease in the luminescent efficiency or cause undesired properties, e.g. afterglow, as is the case with the Ce^{3+} doped rare earth oxyorthosilicates [6,7]. A systematic study of the persistent luminescence properties, especially the effect of all the silicates is, however, lacking. Long-lasting phosphorescence has also been reported in $Ca_2Al_2SiO_7:Eu^{2+}$, $Ca_2Al_2SiO_7:Ce^{3+}$ and $Ca_2Al_2SiO_7:Ce^{3+}$, Mn^{2+} [8–10]. However, to our knowledge, there have been no attempts to investigate $Ca_2Al_2SiO_7$ based phosphors as a potential component used in semiconductor based light-emitting diodes (LED) for solid state lighting. The white LED can be generated by several methods [11–15]. The most commonly used method is to combine the red /green /blue tricolours phosphors with a GaN/InGaN chip. The presently reported red phosphors for near UV InGaN based LEDs are mainly $Y_2O_2S:Eu^{3+}$ [16], $Na_5La(MoO_4)_4:Eu^{3+}$ and $Na_5(MoO_4)_4:Eu^{3+}$ [17]. But the red phosphor shows lower efficiency

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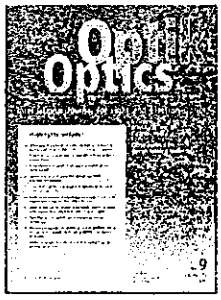

Title: Estimation of Kinetic Parameters from Thermoluminescence Glow Curves of Pure and Eu^{3+} Doped Barium Zirconate Titanate (BZT)

Author: G. Nag Bhargavi Ayush Khare Namita Brahme

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Full Length Article

Mechanoluminescence, thermoluminescence and photoluminescence studies of UV/γ-irradiated $Ba_2MgSi_2O_7:Dy^{3+}$ phosphors

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ABSTRACT

In this paper, Dy^{3+} doped phosphors were synthesized by high temperature solid state reaction technique. The phase purity of the sample was confirmed by the X-ray diffraction (XRD) technique. Elemental analysis was analyzed by using EDX. Photoluminescence spectra reveal that under the ultraviolet (UV) excitation at 352 nm, white light emitting phosphorescence originated from the mixtures of three emission of Dy^{3+} characteristic luminescence, the 481 nm blue emission ($^4F_{9/2}$–$^6H_{15/2}$), the 572 nm yellow emission ($^4F_{9/2}$–$^6H_{13/2}$) and the 672 nm red emission ($^4F_{9/2}$–$^6H_{11/2}$). Commission International del' Eclairage (CIE) color coordination was calculated, which confirms the white light emission of the phosphor. The thermoluminescence (TL) and mechanoluminescence (ML) properties of UV and γ-irradiated samples were studied, which reveals that, the maximum TL and ML intensity is obtained for 3 mol% of Dy^{3+} doping in $Ba_2MgSi_2O_7$ phosphors for both UV and gamma irradiation. The TL intensity increases with the increase in UV exposure time up to 35 min after that it became saturated for higher UV exposure time. Also the TL intensity increases linearly with the increase in gamma dose up to 1475 Gy. The ML intensity of the phosphors increases with the increase in UV and γ-dose. Also the ML intensity of the phosphor increases proportionally with the increase in impact velocity of the moving piston.

1. Introduction

Phosphors are promising materials in various fields of study, including solid state lighting and dosimetry [1,2]. In the past several years, there has been increasing interest in rare earth doped alkaline earth (Sr, Ca, Ba) silicate and aluminate based phosphors for various display and signing applications in traffic signs, emergency route markings, warning signboards, luminous paints, decoration etc. Compared with the conventional sulfide based phosphors used earlier, silicate and aluminate has higher luminosity, thermal stability, easier synthesis, low cost and non-toxicity [3,4]. However luminescent properties of aluminate are degraded in moisture environment [5]. The properties mentioned of these phosphors might decrease greatly when soaked in water after several hours and this greatly limits their future applications [6,7]. Therefore, the preparation of efficient luminescent phosphor with better stability is an important requirement. Silicate is an excellent host matrix for phosphors because of its various stable crystal structures, high physical and chemical stability, strong water persistence and varied luminescence color compared with other conventional phosphors [8]. $Ba_2MgSi_2O_7$ has a monoclinic crystal structure in which Ba^{2+} site is coordinated with eight oxide ions of MgO_4 and SiO_4 units. Also, $Ba_2MgSi_2O_7$ has a structure similar to one-dimensional layer structure and it could be an excellent host material in which the probability of the excitation energy to be trapped by the killer center is lower [9]. Theoretically, one can obtain white- light emitting phosphorescence by mixing a blue and a yellow light-emitting phosphors. However, it is difficult to fabricate those persistent phosphors (RGB/YB) which have similar phosphorescence decay ratio to ensure the white emitting long-lasting phosphorescence all the time. The potential benefit of lanthanide ions as activators is well established in the field of luminescence [10]. Dy^{3+} ions, which have the luminescence lines in the 470–500 nm region due to $^4F_{9/2} \rightarrow {}^6H_{15/2}$ transition and in the 570–600 nm region due to the $^4F_{9/2} \rightarrow {}^6H_{13/2}$ transition, have attracted much more attention because of its white light emission [11]. Dy^{3+} in the silicates acts as traps and can also act as luminescence center [12,13].

Thermoluminescence properties of the phosphors depend on presence of carrier traps, which are associated with crystal defects or doped impurity in host. The traps can capture electron and/or

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Luminescence properties of dysprosium doped di-calcium di-aluminium silicate phosphors

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ABSTRACT

A Dysprosium doped di-calcium di-aluminium silicate phosphor emitting long-lasting white light was prepared and investigated. Phosphors were synthesized by combustion-assisted method. The effect of doping concentration on the crystal structure and luminescence properties of $Ca_2Al_2SiO_7:Dy^{3+}$ phosphors were investigated. The phase structure, surface morphology, particle size, elemental analysis was analyzed by using X-ray diffraction (XRD), transmission electron microscope (TEM), Scanning electron microscopy (SEM) and Energy dispersive X-ray spectroscopy (EDX) techniques. X-ray diffraction (XRD) profiles showed that all peaks could be attributed to the tetragonal $Ca_2Al_2SiO_7$ phase when the sample was annealed at 1100 °C. The increase in TL intensity indicates that the concentration of traps increases with UV irradiation. Under the UV-excitation, the Thermoluminescence (TL) emission spectra of $Ca_2Al_2SiO_7:Dy^{3+}$ phosphor shows the characteristic emission of Dy^{3+} peaking at 484 nm (blue), 583 nm (yellow) and 680 nm (red), originating from the transitions of $^4F_{9/2} \rightarrow {}^6H_{15/2}$, $^4F_{9/2} \rightarrow {}^6H_{13/2}$ and $^4F_{9/2} \rightarrow {}^6H_{11/2}$. Photoluminescence (PL) decay has also reported and it indicates that $Ca_2Al_2SiO_7:Dy^{3+}$ phosphor contains fast decay and slow decay process. The peak of Mechanoluminescence (ML) intensity increases linearly with increasing impact velocity of the moving piston. The possible mechanism of Thermoluminescence (TL), Photoluminescence (PL) and Mechanoluminescence (ML) of this white light emitting long lasting phosphor is also investigated.

1. Introduction

In the last few years, the phosphors with long lasting afterglow rare earth doped aluminates and silicates have been proposed and developed for various display and signaling applications because of their high luminosity, long duration time and improved chemical stability [1–3]. The newly developed colours of the long lasting phosphors cover from blue to red. However until now, no phosphor with white long afterglow has been developed into a commercial application. In recent past, production of white LED with minimum cost has been an important topic to research. Numbers of aluminates, silicates, doped with rare earth materials have been discovered as different color emitting materials. It is not an easy task to maintain the proper ratio of existing blue, yellow, green and red emitting phosphor for retrieving white color. Rare earth dysprosium ions have at least three dominant emission bands in the blue region (470–500 nm) due to (blue), (550–600 nm) (yellow) and (600–700 nm) (red), originating from the transitions of $^4F_{9/2} \rightarrow {}^6H_{15/2}$, $^4F_{9/2} \rightarrow {}^6H_{13/2}$ and $^4F_{9/2} \rightarrow {}^6H_{11/2}$ [4,5]. It is possible to achieve near white light emission by adjusting the yellow to blue intensity ratio value. Consequently, Dy^{3+}activated luminescent materials attracted much attention, because of their significant applications as potential single phase white phosphors. White light emission resulted from a single phase phosphor is expected to obtain high luminous efficacy. Few silicates like $SrSiO_3$, $Sr_2MgSi_2O_7$, $Ca_2MgSi_2O_7$ and Sr_2SiO_4 doped with Dy^{3+} ions have already exhibited white light emissions [6,7]. In this paper we have prepared $Ca_2Al_2SiO_7:Dy^{3+}$with changing concentration of Dy^{3+} (0.5, 1, 2, 3, 4 mol%). Conventional combustion – assisted method was employed for this. Detailed studies of photoluminescence, mechanoluminescence and thermoluminescence process have been done.

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Luminescent properties of R^+ doped $Sr_2MgSi_2O_7:Eu^{3+}$ ($R^+ = Li^+$, Na^+ and K^+) orange–red emitting phosphors

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Abstract $Sr_2MgSi_2O_7:Eu^{3+}$ and $Sr_2MgSi_2O_7:Eu^{3+}$, R^+ ($R^+ = Li^+$, Na^+ and K^+) phosphors were prepared by conventional solid state reaction method. The crystal structures of synthesized phosphors were an akermanite type structure which belongs to the tetragonal crystallography. The thermoluminescence kinetic parameters such as activation energy, order of kinetics and frequency factor was calculated by peak shape method. In this work, the orange-red emission originated from the $^5D_0$–^7F_J (J = 0, 1, 2, 3, 4) transitions of Eu^{3+} ions could clearly be observed after samples were excited at 395 nm. Decay graph indicate that these phosphors also contain the fast and slow decay process. Mechanoluminescence intensity of prepared $Sr_2MgSi_2O_7:Eu^{3+}$ and $Sr_2MgSi_2O_7:Eu^{3+}$, R^+ ($R^+ = Li^+$, Na^+ and K^+) phosphors were increases linearly with the increasing impact velocity of moving piston (load). CIE color chromaticity diagram confirm that the prepared phosphors would emit orange-red color. Thus the present investigation indicating that this phosphor may be a potential candidate for stress sensors. The dopant R^+ ($R^+ = Li^+$, Na^+ and K^+) as charge compensator in $Sr_2MgSi_2O_7:Eu^{3+}$ can further enhance luminescence intensity, and the emission intensity of $Sr_2MgSi_2O_7:Eu^{3+}$ doping Li^+ is higher than that of Na^+ or K^+.

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1 Introduction

Phosphors are widely used in emissive displays. However, all currently used phosphors still need considerable improvement, such as lower current saturation, higher efficiency, and better chromaticity [1]. Oxide phosphors (including silicate phosphors) are more chemically stable than sulfide phosphors under high Coulomb loading. Metal silicates have been widely reported as promising host materials for rare earth and transition metal ions with excellent luminescence properties in the blue, green and red spectral regions [2]. A strontium silicate phosphor would be ideal from the manufacturing point of view, because both strontium and silica are abundant and are relatively inexpensive. These materials are widely used in the illumination, the displays, storage devices, medical instruments and many more [3, 4].

Rare earth oxides (RE_2O_3) are the most stable rare earth compounds, in which the rare earth ions hold typically a trivalent state [5]. Rare earth oxides have been widely used in the field of luminescent devices, optical transmission, bio-chemical probes, medical diagnosis and so for, because of their optical, electronic and chemical properties resulting from their 4f electrons [6, 7]. Inorganic compounds doped with trivalent europium cations (Eu^{3+}) are used for many different applications. The luminescence properties of Eu^{3+} ions involve intra $4f^6$ (4f–4f) transitions mechanisms between excited state to ground state [8, 9]. The emission wavelength of the 4f–4f transition of Eu^{3+} is relatively insensitive to the host and temperature because the 4f shell is shielded by the outer filled 5s and 5p shells. Eu^{3+} ions are employed in luminescent devices such as fluorescent lamps and cathode ray tubes [10]. Currently transitions of Eu^{3+} ions have attracted considerable interest owing to the attempt to develop novel phosphors that can

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Synthesis and characterization of ion transport behavior in Cu^{2+}-conducting nano composite polymer electrolyte membranes

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Abstract

Synthesis and characterization of ion transport behavior in Cu^{2+}-conducting nano composite polymer electrolyte (NCPE) films: [90PEO: $10Cu(CF_3SO_3)_2$] + x CuO have been reported. NCPE films have been formed by hot-press casting technique using solid polymer electrolyte (SPE) film composition: [90PEO: $10Cu(CF_3SO_3)_2$] as 1st-phase host and nanoparticles of CuO in varying wt.(%) as 2nd-phase active filler. SPE: [90PEO: $10Cu(CF_3SO_3)_2$] was identified earlier as highest conducting film with room temperature conductivity (σ_{rt}) ~ 3.0×10^{-6} S cm^{-1}, which is three orders of magnitude higher than that of pure polymer host PEO with $\sigma_{rt} \sim 3.2 \times 10^{-9}$ S cm^{-1}. Filler particle concentration dependent conductivity study revealed NCPE film: [90PEO: $10Cu(CF_3SO_3)_2$] + 3%CuO as optimum conducting composition (OCC) exhibiting $\sigma_{rt} \sim 1.14 \times 10^{-5}$ S cm^{-1}. Hence, by the fractional dispersal of 2nd-phase active filler into 1st-phase SPE host, σ-enhancement of approximately an order of magnitude has further been obtained. Ion transport behavior in NCPE OCC film has been characterized in terms of basic ionic parameters viz. ionic conductivity (σ), total ionic transference (t_{ion})/ cationic (t_+) numbers. Temperature dependent conductivity measurement has also been done to explain the mechanism of ion transport and to compute activation energy (E_a). Materials characterization and hence, confirmation of complexation of salt in polymeric host and/ or dispersal of filler particles in SPE host have been done by scanning electron microscopy (SEM), energy dispersive x-ray spectrometer (EDS), x-ray diffraction (XRD), Fourier transform infra-red (FTIR), differential scanning calorimetry (DSC) and thermogravimetric analysis (TGA). All-solid-state battery in the cell configuration: Cu (Anode) || SPE host/NCPE OCC film || C + I_2 + Electrolyte) (Cathode) has been fabricated and cell performance has been studied under two load resistances viz. 60 and 100 kΩ. Each NCPE cell gave on an open circuit voltage (OCV) ~ 0.68 V. Some important battery parameters have also been evaluated from the plateau regions of cell potential discharge profiles.

Keywords: dry polymer electrolyte, nano composite polymer electrolytes (NCPEs), hot-press film casting, ionic conductivity (σ), ionic transference numbers (t_{ion} and t_+)

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Original research article

Tuning of photoluminescence emission properties of Eu^{3+} doped Gd_2O_3 by different excitations

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ABSTRACT

In this work, we investigated cubical particles of europium doped gadolinium oxide based material for colour tuning by different excitations. Structural properties of the material were studied by transmission electron microscopy and X-ray diffraction analysis. The Photoluminescence (PL) technique was used to study luminescent properties of the material and its optical features were thoroughly investigated by calculating CIE chromaticity. Effect of Eu^{3+} concentration on emission spectra for three excitations was also recorded. The emission intensity for 613 nm, 584 nm and 467 nm were recorded as the function of dopant ion concentration. It was observed that the blue emission quenched at 1 mol% Eu^{3+} whereas red and green quenched after 2 mol% of Eu^{3+}.

1. Introduction

Rare earth ions doped materials promotes practical applications in the field of optical devices. They shows significant application in preparation of solid state laser, efficient solar cells or biologicl fluorescence label under infrared excitation [1–3]. Rare earth oxides (RE_2O_3) are well known to crystallize in various structures according to the radius of RE ions. Due to their unique optical and chemical properties lanthanide doped rare earth oxide in nano range have a verity of research and practical utilities [4].

Doping of europium in rare earth oxides generates a new interaction between the atomic levels of host material and dopant material behaves as luminescence centre. This interaction between these two energy states makes them potential phosphor for application in integrated optics [5–7].

The synthesis and precise manipulation of phosphor materials on the submicron and nanoscale regime have attracted considerable attention for display and lighting technology. Phosphor particles with different luminescence emission spectra can be fabricated by the controlled doping of some specific lanthanide ions into a suitable host material. The morphology, size and synthesis process of rare earth doped phosphor considerably affects the luminescent behaviour of the phosphor materials. Each host material can accommodate a certain concentration of dopant ions, above that concentration of dopants constant decreases in luminescent behaviour is observed [8,9].

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Original Article

Luminescence studies on the europium doped strontium metasilicate phosphor prepared by solid state reaction method

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ABSTRACT

Europium doped strontium meta-silicate (namely $SrSiO_3:Eu^{3+}$) phosphor was prepared by traditional high temperature solid state reaction method. Crystal structure of sintered $SrSiO_3:Eu^{3+}$ phosphor was investigated which confirms the monoclinic structure. Energy dispersive X-ray spectrum (EDS) confirms the presence of elements in discussing phosphor. Thermoluminescence (TL) kinetic parameters such as activation energy (E), order of kinetics (b) and frequency factor (s) were calculated by peak shape method. The orange-red emission was originated from the $^5D_0-^7F_J$ (J = 0, 1, 2, 3, 4) transitions of Eu^{3+} ions; could be clearly observed after sample was excited at 396 nm. It is shown that the phosphor with almost pure orange-red color purity (99.62%) and with a quantum efficiency of 10.2% (excited by 396 nm) can be obtained, which is higher than the commercial red phosphors $Y_2O_3:Eu^{3+}$, $Y_2O_2S:Eu^{3+}$ with quantum efficiencies of 9.6% (excited by 394 nm) and 4.2% (excited by 395 nm), respectively. Mechanoluminescence (ML) intensity of discussing $SrSiO_3:Eu^{3+}$ phosphor was increased linearly with increasing the impact velocity of the moving piston; which suggest that, the discussed phosphor can be used as stress sensor. Thus, the present investigation indicates the piezo-electricity was responsible to produce ML in prepared phosphor.

1. Introduction

The phosphors are widely used in emissive displays. However, all currently used phosphors still need considerable improvement, such as lower current saturation, higher efficiency, and better chromaticity [1]. Oxide based phosphors (including silicate phosphors) are more chemically and physically stable than sulfide and aluminates phosphors under high Coulomb loading. Metal silicates have been widely reported as promising host materials for rare earth and transition metal ions with excellent luminescence properties in blue, green and red spectral regions [2]. Strontium silicate phosphor would be ideal from the manufacturing point of view, because both strontium and silica are abundant and are relatively inexpensive. These materials are widely used in the illumination, displays, storage devices, medical instruments and many more [3,4].

Rare earth oxides (RE_2O_3) are the most stable rare earth compounds, in which the rare earth ions hold typically a trivalent state [5]. Rare earth oxides have been widely used in the field of luminescent devices, optical transmission, bio-chemical probes, medical diagnosis and so for, because of their optical, electronic and chemical properties resulting from their 4f electrons [6,7]. Inorganic compounds doped with trivalent europium cations (Eu^{3+}) are used for many different applications. Luminescence properties of Eu^{3+} ions involve intra $4f^6$ (4f–4f) transitions mechanisms between the excited state to ground state [8,9]. The emission wavelength of the 4f–4f transition of Eu^{3+} is relatively insensitive to the host and temperature because the 4f shell is shielded by the outer filled 5s and 5p shells. Eu^{3+} ions were employed in luminescent devices such as fluorescent lamps and cathode ray tubes [10]. Currently transitions of Eu^{3+} ions have attracted considerable interest owing to the attempt to develop novel phosphors that can improve the color temperatures and the color rendering index of White Light Emitting Diode (WLED) [11].

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Enhanced Luminescence on doping of Charge Compensator Ions ($R+ = Li^+, Na^+$ and K^+) in $Ca_2MgSi_2O_7:Eu^{3+}$ Phosphors

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Abstract *- The role of charge compensator ions ($R^+ = Li^+$, Na^+ and K^+) co-doped with Eu^{3+} in di-calcium magnesium di-silicate ($Ca_2MgSi_2O_7$) phosphors were investigated. The $Ca_2MgSi_2O_7:Eu^{3+}$ and $Ca_2MgSi_2O_7:Eu^{3+}$, R^+ ($R^+ = Li^+$, Na^+ and K^+) phosphors were prepared by conventional solid state reaction method. The crystal structures of synthesized phosphors were an akermanite type structure which belongs to the tetragonal crystallography. Thermoluminescence (TL) kinetic parameters such as activation energy, order of kinetics and frequency factor was calculated by peak shape method. The excitation and emission spectra indicate that this phosphor can be excited by near ultraviolet light at 396 nm, and exhibits bright orange – red emission with the highest peak at 595 nm corresponding to the $^5D_0 \rightarrow {}^7F_1$ transition of Eu^{3+} ions. Decay graph indicate that these phosphors also contain fast and slow decay process. CIE color chromaticity diagram confirm that the prepared phosphors would emit orange-red color. The addition of charge compensator ions enhances the luminescence intensity of prepared $Ca_2MgSi_2O_7:Eu^{3+}$ phosphors because they neutralize the charge generated by Eu^{3+} substitution for Ca^{2+} ions. The role of Li^+ ions among all charge compensator ions (Na^+ or K^+) used was found to be most effective for enhanced Eu^{3+} ion emission.*

Keywords: *Alkaline earth silicates; XRD; Photoluminescence; CIE color co-ordinates.*

1. INTRODUCTION

Semiconductor white light-emitting diodes (WLEDs) have emerged as the fourth generation of illumination technology, and are expected to replace the traditional incandescent, fluorescent, and high intensity discharge lamps due to advantages such as energy-saving, long service life, low voltage, high

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The effect of annealing and irradiation dose on the thermoluminescence glow peak of a monoclinic $Gd_2O_3:Yb^{3+}$ phosphor

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A monoclinic $Gd_2O_3:Yb^{3+}$ phosphor was prepared using the combustion synthesis method. This study is mainly centered on the thermoluminescence behaviour of this monoclinic $Gd_2O_3:Yb^{3+}$ phosphor. TL glow curves were recorded for two different irradiations, UV and gamma irradiation. The effect of annealing temperature, irradiation dose and Yb^{3+} concentration on thermoluminescence behaviour is studied. Computerized glow curve deconvolution (CGCD) was applied using the peak fit method on the TL glow curve for optimized conditions. Kinetic parameters were calculated for the optimized TL glow curve as well as for the deconvoluted glow curve. The activation energy calculated for the gamma irradiated samples is greater than the UV irradiated samples, which is due to the deeper traps formed by gamma irradiation.

Introduction

Nowadays, thermoluminescence dosimetry has found remarkable applications in various fields, which have attracted researchers to study the thermoluminescence behaviour of various phosphor materials.[1] The literature reveals only a few reports on the thermoluminescence behaviour of oxide based phosphor materials.[2] Various studies have been carried out for rare earth doped phosphors, such as Dy and Eu, rather than oxide hosts.[3] Furthermore, oxide hosts are generally used for low dose measurement because of their properties.[4]

We previously reported the thermoluminescence behaviour of oxide based phosphors, in which the thermoluminescence behaviour of Er^{3+} and Yb^{3+} doped gadolinium oxide was reported for two different radiations, specifically UV and gamma irradiation.[5,6] The thermoluminescence behaviour of Er^{3+} doped gadolinium oxides has been reported for a solid state synthesized phosphor.[7] The effect of Eu^{3+} concentration on the thermoluminescence behaviour of ZrO_2 has been studied for a solid state synthesised $ZrO_2:Eu^{3+}$ phosphor.[8] A $Y_2O_3:Gd^{3+}$ nanophosphor was prepared *via* the solid state reaction method and the thermoluminescence behaviour of the prepared phosphor was studied for a gamma ray induced phosphor.[9]

In the present study, Gd_2O_3 doped with Yb^{3+} is prepared *via* the combustion synthesis method. TL glow curves of the prepared phosphor annealed 600 °C and 900 °C for 2 h have been recorded after UV and gamma exposure. The TL glow curves of the samples were recorded by irradiating with different doses, different Yb^{3+} concentrations, and variable heating rates. The trapping parameters of the observed peaks present in the TL glow curves are evaluated for the optimized glow curve as well as the deconvoluted glow curve.

Experimental

Combustion synthesis

Nanophosphors of Gd_2O_3 doped with Yb^{3+} ions were prepared *via* the solution combustion synthesis method. For the preparation of the phosphor, an aqueous solution containing urea, $Gd(NO_3)_3 \cdot 6H_2O$ and $Yb(NO_3)_3 \cdot 5H_2O$ was prepared as the precursor material. A constant percentage of urea and metal nitrate in the molar ratio of 2 : 1 was mixed to prepare the precursor solution. The solution was concentrated by heating until excess free water evaporated and spontaneous ignition occurred. The solution undergoes dehydration with the liberation of a large amount of gaseous products. At the point of spontaneous combustion, the solution begins burning and releases a lot of heat; the solution vaporizes instantly and becomes a burning solid with the liberation of gaseous by-products, such as oxides of carbon and nitrogen. When the combustion was finished the solid was left to cool down to room temperature, and the resultant particles were crushed using

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RESEARCH ARTICLE

Thermoluminescence properties of Eu-doped and Eu/Dy-codoped $Sr_2Al_2SiO_7$ phosphors

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Abstract

We report the thermoluminescence properties of $Sr_{1.96}Al_2SiO_7:Eu_{0.04}$ and $Sr_{1.92}Al_2SiO_7:Eu_{0.04}Dy_{0.04}$ phosphors. These phosphors were prepared by a high-temperature solid-state reaction method. The prepared phosphors were characterized by X-ray diffraction. A 254 nm source was used for ultraviolet (UV) irradiation and a ^{60}Co source was used for γ-irradiation. The effect of heating rate and UV-exposure were examined. The thermoluminescence temperature shifts to higher values with increasing heating rate and thermoluminescence intensity increases with increasing UV exposure time. The trapping parameters such as activation energy (E), order of kinetics and frequency factor (s) were calculated by peak shape method. The effect of γ- and UV-irradiation on thermoluminescence studies was also examined.

KEYWORDS

activation energy, phosphors, $Sr_2Al_2SiO_7$:Eu,Dy, thermoluminescence

1 | INTRODUCTION

In the recent past, researchers and scientific communities around the world have taken a great deal of interest in the development of new materials that can be used in applications to detect and measure radiation. Materials with high chemical stability and water resistance are always a priority because they can be used in radiation dosimetry. Thermoluminescence (TL) is a powerful technique used for dosimetry.[1] TL is a radiation-induced defect-related process in crystalline materials. In TL, the energy absorbed by the phosphor on exposure to ionizing radiation can be easily detected as light upon heat treatment. TL provides very useful information about the charges trapped and energy transfer processes in a crystalline lattice resulting in light emission.[1–3] TL a possible way to investigate the trap states of materials. Various TL parameters like activation energy (E) and frequency factor (s) can be obtained from the TL glow curve. The dosimetric properties of TL materials depend mainly on the kinetic parameters of the glow peak.[4] When lanthanide ions are incorporated into certain materials, such as glasses, crystals and powders, the materials may become luminescent. Dy^{3+} is one such lanthanide ion. Dy^{3+} is a rare earth ion important in the development of phosphors with long-lasting afterglow, and plays a crucial role in luminescence. Doping of Dy^{3+} creates trap centers in the host material[5,6] than enhance the photoluminescence and TL properties of materials.

As aluminates and sulfide absorb moisture, their luminescence properties, such as afterglow, photoluminescence and TL, decrease gradually, and the attention of scientists and researchers has turned to developing phosphors that are water resistant. Increased water resistance enhances the durability and efficiency of the phosphors. Therefore, we chose $Sr_{1.96}Al_2SiO_7:Eu_{0.04}$ and $Sr_{1.92}Al_2SiO_7:Eu_{0.04}Dy_{0.04}$ phosphors for TL studies prepared by the solid-state reaction method. These phosphors have many qualities such as low cost, ease of preparation, excellent thermal and chemical stability, and particularly strong absorption in the near-UV region. We experimentally found that a 0.04% doping concentration of Eu in $SrAl_2SiO_7$ gives maximum TL intensity. In the case of $Eu_{0.04}$,$Dy_{0.04}$ co-doped $SrAl_2SiO_7$ phosphor, the traps were formed by codoped Dy^{3+} ions that replaced the original Sr^{2+} ions in the host lattice. Their placement caused positive centers around Dy^{3+} ions which then became electron traps. A deeper trap level and a higher trap density lead to better TL and other luminescence properties, such as higher initial afterglow and longer persistence. Here, we report the TL of $Sr_{1.96}Al_2SiO_7:Eu_{0.04}$ and $Sr_{1.92}Al_2SiO_7:Eu_{0.04}Dy_{0.04}$ phosphors, and the effect of UV-irradiation, heating rate and γ-irradiation on TL.

Abbreviations used: TL, Thermoluminescence; UV, Ultraviolet; Vis, Visible; XRD, X-ray diffraction.

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ORIGINAL PAPER

Characterization of ion transport property in hot-press cast solid polymer electrolyte (SPE) films: [PEO: $Zn(CF_3SO_3)_2$]

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Abstract Characterization of ion transport property in dry solid polymer electrolyte (SPE) films: [PEO: $Zn(CF_3SO_3)_2$] in different salt wt% ratio has been reported. SPE films have been prepared by a hot-press casting procedure. Salt concentration dependent conductivity study at room temperature identified SPE film: [90PEO: 10 $Zn(CF_3SO_3)_2$] as optimum conducting composition (OCC) with $\sigma_{rt} \sim 1.09 \times 10^{-6}$ S/cm which is approximately three orders of magnitude higher than that of pure PEO host ($\sigma_{rt} \sim 3.20 \times 10^{-9}$ S/cm). The reason attributed for σ_{rt} enhancement has been the increase in degree of amorphous phase in polymeric host after salt complexation. This has been confirmed by X-ray diffraction (XRD), Fourier transform infrared (FTIR), differential scanning calorimetry (DSC), and polarized optical microscopy (POM) analysis. To evaluate the usefulness of SPE OCC film in all-solid-state-battery applications, ion transport property has been characterized in terms of basic ionic parameters viz. ionic conductivity (σ) and total ionic (t_{ion})/cation (t_+) transport numbers. Mechanism of ion transport has been explained by temperature dependent conductivity measurements and the activation energy (E_a) has been computed by least square linear fitting of "log $\sigma - 1/T$" Arrhenius plot.

Keywords Dry solid polymer electrolyte (SPE) · Hot-press casting procedure · Ionic/cationic transference number · All-solid-state polymer batteries

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Introduction

Ion conducting electroactive polymers or dry polymer electrolytes viz. solid polymer electrolytes (SPEs)/composite polymer electrolytes (CPEs) are potential solid-state ionic materials for all-solid-state battery applications. Ion conduction in otherwise insulating polymers was reported for the first time by Fenton et al. [1]. Subsequently, the first practical battery, based on Li^+-ion conducting poly (ethylene oxide) PEO-based polymer electrolyte, was demonstrated by Armand et al. [2]. These discoveries attracted widespread attention of researchers. As a result, a large number of polymer electrolytes involving different mobile ions viz. H^+, Li^+, Ag^+, Cu^+, Na^+, K^+, Mg^{2+}, Zn^{2+}, etc. have been investigated since then in the last nearly four decades and their cell performances have been tested by fabricating all-solid-state batteries in all possible shapes/sizes [3–15]. Majority of the polymer electrolyte materials reported so far commonly used high molar weight polar poly(ethylene oxide) PEO as polymeric host due to its inherent ability to dissolve wide variety of ionic salts in substantially larger proportion. Further, modern portable polymer electrolyte batteries available today in the market are based on PEO complexed with Li^+– ion salts and lithium metal electrode couples. However, these batteries have reported to encounter some serious fire-hazards in the recent past which was mainly due to use of lithium chemicals [16, 17]. Hence, on account of safety of the batteries while in use, the need of some non-lithium chemicals based polymer electrolytes and electrodes has been strongly felt in the recent time. The work reported in this paper is an attempt in this direction. We report the synthesis of Zn^{2+}-ion conducting SPE films: [(1−x) PEO: x $Zn(CF_3SO_3)_2$] in different salt concentration (x). The film exhibiting optimum room temperature conductivity (σ_{rt}) was identified and has been referred to as optimum conducting composition (OCC) SPE film. The investigations on materials

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Conductivity enhancement in K^+-ion conducting dry Solid Polymer Electrolyte (SPE): [PEO: KNO_3]: A consequence of KI dispersal and nano-ionic effect

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HIGHLIGHTS

- Non-lithium chemical based SPE films: [95PEO:5KNO_3] & [70PEO:30-KNO_3] investigated.
- Substantial enhancement in σ_{rt} and t_+ achieved adopting two approaches.
- As first approach, CPEs prepared dispersing IInd-phase active filler into Ist-phase SPE.
- As second approach, Nano–ionic effect introduced by ball milling prior to casting CPE film.
- Dry polymer electrolytes can be used for All-Solid-State battery applications.

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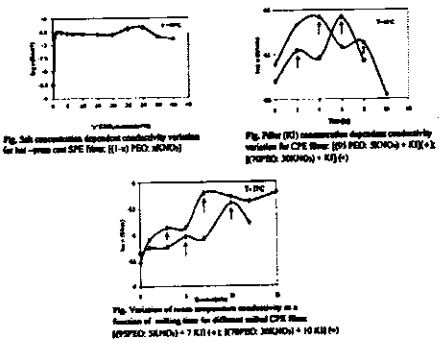
GRAPHICAL ABSTRACT



ABSTRACT

Flexible films of dry Solid Polymer Electrolytes (SPEs): [PEO: KNO_3] in varying salt concentrations have been hot-press cast. Salt concentration dependent conductivity study revealed two SPE films: [95PEO: 5KNO_3] and [70PEO: 30KNO_3] exhibiting relatively higher room temperature conductivity (σ_{rt}) ~ 2.76×10^{-7} S/cm and ~4.31×10^{-7} S/cm respectively. In order to increase σ_{rt} further, two strategies have been adopted. Firstly, fractional amount of KI has been dispersed as IInd-phase active filler into above two SPE film compositions which acted as Ist-phase host and Composite Polymer Electrolyte (CPE) films were hot-press cast. Filler particle concentration dependent conductivity study identified CPE films: [(95PEO: 5KNO_3) + 7KI] and [(70PEO: 30KNO_3) + 10 KI] as optimum conducting films with σ_{rt} ~ 6.15×10^{-6} S/cm and ~3.98×10^{-6} S/cm respectively. σ_{rt}-enhancement of approximately an order of magnitude was achieved by this approach. In second approach, dry powder mixture of (KNO_3 + KI), in ratio that of above two CPE films, were subjected to high energy ball-milling separately for different durations prior to casting the films again. The conductivity measurements as a function of milling time identified CPE films: [(95PEO: 5KNO_3) + 7KI] and [(70PEO: 30KNO_3) + 10 KI] in which two respective (KNO_3 + KI) ratios milled for 4- and 6-h, exhibited almost similar value of σ_{rt} ~ 2.09×10^{-5} S/cm. This approach increased σ_{rt} further by ~3–6 fold. The reason attributed for this has been Nano–ionic effect introduced at the interphase boundaries between KNO_3 and KI, as a consequence of milling. These films have been referred to as milled CPE films. Subsequently, all the optimum conducting SPE and CPE (unmilled/milled) films were subjected to various characterization studies in order to evaluate their utility in potential All–Solid–State batteries. Ion transport behaviour has been characterized in terms of

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Impact of welfare schemes and gender on mental health and emotional intelligence among Maoist conflict exposed youth: Implication for psychological intervention

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Exposure to unending Maoist violence and uncertain course of life can generate long-lasting effects on emotional and mental health of young population. Present research was an attempt to explicate the current status of mental health and emotional intelligence among youth of Maoist conflict affected districts of Chhattisgarh state and to compare these with youth from main stream. The main objectives of the study were (Anderson, 2014). To investigate the effect of gender and welfare schemes on the mental health of youth of Maoist conflict exposed regions (Baider et al., 1989). To examine the effect of gender and welfare schemes on emotional intelligence (Barlow, 1985). To study the interaction effect (Basow, 1986). To determine the effectiveness of emotional intelligence training on the mental health. A random sample of 80 youth (40 boys , 40 girls) studying in Prayas, a residential school meant for youth from maoist hit districts, 80 youth (40 boys, 40 girls) from Nishthha, a scheme for youth of maoist violence victim families and 80 youth (40 boys, 40 girls) from main stream were selected. Mean age of the participants were 16.8.Tools used to assess variables under study were the Mental Health Scale by Sharma (1996) and Youth Emotional Intelligence Scale by Ajawani (2008). 40 participants of Nishthha scheme who scored low on mental health scale were randomly assigned in experimental and control group. Only experimental group was given training to enhance mental health through emotional intelligence (10 sessions, 60 minutes; twice a week). Analysis of covariance (ANCOVA) was used for analyzing the data. Two way ANOVA results indicated a significant effect of gender on mental health ($F=7.88$, $p < .05$) and on emotional intelligence ($F=6.19$, $p < .05$). The findings revealed that boys have higher level of emotional intelligence and mental health than girls. Further, significant effect of various welfare schemes is also found on mental health ($F=5.17$, $p < .05$) and on emotional intelligence ($F=9.06$, $p < .05$). Youth from mainsteam have shown high level of Emotional Intelligence and Mental Health while Nishthha students were on least level. Interaction effect is not significant for both the variables. There was a significant difference ($p<0.001$) between experimental and control group in relation to mental health after participation in intervention sessions.

Keywords: mental health, emotional intelligence, intervention

The word 'Maoist' has become an unavoidable portion of the Indian lexicon. It refers to people in an organisation with an objective to demolish India's legitimate structure through force and the formation of a dictatorship pronounced by Mao Zedong in China. The term Naxalite is also used for the Maoist as the movement started in the Naxalbari block of West Bengal. The Indian Ministry of Home Affairs (MHA) declares that 223 districts in 20 states are affected by naxalism (Sahni & Singh, 2010) while seven states known as red corridor encompasses Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, Uttar Pradesh, and West Bengal are severely affected (Sen, 2009). This belt includes the least developed and poorest sections of India with an observable high amount of tribal population (Adivasis), Untouchables (Dalits) and other weak groups.

The Naxals have made encroachment into Chhattisgarh during early 1980s. However, their existence in the State was sensed only in late 1990s after having their grip in most of rural belts where the government had little existence. In May 2005, a state government intelligence report stated that the Maoists have become a prevalent power in Chhattisgarh. Official sources estimated 3000 cadres of the Naxals in Chhattisgarh. The harsh consequences of conflict were suffered by innocent local residents from both the ends, i.e. by the hands of the security forces as well as the Naxalites. Salwa Judum which was a militia set up with the support of the government to counter the Naxals caused the dislocation of 43,740 people as of 31, December 2006 from Chattisgarh. Often villagers and adivasis are killed in the cross firing between the security forces and the Naxals causing loss of life and property. There have been frequent incidents of Naxalites demolished schools, bridges and rail lines apart from government buildings which make the condition worse for the common masses.

In such pathetic conditions, proper development of young generation living in Maoist violence affected districts is severely troubled. Sensing the need of hour State government has launched 'Baal Bhavishya Suraksha Yojana' to make sure that the children in Maoist-hit districts get better education.There are four pillars of this scheme including 'Aastha', 'Nishtha' 'Sahyog' and 'Prayas'. Each sub-scheme has a different purpose. Aastha is situated at Dantewara district. Under 'Aastha', children of Naxal-violence affected families are provided education from Standard 1 to 12 in boarding schools where they are taught in conventional 'Gurukul' style. 'Nishtha' is a

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Occupational stress as a function of type of school and gender

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WHO defined as occupational stress is the response people may have when presented with work demands and pressures that are not matched to their knowledge and abilities and which challenge their ability to cope. Several studies reported that occupational stress influenced by certain psychological, organizational and demo-graphical factors in western context (Jeyaraj, 2013; Morrison, 2005; Berhem et al., 2004; Lewis, 1999). On the other hand in Indian context studies are lacking. The aim of current empirical research work is to examine that whether or not type of school, and gender work independently or interaction with each other are capable of generating variance in occupational stress in case of school teacher. Employing a (2)2 ex-post facto, non-experimental factorial design (fixed model) the two levels of type of school, i.e., residential and non-residential, the two levels of gender, viz. male and female were manipulated in the study. Employing the incidental cum random sampling technique, finally 120 teachers (60 males & 60 females) within the age range of 30 to 45 years were drawn randomly from different school run by Govt. of India at Chhattisgarh state to serve as subjects in the current research work. All the two independent variables were found to be potential enough in generating variance in occupational stress. Interaction was found significant for almost four components of occupational stress. Theoretical interpretations have been given.

Keywords: occupational stress, type of school and gender

Occupational stress is the inability to cope with the pressures in a job (Rees, 1997). It is a mental and physical condition which affects an individual's creativeness, effectiveness, personal health and quality of occupation (Comish & Swindle, 1994). Teacher stress is a specific type of occupational stress. Occupational stress is the experience by a teacher of unpleasant emotions such as anger, tension, frustration and depression resulting from aspects of his/her work as a teacher (Kyriacou, 1987). Overall, teachers manifesting high levels of stress also show signs of high levels of psychological distress, generally demonstrated by high anxiety and low psychological well-being, as well as decreased job satisfaction that is mental ill-health, burnout and dissatisfaction of job among the teachers (Traverse & Cooper, 1996).

Each profession causes a specific level of stress. However, teaching is among the professions that cause more stress compared to other professions (Hargreaves, 1999; Pithers, 1995). Stress affects both the teacher and the learners in the teaching process (Forlin, Douglas, & Hattie, 1996). Kyriacou (1987) who has carried out varies studies on teacher stress, described teacher stress as the experiencing of unpleasant feelings such as depression, anger, worry, irritableness and tension which are formed as a result of working as a teacher. Stress sources of teachers may be summarized as low motivation in students, discipline problems, the pressure of time and the work load, being assessed by, colleague relationship, conflict and indefiniteness of roles, and self-respect, bad working conditions students' discipline problems, the inadequate support of colleagues, family and friends (Kyriacou, 2001; Detert, Derosia, Caravella, & Duquette, 2006). In addition, students' being late to school, not doing homework, their failure and students' may cause stress in teachers (Joseph, 2000; Adams, 2001). It is essential for educational organizations to study and manage rationalistically the stress sources of teachers who have the important duty of educating individuals. After scanning of relevant research literature, it is found that this is dearth of studies in which occupational stress of teachers working in residential and non-residential schools are conducted that to under Indian conditions. It was also found that gender as an independent variable has not been considered as a factor affecting the occupational stress of teachers. So, it is considered appropriate to find out the main and interactional effect of type of schools and gender on occupational stress of teachers.

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Research design

In the present study, a 2X2 factorial design has been employed which means that the design used 2 factors or independent variables, viz. type of school and gender were to be varied at two levels to study their main and interaction effects on dependent variable, i.e., type of school and gender.

Method

Participants

In the present study stratified random sampling technique was employed to meet the requirement of 120 subjects distributed over 2x2 cell of factorial design. To select homogeneous and unbiased sample in the present study, the sample has been drawn from the population of teachers of schools of Chhattisgarh. The age group for the sample taken into consideration is from 30 to 45 years. In this study we have 2x2 or 4strata viz. Residential School and Male Teachers; Residential School and Female Teachers; Non-residential School and Male Teachers; Non-residential school and Female Teachers. In present study, 2x2 factorial design having at least 30 subjects in each cell. A total number of 120 subjects were randomly drawn following the stratified random sampling technique.

Psychometric Properties and Confirmatory Factor Analysis of the Social Support Scale

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DOI: 10.25215/0304.152

Authors:

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Priyamvada Srivastava
Pt. Ravishankar Shukla University

Abstract and Figures

The aim of the present study was to investigate the reliability and validity of a standardized assessment of social support towards HIV positive patients is considered to be associated with improved physical health outcomes. Many scales have been developed to measure social support in psychological professional and researchers. The social support scale has been widely used. This study was designed to examine the psychometric properties and the theoretical structure of the Social support scale. A total of 200 HIV positive participants responded to the social support scale. A hypothetical model was evaluated by structural adequacy of goodness-of-fit to sample data. The model

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Coping Behavior Assessment Scale (Indian Adaptation): Establishing Psychometrics Properties

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Comparative Study | Published: May 30, 2017

Coping Behavior Assessment Scale (Indian Adaptation): Establishing Psychometrics Properties

Dr. Gaukaran Janghel , Dr. Priyamvada Shrivastav

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Abstract

The stress coping behavior scale (SCBS) was designed to measure the stress coping behavior of the Indian adult population. The brief cope scale was originally developed by Carver (1997). This measured stress coping styles and used as a base for the development of SCBS in Indian context. The main objective of the present study was to determine the psychometric properties of SCBS. The SCBS has 28 items [illegible]

Keywords

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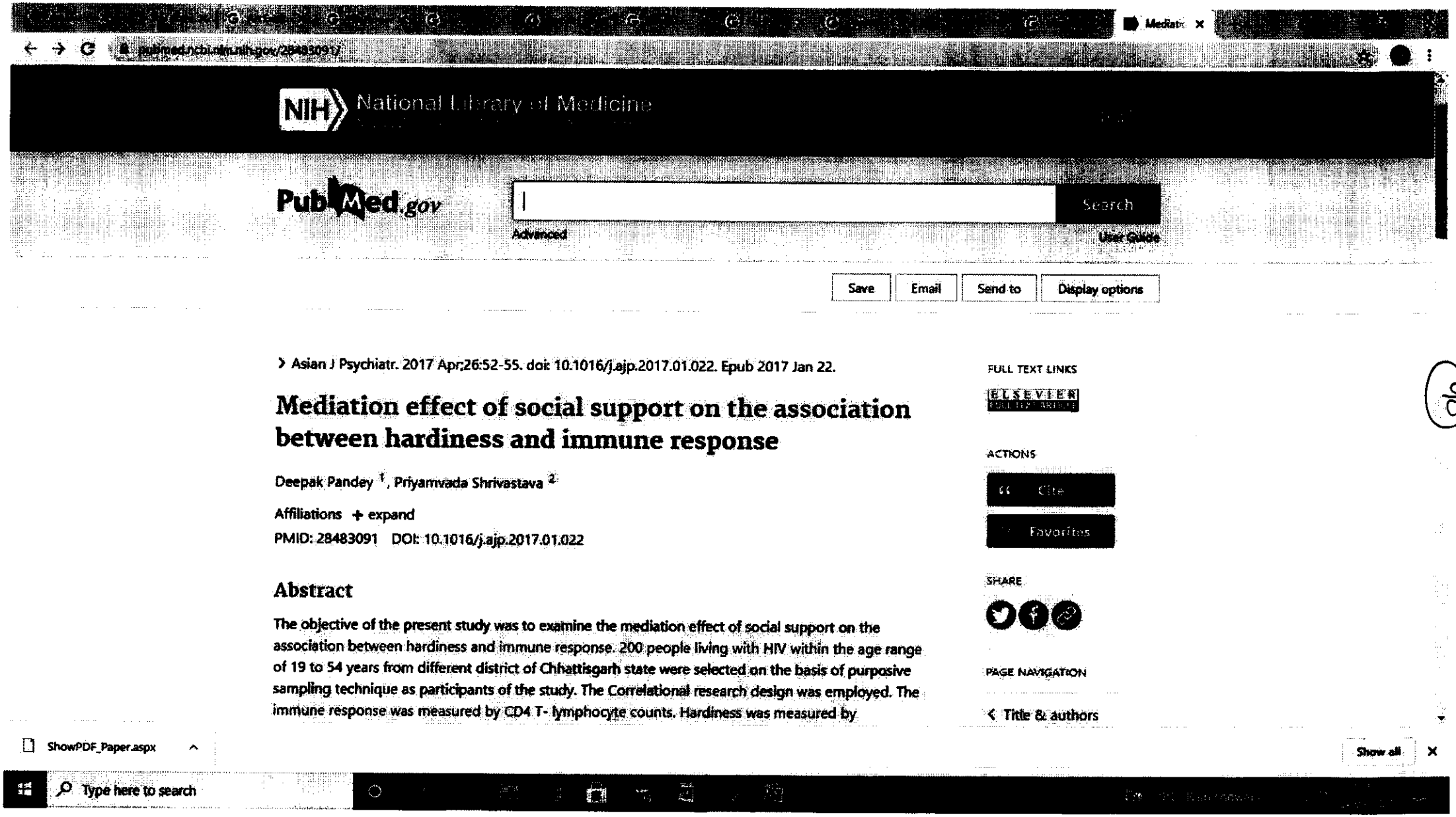
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Asian J Psychiatr. 2017 Apr;26:52-55. doi: 10.1016/j.ajp.2017.01.022. Epub 2017 Jan 22.
Mediation effect of social support on the association between hardiness and immune response
Deepak Pandey [1], Priyamvada Shrivastava [2]
Affiliations + expand
PMID: 28483091 DOI: 10.1016/j.ajp.2017.01.022
Abstract
The objective of the present study was to examine the mediation effect of social support on the association between hardiness and immune response. 200 people living with HIV within the age range of 19 to 54 years from different district of Chhattisgarh state were selected on the basis of purposive sampling technique as participants of the study. The Correlational research design was employed. The immune response was measured by CD4 T- lymphocyte counts. Hardiness was measured by
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Relationship of Acculturative stress with Social Support, Acculturation Experience and Cultural Intelligence: A Systematic Review

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January 2016

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Abstract

The objective of the present systematic review was to examine the role of acculturation experience, cultural intelligence and social support on acculturative stress. 30 peer reviewed studies (full text) were identified (with inclusion criteria) through the J-Gate Plus database, covers the period from 1994 to 2014, using the search terms acculturation experiences, social support, cultural intelligence and acculturative stress. Six parameters are decided to assess internal validity of reviewed studies as recommend by Zhang and Goodson (2011), viz., research design, validity coefficients of criterion measure on own data, reliability coefficients of criterion measure on own data, validity and reliability coefficients of different predictor measures on own data, statistical analyses, effect size. Reviewed studies provide contradictory information regarding direct effect of social support on acculturative stress.

Self concept and academic stress among boys and girls students

May 2016

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Deepak Pandey
Pt. Sundarlal Sharma (Open) University C...

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Relationship between Somatic Problems and Socio-demographic Factors among Sickle Cell Anaemic Adolescent of Chhattisgarh, Central-East India

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Abstract. The main objective of the study was to see association if any, between somatic symptoms/clinical manifestations with various socio-demographic factors which affect somatic problems in sickle cell anaemic adolescents. The data was collected purposively from 309 sickle cell anaemic (HbAS/HbSS) adolescents of both the sexes hailing from various districts of Chhattisgarh by using Interview schedule and a checklist of clinical manifestation. Out of 309 sickle cell anaemic adolescents, 72 were homozygous (23.3 percent) and 237 were heterozygous (76.7 percent). Study revealed that 63.1 percent patients felt that weakness was higher in females as compared to males. 50.2 percent patients were anaemic which was also observed to be higher in females. Maximum (79.3 percent) patients belonged to lower socio-economic status. The highest percentage of sickle cell anaemia (21.0 percent) was observed in the 17 year age group. Significant negative relation was observed between somatic symptoms with age, gender, educational status of the patients, age at onset of sickling, family income, and socio-economic status. Only blood transfusion and zygosity showed positive correlation with somatic symptoms. The mean and standard value of different variables revealed that each patient with sickle cell anaemia had on average 3.64 problems. Mean age was 15.5 years and most of the patients were diagnosed at 12.23 years of age. Number of hospitalizations during the last one year was 3.25 (SD- 3.7). Blood transfusion during hospitalization was 1.29 (0.63 percent) and mean age at menarche was 13.2 (1.4 percent). The study observed significant contribution of independent variable of change of dependent variables.

Keywords: Sickle Cell Anemia, Adolescents, Somatic symptoms, Socio-demographic factors, Chhattisgarh

Introduction

Sickle cell anaemia is a hereditary haemolytic disorder which is a structural variant of haemoglobin in which a glutamic acid at position 6 of β-polypeptide chain of haemoglobin is replaced by valine (Ingram, 1957) and Haemoglobin (Hb) molecule becomes mutant which is the cause of crescent/ sickle shaped red cells, therefore, it is known as sickle cell. The homozygous (Sickle cell disease) condition is more severe than heterozygous (Sickle cell trait). A person with sickle cell trait (HbAS) leads a normal life but the Sickle cell disease (HbSS) person suffer from various complications throughout the life such as anaemia, jaundice, foot and hand syndrome, recurrent infection, osteomyelitis, necrosis of bone, aplastic crisis, abdominal pain, splenic sequestration crisis, hepato-splenomegaly etc. (Serjeant and Serjeant, 2001). There is no permanent treatment for sickle cell disease however; hydroxyurea, blood transfusion, stem cell transplantation are some of the methods used to reduce the problems.

It is an important public health challenge which causes a high degree of morbidity, mortality and fetal wastage in vulnerable communities (Balgir, 2007). World Health Organization estimated that 5 percent of the world population is carrier for hemoglobin disorders. Out of which 2.70 crore carriers reside in India. High incidence of sickle cell anaemia was found in Africa and Mediterranean countries (WHO, 2006). The sickle cell gene was reported with highest frequency in Orissa followed by Assam, Madhya Pradesh, Uttar Pradesh, Tamilnadu and Gujrat (Balgir, 1996) specially recognized widely in central India (Negi, 1975).

The occurrence of vaso-occlusive pain is higher in adolescents than children (Dampier *et al.*, 2002; Platt *et al.*, 1991). Patra *et al.* (2013) studied 330 clinically suspected sickle cell disease patients (comprising 195 HbSS and 135 HbAS) to know epidemiological profile of sickle cell disease children of Chhattisgarh and showed general weakness was the most common symptom in sickle cell anaemia (87.7 percent) compared to sickle cell trait (60 percent). 75.4 percent and 61.5

Effect of GSR Biofeedback Relaxation Training on Blood Glucose and Anxiety Level of Type 2 Diabetic Patients

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Effect of GSR Biofeedback Relaxation Training on Blood Glucose and Anxiety Level of Type 2 Diabetic Patients

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ABSTRACT

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Psychological study on the drop out cases in school going age in the Chhattisgarh state specially Raipur and Jashpur districts

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To find out psychological reasons of dropout in the elementary and middle school going students in Chhattisgarh state (Raipur and Jashpur district). The sample size of study consists of 400 students .They were selected from different schools (primary & middle school) in session 2013-14 in Raipur &Jashpur districts. The sample size for study was selected on the basis of stratified random sampling technique in the rural and urban areas of different blocks of Raipur and Jashpur district Chhattisgarh. The survey type of research design is applying to data collection in the present study. The main components in a student education are student himself, parents & teachers. Thus to find out reasons of students drop out from the school, questionnaires were prepared to know the perception of student related to CPR (Child Parent Relationship), PF (peer factor), IS (interest in studies), TSR (teacher student relationship). An attempt was made to find out the students opinion on these aspects which may force them to dropout from the school. The factors related to student dropout were also examined. For this purpose MANOVA was computed. present study showed following factors responsible for dropouts :- migration, low interest in studies for student and parents, economic conditions for parents, lack of basic facilities in home, education level of parents, lack of fear for parents and teachers, and lack of respect for teacher and parents.

Keywords: school student, drop-out, psychological factors

In today's increasing technological society, formal school education is becoming a necessity. Since the incorporation of the right to education, the student dropout has become an issue for policy makers and educationist. India's censes has 40% of young population below age of 18. India spends 3.5% of its gross domestic product on education, whereas China spends 8%. There are a number of schools (approx. 1 million) most are state run. Despite of large number of schools, India's education system is in dismal state. While 96% of India's children enroll in primary school by the age of 10 about 40% have dropped out (Census India, 2001).

Schooling has been made compulsory for all children under fourteen. The government spending on education is being raised to six percent of G.D.P. Incentives are given to schools. The government sponsored Sarva Shiksha Abhiyan (Universal Elementary Education) focuses on increasing enrollment rates and reducing drop-out rates.

There is wide spread prevalence of poor quality of education at the primary and secondary level across the country. Even though children are promoted to the next grades based on show attendance and practical are unable to control the absenteeism of the students.

As per selected educational statistics 2000-2001 given by ministry of Human Resource Development, Government of India, the dropout rate for classes I to VIII is 54% and for classes upto X is 69%. The dropout is a universal phenomenon of education system in India. There are number of factors identified related to problems of dropout. SES, low education level of parents, weak family structure, pattern of schooling of sibling and lack of pre-schools experiences, family background and domestic problems etc. It is important to carefully design preventive measures and investigation strategies that could be adopted in order to help all dropouts. The present study investigated the major pull and push factors that lead to dropping out of school at primary and middle schools of industrial belt and tribal district of Chhattisgarh.

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Chhattisgarh has education index or 0.526 according to report in 2011. NHOR, which is higher than the states live in Bihar, Jharkhand, Uttar Pradesh though it is lower than the national average of 0.563.

The literacy rate according to recent estimates from census (2011) is 71% (81.4% males and 60.5%) which is close to all India literacy rate of 74%.

According to NSS (2007-08), the literacy rate of STs and SCs was better than corresponding national average. Bastar and Dantewada are the most illiterate districts and the dropout ratio is highest among all districts.

Primary and middle education in Chhattisgarh

Education forms the backbone of any social and economic development of a country. It acts as the catalyst for human development. The state recognizes that Chhattisgarh has shown healthy improvement in its literacy rates. A series of measures have been identified to universalize primary education and carve a niche for itself creating regional best in class education. The first step is to ensure primary education for all children in the age of 6-14 years which include developing infrastructure for quality of learning. In this process problem of less enrollment or drop-out is a big hurdle.

Therefore a study is designed to find out the reasons (especially psycho-social factors), for drop-out. In order to fulfill the objectives of UEE, the reasons of dropout would be of immense help.

Rationales for undertaking the following study

The understanding of people perception of education is important. As the administrators views on "control" of the system and teachers

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Relationship between Somatic Problems and their Coping Strategies among Sickle Cell Anaemic Adolescents

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Out of total sample of the study 72.7 % adolescents were homozygous and 76.7 % were heterozygous. Male and females of Age group 14-16 years were maximum number. Percentage of heterozygous males complaining somatic problems is higher, whereas percentage of homozygous females complaining somatic problems is high. There is significant positive relationship between Maladaptive coping style and somatic problems. Somatic problems emerge as significant predictor in variation of criterion variable somatic problems. The t values explain significant difference in somatic complaints among sickle cell adolescents with respect to gender and zygosity.

Keywords

Adaptive Maladaptive Coping, Sickle Cell Anaemia, Adolescents, Somatic Problems.

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ग्रामीण महिलाओं की समस्याओं का समाजशास्त्रीय अध्ययन (दुर्ग जिले के ग्राम-रूदा के विशेष संदर्भ में)

प्रस्तुत शोधपत्र छत्तीसगढ़ राज्य के दुर्ग जिले के ग्राम रूदा के विशेष संदर्भ में ग्रामीण महिलाओं की समस्याओं के समाजशास्त्रीय अध्ययन से सम्बंधित है। अध्ययन हेतु चयनित ग्राम रूदा के कुल 695 परिवारों में से 120 उत्तरदाताओं का चयन किया गया है, जिसमें शिक्षित, अशिक्षित, कामकाजी, घरेलू महिलाओं को सम्मिलित किया गया है। तथ्यों के संकलन हेतु साक्षात्कार अनुसूची एवं द्वितीयक स्त्रोतों के माध्यम से जानकारी प्राप्त की गई है। प्राप्त तथ्यों के वर्गीकरण के पश्चात् सारणीबन किया गया है। तथ्यों का विश्लेषण करने के बाद निष्कर्ष प्राप्त किया गया है। अध्ययन के आधार पर कहा जा सकता है कि ग्रामीण महिलाओं की शिक्षा पर विशेष ध्यान दिया जाना चाहिए, क्योंकि शिक्षा का अभाव ग्रामीण महिलाओं को हर क्षेत्र में पीछे रहने के लिए मजबूत करता है। ग्रामीण महिलाओं को प्राथमिकता देनी चाहिए। ग्राम विकास योजनाओं में महिलाओं की भागीदारी को अनिवार्य किया जाना चाहिए, तभी महिलाओं की स्थिति में अपेक्षित सुधार आ सकेगा।

श्रीमती सरिता देवांगन* एवं डॉ.हेमलता बोरकर (वासनिक)**

ग्रामीण महिलाओं को आर्थिक दृष्टि से संपन्न बनाने हेतु वर्तमान में कई महत्वपूर्ण कार्यक्रमों और योजनाओं जैसे–ग्रामीण क्षेत्रों में महिला एवं बाल विकास कार्यक्रम, महिला साक्षरता योजना, महिला समृद्धि योजना, विशेषकर व्यावसायिक एवं तकनीकी प्रशिक्षण कार्यक्रम आदि अनेक कार्यक्रमों एवं योजनाओं का संचालन भी किया जा रहा है, लेकिन इन योजनाओं एवं कार्यक्रमों का लाभ वांछित लोगों को नहीं मिल पा रहा है, जिसके कारण इन योजनाओं की जानकारी का अभाव है। यदि जानकारी मिल भी जाती है, तो उन्हें अनेक बाधाओं का सामना करना पड़ता है, जिसके कारण वास्तविक लक्ष्य समूह के लोगों का लाभ नहीं मिल पाता है।

ग्रामीण महिलाओं का सामाजिक, आर्थिक, राजनीतिक आदि सभी स्तरों पर शोषण होता आया है। शिक्षा के अभाव में उनकी अज्ञानता का लोग नाजायज फायदा उठाते हैं। ग्रामीण महिलाओं को स्त्री-पुरूष में भेदभाव किया जाता है। ग्रामीण महिलाओं को विभिन्न समस्याओं का सामना करना पड़ता है। शिक्षा की समस्या, स्वास्थ्य की समस्या, दहेज की समस्या, स्त्री पुरूष में अंतर की समस्या, रोजगार की समस्या, राजनीतिक समस्या, जनसंख्या की समस्या आदि।

शोध साहित्य का पुनरावलोकन :

(1) सिंह, विमला (2004) : राजकीय संस्थाओं में कार्यरत महिला शिक्षिकाओं की समस्याओं का एक समाजशास्त्रीय अध्ययन' (बालको नगर के विशेष संदर्भ में) उनका कहना है कि महिला शिक्षिकाओं के ऊपर कार्यभार अत्यधिक है, परन्तु उनका पूरा करने के लिए कार्य दशाएँ अत्यधिक असंतोषजनक है। विद्यालय पहुँचने और विद्यालयों से लौटने के समय की पाबंदी निश्चित समय में कार्य करना, विद्यालय में 4–5 घण्टे अध्यापन कार्य, लेखन कार्य की जाँच एवं विद्यार्थियों को अनुशासन आदि कार्य दैनिक दिनचर्या में सम्मिलित है। कुछ समय घर के उत्तरदायित्वों पर भी समय लगाना पड़ता है।

(2) गोयल, सुनील एवं गोयल, सुनीता (2003) : ने "भारतीय समाज में नारी" में शिक्षित कार्यशील महिला एवं उसके पारिवारिक दायित्व के निर्वहन के संबंध में विस्तृत अध्ययन प्रस्तुत किया है।

(3) कौर, अमृत (2003) : ने "चैलेंजेस टू वूमन" में महिलाओं की नई जिम्मेदारियों भूमिकाओं में पर्दापण उनकी पूर्ति उसमें सफलता-असफलता की व्याख्या की है। जिसमें उन्होंने बताया है कि महिलाएँ नई जिम्मेदारियों का सफलता के साथ निभा रही है। उनका कार्य क्षेत्र विस्तृत हो रहा है, जिसकी वजह से समाज की उनके प्रति मान्यताएँ बदल रही है।

अध्ययन के उद्देश्य :

ग्रामीण महिलाओं की समस्याओं का अध्ययन करना।

अध्ययन पद्धति : इसे चार भागों में बाँटा गया है :

(1) अध्ययन क्षेत्र का संक्षिप्त परिचय :

ग्राम-रूदा दुर्ग से 29.5 किमी. की दूरी पर स्थित है। वहाँ कुल जनसंख्या 690 है जिसका अध्ययन 63.30 प्रतिशत में विवाह करना है। वहाँ 123 परिवार निवास करते हैं। इनमें अनुसूचित जाति के 23 अनुसूचित जनजाति के 37 तथा अन्य पिछड़ा वर्ग के 63 परिवार

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Full Length Research Article

PROBLEM OF GIRLS EDUCATION IN LEFT WING EXTREMISM EFFECTED AREAS OF CHHATTISGARH STATE (INDIA)

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ABSTRACT

Present paper is based on findings of research project of Rajiv Gandhi Siksha Mission of Chhattisgarh Govt. India. The main objective of the study was to find out the problems of girls education in LWE areas of Chhattisgarh state. Researcher has been tried to find out what are the adverse conditions responsible for girls education in LWE areas. Following the purposive sampling technique 750 girls of upper middle school were selected as respondents. As a tool for the collection of data an interview-schedule was constructed. The findings of the study shows that Left Wing Extremism movement is partially responsible for problems of girl's education in the region together with some cultural issues are also effect the girl's education.

INTRODUCTION

At present more than 200 districts in the country are under effect of movements and struggles based on leftist ideology. Looking on the map of areas affected by the problem of naxalism in the country, it can be clearly identified that the effect of leftist movement is mainly in the hilly and forest areas and these areas are chiefly inhabited by tribes. The present study is also based on South Bastar, Rajnandgaon and Jashpur districts which are the most naxal affected regions of Chhattisgarh state. Although naxalism is being considered as the problem of law and order today, but basically it is a social, economic and political problem which has originated as a result of oppression and social tribulations. The mass support it gains and the failures of the administration in its annihilation indicates that, by considering naxalist movement as a major problem of future, efforts should be made to correct the faults within the system; otherwise it is probable that the situation will be more terrible. The facts collected from various research studies and newspapers shows that the naxalists create obstructions in smooth running of schools, so that the tribal's remain illiterate. They demolish and destruct the school buildings, hostels, ashram buildings etc., they loot the food brought for the children in the ashrams and schools, and they beat and thrash the teachers and even kill them. Due to the naxal terror the teachers fear going to schools. Thus the schools get closed. No one wants to work as a teacher in naxal areas. Hundreds of teaching posts are vacant. This is greatly affecting the education of the tribes. The school buildings in the naxal affected areas are demolished by the naxals because these buildings are used by the security forces to halt at nights during the anti-naxal operations. In this crucial situation, today naxalism has emerged as a serious problem before the tribes, which has become a question of life and death too. Although for the tribes of this region this problem is a new one, but even though this problem is only 42 years old, it has gained such a massive form that it has ruined the normal life of these people.

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Review of Literature

Nationally and internationally many research scholars had studied on the causes and effects of the problems of naxalism, but especially there is a lack of research study on the problem of Naxalism and Tribal Girls. Therefore, a review of some important research studies to understand the research topic is as follows According to Elvin (1951), "For a tribal family, sending children to school necessarily depends upon the economic condition.

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भारत में बांग्लादेशी शरणार्थियों से जुड़े प्रमुख मुद्दों का अध्ययन (छत्तीसगढ़ राज्य के कांकेर जिले के विशेष संदर्भ में)

प्रस्तुत शोधपत्र में भारत में बांग्लादेशी शरणार्थियों से जुड़े प्रमुख मुद्दों का अध्ययन, छत्तीसगढ़ राज्य के कांकेर जिले के विशेष संदर्भ में किया गया है। अध्ययन मुख्य रुप से इस बिन्दु पर केन्द्रित रहा है कि बांग्लादेश में हुए साम्प्रदायिक दंगे और 1971 में बांग्लादेश के विभाजन के समय जिन शरणार्थियों को भारत सरकार के द्वारा छत्तीसगढ़ राज्य में शरणार्थी शिविरों में बसाया गया, ये शरणार्थी देश तथा राज्य की आंतरिक सुरक्षा व्यवस्था, स्थानीय समुदाय व जनजाति संस्कृति की दृष्टि से किसी भी प्रकार से समस्यामूलक नहीं हैं? इन्हीं तथ्यों का परीक्षण शोध अध्ययन से माध्यम से किया गया है। शोध को व्यवस्थित रुप देने के लिए बांग्लादेशी शरणार्थियों के गैर-शिविरार्थी शरणार्थी जो कि कांकेर जिले के पंखाजूर में निवासरत हैं, उन्हें लिया गया है।

[redacted] एवं राम नरेश टण्डन**

प्रस्तावना :

अवांछित प्रवास सम्पूर्ण विश्व की ज्वलंत समस्याओं में से एक है। जब कभी भी व्यक्ति धार्मिक, राजनीतिक बाधाओं, युद्ध, आतंकवादी गतिविधियों, साम्प्रदायिक संघर्षों तथा निर्भयता के चलते अपने जीवन को जोखिम में डालकर बेहतर जीवन के लिए प्रवास करता है, तो ऐसी गतिविधियाँ लोगों को पड़ोसी देशों की ओर ले जाकर शरणार्थियों के रूप में खड़ा कर देती है, तब यह प्रवास कई मायनों में समस्या–मूलक होता है। युगों से मानव द्वारा पलायन किए जाते रहे हैं। इस प्रकार बड़ी संख्या में लोगों का अंतर्राष्ट्रीय पलायन धार्मिक, राजनीतिक तथा जातियता के आधार पर हुआ।

साधारणतः अंतर्राष्ट्रीय पलायन (प्रवास) निर्धन देशों से धनी देशों की ओर हुआ है। इस सदी का सबसे प्रमुख लोक–प्रवास जो दक्षिण–एशिया के भारतीय उपमहाद्वीप में हुआ, जब भारतीय गणराज्य का विभाजन सन् 1947 में एक पृथक राष्ट्र पाकिस्तान के रूप में हुआ, जिसके चलते अनुमानतः 7 मिलियन लोग भारत से पाकिस्तान और लगभग 8 मिलियन लोग पाकिस्तान से भारत पलायन करके एक–दूसरे देशों में गए, जो आज भी दोनों देशों के लिए एक प्रमुख समस्या बना हुआ है।[1]

अदस्तावेजित पलायन का मुद्दा आज विश्व की ज्वलंत समस्या है। जब भी मानवीय मतभेद, स्थानीय विवाद या गरीबी का प्रश्न उठता है, तो लोग जीवन की बाजी लगाकर पारिवारिक बंधनों, आश्रय, भाषा, संस्कृति एवं बेहतर जिंदगी की खोज करती है। सन् 1947 में बंगाल का विभाजन विश्व इतिहास में सबसे विभाजन था। जहाँ घर के सोने का कमरा पश्चिमी बंगाल की सीमा के अन्दर था और रसोई घर सीमा के दूसरी ओर था। जिससे अनाधिकृत पूर्वी पाकिस्तान से भारत में बहुसंख्यक पलायन हुआ। (प्रणती दत्ता : 2004)[2]

इस आधार पर हम कह सकते हैं कि भारत के विभिन्न हिस्सों में रहने वाले बांग्लादेशी शरणार्थियों तथा उनका भारत की सामाजिक, सांस्कृतिक व आर्थिक परिवेश पर पड़ने वाला प्रभाव अध्ययन की दृष्टि से सम–सामायिक है। अतः प्रस्तुत समाजशास्त्री अनुसंधान हेतु बांग्लादेशी शरणार्थियों का चयन किया गया है।

बांग्लादेशी शरणार्थियों का इतिहास :

बांग्लादेश, बांग्लादेशीय लोगों का मूल स्थान है। वह बंगाली, संस्कृति के विरासत का केन्द्र है। जिसे एक दीर्घ और दुखदायी शासन पहले अंग्रेजों और फिर पाकिस्तानियों से आजाद कराया गया था। भौगोलिक, ऐतिहासिक और सांस्कृतिक रूप से बांग्लादेश बहुसंख्यात्मक विस्तृत बंगाल का भाग था, जो आज पश्चिम बंगाल राज्य है। 1947 से 1971 तक बांग्लादेश का क्षेत्र पाकिस्तान का एक भाग था, इस तरह उसका अधिकारिक पदनाम पूर्वी बंगाल के स्थान पर पूर्वी पाकिस्तान था। बांग्लादेश (बंगाली राष्ट्र के लिए बंगाली नाम) और उसकी आजादी 16 दिसम्बर 1971 को सुनिश्चित की गई, जबकि क्षेत्र में पाकिस्तानी सेनाओं ने बंगलादेशी और भारतीय सेना की संयुक्त कमान के आगे समर्पण किया। बांग्लादेश विश्व में लगभग 1,44,000 वर्ग के क्षेत्र के साथ सबसे निर्धन क्षेत्रों में से एक है। 1947 से बांग्लादेश में हिन्दू जनसंख्या 30 प्रतिशत से घटकर 10 प्रतिशत रह गई है, क्योंकि उन्हें भयंकर धार्मिक और राजनैतिक आतंकवाद से पीड़ित होना पड़ा। 1947 में विभाजन के तुरन्त ही बाद शरणार्थियों का बहुसंख्यक पलायन शुरू हुआ और बाद में सभी अवैध । पलायनों को भी शासन ने वैध मान लिया।

भारत बांग्लादेश के साथ 4,095 किमी लम्बी सीमा अपने सभी पड़ोसियों के साथ सहभागिता करता है। इनमें से चार उत्तर–पूर्वी राज्यों–त्रिपुरा, मेघालय, मिजोरम और आसाम ही 1,879 किमी में है, जबकि पश्चिमी बंगाल के पूर्वी राज्यों में 2,216 किमी लम्बी सीमा है।

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नगरीय परिवेश में मुस्लिम महिलाओं के स्वास्थ्य की स्थिति
(छत्तीसगढ़ के महासमुन्द जिले के महासमुन्द नगर के विशेष संदर्भ में)

प्रस्तुत शोधपत्र में नगरीय परिवेश में मुस्लिम महिलाओं के स्वास्थ्य की स्थिति का अध्ययन, छत्तीसगढ़ के महासमुन्द जिले के महासमुन्द नगर के विशेष संदर्भ में विवेचन किया गया है। अध्ययन हेतु महासमुन्द नगर की 312 महिलाओं का चयन दैव-निदर्शन आधार पर किया गया है। अध्ययन हेतु तथ्यों का संकलन साक्षात्कार अनुसूची के माध्यम से किया गया है। मुस्लिम महिलाओं में व्याप्त अशिक्षा, अज्ञानता, अंधविश्वास, प्रचलित एवं परंपरागत मान्यताएँ, धार्मिक विश्वास, संयुक्त परिवार, वैवाहिक कारण है, जिनसे उनकी स्वास्थ्य की स्थिति असंतोषजनक है। मुस्लिम महिलाओं में स्वास्थ्य के प्रति जागरुकता की कमी है। अध्ययन से प्राप्त तथ्य ये दर्शाते हैं कि मुस्लिम महिलाएँ शैक्षणिक दृष्टि से आगे बढ़ रही हैं, लेकिन उनके स्वास्थ्य की स्थिति चिंताजनक है।

नसरीन मुमताज*, डॉ.जया ठाकुर** एवं डॉ. एल.एस.गन्धर्व***

स्वास्थ्य किसी भी देश के विकास के लिए सर्वोच्च स्थान रखता है। हम एक सशक्त स्वस्थ्य और विकसित भारत का निर्माण करना चाहते हैं, तो क्या कमजोर, अशिक्षित, कमबुद्धि और अस्वस्थ्य नागरिकों के सहारे यह संभव है ? किसी भी समाज की खुशहाली का अनुमान वहाँ के स्वास्थ्य की स्थिति को देखकर लगाया जा सकता है। किंतु जिस देश में हर साल तीन लाख बच्चे इस दुनिया में अपना एक दिन भी पूरा नही कर पाते और करीब सवा लाख माताएँ हर साल प्रसव के दौरान मर जाती हैं। यह स्थिति चिंताजनक है।

आधुनिक युग में महिलाओं की स्थिति में सुधार किए बिना सम्पूर्ण विकास की परिकल्पना नहीं की जा सकती। भारत की आबादी में 14.23 प्रतिशत मुस्लिम है। स्वास्थ्य का तात्पर्य "आरोग्यता" से रहा है। WHO के अनुसार सम्पूर्ण शारीरिक, मानसिक और सामाजिक समृद्धि की अवस्था का नाम स्वास्थ्य है। अब प्रश्न जहाँ तक मुस्लिम महिलाओं की स्वास्थ्य की स्थिति का है, उनकी स्थिति असंतोषजनक है। मुस्लिम महिलाओं में व्याप्त अशिक्षा, अज्ञानता, अन्धविश्वास, प्रचलित एवं परम्परागत मान्यताएँ, धार्मिक विश्वास, संयुक्त परिवार, पारिवारिक कारण, वैवाहिक कारण, उचित आहार का अभाव, स्वास्थ्य संबंधी जानकारी का अभाव, रोगग्रस्त स्थिति में महिलाओं का खराब देखभाल, उपचार की उचित व्यवस्था न होना प्रशिक्षित कर्मचारी के सहायता के बिना बच्चों को जन्म देना एवं स्वयं मुस्लिम महिलाओं द्वारा अपने स्वास्थ्य पर ध्यान न देना कुछ ऐसे महत्वपूर्ण कारण है, जो न केवल मुस्लिम महिलाओं के मृत्युदर को बढ़ाते हैं, उनमें अनेक स्वास्थ्यगत समस्याओ को भी बढ़ाते हैं और यदि रोगग्रस्त महिलायें उपचार कराने स्वास्थ्य केन्द्रो में पहुँच भी जाते है, तो महंगी–महंगी दवाइयाँ और डॉक्टर एवं नर्सों के व्यवहार से संतुष्ट नहीं हो पाती, जिसके परिणामस्वरूप वे घरेलू नुस्खे का प्रयोग करने लगती है और झाड़–फूंक पर विश्वास करने लग जाती है, जिसका प्रभाव उनके स्वास्थ्य पर पड़ता है। त्रिपाठी और दुबे का मानना है कि मुस्लिम महिलाओं के स्वास्थ्य एवं प्रजनन से संबंधित बहुत कम अध्ययन हुए हैं, विशेशकर भारत में जिसका कारण इस्लाम में इस विषय में नियंत्रण कठोर होता हैं।

अल्पसंख्यकों के कल्याण के लिए किए जा रहे शासकीय प्रयास :

शासन द्वारा अल्पसंख्यक (मुस्लिम) के कल्याण के लिए किए जा रहे शासकीय प्रयास निम्नानुसार हैं : मुख्यमंत्री बाल श्रवण योजना, मुख्यमंत्री बालहृदय सुरक्षा योजना, संजीवनी कोष योजना, जननी सुरक्षा योजना, जननी शिशु सुरक्षा कार्यक्रम, राष्ट्रीय क्षय नियंत्रण कार्यक्रम, राष्ट्रीय कुष्ठ उन्मूलन कार्यक्रम, राष्ट्रीय स्वास्थ्य बीमा योजना, संजीवनी एक्सप्रेस, नोनी सुरक्षा योजना आदि।

शिक्षा एवं शासकीय प्रयासों के परिणामस्वरूप मुस्लिम महिलाओं की स्थिति में काफी सुधार आया है, किन्तु निम्न वर्ग की मुस्लिम महिलाएँ अभी भी अशिक्षित हैं, इसलिए अशिक्षित मुस्लिम महिलाओं को स्वास्थ्यगत समस्याओं का अधिक सामना करना पड़ता है।

उद्देश्य :

(1) मुस्लिम महिलाओं की स्वास्थ्य की स्थिति को ज्ञात करना। (2) शासन द्वारा मुस्लिम महिलाओं की स्वास्थ्य की स्थिति में सुधार के लिए किए जा रहे शासकीय प्रयत्नों को ज्ञात करना।

परिकल्पना :

मुस्लिम परिवार में अशिक्षित महिलाओं की तुलना में शिक्षित

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प्राथमिक विद्यालयों की सहायक शिक्षिकाओं की भूमिका, सामंजस्य एवं समस्याएँ (महासमुन्द विकासखंड के विशेष संदर्भ में)

प्रस्तुत शोधपत्र छत्तीसगढ़ राज्य के महासमुन्द जिले के महासमुन्द विकासखंड के प्राथमिक विद्यालयों में कार्यरत महिला सहायक शिक्षक पंचायक की भूमिका सामंजस्य एवं समस्याओं का अध्ययन है। दोहरी भूमिका से कामकाजी महिलाओं के लिए भूमिका संघर्ष जैसी समाजशास्त्रीय समस्या पैदा हो जाती है, जिसका प्रभाव पारिवारिक संम्बंधों, बच्चों की देखभाल पर होता है, जिससे तनाव की स्थिति उत्पन्न होती है। भूमिका निर्वाह के लिए महिलाएँ दोनों ही क्षेत्रों में सामंजस्य स्थापित करने का प्रयास करती हैं। वर्तमान समय में शिक्षिकाओं का कार्य क्षेत्र बहुत अधिक विस्तृत होता जा रहा है, उन्हें कार्य क्षेत्र में गैर-शिक्षकीय कार्यों का संचालन भी करना पड़ता है, जिससे वे घर और स्कूल के मध्य सामंजस्य स्थापित करने में बहुत अधिक कठिनाइयों का समाना करती है।

श्रीमती सीमा टंडन*, डॉ.जया ठाकुर** एवं [redacted]

प्राचीन काल से ही हमारा समाज पुरूष प्रधान रहा है, आदिकाल से ही सामाजिक परिवेश में महिलाओं की स्थिति को बहुत ही निम्नतम स्थान में रखा गया है। वैदिक काल में भारतीय समाज में नारी को पुरूषों के समान शिक्षा, धर्म, राजनीतिक और संपत्ति में अधिकार प्राप्त थे इस काल में धर्म एवं अनुष्ठान के कार्य बिना नारी के पूरे नहीं किए जा सकते थे।

स्कालस्तिका कुजूर ने वैदिक नारी के संबंध में अपने अध्ययन में लिखा है कि वैदिक काल में कन्याओं को वेदाध्ययन का अधिकार था और उन्हें विविध प्रकार की शिक्षा दी जाती थी।

पी.एन.प्रभु के अनुसार जहाँ तक शिक्षा का संबंध था। वैदिक काल में स्त्री पुरूष में कोई विशेष भेद नहीं था। इस युग में दोनों की सामाजिक स्थिति समान रूप से महत्वपूर्ण थी।

21वीं सदी को महिला सशक्तिकरण सदी के रूप में देखा जा रहा हैं। इसी कड़ी में वर्ष 2001 को महिला सशक्तिकरण वर्ष घोषित किया गया था। सभ्यता के विकास के प्रारंभिक युग से लेकर आज तक महिलाएँ प्रत्येक सामाजिक परिवेश में अपनी भूमिका निभानें में सफल रही हैं, भले ही पुरुष प्रधान समाज ने उन्हें मान्यता न दी हो, तथापि सामाजिक जीवन के हर मोर्चे पर वह पुरूषों से किसी भी रूप में कम नहीं हैं।

शिक्षिकाएँ :

स्वतंत्रता प्राप्ति के पश्चात् जो सर्वाधिक तात्विक परिवर्तन हुए हैं, उनमें से एक हैं, परंपरागत व्यवस्था से महिलाओं की मुक्ति।

जो उन्हें विभिन्न राजनैतिक कानूनी एवं सामाजिक आर्थिक अधिकार तथा सुविधाएँ प्रदान किए जाने, अधिकाधिक संख्या में उनके शिक्षा ग्रहण करने तथा मध्यम एवं उच्च वर्गों की महिलाओं के ऐसे आर्थिक लाभ वाले विभिन्न धंधों में प्रवेश करने का परिणाम है, जिन पर अब तक पुरूष का एकाधिकार हैं।

पं.जवाहर लाल नेहरू ने कहा था कि लोगों में जागृति लाने के लिए हमें पहले स्त्रियों में जागृति लानी होगी, स्त्रियों के आगे बढ़ने से राष्ट्र भी आगे बढ़ेगा।

किसी भी राष्ट्र के विकास में शिक्षा प्रणाली का महत्वपूर्ण योगदान होता हैं। योग्य शिक्षकों के अभाव में देश की शिक्षा पद्धति निर्जीव व निस्तेज हो जाती हैं। समाज में महिलाओं ने हर क्षेत्र में अपनी भूमिका ईमानदारी से निभाई हैं। शिक्षिका के रूप में महिलाओं ने समाज में अपना महत्वपूर्ण योगदान दिया हैं।

भूमिका एवं सामंजस्य :

शिक्षिकाओं को दोहरी भूमिका निभानी पड़ती है, गृहिणी की भूमिका एवं शिक्षिका की भूमिका। महिलाएँ परिवार की केन्द्र बिन्दु होती हैं और उनके घरेलू कार्य का भी अपना क्षेत्र है, जिसकी उपेक्षा नहीं की जा सकती। अपने बच्चों को देखरेख से लेकर परिवार के सारे कार्य करने के बाद सही समय पर शैक्षणिक संस्था में पहुँचना भी आवश्यक है। भूमिका निर्वाह के लिए महिलाएँ दोनों की क्षेत्रों में सामंजस्य स्थापित करने का प्रयास करती है। इस कार्य में इतनी ज्यादा व्यस्त रहती हैं कि वह आराम और अपने बारे में कुछ सोच ही नहीं पाती है।

आज शिक्षिकाओं को बच्चों को विद्यालय में 6 घंटे पढ़ाने के अतिरिक्त विभिन्न प्रकार के सर्वे कार्य जैसे, पल्स पोलियो अभियान,

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SOS in Sociology & Social Work

Tribal life in base camps and Religious believe (With special Reference to South Bastar of Chhattisgarh State)

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Abstract

Present study is based on Naxal movement in Chhattisgarh state and its impact on Tribal life. Researcher has been try to find out what are the adverse conditions responsible for migration of tribal people from native places and how they lived in base camps. Study is also focus on comparative study of social and religious life of tribal people before coming to base camps and changes after boarding to base camps. Following the purposive sampling technique 300 tribal migrants were selected as respondents. As a tool for the collection of data an interview-schedule was constructed. Findings of the study shows that the education status, social life and the religious believe of tribes in Dantewada district are totally suffered due to residing in base camps.

Keywords: Base camp, Tribal life, Religious believe..

Introduction

Many ministries of central government have gradually started recognizing the fact that Naxalism is not merely question of a law and order but has its roots to socio-economic deprivation and backwardness of the dispossessed – the tribal's and the Dalits. The Planning Commission of India in its Draft Approach Paper on the 11th Five Year Plan titled "Towards Faster and More Inclusive Growth" of June 2006 stated, "Backward districts of otherwise well performing states, present a dismal picture of intra-state imbalance and neglect. The Centre and the States together must deal with this problem as a priority basis. We cannot let large parts of the country be trapped in a prison of discontent, injustice and frustration that will only breed extremism. The spread of Naxalism in more than 200 districts in the country is a warning sign [1].

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Sociological review of Mendicancy

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Abstract: The present era known us era of development. What is development? What are the measurenment of development? What level are stishfied levels of development? These are questions which makes two different views about development. Process of development is result of changes. Every changes of socities origion some positive and some negative results. Positive result called development and negative changes called social problems and mendicancy is one of them. Every undeveloped and developing country is suffering with these problems. Mendicancy affected directly baggers and their families. Human are primary unit of society so if one man effected with some problem naturally all family member are affected. There are no satishfied definitions of mendicancy in social sciences. As nature and work behavioure we can define it as social problem like "Mendicancy is a socio-economic problem, which is done by poor and physically hanicaped men, women and children for their survival." Mendicancy is generally affected childern and old age men/women. Mendicants are suffering for basic needs of life like food, cloths and shelters. Generally mendicancy is known economic problems but that is socio-cultural problems also. Present paper tries to know mendicant problems in old age men and woemen. What are the reasons because of old age men/women expend their whole life in mendicancy? If they are come suddenly in this field so what are the reasons? All the old agers are not poor as well as phycially hanicaped so why they are in these field? Present paper tried to know answers of these questions. Present research work conduct in three major railway stations Durg, Raipur and Bilaspur of Chhattisgarh state. Trinagulation methods (quantitative and qualitative) are used in present work. Present work reveled division of labour in socity and concept of nucaluer family are major factors of mendicancy.

Key Words: Mendicancy, old age, division of labour.

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स्वामी विवेकानन्द के महिला शिक्षा पर विचार

प्रस्तुत शोधपत्र स्वामी विवेकानंद के महिला शिक्षा विचार पर आधारित है। समाज में स्त्रियों की स्थिति में बदलाव के लिए शिक्षा एक महत्वपूर्ण तथ्य है, शिक्षा ही वह माध्यम है, जो इन्हें पुरुषों के साथ कंधे से कंधा मिलाकर चलना सीखा सकती है। शिक्षा एक अमूल्य धरोहर है, जिसे जो भी प्राप्त करता है, वह अपने जीवन में कभी दुःख का भागी नहीं बनता है। पाश्चात्य काल से लेकर आज तक चले आ रहे शिक्षा के नियमों का स्त्री शिक्षा पर कुछ अधिक प्रभाव नहीं पड़ा है। स्वामीजी ने स्त्री शिक्षा को बढ़ाने के लिए अनेक उपाय सुझाये हैं, जिसमें स्त्री मठ की स्थापना करने से लेकर स्त्रियों में निहित कलाओं को उभारना आदि है। स्त्रियों को एक जगह बांधकर उनकी इच्छाओं को कुण्ठित करना समाज की पतन की निशानी है। बिना स्त्रियों के शिक्षा और कौशल विकास के समाज और देश की विकास की सोचना शायद एक सोच ही बनकर रह जाएगी। देश और समाज की उन्नति और विकास को एक नए शिखर पर पहुँचाने के लिए, स्त्रियों की शिक्षा को बढ़ाना ही होगा, उन्हें स्वावलंबी बनाना होगा।

ओम प्रकाश*, डॉ.सुचित्रा शर्मा एवं डॉ.हेमलता बोरकर*****

वैदिक और वर्तमान युग में नारी शिक्षा :

समझ में नही आता कि हमारे देश में पुरुष और स्त्रियों में इतना भेद क्यों किया जाता है। वेदान्त में तो कहा है कि एक ही चेतन सत्ता सर्वभूतों में विद्यमान है। तुम लोग स्त्रियों की निन्दा करते हो, पर उनकी उन्नति के लिए तुमने क्या किया? स्मृति आदि लिखकर, नियमों में आबद्ध करके इस देश के पुरुषों ने स्त्रियों को केवल बच्चे पैदा करने की मशीन बना डाला है। महामाया की साक्षात् मूर्ति इन स्त्रियों का उत्थान हुए बिना क्या तुम लोगों की उन्नति सम्भव है? भारत का अधःपतन तभी से शुरु हो गया, जब ब्राह्मण पण्डितों ने अन्य जातियों को वेद– पाठ का अनधिकारी घोषित किया और साथ ही स्त्रियों के भी सभी अधिकार छीन लिए। नहीं तो देखो, वेदों तथा उपनिषदों के युग में मैत्रेयी, गार्गी आदि प्रातः स्मरणीय स्त्रियाँ ब्रह्म विचार में ऋषितुल्य हो गयी हैं। बृजार दक्ष ब्राह्मणों की सभा में गार्गी ने गर्व के साथ याज्ञवल्क्य को ब्रह्मज्ञान पर शास्त्रार्थ के लिए चुनौती दी थी। इन आदर्श विदुषी स्त्रियों को जब उन दिनों अध्यात्म में अधिकार था, तो फिर आज भी स्त्रियों को वह अधिकार क्यों न रहेगा? एक बार पी हो चुका है यह फिर अवश्य हो सकता है। इतिहास की पुनरावृत्ति हुआ करती है।[1] वास्तविक शिक्षा ही सभी समस्याओं का समाधान करने वाली छाती और धन उसका कम्ब होगा।

हमारे यहाँ नारियों की समस्याएँ अनेक और गम्भीर भी हैं, परन्तु उनमें एक भी ऐसी नहीं है, जो जादू भर शब्द शिक्षा से हल न हो जा सकती हो। पर वास्तविक शिक्षा की न अभी इन लोगों में कल्पना भी नहीं की गयी है।[2] शिक्षा केवल शब्दों का रटना मात्र नहीं है, हम इसे मानसिक शक्तियों का विकास अथवा व्यक्तियों को ठीक तरह से और दक्षतापूर्वक इच्छा करने का प्रशिक्षण देना कह सकते हैं। इस प्रकार हम भारत की आवश्यकता के लिए महान निर्भीक नारियाँ तैयार करेंगे। नारियों जो संघमित्रा, लीला, अहिल्या बाई तथा मीराबाई की परम्पराओं को चालू रख सके, नारियाँ जो वीरों की माताएँ होने के योग्य हों, इसलिए कि वे पवित्र तथा आत्मत्यागी हैं और उस शक्ति से शक्तिशाली है, जो भगवान के चरण छूने से आती है।[3] परन्तु नारियों के मामले में हमारा हस्तक्षेप करने का अधिकार केवल उनमें शिक्षा का प्रचार करने तक ही सीमित है। हमें नारियों को ऐसी स्थिति में पहुँचा देना होगा, जहाँ वे अपनी समस्याओं को स्वयं अपने ढंग से सुलझा सकें उनके लिए यह काम न कोई कर सकता है और न किसी को करना चाहिए। और हमारी भारतीय नारियाँ संसार की अन्य किन्हीं भी नारियों की भांति इसे करने में पूर्ण सक्षम हैं।[4]

धर्म, शिल्प, विज्ञान, गृहकार्य, भोजन बनाना, सीना, शरीर–पालन आदि सब विषयों की मोटी–मोटी बातें सिखाना उचित है। नाटक और उपन्यास तो उनके पास तक पहुँचने ही नहीं चाहिए। महाकाली पाठशाला उनके विषयों में ठीक पथ पर चल रही है, किन्तु केवल पूजा पद्धति सिखाने से ही काम न चलेगा। सब विषयों में उनको आँख खोल देना उचित होगा। आदर्श नारी–चरित्र सदा आँखों के सामने रखकर त्याग–रूप ब्रह्म में उनका अनुराग उत्पन्न कराना चाहिए। सीता, सावित्री,

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महिला सुरक्षा की चुनौतियां : एक विश्लेषण

हेमलता बोरकर वासनिक [a] एवं प्रमोद कुमार शर्मा [b]

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सारांश

समकालीन महिला समाज में कई प्रकार की समस्याएं है, किन्तु महिला सुरक्षा की समस्या सबसे बड़ी समस्या एवं चुनौती कही जा सकती है। भारतीय समाज के ऐतिहासिक पृष्ठभूमि को देखने पर ज्ञात होता है कि पूर्व में महिलाओं से संबंधित मामलों को उजागर नहीं होने दिया जाता था जिसके कारण अपराध के कारणों व अपराधियों तक पहुंचना असंभव कार्य होता था। सामाजिक लोकलज्जा के कारण कई बार परिवार में ही मामलों को दबा दिया जाता था। जैसे–जैसे महिलाओं के विरूद्ध अत्याचार के मामले बढ़ते गए वैसे–वैसे समाजसुधारकों के प्रयास से मामलों के विरूद्ध कार्यवाही होने लगी तब कहीं जाकर महिलाओं के साथ परिवार के सदस्यों ने आपराधिक मामलों को उजागर करना जरूरी समझा और आज हम पाते है कि महिलाओं के खिलाफ दर्ज किए मामलों की संख्या में काफी वृद्धि हो गई है। छेड़छाड़ एवं बलात्कार के मामलों को देखें तो ज्ञात होता है कि आज दुनिया की हर दुसरी महिला छेड़छाड़ का शिकार होती है। भारत में बलात्कार की घटनाएं निरंतर बढ़ रही है 2011 के राष्ट्रीय क्राईम रिर्पोट ब्यूरो के अनुसार इसकी संख्या 23939 हो गई है जिसमें सभी आयु वर्ग की महिलाएं शामिल है, लेकिन सर्वाधिक रूप से 18 से 30 वर्ष की महिलाएं बलात्कार का शिकार होती है इनकी संख्या 13189 है। वर्तमान में 2 से 10 वर्ष तक की बच्ची भी सुरक्षित नही है। ये तो केवल पंजीकृत मामले है परंतु कई मामले पंजीकृत नही होने की वजह से प्रकाश में नही आ पाते हैं। इस तरह हम कह सकते है कि महिलाओं की सुरक्षा का विषय एक गंभीर मुद्दा है। यदि इस विषय पर नही सोचा गया तो महिलाओं का इस समाज में जीना दुभर हो जायेगा यही कारण है कि प्रस्तुत अध्ययन में महिला सुरक्षा विषय को चुना गया है। यह अध्ययन द्वितीय स्रोतो पर आधारित है। अध्ययन अंर्तवस्तु विश्लेषण पर केन्द्रित है। इसके लिए दैनिक भास्कर समाचार पत्र के 1 अक्टुकर 2013 से 31 दिसम्बर 2013 अर्थात 3 माह तक के समाचार पेपर पर प्रकाशित महिला बलात्कार मामलों का विवेचन किया गया है। 1 अगस्त 2013 से 1जनवरी 2014 के समाचार पत्र दैनिक भास्कर का अवलोकन करने पर ज्ञात होता है कि ऐसा कोई भी दिन नही बचा जिसमें बलात्कार की घटना का उल्लेख नही हुआ है। समाचार पत्र में यह भी खुलासा हुआ की सामान्यत: बलात्कार की घटना परिचितो के द्वारा की जाती है। ग्रामीण एवं शहरी क्षेत्रों में इस प्रकार की घटना को देखा जा सकता है।

शब्द कुंजी– महिला सुरक्षा, चुनौतियां ।

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हिंदी माध्यम शिक्षा में नवाचार की आवश्यकता : एक मूल्यांकन

हेमलता बोरकर वासनिक

समाजशास्त्र अध्ययनशाला, पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर (छ.ग.)

सारांशः

भारत में शिक्षा प्रदान करने का माध्यम मुख्य रूप से हिन्दी है। विशेष रूप से हिन्दी भाषी क्षेत्रों में अंग्रेजी को लेकर विद्यार्थियों में ज्ञानार्जन के प्रति सीखने की क्षमता में कमी दिखाई देती है। इसका मुख्य कारण शिक्षा के क्षेत्र में प्रदत्त जानकारी का हिन्दी भाषा में उपलब्ध होना है। ग्रामीण अंचलों में अंग्रेजी भाषा में सीखने की बात बहुत दूर है क्योंकि वहाँ शिक्षा और पाठ्य सामग्री हिन्दी में ज्यादा उपलब्ध है। शिक्षक भी भाषा को लेकर कहीं न कहीं अपने दायरे में कैद होते हैं। जिससे अंग्रेजी भाषा से उनका परिचय हो नहीं पाता है और यह भाषा भी उन्हें कठिन मालूम होती है। ऐसी स्थिति में आज के परिवेश में यह आवश्यक है कि हिन्दी माध्यम शिक्षा पद्धति में कुछ सुधार हो और कुछ अंग्रेजी भाषा में सरलता और सहजता हो ताकि सुदूर क्षेत्रों में विद्यार्थियों में शिक्षण पद्धति के प्रति जागरूकता पैदा हो। प्रस्तुत शोध पत्र इन्हीं बिन्दुओं पर केन्द्रित है।

बीज शब्द–नवाचार, उच्च शिक्षा, व्यावसायिक शिक्षा

भूमिका

भारत में उच्च शिक्षा के क्षेत्र में शिक्षा का प्राथमिक माध्यम अंग्रेजी है, इसके लिए कई कारण हैं. किताबें अंग्रेजी में लिखी गई हैं और कंप्यूटर में अंग्रेजी का उपयोग होता है। कोई व्यक्ति यदि उच्च शिक्षा विदेश से प्राप्त करना चाहते हैं तो अंग्रेजी का ज्ञान होना अनिवार्य हो जाता है । यहाँ के अधिकतर छात्र अपनी प्राथमिक और सेकेंडरी शिक्षा अपनी मातृभाषा (या हिंदी) में प्राप्त करते हैं । छत्तीसगढ़ की 31% आबादी जनजातीय है तथा 76% आबादी ग्रामीण क्षेत्रों में निवास करती है. 98% स्कूलों में शिक्षा का माध्यम हिंदी है। ऐसे में हिन्दी माध्यम के छात्रों को उच्च शिक्षा प्राप्त करने के लिए सर्वप्रथम भाषा की चुनौती का सामना करना पड़ता है।

अध्ययन का उद्देश्य

प्रस्तुत अध्ययन में हिन्दी माध्यम के छात्रों को उच्च शिक्षा प्राप्त करने की चुनौतियों का सामना करने के नए तरीकों पर विचार गया है।

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भारत में कुपोषण की समस्या एवं समाधान के सुझाव : एक अध्ययन

प्रस्तुत शोधपत्र, भारत में कुपोषण की समस्या एवं समाधान के सुझावों पर आधारित है। कुपोषण की समस्या एक गंभीर समस्या बनती जा रही है और जो सरकारी प्रयास किये जा रहे हैं, उनका लाभ केवल कुछ क्षेत्रों तथा कुछ लोगों तक ही पहुँच रहा है। अगर इस समस्या के निदान के लिए कोई उचित कदम नहीं लिया गया, तो समस्या कम नहीं होगी। कुपोषण की समस्या से निजात पाने के लिए प्रत्येक क्षेत्र में स्वास्थ्य चिकित्सा सेवाएँ उपलब्ध करवाई जाए। उचित शिक्षा की व्यवस्था करवाई जाए। खाद्य सामग्री का अधिक से अधिक उत्पादन हेतु प्रेरित एवं प्रोत्साहित किया जाए।

कु.रीना ताम्रकार*, डॉ.संजय चन्द्राकर एवं डॉ.(श्रीमती) हेमलता बोरकर वासनिक*****

प्रस्तावना :

आज भारत विश्व के विकासशील देशों में आता है तथा जनसंख्या की दृष्टि से विश्व का दूसरा सबसे बड़ा जनसंख्या बाहुल्य देश है, भारत जहाँ एक ओर प्रगति कर रहा है, वहीं वहाँ पर कई प्रकार की समस्याएँ भी हैं, जिन समस्याओं में आज कुपोषण की समस्या सबसे बड़ी स्वास्थ्य की समस्या के रूप में उभर कर सामने आ रही है। पूरे विश्व में 47 प्रतिशत कुपोषण की जनसंख्या भारत में है, कुपोषण की शिकार अधिकतर महिलाएँ एवं बच्चे हैं, जिनमें अधिकतम पोषण की कमी पाई जाती है। भारत वर्ष में कुपोषण की समस्या में तेजी से विकास हो रहा है, जिससे स्वास्थ्य की कई और समस्याएँ उत्पन्न हो रही हैं, जिससे भारत का विकास अवरुद्ध हो रहा है, जब तक इस समस्या का निदान नहीं किया जाएगा, भारत एक स्वस्थ्य और प्रगतिशील राष्ट्र नहीं कहलाएगा। प्रस्तुत अध्ययन में भारत वर्ष में कुपोषण की समस्या एवं उनके कारणों पर विचार किया गया है।

अध्ययन के उद्देश्य :

(1) कुपोषण की समस्याओं के कारणों को ज्ञात करना।
(2) कुपोषण की समस्याओं के समाधान के उपाय ज्ञात करने का प्रयास करना।

शोध प्रारूप :

प्रस्तुत शोध विश्लेषणात्मक एवं निदानात्मक शोध प्रारूप पर आधारित है।

अध्ययन पद्धति :

प्रस्तुत अध्ययन द्वितीयक स्त्रोतों पर आधारित है। शोध अध्ययन में भारत वर्ष की जनसंख्या से संबंधित आंकड़े तथा केन्द्रिय महिला एवं बाल विकास मंत्रालय से संबंधित आंकड़ों का लिया गया है। भारत का कुल क्षेत्रफल 32872 वर्ग कि.मी. है, इसकी जनसंख्या 2011 की जनगणना के अनुसार 121 करोड़ है, जिसमें पुरूषों की संख्या 62 करोड़, महिला की संख्या 58 करोड़ तथा बच्चों की संख्या 158,789,287 जिनकी आयु 0–6 वर्ष है। भारत में सबसे ज्यादा महिला एवं बच्चों में कुपोषण पाया जाता है। अध्ययन विषय में भारत के कुपोषण के शीर्ष पाँच राज्य के कुपोषित महिलाओं एवं बच्चों के प्रतिशत तथा खाद्य सामग्री से संबंधित द्वितीयक आंकड़ों को सारणीबद्ध किया गया है। इन आंकड़ों को प्रस्तुत करने से पूर्व कुपोषण क्या है तथा इनके कारण को बताने का प्रयास किया गया है।

कुपोषण :

कुछ विकासशील देशों में भोजन में प्रोटीन की कमी से बच्चों का विकास रुक जाता है, जिसके फलस्वरूप संक्रमण के आसार अधिक हो जाते हैं, ऐसे बच्चों का वजन अपनी आयु से कम होता है और उनका शरीर लंबा, भुजाएँ पतली व सिर बड़ा होता है, त्वचा पर झुर्रियां पड़ी होती हैं, पेट फूला हुआ रहता है।

भारत में कुपोषण की दर को शीर्ष पाँच राज्य में तालिका 1 द्वारा प्रस्तुत किया गया है :

तालिका 1 : भारत के सबसे ज्यादा कुपोषित राज्य

क्र0	राज्य	कुपोषण की दर	
		बच्चे	महिला
1.	मध्यप्रदेश	60.00	41.7
2.	छत्तीसगढ़	47.1	43.4
3.	बिहार	55.90	45.10
4.	झारखंड	56.5	43.00
5.	उड़ीसा	40.7	41.40

*शोधार्थी, पं.रविशंकर शुक्ल विश्वविद्यालय, रायपुर (छत्तीसगढ़)
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3 3.4.5

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Since March 2002
Sociology

ग्रामीण महिलाओं की परिवार में आर्थिक स्थिति : एक अध्ययन (मुंगेली जिले के लोरमी क्षेत्र के विशेष संदर्भ में)

प्रस्तुत शोधपत्र में ग्रामीण महिलाओं की परिवार में आर्थिक स्थिति का अध्ययन, मुंगेली जिले के लोरमी क्षेत्र के विशेष संदर्भ में किया गया है। स्त्री-पुरुष जीवन रुपी गाड़ी के दो पहिए हैं। सामाजिक धरातल पर पितृसत्तात्मक परिवार में पुरुष मुखिया रहते हैं। परिवार में उनके आपसी समन्वय से ही परिवार कायम रहता है। यही समन्वय समाज में दिखाई दे, इसके लिए आवश्यक है कि पुरुष भी स्वस्थ मानसिकता से महिलाओं की प्रगति में इसका प्रारंभ अपने घर से करें। ग्रामीण क्षेत्र में महिलाएँ कृषि कार्य में सहयोग तो करती हैं, किन्तु फसलों के उत्पादन, विक्रय आदि में उनकी राय को महत्व नहीं दिया जाता है। उनके नाम पर कोई जमीन या घर नहीं है तथा अधिकतर मूल्यवान वस्तुओं की खरीददारी में महिलाओं की राय नहीं ली जाती है।

पुष्पा सोनी*, डॉ.ललित शुक्ला** एवं डॉ.एल.एस.गजभिये***

प्रस्तावना :

एक महत्वपूर्ण आवश्यकता महिलाओं की आर्थिक स्वतन्त्रता है। महिलाओं की आर्थिक स्थिति को आजकल समाज की स्थिति के विकास के एक निर्धारक के रूप में स्वीकार किया जाता है, क्योंकि महिलाएँ प्रत्यक्षतः अथवा अप्रत्यक्षतः आर्थिक क्रियाओं में योगदान देती है। वे समस्त पारिवारिक दायित्वों का बोझ स्वयं उठाकर पुरूषों को केवल आर्थिक क्रियाएँ संपादित करने का पूरा समय व अवसर प्रदान करती है अथवा स्वयं भी पारिवारिक उत्तरदायित्वों का निर्वाह करने के साथ–साथ पुरूषों के साथ कंधे से कंधा मिला कर आर्थिक क्रियाओं में संलग्न होती है। आर्थिक स्थिति के अनुसार महिलाओं को भी तीन वर्गो में बांटा जाता है, उच्च, मध्य और निम्न वर्ग। उच्च वर्ग की महिलाओं में शिक्षा का प्रचार प्रसार होने लग गया था। पर्दा प्रथा भीं कम थी, पर वे भी अपनी दैनंदिनी के कार्यो का स्वयं निर्णय नहीं ले पाती थी। परिवार के पुरूषों पर निर्भरता अधिक थी। मध्यम वर्ग में गिनी–चुनी महिलाओं को छोड़कर अशिक्षा बरकरार थी पर्दाप्रथा के कारण कहीं अकेले जाना आना तो था ही नहीं, अपने या परिवार के बारे में निर्णय उनके लिए दूर की चिड़िया थी। आर्थिक दृष्टि से निम्न वर्ग, जिन्हें हम श्रमिक वर्ग कहें, उनमें अवश्य महिलाएँ घर से बाहर आने जाने के लिए स्वतंत्र थी। घूंघट और पुरूषों से पर्दा अवश्य था, पर वे खेत–खलिहान मे काम करने जाती थी, किन्तु परिवर्तित समाज में महिलाओं की स्थिति में भी परिवर्तन आ गया है। वेतन के लिए यदि महिलाएँ कार्य करे तो उसे ग्रामीण समाज में किंचित हेय दृष्टि से देखा जाता है। शहरों में इस स्थिति में परिवर्तन आया है और लोग कामकाजी महिलाओं को सामान्य परिस्थिति ही नहीं बल्कि वांछनीय मानने लगे हैं। किंतु गाँव में यह स्थिति अभी भी नहीं आई है। यह माना जाता है कि एक महिला को तभी मेहनत–मजदूरी करनी चाहिए, जब उसके पति की आय परिवार के गुजारे के लिए पर्याप्त नही हो। इस स्थिति से महिलाओं को और अधिक कार्य कुशल बनाने की दिशा में अड़चन आती है। साथ ही उसको अपने कार्य में गौरव अनुभव कराने की भी कमी होती है, इसी धारणा के कारण बहुत सी महिलाएँ आर्थिक रूप से निष्क्रिय रहती है।

किंतु इसका दुसरा पहलू यह है कि वे अपने पति पर ही अपनी किसी छोटी सी इच्छा के लिए भी निर्भर रहती है। एक आर्थिक बोझ भी समझी जाती है।

अध्ययन पद्धति :

(अ) अध्ययन क्षेत्र का परिचय : छत्तीसगढ़ भारत का एक राज्य है। छत्तीसगढ राज्य का गठन 1 नवम्बर 2000 को हुआ था। यह भारत का 26 वां राज्य है। राज्य सरकार ने बिलासपुर जिले को पुनगर्ठित कर नये मुंगेली जिले का निर्माण किया है। इस नए जिले का गठन मुंगेली, पथरिया और लोरमी तहसीलों को मिलाकर किया गया है। नये जिले में कुल 669 गाँव और 149 पटवारी हल्के हैं, इस नये जिले का कुल भौगोलिक क्षेत्रफल एक लाख 63 हजार 942 हेक्टेयर है। नवगठित मुंगेली जिले की कुल जनसंख्या चार लाख 72 हजार है।

(ब) उत्तरदाताओं का चुनाव : मुंगेली जिले के लोरमी क्षेत्र के 7 ग्राम के 2510 परिवार में से 250 परिवार का चुनाव दैवनिर्दशन की लाटरी पद्धति के माध्यम से किया जाएगा। अध्ययन हेतु प्रत्येक गाँव की कुल जनसंख्या के 10 प्रतिशत परिवारों को लिया जाना है।

(स) तथ्य संकलन की प्रविधि एवं उपकरण : प्रस्तावित अध्ययन के तथ्यों के संकलन हेतु साक्षात्कार अनुसूची उपकरण तथा अवलोकन प्रविधि के माध्यम से किया जाना है।

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खेलों में महिलाओं की भागीदारी और संभावनाओं का विश्लेषण

प्रस्तुत शोधपत्र में खेलों में महिलाओं की भागीदारी और संभावनाओं का विश्लेषण किया गया है। खेल न सिर्फ मानसिक और शारीरिक विकास के लिए आवश्यक है, बल्कि यह महिलाओं के सशक्तिकरण का भी बेहतर माध्यम है। सन् 1900 के ओलंपिक खेलों में दो प्रतिशत महिलाओं ने हिस्सा लिया था। वर्ष 2012 लंदन ओलंपिक में 42 प्रतिशत महिलाओं की विभिन्न खेलों में भागीदारी ने वैश्विक खेल जगत में नई संभावनाओं को जन्म दिया है। भारतीय महिलाओं ने राष्ट्रीय-अंतर्राष्ट्रीय स्तर पर अपना परचम लहराया है। छत्तीसगढ़ राज्य की महिलाओं ने भी खेल के क्षेत्र में नई बुलंदियों को हासिल किया गया है। खेलों में महिलाओं की भागीदारी लैंगिक समानता का महत्वपूर्ण उपकरण है।

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प्रस्तावना :

सामाजिक कुरुतियों और रुढ़ियों के बंधन से उबरकर महिलाओं ने विभिन्न क्षेत्रों में काफी प्रगति की है और विश्व को भी प्रगति के रास्ते पर आगे बढ़ाया है। फिर वह खेल का क्षेत्र ही क्यों न हो। विश्व खेल परिदृश्य के इतिहास से पता चलता है कि ओलंपिक खेल ईसा-पूर्व 776 में यूनान के ओलंपिया में एक दौड़ से शुरू हुए थे। तब ओलंपिक खेलों में महिलाओं की भागीदारी तो दूर उनके लिए खेल देखना भी वर्जित था। यदि वे दर्शक के रूप में पकड़ी जाती थीं, तो उन्हें मौत की सजा दी जाती थी।

समय के साथ-साथ कई बदलाव हुए। ओलंपिक खेलों में महिलाओं की भागीदारी सन 1900 से शुरू हुई। 1912 स्टाकहोम ओलंपिक में महिलाओं ने तैराकी, जिम्नास्टिक में हिस्सा लिया और फिर 1928 ओलंपिक में एथलीट फील्ड में उतर पड़ी थीं। 1920 के ओलंपिक खेलों में 20 देशों की 139 महिलाओं ने टेनिस, तैराकी, तीरंदाजी, स्केटिंग तथा नौका दौड़ में हिस्सा लिया था। 1980 मास्को ओलंपिक में 22 प्रतिशत, 2000 सिडनी ओलंपिक में 38 प्रतिशत महिलाओं ने हिस्सा लिया था। रिकार्ड 2008 के बीजिंग ओलंपिक में 42 प्रतिशत महिलाओं ने हिस्सा लेकर इतिहास रच दिया। 2012 लंदन ओलंपिक में पहली बार सऊदी अरब की महिलाओं ने भी दस्तक दी। ओलंपिक के इतिहास में यह पहला अवसर था।

विश्व खेल परिदृश्य में भारतीय महिलाओं की भूमिका भी काफी अहम रही है। लास एंजिल्स के 1984 ओलंपिक में उड़नपरी पीटी ऊषा 400 मीटर बाधा दौड़ के सेमीफाइनल में अमेरिकन चैंपियन जूडी ब्राउन को हराने वाली पहली भारतीय महिला एथलीट बनीं। तब भारतीय खेल जगत में महिला शक्ति का दौर शुरू हुआ। कर्णम मल्लेश्वरी सिडनी 2000 के ओलंपिक खेलों तथा चाइना की वर्ल्ड वेटलिफ्टिंग चौंपियनशिप में पदक हासिल करने वाली पहली भारतीय महिला वेटलिफ्टर बनीं। भारतीय महिला खिलाड़ियों ने वर्ष 2010 के 19वें राष्ट्रमंडल खेलों और 16वें एशियाई खेलों में यादगार प्रदर्शन करते हुए देश के लिए एक तिहाई से ज्यादा पदक जीतें और अंतर्राष्ट्रीय स्तर पर कई प्रतियोगिताओं में देश का झंडा बुलंद किया। लंदन 2012 ओलंपिक में साइना नेहवाल और मैरिकाम ने भारत को पदक दिलाए। भारतीय महिला हॉकी टीम 2016 ओलंपिक के लिए पात्रता हासिल कर चुकी है। एथलीट अंजु बॉबी जॉर्ज, पहली महिला पर्वतारोही बछेंद्री पाल, महिला मुक्केबाज मैरिकाम, बैडमिंटन क्वीन सायना नेहवाल, सानिया मिर्जा, कोनेरू हंपी, झूलन, मिताली राज, अंजली भागवत, कुंजुरानी देवी और तैराक शिखा टंडन, ऐसी कई हस्तियां हैं, जिन्होंने महिला सशक्तिकरण का बेहतर उदाहरण पेश किया है। खेलों के माध्यम से लैंगिक समानता को बढ़ाने के प्रयास विश्व में पिछले कई सालों से हो रहे हैं। अंतर्राष्ट्रीय ओलंपिक समिति ने संयुक्त राष्ट्र संघ के साथ मिलकर लैंगिक समानता को बढ़ावा देने पर ज्यादा जोर दिया है। भारत सरकार ने भी खेल से संबंधित अनेक प्रकार के मुद्दों पर अध्ययन कर खेलों में महिलाओं की अपर्याप्त भागीदारी की कमी को दूर करने पर जोर दिया है।

छत्तीसगढ़ राज्य निर्माण के बाद लगभग सभी खेलों में महिलाओं की भागीदारी बढ़ी है। वर्ष 2010 में छत्तीसगढ़ में पहली बार राज्य खेल महोत्सव का आयोजन किया गया जिसमें विकासखंड स्तर पर इन खेलों में 24740 बालकों और 15036 बालिकाओं ने हिस्सा लिया। राज्य स्तर पर 2448 बालकों तथा 2060 बालिकाओं ने भागीदारी निभाई। इन आंकड़ों से यह स्पष्ट है कि छत्तीसगढ़ में खेलों के माध्यम से लैंगिक समानता में वृद्धि हुई है। जो अंतर्राष्ट्रीय ओलंपिक संघ की अवधारणा के साथ-साथ संयुक्त राष्ट्र संघ

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ORIGINAL ARTICLE

APPLICATION OF CRITICAL PATH ANALYSIS FOR TRANSPORTATION PROBLEMS IN RURAL DEVELOPMENT OF INDIA

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Abstract : Operations Research has benefited mankind in nearly all aspects of life; it tries to make usage of available resources. Health and education is the fundamental human right and it is the responsibility of the government to provide the Primary Education and Primary healthcare services to all people of India under various Social and Economic development plans. This article aims to explore the application of Operations Research Techniques to solve the problems related to the development of infrastructures to provide basic facilities in the rural area under different rural development programs of Government of India and make policies to implement those programs. Owing the scarce resources and increasing population, it has become more difficult to the government to provide primary education and quality healthcare services under so many limitations in Rural India. In this article, Network analysis (PERT/CPM) is applied to solve the Transportation problem in a cluster of Rural area together with concept of PURA model (VISION 2020 given by Dr. A.P.J. Abdul Kalam) for integrated development program in villages, that is, for the Social and Economic development in the complex village cluster. This scientific method of development of all types of facilities within a circular network road map is derived to minimize the travelling time of the people and hence to minimize the unemployment problem among the educated people driven by provision of habitat, education, primary healthcare services, skill development programs, physical and electronic connectivity and market development etc. A numerical example is discussed by using actual geographical structure of villages of Chhattisgarh State to show that how Scientific methods could be used to solve real life problems.

Key words : Transportation problem, PURA- VISION 2020 model, Network Analysis, PERT/CPM, Shortest Route method

1. Introduction

Operations Research (OR) is concerned with the conduct and co-ordination of activities within complex systems. Using tools like Network Analysis with PERT/CPM, Routing and Transportation, mathematical programming, decision analysis etc could be applied to study the consequences of alternative courses of action and to optimize performance of the system. Compared to many other organizations, healthcare services and education department have been slow in adopting Operations Research as a scientific technique to improve their performance. Operations Research provides rational basis for decision making by seeking to understand and structure complex situations as mathematical model and to use this understanding for predicting system behavior and improve system performance. Education department and Healthcare services have attracted a great attention of governments in order to provide an adequate healthcare service and Primary education to rural people under so many programs launched by Central government. Owing to scarce resources and increased population, it has become quite difficult to the governments, to provide essential education facility and quality healthcare services to their citizens, for the Social and Economic development under rural development program in India. Application of Operations Research techniques with its useful modelling of problems as OR problem will help to solve approximately all the real life problems. In this paper, problems related to primary education and quality healthcare services are dealt with. To maximize the fund utilization and minimize the unemployment among qualified personnel and also to improve the willingness of doctors and teachers to give their services in the villages, we have to develop some scientific methods.

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Degradation of Organophosphate Pesticides Using Pyridinium Based Functional Surfactants

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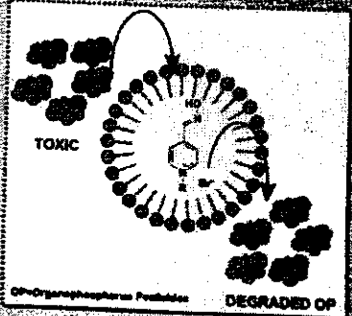
Supporting Information

ABSTRACT: The enhancement of environmental quality is one [illegible] principles [illegible] which points to less use of synthetic pe[illegible] chemical [illegible] offers an array of innovative approa[illegible] safe [illegible] of chemical transformation toward nonto[illegible] readily [illegible] under mild conditions. The development of new strategies for chemical decontamination of organophosphorus nerve agents and pesticides is an issue of immediate concern. Oximes have been demonstrated to find an application as [illegible] molecular systems. In this study, kinetic investigations have [illegible] the nucleophilic efficiency of the oxime-functionalized [illegible]hydroxyiminomethyl-1-alkylpyridinium bromide (alkyl = [illegible]) and 4-hydroxyiminomethyl-1-alkylpyridinium bromide [illegible] for the hydrolysis of the pesticides paraoxon (NPDEP) [illegible] in comicelles with the conventional cationic [illegible] and CDMEAB. Comprehensive study of the surface properties [illegible] equilibria of micellar systems composed of (i) functionalized surfactants and (ii) mixed functionalized/conventional [illegible] micelles has been carried out. The pK_a of studied nucleophiles in the presence of surfactants has also been [illegible] the comicellar effect of other surfactants, and the effect of alkyl chain length of functionalized [illegible] observed rate constants of cleavage of the studied organophosphates.

KEYWORDS: Organophosphorus pesticides, α-Nucleophile, Oximes, Functionalized surfactants



■ INTRODUCTION

The concept of sustainable development is in consonance with a safe environment and environmental protection due to [illegible] of all the land users guaranteeing a safe, [illegible] for humans and other living organisms. [illegible] Rio Declaration on Environment and Development [illegible] it has been pointed out that a crucial step to ensure [illegible] is to remove all negative factors leading to [illegible]. Enhanced environmental quality is one of the [illegible] of sustainable agriculture and follows lesser use [illegible] chemical fertilizers. Green chemistry [illegible] approaches for safe and efficient [illegible] transformation toward nontoxic and [illegible] mild conditions. Organophos[illegible] used as pesticides, insecticides, rodenticides, and other bioactive agents.[2] Due to the biological significance of these esters, their environmental implications and degradation have been extensively studied over the past decades. Exposure to even a small amount of organophosphorus compounds is fatal and may result in death due to respiratory failure. Despite the frequent efforts to limit the misuse and mishandling of toxic organophosphorus based pesticides, their toxicity resulted in 200,000 fatalities annually.[3,4] The inactivation of acetylcholinesterase (AChE) leads to improper functioning of the nervous system and finally to death.[5,6] Using organophosphorus (OP) compounds as

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pesticides and chemical warfare agents may lead to massive intoxication from suicidal and accidental events, or terrorist attack. In 1995, the religious sect Aum Shinrikyo used the nerve agent GB (sarin) to poison people on a Tokyo subway.[7] Sarin, delivered by rockets was used in the chemical warfare attack in Syria in 2013.[8] Chemical weapons still pose a serious concern in the age of terrorist activity and a risk of it being used by rogue states. There is no disagreement among chemists regarding whether a plant which produces OP pesticides can also be used to make nerve agents. Another example of misusing OP pesticides is the Project Coast program, launched in South Africa during apartheid. It aimed to develop a range of chemical and biological agents, including the pesticide paraoxon (NPDEP), being used as an assassination weapon in South Africa.[9] It is noteworthy that paraoxon is one of the most potent AChE-inhibiting insecticides available. In spite of being used as an ophthalmological medicine, it is now rarely used as an insecticide, due to the risk of poisoning to humans and animals. The name paraoxon is applied to two compounds: the 4-nitrophenyl esters of dimethyl- (NPDMP, or methyl paraoxon) and diethyl- (NPDEP, or ethyl paraoxon) phosphoric acid. The latter is usually called simply paraoxon; see Figure 1. In spite of the chemical similarity, the methyl and

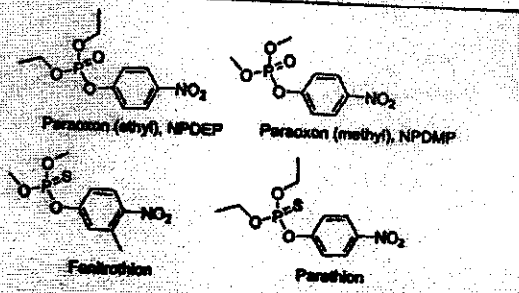


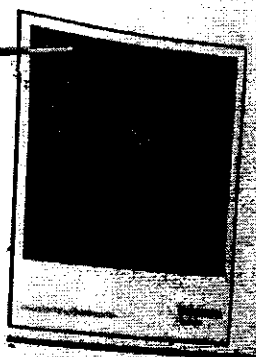
Figure 1. Examples of organophosphate based pesticides.

ethyl derivatives have been reported to demonstrate methyl vs ethyl group selectivity in some cases, e.g. to the sunfish,[10] whereas it has not been reported for mammals, e.g. mouse[11] and human.[12]

The facile hydrolysis of organophosphorus compounds (OP) is of theoretical and practical interest. Over the last few decades, a number of different approaches have been used to address the issue of detoxification/hydrolysis of such OP compounds. These include the reaction of these esters with some potent nucleophiles, e.g. oximes,[13,14] hydroxamates,[15−18] peroxides,[19] α-iodosocarboxylates,[20] etc. The therapeutic ability of pyridinium based oximes as antidotes has been illustrated under physiological conditions and in several cases of patients intoxicated with OP insecticides.[21] Numerous steps have been undertaken to develop a better nucleophile by the insertion of a nucleophilic moiety into the polar headgroup of surfactants to generate more efficient "functionalized surfactants" with high nucleophilicity and solubilizing power.[22−24] Functionalized surfactants belong to the class of most potent reactants in their ability to cleave the P−O bond in OP esters.[25−28]

For the last several years, ionic liquids (ILs) have grasped huge and ever-growing attention from both the scientific and industrial communities[30] in various fields, including their use in effective and selective extraction.[31] They are also utilized in designing composite systems for detection[32] of OP pesticides. Among the library of ILs, few ILs with long-chain alkyl groups are capable of self-assembling to form aggregates in aqueous solutions, these were studied meticulously because of their inherent amphiphilic nature and nowadays may be considered as promising environmentally friendly solvents for solubilization of sparingly soluble pesticides.[33,34] Recently reported progress in the development of IL based micellar-catalytic systems[35] and the versatile "benign by design" approach toward synthesis of biodegradable pyridinium ILs[36−39] opens wide opportunities for using sustainable microorganized ILs systems for pesticide degradation.

In spite of huge efforts devoted to design in the past several decades, and to synthesis and development of novel pyridinium oximes as potential antidotes for OP-intoxication, there were no fruitful advances in designing compounds effective against all kinds of nerve agents and other OPs. For the past few years, we have been involved in studying the catalytic potencies of various α-nucleophiles against hydrolysis of various esters in self-organized systems.[40−45] Earlier we reported the cleavage of phosphate and sulfonate (*p*-nitrophenyl toluene sulfonate, PNPTS) esters with pyridinium oxime based 3-series (3-C_n) and 4-series (4-C_n) functionalized surfactants.[41] The effect of cetylpyridinium bromide (CPB) was also studied on the rate of esterolytic reactions. In continuation herein, we have examined



Toxicology Mechanisms and Methods

Oxime-mediated in vitro reactivation kinetic analysis of organophosphates-inhibited human and electric eel acetylcholinesterase

Arvind Kumar Sahu, Rahul Sharma, Bhanushree Gupta, Kamil Musilek, Kamil Kuca, Jyotiranjan Acharya & Kallol K. Ghosh

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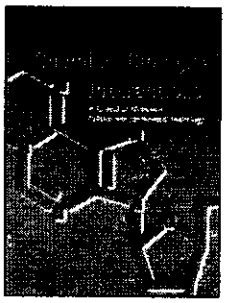

Synthesis and *in-vitro* reactivation screening of imidazolium aldoximes as reactivators of sarin and VX-inhibited human acetylcholinesterase (*h*AChE)

Rahul Sharma, Bhanushree Gupta, Arvind Kumar Sahu, Jyotiranjan Acharya, Manmohan L. Satnami, Kallol K. Ghosh

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Synthesis and *in-vitro* reactivation screening of imidazolium aldoximes as reactivators of sarin and VX-inhibited human acetylcholinesterase (*h*AChE)

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Abstract

Post-treatment of organophosphate (OP) poisoning involves the application of oxime reactivator as an antidote. Structurally different oximes are widely studied to examine their kinetic and mechanistic behavior against OP-inhibited cholinesterase enzyme. A series of structurally related 1,3-disubstituted-2-[(hydroxyiminomethyl)alkyl]imidazolium halides (**5a-5e, 9a-9c**) were synthesized and further evaluated for their *in-vitro* reactivation ability to reactivate sarin- and VX- inhibited human acetylcholinesterase (*h*AChE). The observed results were compared with the reactivation efficacy of standard reactivators; 2-PAM and obidoxime. Amongst the synthesized oximes, **5a**, **9a** and **9b** were found to be most potent reactivators against sarin-inhibited *h*AChE while in case of VX only **9a** exhibited comparable reactivity with 2-PAM. Incorporation of pyridinium ring to the imidazole ring resulted in substantial increase in the reactivation strength of prepared reactivator. Physicochemical properties of synthesized reactivators have also been evaluated.

Keywords:- Organophosphates, Acetylcholinesterase, Oximes, Antidote, Reactivators, Reactivation kinetics.

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Metallosurfactant Aggregates as Catalysts for the Hydrolytic Cleavage of Carboxylate and Phosphate Esters

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Santanu Bhattacharya

Abstract: Metallosurfactant aggregates have grasped a great attention of researchers worldwide owing to their unique surface activity and catalytic efficiency. They serve themselves as perfect blends of both surface science and metallo-organic chemistry. Metallosurfactant aggregates have a variety of fascinating applications like in drug delivery, membrane mimetics, in various separation methods and most importantly in catalytic cleavage of various toxic esters. Due to the resemblance in the catalytic property of metallosurfactant aggregates with natural enzymes they are broadly employed as metalloenzyme mimics for the hydrolysis of activated carboxylic esters, phosphate esters and amides in general laboratory settings. This review summarizes the design and syntheses of metallosurfactant aggregates and their role as proficient catalysts for the hydrolysis of different esters. Special emphasis is given toward the development of structurally diverse surfactant type ligands and use of variety of metal ions specifically for the hydrolytic cleavage of carboxylate and phosphate esters. Generally, the catalytic strengths of numerous synthesized metallosurfactant aggregates have been quantized by exploring kinetic investigations. Hence, a brief account on the quantitative treatment of rate data with the help of kinetic models has also been presented.

Keywords: Carboxylate esters, catalysis, hydrolysis, metallosurfactant aggregates, phosphate esters, vesicles.

1. INTRODUCTION

[illegible] amphiphiles have gained a widespread attention of [illegible] worldwide due to their remarkable ability [illegible] acceleration of a number of reactions [1]. [illegible] carbohydrates, peptides, metals etc into the [illegible] of an amphiphile results in the formation of [illegible] class of surfactants, which can aggregate into various supramolecular assemblies [2]. The idea of developing met[illegible] by metalloenzymes, which ex[illegible] efficiency for various hydrolytic cleavage reactions [illegible]. Many hydrolytically active metal[illegible] organisms as carboxypepti[illegible] and is well known for its catalytic potential [6]. The outstanding catalytic strength of these enzymes has motivated scientists to focus on the de[illegible] of new class of metal complexes that can [illegible] of enzymes. Numerous investigations [illegible] to recognize the factors that govern the rate [illegible]. Accordingly, attempts have been [illegible] like metallomicelles [7-10]. Metal[illegible] are recognized as effective Lewis [illegible] hydrolysis of carboxylate and phos[illegible] co-ordinate with C=O and P=O [illegible] of [illegible] esters thus serve themselves as potent [illegible] hydrolysis reactions [11]. They may be also [illegible] important chemical reactions such as hydrogenation [12, 13], Diels-Alder reaction [14-16], aldol type reactions [17, 18] *etc*.

Since, carboxylate and phosphate esters play crucial role in various important biochemical processes, hence their hydrolysis are broadly studied [1, 3, 11, 19]. Phosphate esters, mainly mono- and di-esters are ubiquitous in nature and are essential component of coenzymes, genetics materials, energy reservoirs etc. Phosphodiesters are quite resistant to hydrolysis, thus necessitates such a synthetic system, which can mimic catalytic activity of enzymes for the cleavage of phosphate esters [20]. Similarly, carboxylic esters and their hydrolysis also have significant role in various biochemical reactions [21]. Some common carboxylate and phosphate esters are presented in Scheme 1. Owing to the importance of these reactions, several research groups are engaged in developing competent functionalized catalytic systems [22, 23]. However, imitation of structure and function of natural enzyme active sites in the form of synthetic system is a challenging task and metallosurfactant aggregates may mimic only some important features of the enzymes. They combine the properties and functions of both metalloenzymes and micelles. Therefore, these are interesting candidates, which can simulate hydrophobic microenvironment and act as novel supramolecular vehicles to mimic enzyme active sites.

The present review is focused on the catalytic potency of metallosurfactant aggregates for the hydrolysis of carboxylate and phosphate esters. Early examples of metallosurfactant aggregates for enhanced rate of hydrolysis reaction are described in detail. The role of synthetic metallovesicles for the breakdown of esters has also been discussed. Further, the

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Manju Kapur and Jhumpa Lahiri: Indian Vs. Immigrant Experiences

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Asst. Prof. (Guest Faculty in English)
SOS in Literature & Languages
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Chhatisgarh
India

Abstract- Literature celebrates differences- differences in perception and expression. The huge wealth of the world's literary output is richer due to the immense variety and array of intellectual and creative enterprise captured within the covers of thousands of books. Writers come from myriad backgrounds and sensibilities and they portray their experiences as man through their works. View points, levels of perception, attitudes, mindsets, sympathies, leanings of people are always different. The core issues on which conflicts arise are also based on differences. Thus one can credit difference with richness of output.

Whether we take Manju Kapur and Jhumpa Lahiri, or any other two novelists, they are bound to have several differences. Differences lie not only in language and style of narration, but also some major differences can be seen in the depiction of character. The difference between these two writers is that of their base, yet similarities too abound.

Expression, use of language, idiom differ from one writer to another. Though the alphabet and the words are the same, the usage changes from one creative writer to another. Man's genius can be measured by range and volume of his intellectual output. The genius of a creative work is gauged by the number of people it can touch and influence. Different writers, different works, different audiences- the world full of different people, an ode to difference!

Critics go berserk in trying to actually fit a work of art with a fixed meaning. Differences abound in appraisal and appreciation Peter Barry in *Beginning Theory* declares:

> The meanings within a literary work are never fixed and reliable, but always shifting, multifaceted and ambiguous. In literature as in any